

REVIEW AND APPROVAL

MODOC NATIONAL WILDLIFE REFUGE

ALTURAS, CALIFORNIA

ANNUAL NARRATIVE REPORT

CALENDAR YEAR 1989

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5/15/90
Date

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5/14/90
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Regional Office Approval

5/10/90
Date

ARD - Refuges and Wildlife

INTRODUCTION

The 6283 acre Modoc National Wildlife Refuge (NWR) is located along the south fork of the Pit River in Modoc County, just south of the town of Alturas in extreme northeast California. The refuge is bordered on the east side by the Warner Mountains. This impressive range rises to an average elevation of 8000 feet, and contains harvestable stands of pine and fir trees. This mountain range is also the principal watershed for the entire valley west of it, including the refuge. The country south, west, and north of the refuge is a variety of rolling hills, canyons, and plateaus with a sagebrush/juniper vegetative community.



Goose Pond with the headquarters and Warner Mountains in the background. MDC 1483, 4/2/85, WRR.

Geographically, the refuge is located on the western edge of the Great Basin Desert, resulting in a rather severe climate. Cold, wet winters (temperatures of -40° F have been recorded) and cool, dry summers are the rule. Drought and flooding conditions are quite common and both have been known to occur during the same year.

The refuge itself consists of irrigated meadows, natural flood plains, marsh communities, and sagebrush/juniper uplands. Soil types are basically heavy clays having a high alkalinity. Black alkali surrounded by salt concentrations are not uncommon on the poorly drained areas of the refuge.

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A. HIGHLIGHTS

- A "normal" water year after three years of drought results in a full reservoir (Section B).
- Record low numbers of waterfowl result in low production and a poor waterfowl season (Section H).
- The refuge began a cooperative "catfish condo" program with California Department of Fish and Game (Section G).
- The refuge becomes involved with "T.E.A.C.H.", a state funded youth program (Section E).
- Water rights issue becomes a major problem (Section F).

B. CLIMATIC CONDITIONS

After two years of drought conditions, the refuge was blessed with a normal water year. The winter snowpack was sufficient to fill Dorris Reservoir by mid-May, which provided ample water for the refuge through the growing season and allowed normal fall flood up for migrating waterfowl.

Precipitation for the year was near normal with a total of 12.02 inches occurring by December 31 (Table 1). This amount is .51 inches below the average expected to occur in a normal twelve month period. Although the total was slightly below normal, the frequency of major storms was spread out to provide sufficient moisture for our dry land farming program which had excellent germination and seed production.

March was the wettest month of 1989, with a total of 2.15 inches of precipitation, most of it in the form of rain. July was the only month that had no measurable precipitation during the course of the year. The record high temperature occurred on July 20 when the mercury climbed to 96 degrees Fahrenheit. This summer was considered to be rather mild with most high temperatures in the low to mid 80's. A record low temperature occurred on February 5 when it dipped to -33 degrees Fahrenheit! This is about as cold as it can get in this country and frozen/broken water lines were a daily occurrence for several days. This winter will go down as a record cold one, with a total of 21 days of below zero temperatures!

Dorris Reservoir, the refuge irrigation reservoir, was at a low of 3177 acre feet of storage on January 1. The snowpack was sufficient to bring the reservoir up to its maximum storage of 11,100 acre feet by mid-May. Normal drawdowns for irrigation water reduced the level of the reservoir to a low of 4646 acre feet by the end of November.

Throughout the course of the year, a total of 7460 acre feet of water was discharged from Dorris Reservoir. This water was used for meadow irrigation, stock water and pond maintenance.

The current snowpack in the Warner Mountains is considerably below normal for this time of year. Long range weather forecasts are predicting below normal precipitation which tends to give the upcoming water year a rather bleak outlook. Hopefully, enough spring storms will occur to provide us with sufficient runoff to squeak through what looks like yet another dry year.

Table 1. Temperature and precipitation during 1988 at Modoc NWR.

Month	TEMPERATURE		PRECIPITATION	
	Maximum (°F)	Minimum (°F)	Total (inches)	Snow depth (inches)
January	52	-17	1.43	11.0
February	55	-33	1.00	9.0
March	61	4	2.15	3.0
April	80	21	0.74	1.0
May	84	19	1.80	1.0
June	87	31	0.37	0.0
July	96	31	0.00	0.0
August	91	34	1.07	0.0
September	87	29	1.48	0.0
October	83	14	0.58	0.0
November	71	13	1.17	2.0
December	60	8	0.23	0.0
Totals			12.02	27.0

C. LAND ACQUISITION

1. Fee Title

In August, the Manager was approached by a local citizen who wished to sell the Service a 120 acre parcel known as the "Stephen's Ranch". This parcel is adjacent to the refuge on the east side and included a 40 acre inholding along with 80 acres of wet meadows through which the refuge canal passes through. Since acquisition of this parcel would eliminate some serious hunting problems, water rights problems and provide 120 acres of wet meadows for goose browse and sandhill crane production, a request for acquisition was submitted through our associate manager. Initial approval was granted and an appraiser has been assigned to the project. Although an official appraisal is still forth coming, it is hoped that it is sufficient to meet everyone's needs so the refuge can acquire this valuable wetland. This parcel also contains a relatively new split level 2 bedroom house which could be utilized as quarters for the assistant manager position.



Overview of "Stephen's" Parcel. MDC 2571, 02/26/90, ECB

D. PLANNING

2. Management Plan

The Fire Management Plan, as called for under Part III of the Refuge Management Plan was updated, revised and submitted for approval this year. This revision will bring Modoc NWR's fire plan into compliance with the Refuge Manual.

3. Public Participation

The refuge staff has continued to meet periodically with the Modoc County Fish, Game and Recreation Commission and the Organized Sportsmen of Modoc County. Items discussed included: waterfowl populations and hunting seasons, sandhill crane management, waterfowl production and fisheries management. In addition, the assistant manager spent a considerable amount of time working with a local task force addressing the impacts to the refuge (and county) from a proposed prison. This prison, if approved, is expected to double Alturas' population within three years. The projected increase in population would have a definite effect upon the refuge in the form of increased public use. This increase in use, along with possible restrictions, was explained to the task force which in turn incorporated the information into its final report.

E. ADMINISTRATION1. Personnel

1 2 3 4 5 6
MDC-2573, 12/01/89 CB

1. E. Clark Bloom - Refuge Manager GS-11 PFT EOD: 02/74
2. David A. Hardt - Assistant Refuge Manager GS-09 PFT EOD: 12/88
3. Sharon L. Storm - Refuge Assistant GS-05 PFT EOD: 06/88
4. Bradley M. Storm - Maintenance Worker WG-08 PFT EOD: 09/88
5. Lyle L. Burgoyne - Maintenance Worker WG-06 CS EOD: 06/76
6. Kevin J. DesRoberts - Biological Technician GS-05 TFT EOD: 04/89

No major personnel changes occurred in 1989. Our temporary biological technician position was filled by Kevin DesRoberts of Rock Hill, Connecticut. Kevin's duties included monitoring sandhill crane and Canada goose nest success, rocket netting and banding sandhill cranes, duck banding, pesticide application for hemlock and scotch thistle control. Kevin also had his carpentry skills put to the test when he was assigned the task of modifying the office restrooms to fit handicap access criteria (see Section I-2). He also had the illuminating experience of substituting as supervisor for one of the two T.E.A.C.H. (Training, Employment and Community Help) enrollees the refuge hosted during the summer (See Section E-3).

The following table depicts a five year comparison of on-board strength for Modoc NWR.

Table 2. Staffing levels at Modoc NWR for the past five years.

Year	Permanent		Temporary
	Full Time	Part Time	
1989	4	1	1
1988	5	1	2
1987	4	1	1
1986	5	1	1
1985	5	1	1

3. Other Manpower Programs

Two T.E.A.C.H. enrollees were hosted on the refuge during the summer from July 10 through August 18. Gina Haslett used her clerical skills to help in the office. Gina worked two days a week and helped the refuge assistant with a variety of typing jobs, including: entering management plans on to computer disks for easier updating in the future, typing file lists for the refuge manager and assistant manager's offices, organizing band return printouts, and stamping hunting leaflets with new 25 shell limit regulation. Gina was a good, conscientious worker and a refreshing addition to the refuge staff.

The other T.E.A.C.H. enrollee was Christopher Calhoun who was hired to assist the maintenance crew and biological technician with a variety of projects. Chris was assigned to assist with projects such as tree planting along the riparian areas, light vehicle maintenance, fence repair, trash collection around Dorris Reservoir, painting and some simple biological tasks. We soon learned that Chris severely lacked motivation and would not respond to any supervisory techniques we tried. In addition to lacking motivation, he refused to recognize the need for the slightest attention to detail on any project undertaken. After consulting with past employers and teacher, we found that this trait had been common in all previous situations.

While Chris had been hired to assist with completing station projects, his lack of commitment caused numerous setbacks and delays in accomplishing necessary tasks. Prior to selecting T.E.A.C.H. employees, numerous candidates were interviewed. Although Chris was not at the top of the list nor our choice for a maintenance worker, he was the individual selected by T.E.A.C.H. to be placed at Modoc NWR. In future years, we will only accept the individuals that we select or we will not fill the position through the program.

