

REVIEW and APPROVAL

MODOC NATIONAL WILDLIFE REFUGE

ALTURAS, CALIFORNIA

ANNUAL NARRATIVE REPORT

CALENDAR YEAR 1987

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Refuge Manager	Date	Refuge Supervisor Review	Date

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Regional Office Approval	Date

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## INTRODUCTION

The 6,283 acre Modoc National Wildlife Refuge 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 8,000 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.



87 NR-1, MDC 2151, 02/09/87, WRR

Teal Pond with Warner Mountains in background.

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  $-40^{\circ}$  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.

### A. HIGHLIGHTS

Drought like conditions plagued the refuge for most of the year. As a result, Dorris Reservoir was at a critically low level by the end of summer. (Section B).

Three of Modoc's staff received incentive awards during the course of the year. (Section J, #3).

Declining waterfowl populations were quite noticeable this year, especially during the waterfowl hunting session. Total harvest by hunters was at record low. (Section H, #8)

Goose Pond was drawn down and 70 new nesting islands were constructed. (Section I, #2)

Several worn out farming implements were replaced with new ones. (Section F, #2; I, #1).

### B. CLIMATIC CONDITIONS

Last year's prediction for a below normal water year turned out to be all too accurate. The lack of a snow pack in the Warner Mountains resulted in Dorris Reservoir filling to only 9,000 acre feet instead of the normal 11,600 acre feet. This is the first time that Dorris has failed to fill since the record drought of 1977. The drought became really severe in the late summer and fall with no significant precipitation from July 22 till the 1st of November. This resulted in very poor germination and subsequent growth of 300 acres of winter wheat.

The year ended with a total of 12.57" of precipitation and a near normal snow pack in the Warners giving hopes for a near normal water year in 1988.

The wettest month of 1987 occurred in July when a total of 1.99 inches of precipitation fell, much of it in the form of snow! Both August and September were without any measurable precipitation and the poorest air quality that has occurred in the history of the refuge. The record high for the year occurred on July 15 (two days prior to a day long snow storm) when the century mark was reached. The record low occurred on the 16th of January when the temperature dipped to 7 below zero. There were only six below zero readings for the entire year.

Dorris Reservoir, the refuge irrigation reservoir was at a low of 5,900 acre feet of storage on January 1. The below normal precipitation and resulting poor snow pack yielded a scanty runoff which put our storage at only 9,000 acre feet (77% of normal) by mid-May. Irrigation demands caused a continuous drawdown of the reservoir for the remainder of the irrigation season. By the end of September the level had dropped to

the point where an old coffer dam was severely impeding the required discharge.



87NR-2, MDC 2216, 10/01/87, ECB

Dragline Operator, Billy Sellers, removing an old coffer dam at the Dorris outlet so normal discharge could be accomplished.

Removal of a portion of this coffer dam permitted normal discharge to meet refuge needs. Record water demands continued well into November and by the year's end Dorris had dropped to a low of only 2,500 acre feet in storage.

Throughout the course of 1987 a total of 6,009 acre feet of water was discharged from the reservoir. This water was used for meadow irrigation, stock water and pond maintenance.

The chart on the following page illustrates the recorded temperatures and precipitation totals on a monthly basis for 1987.

TABLE #1 Temperature and Precipitation during 1987 at Modoc NWR

<u>Month</u>	<u>TEMPERATURE</u>		<u>PRECIPITATION</u>	
	<u>Maximum</u>	<u>Minimum</u>	<u>Total</u>	<u>Snow depth</u>
January	60°	-7°	0.90	3.0"
February	65°	8°	0.95	2.0"
March	68°	16°	1.20	3.0"
April	85°	16°	1.70	1.0"
May	87°	27°	1.83	----
June	97°	31°	0.99	----
July	100°	32°	1.99	1.0"
August	97°	32°	----	----
September	97°	24°	----	----
October	87°	16°	0.14	----
November	68°	9°	0.98	1.5"
December	55°	-5°	1.89	10.0"
Totals:			12.57	21.5"

This year will also be remembered for the extremely poor air quality during the month of September. A record number of forest fires throughout California and Oregon put enough smoke into the air that normal breathing became a problem while working out-of-doors. Visibility was reduced to 3-5 miles during most of the month.

### C. LAND ACQUISITION

#### 1. Fee Title

The 20 acre inholding known as the "race track" was again placed in the acquisition pot. Money was available this year and a lot of time and effort was put into an attempt to acquire it. However, the current land owner and the service could not get together on an agreeable price. The F.W.S. appraisal was 30K, realty threw in an extra 5K but still no deal. A pair of doctors from the Bay area offered 65K and the deal was closed. The Doctors plan on using this inholding as their private hunting club in the future. Hopefully, they will attempt to



manage it in such a manner as to be beneficial to Wildlife.

## 2. Easements

Nothing to report.

## 3. Other

With the advent of the Farm Bill, Modoc became involved with Ecological Services in determining the wildlife values of a ranch adjacent to the refuge. The Assistant Manager spent a day on the area with the local FmHA Manager in August and spent another day with Terri Pencovic of the Sacramento Ecological Services office on this project. The ranch in question borders the Godfrey Tract of the refuge along the Pit River. It consists of 140 acres of river bottomland/riparian habitat and 540 acres of undeveloped uplands. The area has an excellent potential for limited waterfowl production and resting area with no further development. With active development, it could produce a significant amount of waterfowl on an annual basis.

The final recommendation was to acquire this ranch if possible. If it cannot be acquired, it is planned to request deed restrictions which will eliminate future cattle grazing along the river bottomlands.



87 NR-3, MDC 2018, 08/14/86, WRR

Pit river oxbow adjacent to refuge and currently being considered for acquisition.



#### D. PLANNING

##### 1. Master Planning

Nothing to report.

##### 2. Management Plan

There were no new plans submitted for approval under Part III of the Refuge Management Plan this year. Work began on a Law Enforcement Plan and a Cropland Management Plan. These two planning efforts will hopefully be completed in 1988.

##### 3. Public Participation

The manager met with the newly formed Modoc County Fish, Game and Recreation Commission to discuss public use activities on the refuge. A considerable interest was expressed in the waterfowl hunting program. The group also requested possible assistance in the form of advice concerning wetland management at future meetings. The refuge agreed to help in any way possible. To date there have been no requests.

##### 4. Compliance with Environmental Mandates

The refuge became actively involved with E.P.A.'s "LUST" program this year. There were a total of six underground fuel storage tanks on the refuge. By the end of the year four had been removed and disposed of.

The remaining two tanks will be removed and disposed of in 1988. Of the six tanks present on the refuge, four contained #2 diesel. The other two tanks contained regular gasoline and non-leaded gasoline respectively.

The removal of these tanks required considerable modification of fuel use at the refuge. Along with two of six storage tanks, two oil burning furnaces were removed. These units were replaced with propane furnaces and one above ground storage tank. The underground tank at the manager's house was replaced with a new 500 gallon above storage tank. All vehicle fuel is now obtained at a "card lock" self service fueling center in Alturas. In addition, a 300 gallon field service trailer was obtained to carry diesel fuel into the field.

Soil samples were taken from all of the excavations of existing tanks and submitted for analysis to California Analytical Laboratories in Sacramento to determine how much, if any, contamination had occurred. Results from the testing came back negative, there was no pollution in any of the excavations.



87 NR-4, MDC 2253, 01/11/88, ECB

New 300 gallon field service trailer  
for fueling equipment in the field.

5. Research and Investigation

Nothing to report.

6. Other

Nothing to report.