4. Volunteer Programs

Lois N. Bloom donated 40 hours of her time handling information requests and preparing interpretive material for the refuge which is used during outdoor classroom programs. She also assisted the refuge manager on two breeding bird surveys.

Clint McCarthy, wildlife biologist for the Supervisor's office of Modoc National Forest, and Vanne Mocilac of Alturas, California volunteered a total of 48 hours assisting with mist net procedures. Clint and Vanne were instrumental in helping to provide complete coverage of the fall migration period. Six extra days of mist netting were completed thanks to their efforts.

Approximately 20 members of the Organized Sportsmen of Modoc County spent one very cold Saturday morning in February hauling juniper tree limbs out onto the ice at Dorris Reservoir where they were wired together and weighed down to provide cover for fish fry after spawning. Although it was really cold that morning (temperature range was -19° to 20° F), six brush piles were weighed down at key spots on the reservoir. There were no known cases of frostbite during the operation although it was highly suspect at times.

A California Department of Corrections work camp crew of ten inmates spent approximately three weeks working on the refuge this year. The first project involved cutting and placing juniper limbs in piles at Dorris Reservoir for spawning/fry habitat. The second project included constructing conservation easement boundary fence on the Russell property which is now under easement by the refuge. This project was completed to keep livestock out of the easement area.



Members of Organized Sportsmen of Modoc County working on a brushpile at Dorris Reservoir. MDC 2391, 2/4/89, ECB

5. Funding

Because of budget cuts, we were not able to hire a temporary equipment operator. Consequently, many of the projects we had hoped to accomplish were put on hold. Also, a sandhill crane telemetry study earmarked for 1989 had to be postponed for future funding.

The following table depicts Modoc's funding levels for the past five years.

Table 3. Funding levels at Modoc NWR for the past five years.

Year	1270 (ADC)	1240 (Fire)	1260	1520 (YCC)	8610	Large ARMM*	6860	Total
1989	n/a	500	226,200	n/a	5,300	n/a	5,000	237,000
1988	n/a	500	225,900	n/a	4,700	55,000	5,000	291,100
1987	n/a	500	309,400	n/a	2,200	50,000	7,000	369,100
1986	500	500	198,700	n/a	1,800	158,500	7,000	367,000
1985	500	500	169,400	10,680	1,800	110,100	7,000	299,980

*This column denotes other than normal funds or "earmarked" funds such as the 55K in 1988 to buy a new farm tractor.

6. Safety

Safety meetings were held every month in an effort to increase safety awareness among staff members, thereby decreasing accidents on the refuge. Although the staff's attitude is generally safety conscious, we had a bad year for vehicular accidents. These accidents are summarized as follows:

On 06/07, Biological Technician Kevin DesRoberts rolled a Service-owned vehicle off a dike while conducting a bird survey. Kevin's attention was on a group of birds that flushed and neglected to bring his vehicle to a complete stop before he started counting the birds. The vehicle slowly edged off the dike where the shoulder was badly eroded. No injuries were sustained in this accident. Kevin was instructed to pay closer attention to surroundings and to bring the vehicle to a complete stop. The dike was mowed to improve visibility of the road shoulder. Damage was estimated at \$50.

On 09/29, Refuge Assistant Sharon Storm was involved in a two vehicle accident during her daily trip to town to get the mail. Sharon was leaving the post office parking lot and while making the turn, packages that were stacked on the seat started to fall. She briefly turned her attention to trying to stop the packages from falling. When she glanced up again, there was a vehicle stopped on the road making a left hand turn. Sharon was also instructed to pay closer attention to surroundings and complete the Defensive Driving Course. Damages amounted to \$629 for the refuge vehicle and \$1438 for the vehicle struck by Sharon.

F. HABITAT MANAGEMENT

1. General

Modoc NWR is geographically located on the western edge of the Great Basin Desert. Habitat consists of typical stand of sagebrush and juniper trees on the drier sites. Rabbitbrush, greasewood, and saltgrass associations are typically located on the poorer drained, more alkaline areas, while reed canary grass intermixed with sedges and juncus are common around the marsh units and on the wet meadows. These basic habitat types are considered to be climax communities and as such are very stable unless disturbed by a modifying factor, such as fire or very heavy grazing.

Significant habitat modifications this year involved two prescribed fires (Section F-9) and enhancement of riparian areas through a tree planting project (Section F-6).

2. Wetlands

Refuge wetlands exist within, and are derived from, a very complex irrigation system. The entire area is managed through the use of a water conveyance system which includes an 11,100 acre foot storage reservoir, 20 miles of major canals, 50 miles of minor ditches, a river, a creek, and several pond and marsh units. Water control structures within the system range in size from eight inch pipes to 60 inch corrugated metal pipes with attached risers to multiple-bay concrete dams.

This system provides water for the entire wetland area and is managed to produce the maximum of benefits with a minimum of labor. Planned annual operations included maintaining non-fluctuating water levels throughout the marsh/pond system while supplying a continuous flow of fresh water. Meeting these two objectives has helped to keep diseases such as botulism from becoming a problem and at the same time provides tremendous amounts of aquatic plants for utilization as a food source by waterfowl.

4. Croplands

Modoc NWR's farming program is conducted entirely by force account and is aimed at providing cereal grain for migrant waterfowl during the fall. Normally grain fields are rotated on an annual basis between winter wheat and spring plantings of barley. During 1989, a total of 83 acres were planted in winter wheat and 157 acres in barley. Additionally, 85 acres of the Town Grain Field were planted in rye.

The largest planting of winter wheat was in the South Grain Field with 60 acres being seeded to replace wheat lost last winter to prolonged flooding. Additionally, 23 acres of wheat were planted in the Matney Field. Eighty acres of barley were planted in the North Grain Field followed by 77 acres in three units of the Matney Field. Barley and rye fields are planted at a rate

of 100 lbs./acre with wheat being seeded at a rate of 110 lbs./acre. Both of these planting rates provide good dense stands of grain for waterfowl food and cover.

5. Grasslands

Modoc NWR has 3000 acres of grasslands; 1000 acres are of the "bunch grass" type intermixed with sweet clover and cheatgrass which can be found on the better drained areas of the refuge. This community type is managed solely for waterfowl production, and is kept in an undisturbed state with no haying or grazing practices permitted.

The remaining 2000 acres are maintained as irrigated meadows in order to provide succulent green browse for Canada geese. In addition, these wet meadows provide excellent nesting habitat for sandhill cranes, rails, snipe, and phalaropes. Cinnamon teal also utilize these meadows to a lesser extent for nesting purposes.

The 22 acre Foxtail Field which was planted to rye in 1988 received good use by geese throughout the spring and by deer most of the year.

6. Other Habitats

A sagebrush/greasewood plant community is present around Dorris Reservoir, along the Pit River, and adjacent to the low, poorly drained, alkaline areas on the refuge. These areas are also in a non-use status by livestock and provide some fair to good cover for quail, pheasants, and numerous species of passerines.

The riparian habitat associated with Pine Creek, which passes through the refuge for three miles has been in non-use status since 1983. Since the elimination of cattle grazing, the understory of willows and multiflora rose has improved significantly. An established overstory is present only along a 1/4 mile section of the creek and an understory is present intermittently along the entire three miles. Over the past five years the refuge has attempted to improve the riparian habitat associated with the creek by planting various species of trees and shrubs with varying degrees of success. This year, 200 trees were planted on the refuge including: 100 golden willow, and ten each of amuir maple, buffaloberry, chokecherry, cotoneaster, black locust, crabapple, Italian hybrid poplar, Jeffrey pine, ponderosa pine and five each; sand cherry and sumac.

The willow and a majority of the buffaloberry, chokecherry, black locust, crabapple, sand cherry, sumac and poplar were planted along Pine Creek while the maple, cotoneaster and both pine species were planted around Subheadquarters. A display plot representing several of these species was planted adjacent to the visitor kiosk at the refuge headquarters.

All seedlings were purchased from the Central Modoc Resource Conservation District for \$1.00 each.

7. Grazing

The main objective of the grazing program has been to encourage growth of succulent green browse for migrating Canada geese during the fall and spring. This practice also provides nesting, feeding and loafing habitat for sandhill cranes. To a lesser degree, the grazing program also provides loafing and feeding areas for the resident flock of honkers, keeping them off neighboring ranches as much as possible.

Grazing permits were issued to four permittees during 1989. John Younger was issued a permit for both summer and fall grazing on the Ebbe tract while Warren Weber and Bob Schluter received permits for fall grazing only. Weber's permit was for the Pine Creek Field while Schluter had permits for the Town and West Hansen fields.

Rates for these three permittees were based on a rate survey conducted in 1987 that established the fair market value for summer grazing at \$9.50/AUM and the fall grazing (October - November) rate at \$7.50/AUM. These rates were unchanged from those of last year since no rate survey was conducted in 1988.

Sean Curtis was issued a permit for fall grazing of the Bayley Field on the basis of being high bidder with a bid of \$10.05/AUM. This was the second year of a three year permit for Curtis to graze this field. This permit was the second to be issued on the basis of a bid system. This system was chosen to reduce complaints by permittees that refuge rates are too high, and to better reflect the real "market value" of this commodity. Long term permittees who were granted "grandfather" permits when the refuge was established will continue to have their permit rates based on rate surveys.

A rate survey was conducted in November to establish a fair market rate for the 1990 grazing season. The results of this survey indicated that an increase of \$1.00/AUM was warranted for both summer and fall grazing to bring refuge grazing rates in line with those of comparable private leased land in the local area. This increase will bring the summer rate to \$10.50/AUM and the fall rate to \$8.50/AUM.

During the 1989 grazing season, a total of 1027.49 AUM's valued at \$8,296.55 were removed.

8. Haying

Approximately 2000 acres of irrigated meadows exists on the refuge, of which roughly 1600 acres are hayed annually. The haying program, combined with the grazing program, is an effective and economical tool used to provide short green browse for Canada geese. The resulting short vegetation the following spring also allows the water in the meadows to warm sooner, thereby providing an abundant food source of invertebrates which are so important to nesting sandhill cranes.

Seven hay permits were issued in 1989, two of which were grandfather permits and five were awarded to high bidders. Grandfather permits were set at

\$12.00/ton based on a rate survey conducted in 1987, while high bids were \$5.00, \$13.00, \$13.65, \$15.05 and \$17.26/ton. A total of 2074.05 tons of meadow hay were harvested for a total revenue to the government of \$24,216.61. A fair market rate survey was conducted in November to determine the rate for refuge hay permits for the 1990 season. The results of the survey indicated that no change was indicated from the current rate of \$12.00/ton.

9. Fire Management

Three prescribed burns were conducted during the year with a total of 102 acres being treated.

Pine Creek - This burn was conducted on April 5 to remove a dense 10 acre stand of reed canary grass that was hindering the flow of irrigation water on the north end of the South Pine Creek Field.

Pit River Flood Plain - This 80 acre burn was accomplished on September 15 and included the marsh area located between the Pit River and the Highline Canal. The purpose of this burn was to remove nearly continuous stands of juncus and reed canary grass which had become rank following three years of non-manipulation. Utilizing both backing and head fires, a very satisfactory burn was accomplished which provided good foraging habitat for cranes in the early fall and geese and shorebirds during the fall and winter.

House Field - On September 15, this 12 acres burn in the southwest portion of the House Field was conducted to remove vegetation that was not removed by haying, thus providing good quality browse for cranes and geese. This field received excellent use by geese throughout the fall and winter.

No wildfires were reported on the refuge during this past year.



Pit River Flood Plain fire in progress.

MDC 2577, 09/15/89, DAH

Maintenance Worker, Brad Storm, completed the S-390 course at Boise Interagency Fire Center from 12-18 February and became a real asset to the fire management program on the refuge. Extensive prescribed burns are planned for 1990.

10. Pest Control

The refuge again participated in a cooperative program with Modoc County to control scotch thistle on the refuge. This is a cooperative program in which the refuge pays for one-third of the cost of chemicals, use of equipment and county labor to control thistle on portions of the refuge that our own staff are unable to treat. In 1989 the refuge paid \$222.33. For the past two years the chemical of choice by the county has been "Banvel" which appears to work well.

Over the past 12 years, the refuge has experienced a problem with an infestation of poison hemlock. This pest has spread throughout much of the refuge, infesting areas of disturbed soil as well as along levees, ditch banks and road shoulders. The quality and quantity of waterfowl nesting cover has been substantially reduced in areas where hemlock has become established.

In an attempt to control this noxious weed, a spraying program was initiated in 1983 utilizing the herbicide Rodeo. This program continued in 1989 with approximately 1000 gallons of one percent diluted spray being applied,

primarily along Pine Creek. Additionally, a small portion of this spray was used to spot treat stands of scotch thistle.

While Rodeo is an efficient control chemical for hemlock, it is also a non-selective herbicide which eliminates all herbaceous plants within the area sprayed. This may in fact contribute to better stands of hemlock the following year by removing all competition from these sprayed plots.



Typical results of Rodeo on poison hemlock.

MDC 2466, 06/22/89, ECB

In 1989 two tests were conducted to identify techniques to reduce this possible impact. The first test utilized earlier spraying of Rodeo after the hemlock had sprouted but before the annual grasses emerged, thus only killing the hemlock. The second used the selective herbicide Garlon.

Both appeared to provide satisfactory results but we will have to evaluate the test plots in the spring before making any significant changes in our hemlock control program.

Dupont Hyvar X-L was again used around the visitor kiosk and parking areas to control the growth of weeds and grasses.



Biological Technician Kevin DesRoberts spraying a scotch thistle patch with experimental Garlon solution.

MDC 2455, 06/09/89, ECB



Same plants as shown being treated by DesRoberts. These plants ultimately recovered and had to be re-treated with Rodeo.

MDC 2469, 06/22/89, ECB

11. Water Rights

Modoc NWR is fortunate to have secure water rights on two creeks which drain portions of the Warner Mountain watershed lying east of the refuge. The refuge retains 52 percent of the total water rights within the Pine Creek irrigation district, the major water source for the refuge. A significant water right is also possessed on Parker Creek. Winter-time diversions from both of these creeks are used to fill Dorris Reservoir. These stored waters are utilized during spring and summer to irrigate refuge hay meadows and maintain ponds and marshes at stable levels.

Refuge water rights are enforced through a state watermaster service which cost \$5,076.00 this year. In 1986 the state watermaster suggested that we apply for a change in "purpose of use" on our water right decree for Pine Creek since the original purpose of use was for "Agriculture". It was suggested that we request that "wildlife and recreation" be added to our purpose of use. We complied and submitted an application in 1987. Upon receiving notification of our application, virtually every water user on Pine Creek and several downstream users on the Pit River filed a protest.

Engineer Richard Johnson in the Regional Office Division of Engineering responded to these protests and a hearing was originally scheduled for January, 1989. This hearing was rescheduled for December, 1989, however, a pre-hearing was held in its place on December 7, in Alturas to give the protestants an opportunity to voice their opinions and have individual specific questions answered. The pre-hearing was conducted by three representatives from the California Department of Water Resources and was chaired by a member of the Water Resources Board. Prior to this meeting, a tour of the refuge water system was conducted by refuge personnel on December 6 to let all interested parties become familiar with how water is used on the refuge.



Part of water rights group touring refuge water system.
MDC 2516, 12/06/89, ECB

Many of the Pine Creek water users who had protested learned that there was no basis for their protests and have tentatively agreed to withdraw pending an agreement that the refuge will not maintain refuge pond levels by direct diversion from Pine Creek. Such an agreement has yet to be finalized.

Downstream water users on the Pit River are less amiable and plan on pursuing this issue to an official hearing which is scheduled to occur sometime in June, 1990 in Sacramento, California. Their major concern is that they consider our refuge ponds to be secondary storage and thus violates the refuge's legal water storage limit. The Service maintains that as long as these ponds are not drained and refilled on an annual basis, we are not violating our legal storage limits.

G. WILDLIFE

1. Wildlife Diversity

The diversity of habitat types that exist throughout Modoc NWR supports a high diversity of wildlife species. At least 240 species of birds have been observed and 78 species have been documented as nesting on the refuge. The riparian corridor along Pine Creek offers the highest diversity of wildlife habitat and continues to be enhanced through plantings, protected from grazing with fencing, and monitored for species trends.

2. Endangered and/or Threatened Species

Two federally listed species of raptors in this category utilize the refuge; the bald eagle and the peregrine falcon.

Bald eagles chiefly use the refuge as a wintering area, often foraging on ducks and geese crippled during hunting season. The number of eagles peaked in December, with one pair and a juvenile being present. Total use days for the year were about 320.

Peregrine falcons use of the refuge has been documented in the past on rare occasions; with the most recent being 1988. However, no peregrines were sighted this year.

3. Waterfowl

a. Ducks

Corresponding with presently low population numbers, duck utilization of the refuge declined 30 percent from the previous year and was about 12 percent below the five year average. Total use days for the year were about 1,087,421. The number of ducks on the refuge peaked during October, with about 13,155 being present (before hunting season).

Lesser scaup was documented as nesting on the refuge for the first time. Two broods were observed on many occasions in Little Teal Pond.

A surf scoter was sighted in October on one of the 395 ponds. This was the first observation of this species utilizing the refuge. This bird was harvested during the hunting season, providing absolute documentation of its occurrence on the refuge.

Duck production declined 34 percent from the previous year and was 33 percent below the five year average.

The following table depicts estimated duck production on Modoc NWR for the past five years.

Table 4. Estimated duck production on Modoc NWR 1985-1989.

Species	Objective	1989	1988	1987	1986	1985
Mallard	2000	861	1825	940	1513	1748
Gadwall	1800	625	860	351	1710	1556
Northern Pintail	500	55	150	55	157	172
Cinnamon Teal	2500	555	605	775	1511	2054
American Wigeon	200	39	95	61	255	92
Northern Shoveler	200	398	440	199	522	175
Redhead	600	351	510	360	921	562
Ruddy Duck	300	381	445	125	225	107
TOTALS	8100	3265	4930	2866	6814	6466

b. Geese

Goose utilization of the refuge was fairly consistent with the previous year. Use days totaled an estimated 636,709, only 5 percent lower than 1988. Great Basin Canada geese numbers peaked at about 3800 during September and represented 96 percent of the total use days. White-fronted geese numbers peaked at about 120 in April and represented 1.4 percent of the total use days. Cackling Canada geese numbers peaked at about 400 in April and represented 2.4 percent of the total use days. Snow geese accounted for less than .02 percent of use days.