## E. ADMINISTRATION

### 1. Personnel



87 NR-5, MDC 2280, 02/17/88, LB

#4                  #3                  #2                  #1

1. E. Clark Bloom - Refuge Manager PFT GS 485/11/07 EOD: 02/74
2. Thomas J. Melanson - Asst. Refuge Mgr. PFT GS 485/09/01 EOD:09/83
3. Marcia I. Cornwell - Clerk Typist Career Cond. FT GS 322/04/01  
EOD: 06/87
4. Lyle L. Burgoyne - Maintenance Worker CS WG 4749/06/04 EOD:06/76

Not pictured:

William R. Radke - Refuge Assistant PFT GS 303/5/04 EOD: 10/84  
Transferred: 03/87

Earl E. Yauney - Engin. Equip. Operator TEMP WG 5716/08/02  
EOD: 05/87

Terminated: 09/87  
David A. Fonseca - Maintenance Worker PFT WG 4749/08/05 EOD: 02/82  
Disability eff: 05/87

Darryl G. Wilkins - Maintenance Worker PFT WG 4749/08/05 EOD:4/87

Several personnel changes occurred on the refuge during 1987. In March Refuge Assistant Bill Radke transferred to Columbia N.W.R. in Washington to fill a refuge biologist position. Maintenance worker Darryl Wilkins transferred in from Nisqually Refuge to fill a position which had remained vacant since the retirement of Raymond Russell in

November 1986. Darryl came on board in April and has done quite well in learning the complicated irrigation system on the refuge. Marcy Cornwell came on board June 16th as a clerk/typist, filling the position vacated by Bill Radke in March.

Maintenance worker David Fonseca had been on leave-without-pay status since July 1985 when he was struck in the face by a steel cable. Dave had applied for disability and was being paid under the Office of Worker's Compensation Program. Dave's disability application was granted in May and he is no longer with the Service. His position has been converted to temporary full time.

In May, Earl Yauney returned for a third consecutive season as engineering equipment operator. "Dude" has worked previously for the Service at Modoc NWR, Sheldon NWR, and Ridgefield NWR. This year he was responsible for a major rehabilitation project involving the construction of over 70 nesting islands in Goose Pond as well as a significant portion of the farming program.

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

<u>Year</u>	<u>On-Board Strength at Modoc NWR</u>	
	<u>Permanent</u>	<u>Temporary</u>
	<u>Full Time</u>	<u>Part Time</u>
1983	4	2
1984	5	2
1985	5	1
1986	5	1
1987	4	1

## 2. Youth Programs

Nothing to report.

## 3. Other Manpower Programs

The refuge again entered into a job training partnership with TEACH, Inc. this year. The major goal of this summer youth employment program is to provide positive summer work experiences which will enhance permanent employment opportunities upon graduation from high school or post secondary education. In return, the refuge gains a cost free employee.

Donald McIntyre worked from July 6 to August 14 as a biological aid, assisting in colonial bird nesting surveys, Sandhill Crane banding and habitat rehabilitation. Donny also conducted several routine maintenance tasks.

#### 4. Volunteer Programs

The volunteer program continued to play an important role in the overall management of the refuge. A total of five volunteers put in over 300 hours of their time on various refuge projects.

Donald R. McIntyre, a local student, volunteered about 70 hours doing wildlife censusing.

Marcia F. Radke donated 30 hours helping with raptor rehabilitation. Marcia was in charge of the rehabilitation program which involved transporting injured birds, nursing wounds, providing food and general care, and cleaning cages.

Lois N. Bloom donated 20 hours of her time handling information requests and preparing interpretive material for the refuge which is used during outdoor classroom programs.

Blair French and Stu Sprecher, summer range techs for the local BLM office both spent considerable time on the refuge assisting with duck banding on a daily basis. In addition, they both were instrumental in the operation of the Rocket Net in the Greater Sandhill Crane banding operation.

#### 5. Funding

Although the funding picture looked grim at the beginning of the year, ARRM'S add-ons permitted more than an adequate budget for the remainder of the year. Actually, at times, there was almost too much money. Eleventh hour spending became quite a chore to insure that the extra money was spent in a prudent manner. However, all's well that end's well and at the years end the refuge had acquired several new pieces of equipment, taken care of "LUST" and let a contract to repair the remaining water control structure damaged in the 1986 flood.

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

Table #3 Funding Levels

<u>Year</u>	<u>1270</u>	<u>1240</u>	<u>1260</u>	<u>1520</u>	<u>8610</u>	<u>2821*</u>	<u>6860</u>	<u>Total</u>
1983	500	9,000	157,400	12,000	2,900	217,000	7,000	405,800
1984	500	-----	194,800	9,000	4,000	20,000	7,000	235,300
1985	500	-----	169,400	10,680	1,800	110,100	7,000	299,480
1986	500	-----	198,700	-----	1,800	158,500	7,000	366,500
1987	---	-----	309,400	-----	2,200	50,000	7,000	368,600

\*This column denotes other than normal funds or "earmarked" funds such as the 50K in 1987 to rebuild the Parker Creek diversion structure.

#### 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 staff attitudes were generally safety conscious, five accidents did occur during the year. These accidents and their corrective actions are summarized as follows:

On 05/01, During a family outing at Dorris Reservoir a young girl ran into the boundary fence near the dam. She suffered a cut lip which required four sutures. The location where the injury took place was not a recognized point of entry, however it is an extremely popular fishing spot and receives a fair amount of foot traffic. Rather than try to stop entry at this location, it was decided to install a small gate which could be locked during the closed season.

On 05/12, a refuge visitor was leaving the refuge when she lost control of her vehicle (probably due to a flat). Due to her "inexperience" she chose not to apply the brakes, but rather let the truck travel off the road into the edge of the Duck Pond. No injury or property damage resulted.

On 06/19, a refuge employee was doing some welding maintenance and repairs. The welding material was placed on the work bench and slipped off the end hitting the employees' forearm, causing a burn. This could have been prevented by having a more secure placement of the material being welded.

On 07/23, while working on a barbed wired fence, a Teach employee suffered a puncture wound in his palm, even though he was wearing gloves. A tetanus shot was required.



On 08/27, a refuge employee was running the TD-18 crawler tractor in the Goose Pond area where dirt and dust is thick. The employee was not wearing the personal protective equipment available to him, causing dirt and dust to lodge in his eyes, scratching one. Employees were reminded to wear their personal protective equipment. This resulted in a visit to a physician, but no lost days.



87 NR-6, MDC 2276, 02//88, ECB

Wilkins putting out fire.  
Fire extinguisher practice for safety meeting.

#### 7. Technical Assistance

Refuge Manager Bloom assisted personnel from the California Department of Fish and Game in management planning on their recently acquired Ash Creek wildlife management area. This area had been considered for acquisition by the FWS in the late 70's at which time Bloom had been involved in developing a potential management plan for the area. He supplied the state with maps and potential management schemes for the area.

#### 8. Other Items

Nothing to Report

## 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.

Major habitat management actions conducted this year included draining Goose Pond and constructing nesting islands (F,2), burning the Pit Marsh (F,9), and converting the south grain field to a seasonal marsh (F,2 & 4).

### 2. Wetlands

Refuge wetlands exist within, and are derived from, a very complex irrigation system. The entire area is managed though the use of a water conveyance system which includes an 11,600 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.

Goose Pond was drained this year and over 70 nesting islands were constructed by temporary equipment operator "Dude" Yauney. Islands were constructed using a TD-18 crawler dozer and a cable operated eight cubic yard earth mover. In addition, a peninsula on the south side of Goose Pond was cut in two locations to provide ground nesting birds protection from mammalian predations. In addition, Mr. Yauney also rehabilitated the headquarters pond by re-setting the outlet water control structure, repairing the dike, and building three nesting islands.



87 NR-7, MDC 2189, 07/01/87, ECB

Temporary equipment operator "Dude" Yauney  
building nesting islands in headquarters pond.

The 120 acre south grain field was planted to barley in May. However germination was virtually nonexistent due to a weevil infestation in our seed supply. Because of this crop failure we decided to manage this unit as a seasonal marsh for a few years and evaluate the results. The unit remained dry through the summer and produced a healthy crop of rumex, mediterranean sage and assorted other weeds before being flooded in October. Duck use during October and November was phenomenal compared to recent years. Since the unit objective is to provide feed for fall migrants it appears that at least one good thing did result from our crop failure.





87 NR-8, MDC 2221, 11/18/87, TJM

General view of wetlands on west  
side of refuge with city of Alturas in background.