Goose production increased by 15 percent over 1988 and remained consistent with the five year average. The estimated total production for the refuge was 1230. Nesting success surveys resulted in a 59 percent success rate. The average brood size was 5.42. The main portion of the refuge attributed to 91 percent of the total production and Dorris Reservoir attributed 9 percent.

Goose production continues to be hampered at Dorris Reservoir by high incidence of predation and recreational disturbances. Nest sites located on peninsulas resulted in high nest failure and adult mortality due to easy access by predators, especially dogs and coyotes. Island nests were often disturbed by fisherman, resulting in abandonment and increased nest predation. Nesting surveys conducted at Dorris resulted in a 36 percent success rate.

During April, ten neck-collared Cacklers were observed in a flock of 400 at Dorris Reservoir. All band code numbers were identified and recorded. These cacklers were part of a neckband project initiated in 1982 to examine changes in survival, movement, and distribution of cackling Canada geese.

c. Swans

Tundra Swans utilize the refuge primarily during migration and as a wintering area. Use days for 1989 totaled to about 9340, with a peak number of 200 swans being present in February and March.

4. Marsh and Water Birds

Seventeen species of marsh and waterbirds utilized the refuge throughout the year for a estimated 64,864 use days. Peak numbers occurred during July with about 563 birds present, represented by 15 species.

White-faced ibis nesting on the refuge was documented for the first time. During the middle of June, twenty-two nests were randomly located in the bulrush stands in Teal Pond. Five nests appeared to be still in the construction phase or abandoned. The average clutch size of 17 nests was 3.41. Based on the number of ibis that were observed while conducting the survey there were an estimated 40 to 50 active nests. When nest sites were revisited in July juvenile birds had already fledged, indicating that hatching occurred within a week after the nests were located. A few nests were found containing dead juvenile birds. Cause of death could not be determined. It was apparent that a good number of nests were successful. The total production for the refuge is estimated to be 110 birds.



White-faced ibis colony at nesting site in hardstem bulrush
on west side of Teal Pond. MDC 2465, 06/19/89, ECB

Since the Central Valley greater sandhill crane population remains a *State* threatened species, a considerable amount of time and effort was spent by refuge personnel on habitat management and data collection.

Breeding pair counts were conducted in May and 18 pairs were counted. Based on the number of nests that were located, nesting success, and the additional four pairs observed with colts, the estimated breeding population for the refuge was 25 pair.

Nineteen nests were located. Fifteen (79%) were located in wet meadows and four (21%) were located in pond/canal margins. The average clutch size (37 eggs/19 nests) was 1.95. Egg lengths ranged from 8.93 cm to 10.82 cm with an average of 9.73 cm. Egg widths ranged from 5.46 cm to 6.83 cm with an average of 6.16 cm.

Thirteen nests (68%) were successful. Hatching dates ranged from 12 May to 15 June, with the mean hatching date being 3 June. Three of the six unsuccessful nests were destroyed by predators (i.e. raccoon, coyote) and three were abandoned. Abandonment of two nests was due to egg infertility and the third nest was found abandoned.

When nests were rechecked, three nests each contained one dead colt. One colt was apparently killed by an adult. It had a gash in the neck region and a ruptured intestinal tract. The fate of the other two colts could not be determined.

A crane production survey was conducted in September. Counts revealed that at least 13 colts had fledged (Table 6). The average brood size (13 colts/11 pairs) was 1.18. The recruitment rate to the refuge breeding population (13 colts/25 breeding pairs) was twenty-six percent, slightly above the 10 year average of 22 percent, and the objective level of 20 percent.

Table 5. Sandhill crane production at Modoc NWR for the past ten years.

Year	Nesting Pairs	Nests Located	Successful Nests		Colts Fledged	Percent Recruitment
			Number	Percent		
1989	25	19	13	68	13	26
1988	30	22	11	50	8	13
1987	28	15	15	100	14	25
1986	32	21	14	66	20	31
1985	30	25	19	76	11	18
1984	27	14	8	57	5	9
1983	26	29	13	45	11	21
1982	22	19	14	73	12	27
1981	23	18	10	55	8	17
1980	22	22	8	40	13	29

Crane banding operations were conducted on the refuge from April to mid-October. A rocket net was set up in the Matney Field and 13 cranes (11 adults and 2 colts) were banded with federal bands and color bands. In addition, 16 crane colts were captured on foot and banded. Three colts were color banded and 13 were banded with federal bands only.

Other species within this category which were documented as nesting on the refuge included American coot, eared grebe, pied-billed grebe, western grebe, great egret, snowy egrets, black-crowned night-heron, and common snipe. Actual production is unknown. Eared grebes established a nesting colony in Teal Pond. There were at least 20 nests, each containing one to three eggs. Unfortunately, the nests all sank as a result of a windstorm with complete loss of all eggs.



Refuge Manager Clark Bloom with crane colt captured adjacent to Little Goose Pond. This bird received an aluminum band only as it was not big enough for color bands.

MDC 2552, 06/15/89, DAH

A radio telemetry study on sandhill crane colts is planned for 1990. The two year study will analyze causes of colt mortality, brood habitat selection/use and the effects of habitat management practices on colt survival. The results of the study should provide the needed information for increasing colt survival prior to fledging, resulting in higher recruitment rates.

5. Shorebirds, Gulls, Terns and Allied Species

Twenty-six species within this category have been present on the refuge at one time or another. This year, 18 species utilized the refuge for an estimated 53,695 use days. Numbers peaked during July and August, with about 600 birds being present. American avocet, black-necked stilt, killdeer, willet, long-

billed curlews and common snipe were documented as nesting on the refuge. Some production occurred, but actual numbers are unknown.

6. Raptors

Thirteen species of raptors utilized the refuge for an estimated 5333 use days. The number of raptors peaked at about 45 during January, February, and March and was represented by 11 species.

Northern harriers, red-tailed hawks, great horned owls, and barn owls were documented as nesting on the refuge. Nesting box surveys revealed that about 20 barn owls were produced. Production for the remaining species was not determined.

7. Other Migratory Birds

Two new species of birds were observed on the refuge during the year. These observations bring the number of documented species on the refuge to 240. The two new species included a surf scoter which was taken by a hunter on 2 November and a pine warbler which was captured in a mist net on 19 September. Both birds are considered to be "accidental" as both are outside of their normal range, especially the pine warbler. Both birds were reported to American Birds for documentation of vagrant movements.

Mourning dove use on the refuge was estimated at 6000 use days, up a bit from last year's 5000 use days. A minor amount of nesting occurred on the refuge, an estimated 30 birds were produced. Peak use occurred in August, as fledgling birds prepared for fall migration. All mourning doves were gone by the end of September.

Common raven and black-billed magpie use of the refuge remained basically unchanged from previous years. Raven use occurred sporadically and caused no known problems with nesting waterfowl and cranes. Black-billed magpies were a common sight throughout the year, and four successful nests were observed.

This year marked the eighth year in a row that a mist netting project in riparian habitat was conducted on the refuge. During the course of this year, 21 days of effort were put into the project as compared to last year's 43 days (Table 6). As in previous years, well over one half of the effort was conducted on a volunteer basis by the manager on weekends or by a qualified volunteer as his time permitted.

Table 6. Riparian habitat mist netting project in 1989.

Total Days of Operation	21
Total Net Hours	612
Birds per 100 net Hours	157
Total Birds Captured	962
Total Number of Species	39
Largest Daily Catch (9/15/89)	114

Table 7. Top ten species captured in mist netting operations in 1989.

<u>Species</u>	<u>Total Captured</u>	<u>Capture Per 100 Net Hours</u>
Yellow-rumped warbler	210	34.3
Orange-crowned warbler	150	24.5
Yellow warbler	133	21.7
Song sparrow	57	9.3
Common yellowthroat	56	9.1
Wilson's warbler	31	5.1
Gambel's white-crowned sparrow	31	5.1
Tree swallow	29	4.7
Lincoln's sparrow	26	4.2
Willow flycatcher	17	2.8

The mist netting project, which began in 1982, was designed to monitor the breeding population of yellow warblers and willow flycatchers. The yellow warbler has since been dropped from the sensitive species category, but it is still monitored as an indicator species. The willow flycatcher is still considered as a sensitive species and as such will be monitored when present

on Modoc NWR. Willow flycatchers normally occur in riparian habitat on the refuge during migration and has been known to nest here in the past. It is hoped that the riparian habitat improvements being conducted by the refuge will in turn offer increased habitat and subsequent use by willow flycatchers. This increase should become obvious in the planned 10 year mist netting project. Figure 1 graphically depicts these trends among willow flycatchers and brown-headed cowbirds which are known to have a detrimental effect upon small passerines such as warblers and flycatchers.

Figure 2 shows a very nice upward trend in yellow warbler use of the riparian habitat being monitored by mist nets. How much of this upward trend is attributed to an overall increase in yellow warbler population and how much is attributed to improved/increased habitat on the refuge is unknown. However, it is believed that the trend is significant and will be monitored for at least two more years.

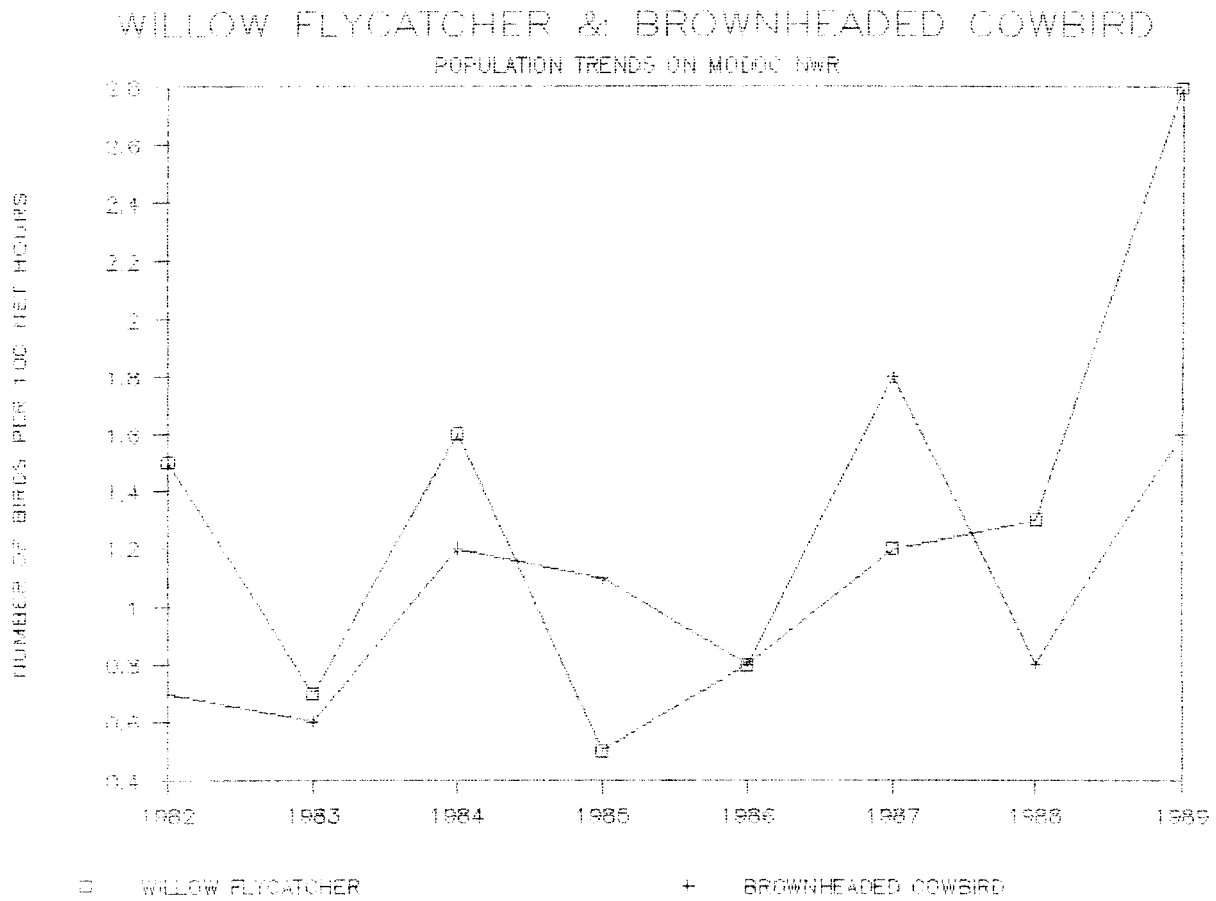


Figure 1. Willow Flycatcher and Brownheaded Cowbird Population Trends on Modoc NWR.

YELLOW WARBLER MIST NET CAPTURES

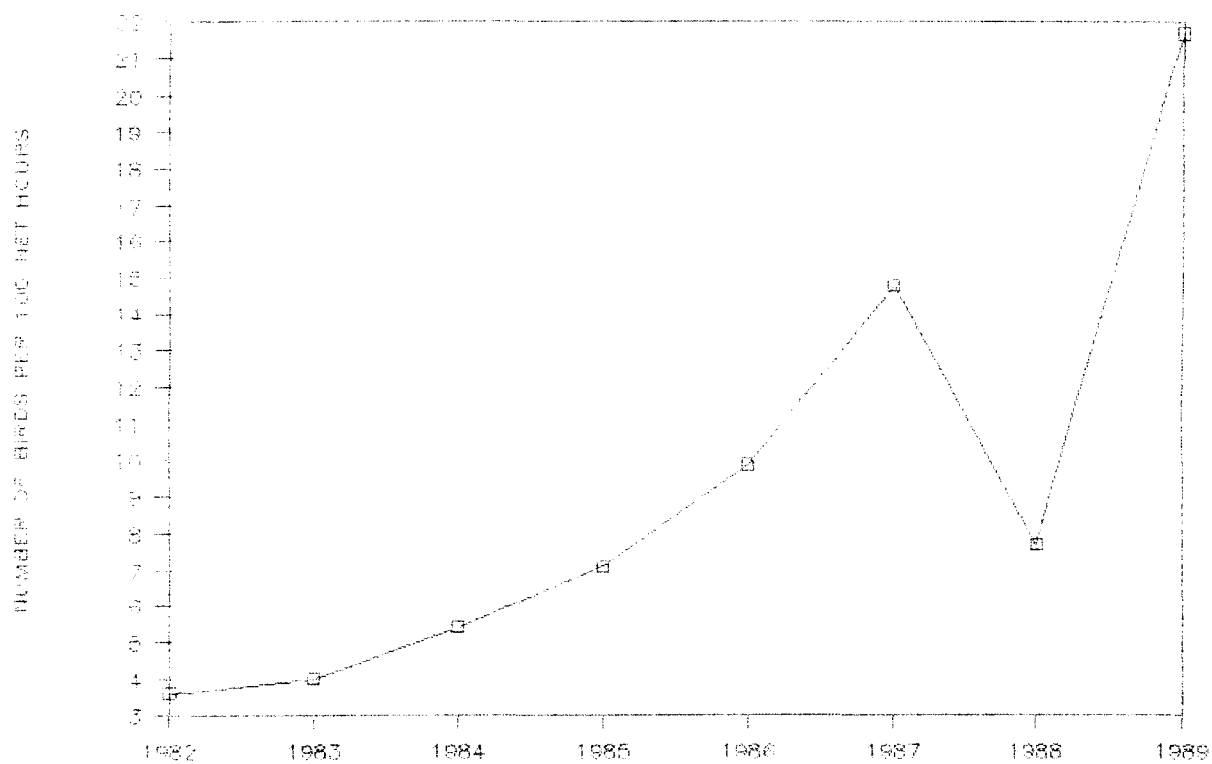


Figure 2. Yellow Warbler Mist Net Captures on Modoc NWR.

The mist netting activities over the past eight years have also been very valuable in documenting use by other small passerines such as the pine warbler captured this year. Without netting activities, it is highly unlikely that this bird would have been documented as occurring on the refuge.



Adult male pine warbler captured in a mist net.
MDC 2509, 09/19/89 ECB

As previously stated, the mist netting operation will be continued during 1990 as time permits. Hopefully, the amount of time spent on the project will be increased in 1990, especially during the spring and fall migrations. This increased activity, which will be provided by volunteers will give us more quantitative data. It is hoped to continue this operation through 1992 to have a total of 10 years' data to work with.

8. Game Mammals

a. Mule Deer

The mule deer population on the refuge has remained stable this year despite the rather severe winter which did cause some mortality. Fawn production was at an all time high; by fall, the population was re-established at about 100 animals. This large number of animals has been a real problem in the riparian habitat development project because of their voracious appetite for young shrubs and trees. In addition, a number of deer are hit by autos on an annual basis.



Typical group of mule deer on the refuge. MDC 1025, 8/16/83 WRR

b) Pronghorn Antelope

Pronghorn antelope use on the refuge dropped this year. There were only two pair observed on the refuge during the summer. Kid production was limited to one pair of twins. As usual a few antelope strayed onto the east side of Dorris Reservoir during their annual migration from winter grounds to summer grounds and back again.

c) Cottontail Rabbit

Cottontail numbers appear to be fairly stable at this time. However, no actual counts are made and actual numbers are unknown. Until the refuge institutes an inventory procedure for game animals, population levels will continue to be estimated.

10. Other Resident Wildlife

California quail and ring-necked pheasants are doing well on the refuge. Both species have responded well to habitat improvement, especially in the riparian corridor that bisects the refuge. It is not uncommon to see upwards to 30 to 40 pheasants during an afternoon in the field. This large number of pheasants resulted in a flurry of activity by roadside hunters during the first two weeks of pheasant season.

Mammals present on the refuge include mink, long-tailed weasel, striped skunk, raccoons, muskrat and an occasional beaver. Upland type mammals include: black-tailed jackrabbit, Belding's ground squirrel, badger and coyotes. Meadow mice, deer mice and shrews are common throughout the refuge. A small colony of Mexican free-tailed bats continue to hold their own at the headquarters.

Badger numbers were up this year and their digging activity was quite noticeable throughout the refuge. Muskrat numbers declined considerably from the previous years' high numbers. Counts conducted in November indicated a population is less than 500 animals, a drastic decline from three years ago when trappers took 1004 rats in six weeks. Reasons for the decline are unknown, but disease is suspected.