Natural hot springs adjacent to refuge headquarters went dry in July and remained so until October. This is the fourth consecutive year and a fifth time this has occurred since 1982. Suspected cause is overdraft by commercial wells in the area.

### 3. Forests

Nothing to report.

### 4. Croplands

Modocs' farming program is conducted entirely by force account and is aimed at providing cereal grain for migrant waterfowl during the fall. The success of our farming program usually depends on how well our equipment holds together, which it did quite well this year. However, our barley crop was a complete failure due to a weevil infestation in our seed which was supplied by the Klamath Basin refuge complex. We contacted the personnel at Klamath Basin and they were not aware of the infestation, however they did get their storage bins fumigated prior to cutting seed in the fall.

Of the 270 acres of barley which failed to germinate, we replanted 150 acres to winter wheat. The 120 acre south grain field was converted to a seasonal marsh. An additional 150 acres were also planted to winter wheat.

## 5. Grasslands

Of a total of 3,000 acres, 1,000 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 2,000 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.

A total of 65 acres of perennial rye was planted in three locations to improve nesting cover. A similar 20 acre plot planted in 1984 provided good nesting cover in 1987 and supported 15 duck nests. These plantings also provide excellent goose browse during their first winter.

## 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 four years we have been planting various species along the creek in an attempt to improve this habitat. This year we planted ten Cotoneaster, fifty Streamco Willow, and fifty Golden Willow. Species planted in the past include: Charagana, Chokecherry, Honeysuckle, Sumac, Hedgerose, Buffaloberry, Russian Olive, Black Locust, Crabapple, Golden Willow, Streamco Willow, and Jeffrey Pine.

These seedlings are obtained from the Central Modoc Resource Conservation District for \$1.00 each.



87 NR-9, MDC 2178, 05/21/87, ECB

For the third consecutive year Lois Bloom brought her third grade class to the refuge in May to assist in planting seedlings along Pine Creek.

## 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 loafing and feeding areas for the resident flock of honkers, keeping them off neighboring ranches as much as possible.

Grazing permits were issued to three permittees this year. John Younger and Bob Schluter were issued permits for summer and fall grazing. Rates for these permits were based on a rate survey conducted in 1986 and amounted to \$9.50/AUM for summer grazing and \$7.50/AUM for fall grazing (Sept. - Nov.).

Stephen Nelson was issued a permit for fall grazing on the basis of being the high bidder with a bid of \$10.26/AUM. This is the first grazing permit to be issued on the bid system. We chose this system to reduce complaints by permittees that our rates are too high, and to better reflect the real "market value" of the commodity. Long time permittees who were granted "grandfather" permits when the refuge was established will continue to have their permits rates based on rate surveys.



A total of 1164 AUM'S worth \$10,037.00 were harvested. A rate survey was again conducted this year which indicated no change in rates will be necessary in 1988.

#### 8. Haying

Approximately 2,000 acres of irrigated meadows exist on the refuge, of which roughly 1,600 acres are hayed annually. Haying is an effective and economical management 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.

In 1985, we began delaying haying dates from July 15th to August 1st on selected units. These delays were implemented in an attempt to increase Sandhill Crane production. When meadows are dried for haying a large part of the invertebrate food source of cranes is lost. In addition, escape cover is lost when haying is completed, leaving young colts more vulnerable to predation. Conversion to the August 1st haying date will continue as permittee attrition occurs.

A total of seven hay permits were issued this year, three were grandfather permits and four were awarded to high bidders. Grandfather permits went for \$12.00/ton based on a rate survey while high bids received were \$5.00, \$13.65, \$14.25 and \$17.26/ton. A total of 1,716 tons were harvested for a total income to the government of \$19,288.19.

#### 9. Fire Management

Six prescribed fires were planned and approved for 1987. However, due to the number of wildfires and extreme fire danger throughout the west this summer we were not able to conduct any burning August through October. Therefore the Pit Marsh burn was the only one conducted. The Pit River flood plain, Heifer field, Sharkey field and west Pit burns have been re-scheduled for 1988.

Pit Marsh - This burn involved 45 acres of reed canary grass and cattails located along old oxbows of the Pit River. The habitat quality for nesting Canada Geese has declined in this unit over the past several years due to an accumulation of matted Canary Grass. The burn was conducted on March 6th and was successful in removing virtually all vegetation in the unit. The area will be monitored for use by nesting geese in 1988.



87 NR-10, MDC 2218, 08/29/87, TJM

Faulty powerline insulator which  
caused the only wildfire on the refuge this year.

One wildfire did occur on the refuge this year when an insulator on a powerline failed, causing two wires to short circuit and arc to the ground igniting Cheatgrass and sagebrush. The fire was discovered at noon Saturday August 29, by Assistant Manager Melanson who was conducting farming operations. Melanson contacted Manager Bloom who was also working and together they began fighting the fire with the refuge fire truck. The Rural Fire Department arrived shortly thereafter and the fire was quickly extinguished after consuming three acres of Cheatgrass and sagebrush.

#### 10. Pest Control

The refuge again participated with the county in an effort to control Scotch Thistle. This is a cooperative program in which the refuge pays for one-third of the cost of the chemicals, use of equipment, and

county employee labor. This year the refuge paid \$174.16. Control is attempted through spot application of the herbicide "Tordon". The refuge has been involved in this control program since 1974.

Poison Hemlock has become a serious pest plant at Modoc NWR over the past 10 years. Each year the plant infests new areas on the refuge, often to the total exclusion of any other vegetation. Levees, ditch banks, and road shoulders are the primary and major locations of establishment. Pond margins and wet meadow/upland interfaces have also become infested although to a lesser degree. The quality and quantity of waterfowl nesting habitat 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. Due to our inability to locate a certified pesticide applicator locally, no spraying was conducted this year. Assistant Manager Melanson is a certified pesticide applicator, however he had taken on the duties of the vacant refuge assistant position mid-March through mid-June and did not have time for spraying. We plan to continue the spraying program in 1988 barring any personnel shortages.

In 1986 and again this year several patches of Poison Hemlock were discovered which had become infested with an unknown species of Lepidoptera larva. These larva appeared to be feeding on the seed heads and leaves of the plants and weakening or killing the plant. Specimens were sent to the University of California at Davis in 1986 and were determined to "probably" be Chionodes sp. Identification problems resulted from difficulty in locating mature larva. This identification problem was not solved this year either, however when we identify the insect we may be able to initiate some type of biological control program.

#### 11. Water Rights

Modoc 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% 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 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 \$4,888.00 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 filed a protest. Hydrologist Richard Johnson in our Portland Regional Office is currently responding to these protests which will hopefully be settled in 1988.

#### 12. Wilderness and Special Areas

Nothing to report.

#### 13. WPA Easement Monitoring

Nothing to report.

### G. WILDLIFE

#### 1. Wildlife Diversity

The wide range of habitat types present on the refuge supports a corresponding amount of wildlife diversity. At least 232 species of birds alone have been observed on the refuge, and at least 76 species nest at Modoc. The greatest diversity of wildlife occurs along the Pine Creek riparian corridor. The importance of this habitat is recognized and has been protected through fencing, enhanced through plantings, and monitored for species trends.

#### 2. Endangered and/or Threatened Species

Bald Eagles and Peregrine Falcons are the only federally listed species in this category occurring on the refuge. The number of eagles peaked at five in January, with the first fall sighting on November 25th on Goose Pond. Bald Eagles utilized 255 use-days, with the majority of this occurring during January and February. Peak eagle use in the fall occurred in December with only two birds present on the refuge. Peregrine Falcon sightings are very rare, normally occurring once every few years. However, one was recorded on November 12th at Dorris Reservoir by Manager Bloom.



87 NR-11, MDC 2132, 01/12/87, WRR

Bald Eagles at Dorris Reservoir

### 3. Waterfowl

#### a) Ducks

Duck use on the refuge increased for the second consecutive year, with 1,244,154 use days being recorded. Part of this 23% increase over 1986 may be due to very mild/warm weather through November and adequate food supplies in Goose Pond and the south grain field.