Resident reptiles documented on the refuge include the western fence lizard, sagebrush lizard, side-blotched lizard, rubber boa, racer, gopher snake and western terrestrial garter snake. The western pond turtle has been introduced into the area and has been observed on the refuge since 1982. Amphibians documented on the refuge include the western toad, Pacific tree frog and bull frog.

11. Fishery Resources

Eight species of fish are known to occur within the various waters of the refuge. These species include: channel catfish, brown bullhead, largemouth bass, bluegill, sunfish, brook trout, Sacramento squawfish, round chubs and an unknown species of sucker. Only three of the eight species, channel catfish, bullhead and bass are considered to be of any recreational importance.

In an effort to provide an improved recreational fishery for the public, the refuge became involved in a cooperative program with the California Department of Fish and Game and the Organized Sportsmen of Modoc County. The thrust of this project involves placing spawning structures for channel catfish and brush piles for increased fry survival in appropriate areas along the shoreline at Dorris Reservoir. This year, an additional 20 spawning structures and one brushpile were added to the Dee's Point area. With this latest addition, the refuge has reached the saturation point for these "catfish condos". In the future, we will attempt to place additional structures on private lands within the shoreline of Dorris Reservoir.



Maintenance Worker Storm pouring concrete into cut pipe for
end wall. MDC 2424, 6/7/89 ECB



The finished product - ready to place in Dorris Reservoir.
MDC 2436, 6/13/89 DAH

14. Scientific Collections

In mid-summer, the refuge participated with Cornell University in a genetics study of red-winged blackbirds. The study, being conducted by Dr. Thomas A. Gavin, was designed to isolate genetic differences in various populations throughout North America. In order to assist Dr. Gavin with his study, the refuge collected 25 red-winged blackbirds in June. This birds were packed in dry ice and shipped to Dr. Gavin on 26 June.

15. Animal Control

The refuge has conducted an active, aggressive animal control program since approval of the Pest Control Plan in 1985. This program is designed to minimize predation by striped skunk and feral house cats on nesting waterfowl. In addition, it allows for the control of other predators when they are impacting approved objectives such as sandhill crane production or causing safety/health hazards. In order to achieve these goals, control efforts are maximized during nesting and brood rearing periods. In addition, fur trapping permittees are encouraged to take pest animals during their winter trapping activities. This year's program was considered to be minimally successful. Periodic checks of duck nests revealed the level of predator destroyed nests at or near previous years' levels.

Studies at Malheur NWR have shown coyotes to be a major predator on sandhill cranes and colts. In order to keep coyote numbers down, they are also controlled, particularly in the spring and summer. Raccoons are also controlled on an opportune basis to increase sandhill crane nest success. In addition, beaver and badger are taken when they cause problems with the refuge water delivery system.

During the course of the year, the following animals were taken:

Striped skunk	46
Feral cat	46
Coyote	13
Raccoon	4
Badger	7

16. Marking and Banding

As required by the Annual Work Plan, Modoc NWR again participated in the pre-season mallard banding program. The refuge manager, assistant refuge manager, and biological technician took turns tending six swim-in traps from mid-August through September. No real problems were encountered during the banding period and 1421 mallards were captured and banded along with 55 other ducks.

The overall results are summarized in Table 8.

Table 8. Waterfowl Banding Accomplishments for 1989.

Species	Number Banded
Mallard	1421
Northern Pintail	3
Cinnamon Teal	7
Green-winged Teal	7
Gadwall	5
American Wigeon	1
Redhead	26
Ring-necked Duck	1
Lesser Scaup	4
Ruddy Duck	1
Total Banded	1476

For the sixth consecutive year, an effort was made to capture and color mark known-age sandhill cranes. This year a total of 29 sandhill cranes were captured, color-marked and banded (Table 9). In addition, 13 local (newly hatched colts) were captured and banded with aluminum bands only.

Table 9. 1989 Sandhill Crane Color-marking Project.

Age	Birds Banded
Hatching Year	4
Second Year	1
After Hatching Year	11
Total Banded	16

17. Disease Prevention and Control

There were no documented disease outbreaks on the refuge this year. Disease was suspected as the cause of our low muskrat population, but samples sent to Madison Health Lab came back as negative.

H. PUBLIC USE

1. General

Public use on the refuge, which covers a wide variety of activities, including warm water fishing at Dorris Reservoir, wildlife observation, waterfowl hunting and environmental education, totaled 5622 visitors for a total of 14,722 hours during this past year. Overall use was down slightly because of the extended record setting cold winter and slow spring thaw which kept the tour route closed for two months and delayed the start of fishing at Dorris Reservoir.

The refuge contributed 18 news releases to local and regional news papers, covering such topics as waterfowl hunting, grazing permits, fishing and the Dorris Reservoir recreation program. The local news paper owner and editor are supportive of the refuge and it's programs and have been cooperative in helping us provide information to the public.

2. Outdoor Classrooms - Students

Throughout late spring, refuge personnel encouraged participation in the refuges environmental education program by school groups from the Modoc County area. This program, through the use of an outdoor classroom setting, provided each group with introductions to wildlife ecology, wildlife management and methods of achieving refuge objectives through various refuge programs. A total of 190 students, representing four schools, participated in this program. Each group of students were presented a program by refuge personnel and then taken on an interpretive hike around the refuge, during which time more specific information was provided on various wildlife related topics.

The tree planting program initiated in 1985 by third grade teacher Lois Bloom continued this year with the planting of 45 assorted trees and shrubs along Pine Creek in the area of Subheadquarters. This type of hands-on learning is very helpful in teaching young students to appreciate their environment and how they can contribute to improvement of natural areas. In turn the refuge benefited through enhancement of much needed riparian habitat.



Biological Technician Kevin DesRoberts with a group of elementary students from the South Fork Elementary School.
MDC 2553, 06/02/89, DAH

5. Interpretive Tour Routes

The two and a quarter mile automobile tour route surrounding Teal Pond is the main route used by visitors for birdwatching, photography and wildlife observation. Preliminary work was begun late this year to develop an interpretive leaflet for a self-guided auto tour route along the Teal Pond loop. This project is scheduled for completion in 1990 and will become an important part of our visitor information program. In addition to the Teal Pond loop, U.S. Highway 395 and County Road 115 which both pass through the refuge, are also used extensively by the public for wildlife viewing. Due to heavy snowfall, the tour route was closed to all visitor use throughout the month of February.

6. Interpretive Exhibits/Demonstrations

The interpretive kiosk, erected at headquarters in 1986, continues to receive positive public reaction. The seven panel exhibit explains refuge management activities, goals and objectives, with emphasis upon sandhill crane management. This year, a visitor registration book was installed at the kiosk to enable the refuge staff to better document the number of visitors who utilize the refuge facilities. Throughout the year a total of 1065 visitors were recorded at this facility.

7. Other Interpretive Programs

Refuge Manager Clark Bloom completed this thirteenth year as a California Hunter Safety Instructor. Approximately 40 students participated in the program which is mandatory before any California resident may obtain a hunting license. In addition to teaching firearm safety, special emphasis is placed on conservation, hunting ethics and refuge regulations regarding waterfowl hunting.

8. Hunting

In response to the continuing dismal level of waterfowl populations in the Pacific Flyway, hunting regulations in the northeastern zone of California remained nearly unchanged from those of the past two seasons. The 59 day duck season extended from 14 October through 11 December with the goose season extending an additional 36 days from 14 October through 14 January, 1990. The only change to the limits this season was the addition of one canvasback to the daily bag.

The acceptance of steel shot, after four seasons of use, seems to be nearly universal although complaints are still heard and some lead shot use is still detected. The majority of hunters contacted, particularly those from outside Modoc County, have adjusted to the change with some actually preferring steel over lead shot.

Hunter use on the refuge, which totaled 1477 persons, declined seven percent from the previous year and fell 31 percent below the ten year average. The decline in hunter use this year was indicative of the general outcome of the hunting season which was by far the poorest season, in terms of hunter success, on record for the refuge.

As could be expected, opening day produced good results for the hunters who were lucky enough to receive permits for that weekend. However, hunter success took a turn for the worse on Sunday and continued throughout the remainder of the season at dismally low levels. A total of 894 ducks were killed throughout the season resulting in a take 45 percent below the previous years harvest (Table 10). This decline in hunter success can be directly correlated to the decline in duck use during the waterfowl hunting season. As usual, mallards were the number one duck in the bag, followed by gadwall, wigeon and green-winged teal topping out the list for the four most prevalent species.

Goose hunting was also slow throughout much of the season with only 330 birds being taken. This figure represents a 35 percent decline from the previous years total and a drop of 45 percent from the ten year average. This decline did not appear to be linked to the population of geese in the vicinity of the refuge since goose numbers ranged from approximately 2000 to 4000 birds throughout the hunting season, which appears to be the normal level of use for the refuge in recent years.

Favorable weather conditions throughout the fall and early winter which failed to move geese out of the area also disappointed hunters by providing less than ideal hunting conditions. Additionally, apparent widespread baiting of private ranches in Modoc County lured geese away from the refuge to hunters on these ranches. Several of these ranches received surprise visits from Service personnel during the hunting season.