Table #4                      Estimated Duck Production on Modoc NWR

<u>Species</u>	<u>Objective</u>	<u>1987</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>
Mallard	2,000	940	1,513	1,748	874	1,220
Gadwall	1,800	351	1,710	1,556	813	800
Northern Pintail	500	55	157	172	165	400
Cinnamon Teal	2,500	775	1,511	2,054	659	1,690
American Wigeon	200	61	255	92	134	200
Northern Shoveler	200	199	522	175	88	290
Redhead	600	360	921	562	202	370
Ruddy Duck	300	125	225	107	222	150
TOTALS:	8,100	2,866*	6,814	6,466	3,157	5,120

\*Estimated production calculated using Mayfield 40% technique.

Low breeding pair counts are attributable for low estimated production, as nest success rates were normal, averaging 53%.

#### b) Geese

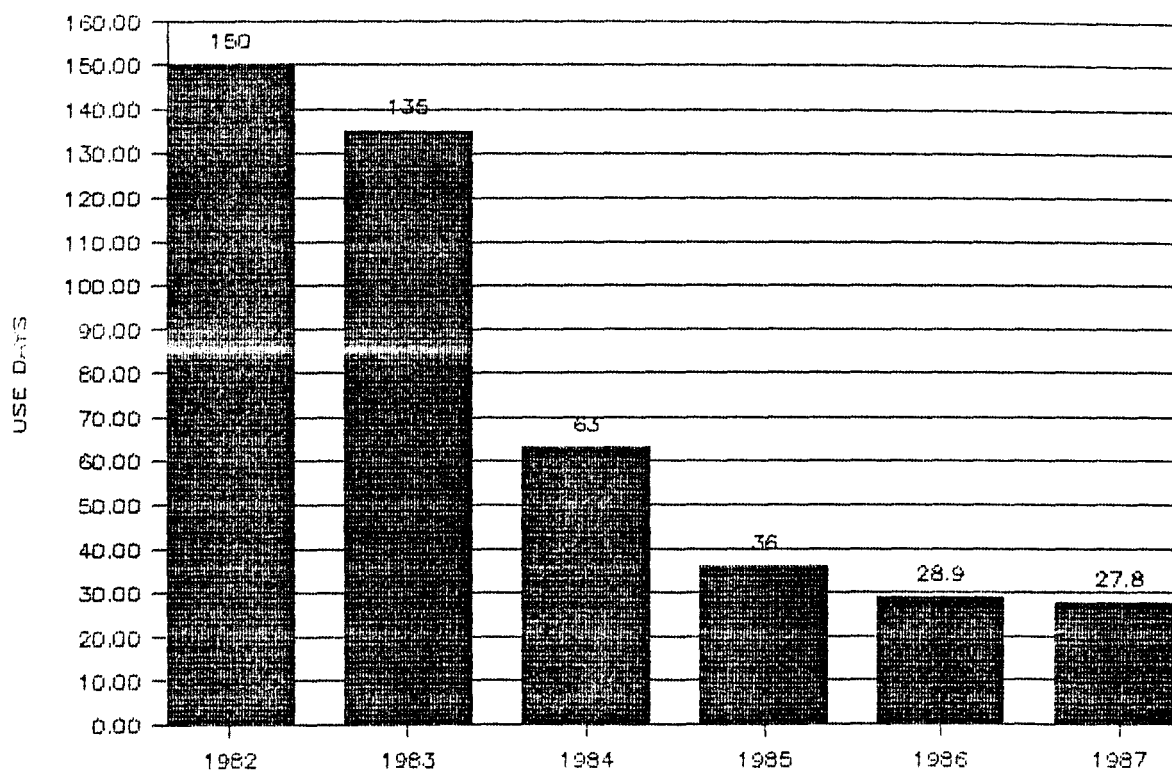
Goose use was virtually identical to last year, with only a 1% increase noted. Great Basin Canada Geese accounted for 94.9% of the 788,000 use days recorded. Cackling Canada Geese made up 3.5% with White-fronted Geese accounting for the remaining 1.6%. Snow Geese were rarely seen on the refuge, which is typical. Cackling Canada and White-fronted Geese are normally present December through April, with peak populations present this year in March and April respectively.

Cackling Canada Goose use dropped for the sixth consecutive year in 1987, although at a lower rate than in the past. Hopefully this is a signal that the population has begun to rebound, or has at least stabilized.



Table # 5

# ACKLING CANADA GOOSE USE-DAYS



Canada Goose production continues to be excellent, with an estimated 1,262 geese raised this year. Nest surveys revealed an 88% success rate which is significantly higher than the ten year average of 70%. Although significantly less than our objective level of 1,800 (which may be overly optimistic), the 70 new islands constructed in Goose Pond could raise well over 100 additional birds in 1988.

## c) Swans

Swan use varies widely from year to year and is heavily influenced by the timing and duration of freeze-up of refuge ponds. This year Swans utilized 15,700 use days, with a peak population of 450 present during November. No Collared Swans were sighted this year.

#### 4. Marsh and Water Birds

Sixteen species of marsh and water birds were present during the year for a total of 60,725 use days. The first documentation of Black-crowned Night Herons nesting on the refuge occurred in 1986, when 12 nests were located on Teal Pond. This year 35 nests were located in the same area. In addition, two Great Egret nests with young were located in Teal Pond. This is the first documentation of this species nesting on the refuge.

Table #6 Marsh and Water Bird Production at Modoc NWR

Species	1987	1986	1985	1984	1983
Western Grebe	5	8	30	25	30
Eared Grebe	15	110	80	90	100
Pied-billed Grebe	25	90	40	100	70
American Bittern	*	*	*	15	20
Black-crowned Night Heron	91	27	*	15	15
Greater Sandhill Crane	14	20	11	15	15
Virginia Rail	*	*	*	60	50
Sora	*	*	*	60	50
Great Egret	2				

\*No documented production

Goose Pond normally supports a major nesting colony of Eared and Pied-billed Grebes. The fact that Goose Pond was drained this year for maintenance is reflected in the extremely low production by these species. A few of these displaced birds did relocate on Teal Pond however.

Once again Sandhill Crane nesting activities were monitored to determine production for this sensitive species. It should be noted that monitoring was hampered somewhat this year due to a two week absence of the assistant manager for training during April. This significantly reduced the number of nests located and monitored.

Breeding pair counts in April revealed 28 pairs which established territories on the refuge. Fifteen nests were located and monitored. Eight nests were located near pond margins, with the remainder located in wet meadows, all nests were successful.

Twenty-nine eggs were present for an average clutch size of 1.93. Twenty-five eggs hatched successfully, one was destroyed by an unknown predator, one was infertile, one was fully developed but did not hatch and one egg had slid inside of a half shell from a previously hatched egg in the same nest, however the colt died before piping through both egg shells. Egg lengths ranged from 10.16 cm to 8.62 cm and averaged 9.55 cm. Egg diameter ranged from 5.62 cm to 6.79 cm and averaged 6.26 cm.

Banding efforts continued this year with nine colts being banded/color marked prior to fledging. A rocket net was set-up by volunteers in late August and one adult crane was captured and banded.

Production was determined by observing fledged colts during August and September. Observations of color banded colts, unbanded colts with color banded adults and unbanded colts with unbanded adults allowed for a fairly accurate production estimate. Counts revealed a minimum of 14 and possibly as many as 19 colts being fledged on the refuge. This yields a production rate of at least 25% and possibly as high as 33%. These exceed the objective production rate of 20% in the stations Sandhill Crane Management Plan.

Table #7 Sandhill Crane Production at Modoc NWR

Year	Nesting Pairs	# Nests Located	Successful Nests		# Fledged	% Recruitment
			#	%		
1979*	16	16	11	69%	11	34%
1980*	22	22	8	40%	13	29%
1981	23	18	10	55%	8	17%
1982*	22	19	14	73%	12	27%
1983	26	29	13	45%	11	21%
1984	27	14	8	57%	5	9%
1985	30	25	19	76%	11	18%
1986	32	21	14	66%	20	31%
1987	28	15	15	100%	14	25%

\* Data is probably an overestimation of actual production.