A prescribed burn of the Pit River flood plain produced prime snipe habitat which contributed to the first increase in hunting pressure on this species in several years. The area was also a good producer of geese late in the season.

Table 10. Hunting statistics on Modoc NWR for the past five years.

	1989	1988	1987	1986	1985	5 year average
Total Hunters	1477	1547	1379	1702	1800	1581
Total Ducks Taken	894	1637	1672	1409	1325	1387
Total Geese Taken	330	509	337	440	796	482
Total Snipe Taken	31	4	1	3	102	28
Total Birds Taken	1255	2150	2009	1852	2223	1898
Average Bird/Hunter	0.85	1.39	1.45	1.08	1.23	1.20

During the 1989 hunting season, a significant increase in the use of the spaced blind area occurred. In past years only a handful of regular hunters used the blinds on an occasional basis. This past season numerous hunters used the five blinds on a regular basis accounting for approximately 70 use days.

In order to provide a waterfowl hunting spot accessible to handicapped individuals without eliminating a regular spaced blind, one additional blind, #6, was constructed on the north end of the spaced blind area. Blind #2 will be equipped with an all weather access path and platform adequate to accommodate a wheelchair for handicapped access.

9. Fishing

During the spring and early summer Dorris Reservoir produced fair to good catches of largemouth bass and brown bullheads for local fishermen. Additionally, channel catfish populations appear to be on the increase with numerous 8 to 10 pound specimens being landed. Considerable fishing pressure, which began when the reservoir was opened on 1 April, continued until mid-summer when water levels began to drop and water temperatures increased causing fishing success to decline.

A contract in the amount of \$1800.00 was awarded to Bobby Easter of Alturas to open and close the Dorris Reservoir area and to perform all custodial maintenance throughout the six month period that the reservoir is open to the

public. This individual proved to be less than dependable and created several maintenance and trespass violations by not performing his duties as required.

10. Trapping

The fur trapping program is conducted annually to reduce damage to roads and dikes by muskrat and beaver. Other furbearing species such as racoon, mink and coyote are also permitted to be taken when populations warrant. Trapping permits have been issued by the bid system since 1985. The refuge is divided into two sections, the east and west units, by County Road 115 which passes through the middle of the refuge with prospective bidders being allowed to bid on one or both units.

This year we had two trappers submit bids with David Jordan being successful for both units. Following notification of being a successful bidder, Dave advised the refuge that he was unable to trap both sides of the refuge and released his interest in the west unit. This unit was subsequently awarded to Frank Worrell who was the other original bidder.

Prior to the beginning of trapping, Frank became ill and was unable to fulfill his trapping commitment. Additionally, record low temperatures which continued for nearly a month prevented Dave from beginning his trapping until very late in the season. Once he began trapping on the east unit he determined that low catch rates and a drop in fur prices would prevent him from making a profit and wanted to pull out of the program. To prevent this from occurring, he was allowed to trap both units of the refuge and a slight reduction in his original bid was permitted. His final payment to the refuge was \$130.94.

At the close of the trapping season, a record low 309 muskrats had been trapped along with a total of five mink. The following table details the number of furbearers removed from the refuge over the past five year period.

Table 11. Trapping data from the past five seasons on Modoc NWR.

Species	1988/89	1987/88	1986/87	1985/86	1984/85
Muskrat	309	1795	1692	1004	837
Mink	5	8	10	18	11
Raccoon	0	1	0	1	1
Skunk	0	0	21	8	3
Coyote	0	0	0	0	1
Beaver	0	0	1	2	0
Weasel	0	0	1	0	0
Non-target species*	0	0	0	2	0
Total Income:	\$ 328	\$6220	\$6174	\$3800	\$1721

*Non-target species consist of waterfowl and marsh birds.

11. Wildlife Observation

Wildlife observation centers around waterfowl, marsh and waterbirds observed from the Teal Pond tour route. However, interest in raptors and passerine species has grown noticeably over the past few years. Viewing mule deer from the county roads is also a popular attraction, particularly with local residents during the fall. Wildlife observation declined slightly this year following three years of gradual increases. The following table illustrates wildlife observation visits for the past eight years.

Table 12. Wildlife observation visits on Modoc NWR 1983-1989.

Year	Number of Visits
1989	2100
1988	2540
1987	2395
1986	2155
1985	2900
1984	2640
1983	1350

12. Other Wildlife Oriented Recreation

Due to the scenic beauty of the refuge location and the abundant photographic opportunities available around the refuge, photography is a popular activity among refuge visitors. Primary photographic subjects include, waterfowl, mule deer, sandhill cranes and raptors. Because of sandhill crane sensitivity to disturbance during nesting, much of the refuge is closed to public entry, thus limiting photography activities to the area around the tour route. During the year we received two requests, both of which were granted, for special photography permits to allow individuals to enter the area which is normally closed to the public.

16. Other Non-Wildlife Oriented Recreation

Waterskiing at Dorris Reservoir continued to attract a few individuals to the refuge during summer months. There were no known problems associated with this limited activity during the course of the summer. However, there is no recognized refuge objective for waterskiing, and it was decided at our programmatic review to begin to take steps to eliminate this activity. The manager spent several hours researching old files and newspapers for items concerning this activity. It soon became apparent that waterskiing was a very popular activity which was promoted by the refuge in the 1960's. Waterskiing popularity began to decline in the 1970's and 1980's and is now limited to no more than five outings per year. Further action to eliminate this activity will be carried out in 1990.

17. Law Enforcement

The law enforcement program at Modoc NWR is focused upon the public waterfowl hunting program with emphasis upon game law enforcement. During the remainder of the year, other problems such as littering, vandalism, trespass and associated problems are dealt with in a spontaneous manner.

Fishing use at Dorris Reservoir has continued to be a very popular activity with a definite increase in fishermen. This increase in use has subsequently spawned an increase in various violations of refuge regulations. State wardens wrote over 20 fishing without license cases along with several multiple pole violations.

During the hunting season, enforcement activities are conducted under an established routine with at least one refuge officer on duty during most of the scheduled 42 shoot days. Besides enforcing the law in both overt and covert fashions, refuge officers conducted bag checks and answered numerous questions from the public. Eight game law related violations were filed this year, down four from the previous year (Table 13). In addition, the manager and assistant manager assisted Special Agents in a baiting case at Goose Lake where several fields were found with very flagrant amounts of bait.

Table 13. Law enforcement violations on Modoc NWR in 1989.

Migratory Bird Treaty Act:

16 USC 718(a)	No duck stamp	1
50 CFR 20.21(b)	Unplugged gun	1
50 CFR 20.24	Exceed daily bag limit	3

National Wildlife Refuge Administration Act:

50 CFR 32.2(a)	Did not possess required state stamp	1
50 CFR 32.2(e)	Did not comply with terms and conditions of hunt program - left decoys out overnight	2
Total		8

I. EQUIPMENT AND FACILITIES

1. New Construction

New construction was limited to the placement of one new water control structure in the Dorris Canal at the north edge of the Pine Creek Field. A 48" pipe with flashboard riser was installed in the canal allowing the water level in the ditch to be raised thus making irrigation of adjacent meadows much easier.

2. Rehabilitation

All rehabilitation projects were accomplished by force account this year. Resulting from record low temperatures, 15 water control structures required removal and resetting due to leaks around the pipes caused by the abnormally deep frost depth and resulting heaving of the soil. Included in this project were nearly all structures along Pine Creek east of County Road 115.



Water control structure on Pine Creek overflow which washed out in the preceeding winter. MDC 2416 05/22/89 ECB

In July, Maintenance Worker Brad Storm spent one week at Klamath Basin NWR learning how to operate a dragline. Upon returning to Modoc NWR, Equipment Operator Larry Bigoni from Klamath Basin NWR provided an additional week of training on our dragline. Brad subsequently proceeded to clean approximately one mile of the Highline Canal which had severely silted since it was last

cleaned in 1975. This project greatly increased the water flow through the canal and our ability to maintain summer water levels in ponds associated with this system.



Maintenance Worker Brad Storm cleaning a portion of the
Highline Canal. MDC 2507, 09/11/89, ECB

Another long overdue project that was completed this year was the rebuilding of the cribbing on one of the major screw gates on the Dorris Canal. The old timbers were replaced and the bank reinforced to prevent any further sloughing of the bank into the canal.

As outlined in the Section 504 plan to provide access to the office restroom facilities for handicapped individuals, the bathroom partitions were removed, handicapped toilets installed and entrance doors enlarged to accommodate wheelchairs. At the same time the entire office interior received a new coat of paint and new linoleum. The floor covering including installation cost \$2,200.00 with paint totaling \$140.00.

3. Major Maintenance

Throughout the year several significant maintenance projects were completed. The severe winter assisted in highlighting insulation deficiencies both in the shop building as well as in the manager's residence. When temperatures fell below -30° F numerous water pipes in the manager's residence broke due to freezing as well as several of the water lines associated with the residence heating boiler.

While repairing these lines, it was found that rodents as well as large numbers of garter snakes had caused the floor insulation to collapse away from the floor as well as the water lines below the flooring. This insulation was replaced and hundreds of snakes removed from under the house. This should prevent any future freezing problems in the house. Water lines in the shop were rerouted away from outside walls to prevent them from freezing.