87 NR-12, MDC 2235, 10/16/87, ECB

Pacific Power and Light Co. installed orange line markers along Co.Rd. 115 to reduce bird-powerline collisions.

In 1986 the refuge purchased orange powerline markers from Tana Wire Marker of California, Missouri for installation on powerlines crossing the refuge. This was called for in the station Sandhill Crane Management Plan to reduce crane/powerline collisions. The Surprise Valley Electrification Corporation installed markers on their lines in 1986 shortly after we made our request. However, it took us a year to get the Pacific Power and Light Company to install markers on their line which parallels Co.Rd. 115. Several sections of line remain without markers due to lack of funds but it appears we may be able to complete this task in 1988.

##### 5. Shorebirds, Gulls, Terns, and Allied Species

Eighteen species in this category were observed on the refuge throughout the year for a total of 155,655 use days. Goose Pond was used extensively by a variety of shorebirds as mudflats were exposed during the spring and early summer.

Table # 8

Production by Shorebirds, Gulls, Terns, & Allied Species.

Species	1987	1986	1985	1984	1983
Wilson's Phalarope	120	150	150	200	100
American Avocet	15	12	20	15	25
Black-necked Stilt	9	15	10	-	5
Common Snipe	140	130	150	180	200
Willet	15	15	20	35	50
Spotted Sandpiper	*	-	10	-	30
Long-billed Curlew	9	12	10	25	20
Killdeer	200	200	200	200	200
Forster's Tern	8	10	-	-	-
Black Tern	*	2	-	-	-

\* No documented Production

An interesting incident of predation by a California gull on ducklings was documented by Manager Bloom on June 13th.

A Gadwall hen and a brood of nine Class I ducklings swam out of the grass/sedges along the eastern shoreline of the middle 395 pond. Almost immediately, a Caspian Tern made two passes at the brood. A California Gull then chased the Caspian Tern away and began attacking the brood. The Gull made ten passes at the brood, which would dive under the water. The Hen jumped up several times in an attempt to defend the brood. On the seventh and tenth attacks, the Gull was successful in catching a duckling which were swallowed in mid-aid. After eating the second duckling, the Gull flew around the pond once and left the area. The Gadwall hen and brood swam to the far side of the pond and entered vegetation on the edge of an island. During this entire episode which lasted approximately five minutes, there was a drake Gadwall near the hen which made no attempt to defend the brood.

## 6. Raptors

Fourteen species of raptors utilized the refuge for varying amounts of time during 1987 for a total of 27,250 use days. The most common species were Red-tailed Hawks, Northern Harriers, and Great-horned Owls. Peak numbers of raptors use the refuge during winter months while feeding on rodents and crippled waterfowl.

Table #9  
oc NWR

Raptor Production on Mod\*\*

Species	1987	1986	1985	1984	1983
Northern Harrier	26	10	2	4	15
Red-tailed Hawk	4	5	6	2	-
American Kestrel	3	-	5	3	-
Great-horned Owl	3	1	3	4	5
Short-eared Owl	25	15	3	3	-
Common Barn Owl	7	-	3	3	-
Burrowing Owl	-	-	-	-	-

7. Other Migratory Birds

Four new species of birds were observed on the area during the year, bringing the total number of bird species on the refuge to 233. In April a Chukar was observed by the manager along the Dorris canal where it intersects Pine Creek. It was at first thought to be an escaped domestic bird from a nearby ranch. However, it was later learned that a wild chukar population exists in Fithzhugh Creek Canyon about seven miles distant giving rise to the possibility that the bird observed on the refuge was a valid observation of a wild bird. In May and again in October, two different Swamp Sparrows were captured in mist nets at subheadquarters. Other mist net captures of new species included a Least Flycatcher and a Red-napped Sapsucker in September. These captures were reported to American Birds for further documentation of vagrant movements.

Mourning Dove use on the refuge was 9,000 use days, up somewhat this year from last years low of 3,000 use days. Very little nesting occurred on the refuge this year, there was no documented production. Peak use occurred in August, just prior to the opening of Dove season. However, most of the Doves had moved on by September first.

Combined Raven and Black-billed Magpie use of the refuge remained basically unchanged from previous years. Raven use dropped off somewhat, only one pair was observed spending 385 use days foraging on the refuge during the year. On the other hand, Black-billed Magpies use increased with up to 40 birds observed spending over 5,500 use days on the refuge throughout the year. Both of these species of birds have been known to take duck eggs, although there was no documentation of this activity this year.

This year marked the sixth year in a row that a mist netting project in riparian habitat was conducted on the refuge. During the course of this year a total of 33 days of effort were put into the project as compared to last year's 56 days. As in previous years, well over one half of the effort was conducted on a volunteer basis by the manager on weekends.



The following table summarizes data gathered this year.

Table #10      1987 Riparian habitat Mist Netting Project

Total Days of Operation	33
Total Net Hours	966
Birds per 100 net Hours	128
Total Birds Captured	1,238
Total Number of Species	56
Largest Daily Catch	(106 birds) 09/30/87

Top Ten Species Captured

<u>Species</u>	<u>Total Captured</u>
1) Yellow-rumped Warbler	263
2) Orange-crowned Warbler	179
3) Yellow Warbler	143
4) White-crowned Sparrow	92
5) Common Yellow Throat	49
6) Song Sparrow	44
7) House Finch	41
8) Tree Swallow	33
9) Lincoln's Sparrow	30
10) MacGillivray's Warbler	25

One of the principal reasons for conducting the mist netting project is to continue to monitor the population trend of Willow Flycatchers on the refuge. This sensitive species utilizes riparian habitat on the refuge during migration and has 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 use by Willow Flycatchers. This increase should show up in current and future mist netting projects. Figure #1, graphically depicts these trends along with Brown-headed Cowbirds which are known to have a detrimental effect upon small passerines such as Warblers and Flycatchers.

# WILLOW FLYCATCHER & BR.-HEADED COWBIRD

POPULATION TRENDS ON MODOC N.W.R.

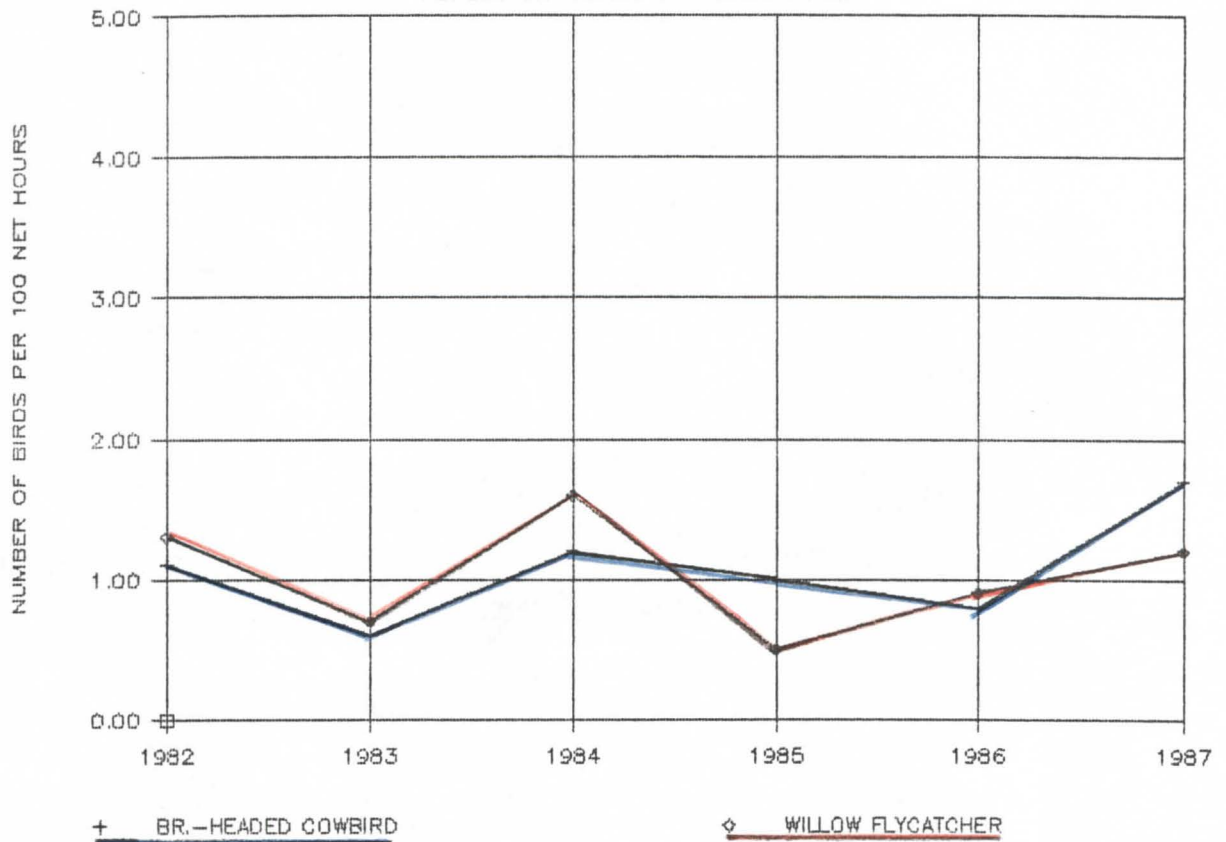


Figure #1

The mist netting activities over the past five years have also been very valuable in documenting use by other small passerines such as the Swamp Sparrows and least Flycatcher captured this year that otherwise would probably have gone unnoticed.

The mist netting operation will be continued during 1988 as time permits. Should a suitable volunteer be located, the amount of time spent on the project will be increased, especially during the spring and fall migration period. We hope to continue this operation through 1992 in order to have a total of 10 years of data to work with.

## 8. Game Mammals

### a) Mule Deer

The mule deer population on the refuge has steadily increased since it was hit by a lungworm outbreak in 1985. The population averaged 50-60 animals and peaked near 100 during the fall. These animals are hampering our efforts to establish shelterbelts and rehabilitate riparian habitat, despite placing wovenwire guards around new plantings.

### b) Antelope

Two pronghorn antelope does were sighted on the refuge entrance hills in June which is rather unusual. A major migration route does exist east of Dorris Reservoir and up to 100 may be seen there during the spring.

### c) Cottontail

Cottontail numbers are up this year.

## 9. Marine Mammal

Nothing to report.

## 10. Other Resident Wildlife

California quail and ring-necked pheasants continue to maintain their populations on the refuge. Quail have responded well to habitat improved by planting cereal crops adjacent to riparian woodland at subheadquarters.

Commonly observed mammals include Muskrat, Mink, Belding's Ground Squirrel, and Striped Skunk. Black-tailed Jackrabbit populations appear to be back on an upward trend.



87 NR-13, MDC 2075, 10/13/86, WRR

"Rubber Boa in defensive posture"

Resident reptiles documented on the refuge include the Western Fence Lizard, Sagebrush Lizard, Side-blotched Lizard, Rubber Boa, Racer, Gopher Snake, Western Terrestrial Garter Snake (*Thamnophis elegans*), and Common Garter Snake (*T. sirtalis*). The Western Pond Turtle has apparently been introduced in the area and has been sighted on the refuge since at least 1982. Amphibians documented on the refuge include the Western Toad, Pacific Treefrog, and the bullfrog.

#### 11. Fishery Resources

In 1986, 5,000 catchable size rainbow trout were planted in Dorris Reservoir, of which 1% were equipped with reward tags. Tag returns will be evaluated for two years to determine if a put and take trout fishery is economically justified. Results are pending.

The reservoir got some much needed improvements in warmwater fish habitat when the Organized Sportsmen of Modoc County volunteered time and materials and constructed 70 bass nesting structures. Structures were placed approximately two feet below maximum pool level and consisted of rock rings two feet wide filled with peagravel. The sportsmens club placed the structures in March during low water, however, due to drought conditions the reservoir did not fill this year and the structures remained exposed. Hopefully the bass will be able to utilized them in the coming year.

## 12. Wildlife Propagation and Stocking

Nothing to report. (See Fishery Resources above).

## 13. Surplus Animal Disposal

Nothing to report.

## 14. Scientific Collections

Nothing to report.

## 15. Animal Control

An active animal control program has been conducted for the past several years. Control efforts are concentrated during nesting and brood rearing periods. In addition, fur trapping permittees are encouraged to take pest animals during their winter trapping activities. Improving waterfowl production is the program goal, with Striped Skunks being the major target animal.

Studies at Malheur NWR have shown coyotes to be a major predator on Sandhill Crane eggs and young, therefore they are controlled also, particularly in the spring and summer as needed. In addition, beaver are occasionally taken to control damage to our water delivery system. Feral cats and raccoon are also taken in conjunction with our skunk control activities. The following animals were removed during the year.

Striped skunk	76
Raccoon	5
Feral cat	50
Beaver	1
Coyote	3



87 NR-14, MDC-2256, 12/30/87, TJM

220 Conibare/box trap used in our animal control program.

#### 16. Marking and Banding

As required by the annual work plan, Modoc again participated in the pre-season Mallard banding program. The refuge manager and assistant manager took turns tending five swim-in traps from August ninth through October fifth. A lack of water put one trap out of action for at least one half the time period while another trap simply did not catch any birds. Despite these problems over 1,800 Mallards (almost 1/2 the entire quota for northern California) were banded.



Banding results are summarized as follows:

Table #11                      1987 Banding Accomplishments

<u>Species</u>	<u>Number Banded</u>
Mallard	1,810
Northern Pintail	13
Cinnamon Teal	15
Green-winged Teal	2
Gadwall	5
Redhead	6
Ruddy Duck	1
American Coot	43
Total Banded	1,895

For the fourth consecutive year, an effort was made to capture and color mark known-age Sandhill Cranes.

This year a total of ten cranes were captured, color marked and banded. The age classes of these ten birds were as follows:

Local -	5
Hatching Year -	4
After Hatching Year -	1

#### 17. Disease Prevention and Control

There were no documented disease outbreaks on the refuge this year. The few dead birds that were found were decomposed beyond the point where any type of lab analysis could be conducted.

#### H. PUBLIC USE

##### 1. General

Public use on the refuge centers around warmwater fishing, wildlife observation and waterfowl hunting. Refuge visits totaled 8,316, down significantly from 14,900 last year. Low water levels and poor fishing results at Dorris Reservoir account for a large portion of the decline. Twenty five news releases were printed in the local newspaper, covering such topics as waterfowl hunting, steel shot requirements, fur



trapping, haying/grazing permits and the Dorris Reservoir maintenance contract. The newspaper owner and editor are very cooperative in helping us get our information out to the public. In addition, the refuge hunting leaflet and bird list were updated this year.

## 2. Outdoor Classrooms - Students

The refuge continued its outdoor classroom program this year, with two school groups and a total of 125 students participating in the program. Refuge personnel presented each group with an introduction to refuge objectives, wildlife management, and wildlife ecology. The students were then taken on a self guided tour conducted by the teacher. The tree planting program initiated in 1985 by third grade teacher Lois Bloom took place again this year. This type of hands-on learning and involvement among students was helpful in teaching them outdoor awareness. In turn, the refuge benefited through the planting of assorted trees and shrubs managed to enhance riparian habitat.

## 3. Outdoor Classrooms - Teachers

Nothing to report.

## 4. Interpretive Foot Trails

Nothing to report.

## 5. Interpretive Tour Routes

A two and a quarter mile automobile tour route circles Teal Pond and is the main route used by refuge visitors for birdwatching, photography etc. Portions of this route were widened and over 800 cubic yards of road base added, greatly increasing the quality and safety of the road. U.S. Highway 395 and County Road 115 pass through portions of the refuge and are also used extensively as wildlife observation routes.