The upstairs portion of the managers residence received a fresh coat of paint. The downstairs is also in need of paint but will have to wait until time permits for this project to be completed.

Miscellaneous maintenance projects included: road maintenance, ditch cleaning, meadow preparation, and service of all refuge farming and heavy equipment.

Our John Deere 210C backhoe was recalled by the manufacturer for repair of faulty brakes. The tractor was taken to Klamath Falls for factory repairs but had only been back in use a short time before it was recalled again. It seems that the first repair kit that was installed to correct the factory defect was also defective and may also cause brake failure. We are currently waiting for the factory to issue a new and improved repair kit to correct this apparently overwhelming problem for the John Deere engineers.

4. Equipment Utilization and Replacement

The only equipment that was purchased this year was a set of harrow drag sections that were acquired to replace an old harrow that was continually breaking during farming operations.

A one-quarter ton trailer which was acquired from Salton Sea NWR last year was modified to carry the spray rig used to treat thistle and hemlock. This rig has worked out well and has freed up a pickup which was formerly tied up during the growing season.



Biological Technician Kevin DesRobert's Jeep and trailer
mounted sprayer. MDC 2354, 06/09/89, ECB

Two small lot sales were held in 1989. In March, the old "bomb service" boom truck was sold for \$602. In November, an old International Scout was sold for \$351.12. Interestingly enough, this is the second time the Scout was sold. In 1988, it was sold for \$369 through GSA, but the buyer went into default (see also Section J-2).

5. Communications Systems

The refuge continued to have Cascade Tele Communications, Inc. of Klamath Falls, Oregon handle all our radio maintenance work. They annually provide checks of all of our mobile radios as well as the base station and correct any defects in the system. These services were provided this year for only \$360.00.

6. Computer Systems

The refuge has now operated a computer for three years, with no significant problems during the last twelve months. On two occasions refuge personnel became instant computer repair technicians under long distance direction from Doug Robertson, Regional Computer Programmer, when we were required to dismantle a portion of the computer to lubricate the hard drive bearings which had begun to produce irritating noises. Both operations were successful.

During the year, Sharon Storm, Refuge Assistant, received instruction in several computer procedures. In January she attended a beginning Lotus 123

session in Sacramento followed by instruction in a budget tracking system using Lotus 123 at Malheur NWR in March. In June she received instruction in using Word Perfect 5.0, the current word processing system that we are using.

7. Energy Conservation

There were no new energy conservation projects accomplished during the year. Routine maintenance was performed on all three heating systems in an effort to keep these systems functioning in an efficient, yet conservative manner.

J. OTHER ITEMS

1. Cooperative Programs

This is the third year that the refuge has been involved in the Farmer's Home Administration (FmHA) Food Security Act of 1985 (also known as the Farm Bill). This year, the refuge inspected five inventory properties which were subjected to loan foreclosures by FmHA in 1989. Two of the properties were not considered suitable and were subsequently dropped as potential wetland additions. Three properties had suitable wetlands and were recommended to be given to the California Department of Fish and Game for management. Because of funding problems, California Fish and Game backed out of the picture and the properties were recommended for conservation easements under Fish and Wildlife Service control. One property, the Nichols Tract, was approved and the easement was fenced off this fall. The other two properties are still pending. The Russell property which was pending from last year, was approved as a conservation easement this year. This property was fenced off by the local California Department of Forestry prison conservation camp in August. There are now two completed conservation easements totaling 139 acres under the management of Modoc NWR. Both properties have wetlands present and are considered to be valuable additions to the refuge system.



Overview of wetlands and riparian habitat on Russell Tract which was approved as a conservation easement. conservation easement. MDC 2471, 07/12/89, DAH.



Local prison conservation camp crew constructing easement boundary fence on Russell Tract. MDC 2495, 07/27/89, DAH



View of wetlands on Nichols Tract which was approved as a conservation easement. MDC 2479, 07/05/89, ECB



View of the conservation easement's boundary fence on the Nichols tract completed force account.

MDC 2539, 12/27/89, ECB

The Phenological Monitoring Program which is done in cooperation with the National Weather Service was carried out by Assistant Manager David Hardt. This program is conducted annually to provide information on blooming dates of two different species of honeysuckle at various sites throughout the western United States. The information gathered is used by the National Weather Service to aid in their long range forecasts.

Refuge Manager Bloom and his wife Lois conducted two breeding bird surveys off the refuge, the Likely Route (#151) and the Ingalls Route (#073). These routes are conducted in cooperation with the research center at Patuxent, Maryland.

The refuge staff participated in the North American Nest Record Card Program and in the Colonial Bird Registry, both in cooperation with Cornell University.

Refuge Manager Clark Bloom participated in his thirteenth year as a hunter safety instructor in cooperation with the California Department of Fish and Game. (Section H-7).

The refuge staff made quarterly reports of noteworthy bird observations to American Birds.

2. Other Economic Uses

Two small lot sales were held in 1989. In March, the old "bomb service" boom truck was sold for \$602. In November, an old International Scout was sold for \$351.12. Interestingly enough, this is the second time the Scout was sold. In 1988, it was sold for \$369 through GSA, but the buyer went into default (see also section I-4).

3. Items of Interest

Training and attendance at key meetings continued as an important part of this stations operation during the course of the year.

Refuge Manager Bloom attended the Law Enforcement 36 hour refresher course held in Sacramento in March. He also re-qualified with his Service revolver and shotgun just prior to waterfowl season. CPR recertification was accomplished in February. Clark also attended the annual hunt meeting with the California Department of Fish and Game in March, the Project Leaders meeting in Portland, Oregon in August.

Assistant Manager David Hardt attended the Law Enforcement 36 hour refresher course held in Sacramento in March and the annual hunt meeting with the California Department of Fish and Game which was also held in Sacramento in March. David re-qualified with his Service revolver and shotgun just prior to waterfowl season. David also attended the Project Leader's meeting in Portland, Oregon in August. Other training received: 16 hours of EEO training in Boise, Idaho; 8 hours of Incident Commander (I-220) training (with certification); the three day marsh management workshop at Sacramento NWR in September; and a four day workshop in Billings, Montana on riparian resources management put on by the Montana Chapter of the American Fisheries Society.

Refuge Assistant Sharon Storm attended the following training: OPM offered class on beginning Lotus 123 in Sacramento, California; a two day workshop on use of Lotus 123 on a budget tracking system offered at Malheur NWR, Princeton, Oregon; Professional Women's Stress Management workshop in Redding, California in March (offered by Federal Women's Program); a one day class on Beginning WordPerfect 5.0 that was added on to the Administrative Workshop in Portland, Oregon in June; and a two day safety training workshop put on by Oregon's OSHA in Klamath Falls, Oregon in May.

Maintenance worker Bradley Storm successfully completed S-390 fire management course in Boise, ID. There are now three people at Modoc NWR certified in S-390 which makes prescribed burning a much easier and safer job. Bradley also went up to Klamath Basin NWR in July for one week to get his dragline certification.

Biological Technician Kevin DesRoberts attended a one day workshop on raptor rehabilitation which was held in Klamath Falls, Oregon. Kevin attended this workshop on his own time in order to gain valuable experience which benefits him and the station.

There were two 10-year milestones reached at Modoc NWR this year. Maintenance Worker Bradley Storm received his 10-year certificate from Associate Manager Bob Fields at our programmatic evaluation held in the first week of May. Assistant Manager David Hardt received his 10-year certificate from the refuge manager at a refuge party in mid-December. Congratulations to both!



Associate Manager Bob Fields presenting Bradley Storm with his 10 year certificate and pin.

MDC 2412 05/03/89 ECB



David Hardt with his 10 year certificate. 12/15/89 LNB

4. Credits

Refuge Manager Clark Bloom wrote sections A, B, C, D, G-7 through 17, H-13 through 19 and J.

Assistant Manager David Hardt wrote sections F, H-1 through 12 and I.

Refuge Assistant Sharon Storm wrote section E.

Biological Technician Kevin DesRoberts wrote section G-1 through 6.

Photographs were taken by refuge staff and are identified by initials.

The report was typed and assembled by Refuge Assistant Sharon Storm. Editing was done by all authors with final editing by Refuge Manager Clark Bloom.

K. FEEDBACK

FmHA - This program is now two years old and gathering steam. It seems like this station is now getting on the average of one property every one and a half to two months for an assessment as to its suitability for inclusion into the refuge system under a conservation easement. This is good. Our mission is to provide nesting habitat for waterfowl and this program will help us in that mission. However, when the money to accomplish this mission is brought up, we run into a stone wall. Granted, there is money available for material and supplies and for contracting services. However, when the subject of salaries for refuge folks is raised, it's no go. I have some problems with this philosophy.

Last fall we went ahead and fenced off a wetland recently brought in under conservation easement. This was done for account to facilitate the project because of its small size and remoteness from any established contractor. This project was still completed after a request for salary dollars was denied by the Regional Coordinator. Salary expenses for Modoc NWR's staff amounted to \$3174.09 for this project.

Now this amount may seem trivial to some. However, it involved a significant amount of this staff's time, hence money, to accomplish this project. Therefore, it is my feeling that some serious thought needs to be given to an equitable sharing of dollars for Farm Bill projects.