## 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, as well as the more important species on the refuge and why.

## 7. Other Interpretive Programs

Refuge Manager Bloom completed his eleventh year as a California Hunter Safety Instructor. Approximately 30 students went through the program, which is mandatory before California residents can receive a hunting license. In addition to teaching safety practices, extra emphasis was placed on conservation, hunting ethics, and refuge regulations regarding waterfowl hunting.

## 8. Hunting

The waterfowl hunting season dates in California's North-eastern zone were virtually the same as last year, with a 79 day duck season (October 10 - December 27) and a 93 day goose season (October 11-January 10). In a continuing effort to reduce harvests of Mallards and Pintails, hunters were allowed five ducks daily of which no more than four could be Mallards and no more than four could be Pintails. In addition, no more than one hen Mallard and one hen Pintail could be in the daily bag.

This was the second year under the new steel shot regulations, and complaints concerning its required use were down considerably. Acceptance is growing with time. We even had several hunters state that they liked it better than lead.

Hunter numbers declined for the fifth consecutive year, down 19% from 1980, with 1,379 visits to the refuge. Excellent food supplies and fair waterfowl numbers resulted in good duck hunting success during the first month of the season. Despite lower hunter numbers, total ducks harvested was up for the first time in three years, with 1,672 taken, mainly Mallard, Gadwall, Wigeon, Pintail and Green-winged Teal. Goose hunters however experienced dismal success in bagging only 337 geese, all but one being Canadians. The lone exception was a Snow Goose. This is the lowest goose take since 1975. The goose population on the refuge and surrounding private land averaged 3,500-4,000 birds during October and November, which is not abnormal for that time of year. Several snow storms and temperatures in the single digits beginning in early December and continuing through the close of the season forced most of the geese to seek warmer areas to the south. At the close of the season the population was down to less than 500 birds.

Table #12

### Hunting Statistics

	<u>1987</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>	<u>1983</u>	<u>5 yr. <math>\bar{x}</math></u>
Total Hunters	1379	1702	1800	1801	2249	1786
Total Ducks Taken	1672	1409	1325	1724	2218	1670
Total Geese Taken	337	440	796	524	484	516
Total Snipe Taken	1	3	102	84	37	46
Total Birds Taken	2009	1852	2223	2332	2739	2231
Average Bird/Hunter	1.45	1.08	1.23	1.29	1.21	1.25

## 9. Fishing

Good catches of Largemouth Bass and Brown Bullheads were taken from Dorris Reservoir in May and early June. However, due to drought conditions the reservoir water level dropped drastically in July and fishing pressure dropped off likewise. Only 4,370 fishing visits were recorded, down significantly from 8,515 last year.

Opening and closing of the area as well as all custodial maintenance is accomplished by contract. Refuge staff handled contract administration again this year. Earl Young a local resident, was the low bidder for the six month job, with a bid of \$2,190.00.

#### 10. Trapping

Trapping permits on the refuge have been issued by a bid system since 1985. The refuge is divided into two units and prospective trappers were allowed to bid on one or both units. The high bidder(s) are required to submit a 10% down payment prior to beginning trapping.

Frank Worrel from Grants Pass, Oregon was the high bidder for the west unit with a bid of \$262.00, while David Jordan bid \$189.00 for the east unit. Frozen ponds inhibited early trapping efforts. However, after they thawed a record number of muskrats were taken as can be seen in the table below.

Table #13

Trapping Data

	<u>1987/86</u>	<u>1986/85</u>	<u>1985/84</u>	<u>1984/83</u>	<u>1983/82</u>	<u>1982/81</u>
Muskrat	1,692	1,004	837	906	832	690
Mink	10	18	11	15	15	34
Raccoon	0	1	1	0	0	0
Skunk	21	8	3	5	1	3
Coyote	0	0	1	0	0	0
Beaver	1	2	0	12	0	3
Weasel	1	0	0	0	0	0
Non-target species*	0	2	0	12	0	3
Total Income:	\$6,174	\$3,800	\$1,721	\$3,650	\$1,990	\$2,368

\*Non-target species consist of waterfowl & marsh birds.

The trapping program is conducted to reduce damage to roads and dikes by muskrats and beavers. Other fur-bearing species such as raccoons, mink, and coyotes are also permitted to be taken.

#### 11. Wildlife Observation

Wildlife observation centers around wildlife observed from the Teal Pond tour route. However, interest in raptors and passerine species has grown noticeably over the past few years. Mule deer are also a popular attraction, particularly with local residents during the fall. Wildlife observation was up slightly this year, as noted in the table on the following page.

Table #14 Public Use in the Form of Wildlife Observations

<u>Year</u>	<u># of Visits</u>
1982	1,330
1983	1,350
1984	2,640
1985	2,900
1986	2,155
1987	2,395

12. Other Wildlife Oriented Recreation

Photographic opportunities are plentiful on the refuge, however demand is rather low. Less than 50 photographic visits occurred this year. Visits to the refuge were primarily focused on photographic opportunities of 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. As a result, most of the photography oriented visits occurred around the tour route at Teal Pond.

13. Camping

Nothing to report.

14. Picnicking

Nothing to report.

15. Off-Road Vehicling

Nothing to report.

16. Other Non-Wildlife Oriented Recreation

Waterskiing and swimming at Dorris Reservoir continue to attract individuals to the refuge during summer months. In the past, regular weekend law enforcement patrols were scheduled to control minor consumption of alcohol and reckless driving. However, due to low water levels and therefore reduced use, these problems were virtually non-existent this year.

17. Law Enforcement

The law enforcement program at Modoc 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.

During the hunting season, enforcement activities are conducted under an established routine with at least one refuge officer on duty during every one of the scheduled 42 shoot days. Besides enforcing the law, in both overt and covert fashions, refuge officers conducted bag checks and answered questions. A total of 16 game law related violations were filed this year, down 7 from the previous year. In addition, two more citations were issued for general trespass. The following table summarizes known violations for 1987.

Table #15                      Known Violations for 1987

Migratory Bird Treaty Act 16 USC 703

50CFR20.21(b)	Unplugged gun	-	3
50CFR20.21(f)	Use of live birds as decoys	-	1
50CFR20.21(j)	Possessing shotshells loaded with shot other than steel	-	4
50CFR20.22	Take Swans during closed season	-	1
50CFR20.24	Exceed daily bag limit	-	3
50CFR20.33	Exceed possession limit	-	1
50CFR20.71	Take protected species (Double-crested Cormorant)	-	1

National Wildlife Refuge Administration Act 16 USC 668dd(e)

50CFR26.21(a)	General trespass (human)	-	2
50CFR32.2(d)	Comply with state law-no state duck stamp	-	1
50CFR32.2(d)	Comply with state law-use "F" shot to take waterfowl	-	1
Total:			18

18. Cooperating Associations

Nothing to report.

19. Concessions

Nothing to report.

## I. EQUIPMENT and FACILITIES

### 1. New Construction

Nothing to report.

### 2. Rehabilitation

One major rehabilitation project was completed this year under large ARRM'S funding. The Parker Creek Dam and diversion structures were rebuilt in order to correct the damages caused by the 100 year flood suffered by the refuge in the spring of 1986. Regional Engineers handled the design while all actual construction was done under contract. The contract itself, was awarded in August to Oller Bros. of Redding, California in the amount of \$50,000.00.

Mother nature was kind and very little bad weather hampered the actual construction which began in mid-October and was completed by the first week in December. The finished product was in full operation by the third week in December providing much needed water to Dorris Reservoir for storage.



87 NR-15, MDC-2250, 12/04/87, ECB

Rehabilitated control weir on Dorris  
supply ditch at Parker Creek diversion





87 NR-16, MDC-2249, 12/04/87, ECB

Main Parker Creek diversion structure  
with Dorris supply ditch weir in background.

A second rehabilitation project involving wetlands was completed by force account this year. Goose Pond, a major production area and Brood Pond was drained and 70 islands were reconstructed. These islands are instrumental in providing safe nesting areas for Canada Geese and providing loafing areas for waterfowl, especially during hunting seasons. In addition to the islands, the long peninsula on the west side of the pond was cut in two places creating two large natural islands. This project really taxed our archaic equipment and breakdowns were a common occurrence throughout the six week construction period. A secondary benefit from this project occurred in the form of a spectacular growth of smartweed which carpeted the entire pond bottom. Most of this growth made seed and provided about 30 days of feeding for several thousands of puddle ducks when it was re-flooded in the early fall.

A final rehabilitation project involved the replacement of two twenty year old badly rusted septic tanks with small ARRM'S dollars. Although not originally scheduled for replacement this year, it became obvious that something would have to be done when it was discovered that one was leaking and the other one caved in. Both tanks were replaced with concrete vaults which should last considerably longer than the old tin tanks.



### 3. Major Maintenance

Several major maintenance projects were accomplished this year. The refuge tour route received approximately 300 yards of three-quarter inch minus base as did the entrance road. Both jobs were completed by a local gravel contractor with small ARRM'S add-ons. In addition to receiving additional base gravel, the tour route was bladed once while the entrance road received four different gradings. The road grader was also used to spread Pit run gravel that had been hauled to the dike/road going to South Dam.

Besides the refuge road system, the refuge fleet received major maintenance as required. The TD18A received considerable attention which included a complete engine overhaul, replacement of brake shoes on the cable winch and rebuilt the P.T.O. shaft on the hydraulic pump. The TD9 had new injectors installed, brakes replaced and engine tuned up.

The D6 had new rails installed, the waterpump was rebuilt along with the generator and the wiring system was replaced. The Huber Road Grader received a new windshield, new tires and had a complete tune up. The John Deere 750, 2440 and 2940 tractors all received major tune ups and were serviced as necessary.

The managers house received some long overdue maintenance. Rotten siding and floor joints were replaced as necessary. The chimney was repaired and the masonry wall surrounding the yard was capped and patched as necessary.



87NR-17, MDC 2185, 07/01/87, ECB

Local Contractor, Davis Wellman working on manager's quarters.

Additional building maintenance will be discussed under the section on energy conservation.

Miscellaneous maintenance projects included dike repairs and the resetting of several water control structures that had washed out. Several leaking slide gates were replaced with screw gates. Two condemned bridges (old railroad flat cars) were removed and replaced with corrugated metal pipes. All of the miscellaneous maintenance projects were completed force account by temporary equipment operator, Dude Yaune.

#### 4. Equipment Utilization and Replacement

Several new pieces of equipment were acquired this year. Prior to the spring farming program a new International 12' roller/harrow was acquired for \$4,995.00 from Shasta International in Klamath Falls, Oregon. End of year ARRM'S money also allowed us to acquire a new John Deere model 425, 13 1/2' Disc and a John Deere Model 8300, 12'

Grain Drill. This machinery will permit us to continue the refuge farming program in such a manner as to meet our refuge objectives to provide "hot" grains for migratory waterfowl.

Other new purchases this year included an electric welder, tool bins and fuel tank for our new service truck which was obtained in 1986 and is yet undelivered. Requisitions for a Blazer type vehicle and a mid size pickup were submitted and approved utilizing FY87 funds. These vehicles, when delivered, will bring the refuge fleet up to modern day standards.

Surplus acquisition and disposal were also utilized during the course of the year. A 20 year old Huber Road Grader with 1,000 hours on it was obtained from Fort Lewis, Washington via Ridgefield Refuge. This grader will replace our old Cat Model 12 which will be disposed of in the near future. Three surplus pieces of equipment were also disposed of. An offset 10' disc was transferred to Tulelake N.W.R., a trailer mounted generator was turned over to the city of Alturas and a trailer mounted Welder was transferred to the county.

A real surprise occurred at the end of the fiscal year when the Region purchased several new John Deere Backhoe/front-end loaders. Modoc was the recipient of one of these machines which was delivered in mid-December. This machine is such an improvement over our old Case 750 that there is no comparison. This machine will be extensively utilized in the maintenance of the refuge irrigation system.



87 NR-18, MDC-2258, 01/27/88, TJM

New John Deere model 210C backhoe/front-end loader with extendable dipper stick and 4WD.





87 NR-19, MDC-2259,01/27/88, TJM

New John Deere offset disc and International roller/harrow provided a much needed upgrade to our farming equipment.

#### 5. Communications Systems

The refuge has continued to have Cascade Telephone Communications, Inc. of Klamath Falls, Oregon handle all our radio maintenance work. This work is done under a blanket purchase arrangement for under \$500.00 per year. Besides installing and repairing radios, they also make one trip per year to Alturas and service our base station.

The refuge upgraded its telephone system this year. In the past, we were only able to have one line to the refuge because the feeder cable would not handle additional lines. However, this year the phone company upgraded their system which in turn allowed us to upgrade ours. The refuge now has two separate lines and the managers house has its own private line. Of course, all improvements have their price and it cost the refuge \$2,500.00 of station funds to enter the space age.

#### 6. Computer Systems

Modoc received its very own computer this year. The computer itself is an IBM clone made up of three components by different companies. The refuge clerk, Marcy Cornwell, underwent a day of basic training with the regional expert, Doug Robertson shortly after we received it. To

date, Marcy has kept quite busy entering all the stations financial transactions into a program developed to help keep our budget within its limitations.

## 7. Energy Conservation

In an effort to continue to improve energy conservation the refuge completed an energy retrofit package. This package, which was funded under large ARRM'S dollars, included replacing the old diesel furnace in the shop with a new propane Space heater. The shop also was insulated, weather striped and had thermopane windows installed. Along the same lines, the old diesel fired boiler in the office was replaced with a new propane boiler. Both buildings had set back thermostats installed. The new heating systems have some "bugs" which needed to be worked out but now seem to be functioning properly. It is too early to tell how much energy will be conserved from this project but it is hoped that it will pay off over time.

## 8. Other

The refuge purchased a new Television and VCR. These items were necessary in order to take advantage of all the new video tapes that are available for a variety of subjects ranging from Safety and Public Use through Interpretive/educational documentaries such as the effects of lead poisoning on waterfowl. These additions have been utilized since we acquired them, especially in the Safety program.

## J. OTHER ITEMS

### 1. Cooperative Programs

Once again, Assistant Manager Melanson carried out the Phenological Monitoring Program which is done in cooperation with the U.S. Weather Bureau. This program is conducted annually to provide information on blooming dates of Honeysuckle at various sites throughout the western United States. The information gathered is used by the Weather Bureau 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.

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

## 2. Other Economic Uses

During the year a large pile of scrap iron and batteries was put up for bid as scrap. Tom Forester of Orland, California was the high bidder at \$6.10/ton for a total of \$59.90. In addition we sold an old 1977 Jeep Pickup which was inoperable. David Macleod of Redding, California was high bidder at \$377.00.

## 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. The manager attended the Waterfowl Communications Workshop in Vallejo in February and the Law Enforcement 40 hour refresher course held in Sacramento in March. Bloom also attended the annual hunt meeting with the California Department of Fish and Game in May, the Project Leaders meeting at Reno, Nevada in August and the Marsh Management Workshop held at Sacramento N.W.R. in September. In addition, Bloom received a \$400.00 monetary award for superior performance.

Assistant Manager Tom Melanson attended the Law Enforcement 40 hour refresher course held in Sacramento in April and the annual hunt meeting with the California Department of Fish and Game which was also held in Sacramento in April. Tom also attended an eight hour course in payroll processing in Portland during April, and the Project Leaders meeting in Reno, Nevada in August, as well as a 40 hour public use awareness class at San Francisco Bay N.W.R. Tom also received a monetary award for taking on the duties of the vacant refuge assistants' position from mid-March through mid-June.

Maintenance worker Wilkins attended a 40 hour heavy equipment certification class at Ridgefield N.W.R. in April.

Clerk/Typist Cornwell attended a 40 hour OSHA Safety training course in Portland in October and returned there in December to attend a three day Administrative Workshop.

Temporary equipment operator Dude Yauney received a monetary award of \$250.00 for outstanding performance. Dude completed the Goose Pond rehabilitation project despite numerous delays resulting from equipment breakdowns.