

BRANCH OF WILDLIFE REFUGES

Narrative Report Routing Slip

Date Oct. 26, 1953

~~Mr. Salyer~~ \_\_\_\_\_

~~Mr. DuMont~~ PAD

~~Mr. Krummes~~ \_\_\_\_\_

~~Miss Baum~~ \_\_\_\_\_

Section of Operations

~~Mr. Baill~~ \_\_\_\_\_

~~Mr. Marley~~ LCM

~~Mr. Regan~~ RR

Section of Habitat Improvement

~~Mr. Griffith~~ RR

Mr. Kubichek \_\_\_\_\_

~~Mr. Brown~~ WSB

Mr. Stiles \_\_\_\_\_

Section of Land Management

~~Mr. Scherkecht~~ EVA

~~Mr. Davis~~ add

Stenographers

Refuge MINGO

Period May-August 1953

A NARRATIVE REPORT

MINGO NATIONAL WILDLIFE REFUGE

PUXICO, MISSOURI

REFUGE PERSONNEL

Lyle J. Schoonover	-----	Refuge Manager
John A. Sifford	-----	Clerk-typist

TEMPORARY PERSONNEL

Frank C. Bailey	-----	O & M Labor Foreman
Howard D. Gaines	-----	Dozer Operator
William J. Glenn	-----	Ciler
Oliver W. Hartz	-----	Operator, Dozer
John D. Heldenbrand	-----	Dragline Operator
Edward P. Neighbors	-----	Laborer
Louis K. Neighbors	-----	Laborer
Joseph B. Suttner	-----	Dragline Operator
Alva E. Wilfong	-----	Laborer
Clayton H. Wilfong	-----	Laborer
Herman E. Wilfong	-----	Tractor Operator

U. S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

PUXICO, MISSOURI

## TABLE OF CONTENTS

1. GENERAL	
A. Weather conditions	Page 1
B. Water Conditions	2
C. Fires	3
II WILDLIFE	
A. Migratory Birds	3
B. Upland Game Birds	6
C. Big Game Animals	7
D. Fur Animals, Predators, Rodents and Other Mammals	8
E. Predaceous Birds, Including Crow, Ravens and Magpie	10
F. Fish	11
III Refuge Development Maintenance	
A. Physical Development	11
B. Plantings	13
C. Collections	14
IV Economic Use of Refuge	
A. Grazing	14
B. Haying	15
C. V Field Investigations Or Applied Research	
A. Progress Report	15
VI Public Relations	
A. Recreational Use	17
B. Refuge Visitors	17
C. Refuge Participation	
VII Other Items	18



## I. GENERAL

### A. Weather Conditions

Rains have been extremely light during the period. The "bootheel" fell into the grips of a dry cycle a year and a half ago and so far there is no indication of a change in the trend. The summer of 1952 will long be remembered for its dryness, crop failures and fires. This summer is following in the footsteps of its predecessor.

Our weather data is obtained from the Army Engineer's Station at the Wappapello Dam, located approximately 3/4 mile from the southwest corner of the refuge.

	<u>Precipitation</u>	<u>Maximum Temp.</u>	<u>Minimum Temp.</u>
May	3.39	95	43
June	.91	102	57
July	2.08	101	58
August	<u>2.14</u>	<u>101.5</u>	<u>59</u>
<u>Total</u>	8.52	<u>Extremes</u> 102	43

The rains came as scattered showers this summer, with the heavier rains centering near the southwest portion of the refuge. Our weather data is not representative of the entire refuge, as some parts of the refuge did not receive more than  $\frac{1}{2}$  of the amount of rainfall recorded at the Wappapello Dam.

### Comparative Tabulation Of Precipitation

1949 - 1953

<u>Year</u>	<u>January thru April Precipitation</u>	<u>May thru Aug. Prec.</u>	<u>Total</u>
1949	20.64	15.67	36.31
1950	25.28	19.06	44.34

Comparative Tabulation of Precipitation (cont'.)

<u>Year</u>	<u>January thru April Precipitation</u>	<u>May thru Aug. Prec.</u>	<u>Total</u>
1951	16.55	14.52	31.07
1952	16.75	9.68	26.43
1953	13.99	8.52	22.51

It is readily seen in a review of comparative rainfalls over the past five years, that we are definitely "drying up."

B. Water Conditions

Our control gates were opened for the last time on May 21. Since then our pool has steadily receded through evaporation, transpiration and percolation.

A brief resume of Gauge Reading Tabulations since January 1 will show the history of water levels at Mingo since water management commenced.

Gauge Reading Tabulations On The First Day Of Each Month

January thru September, 1953

<u>Date</u>	<u>Gauge Reading</u>
January	333.80
February	334.50
March	335.52
April	335.90
May	335.46
June	335.40
July	334.90
August	334.40
September	333.90



We have lost an even 2 feet of water between April 1 and September 1. Admittedly, this has been an unusually dry summer, but the need for additional fall water through the Castor River Diversion is now apparent. During the summer our inundated acreage has reduced from 7,000 acres to approximately 2,000 acres. If the drought persists during the next two months, we may have very little water during the migration period. It is important that our water management agreement with the Missouri Conservation Commission be worked out carefully because the state project will reduce our summer watershed coming into ditch #1 and without additional water from the Castor River, we will have less fall water than we have now.

#### C. Fires

The fire hazard is increasing day by day and has earmarks of equalling the tinder box present a year ago. Many cornfields, pastures and woods are already dry enough to burn. Several small fires have occurred in the community, but none have started on the refuge.

Because of the danger of an uncontrolled fire starting, we do not recommend burning this fall. Fighting fires is very expensive and sometimes destructive. We suggest that any brush removal be carried out by other methods or at a safer time.

## II. WILDLIFE

### A. Migratory Birds

#### 1. Population and Behavior

(a) Waterfowl

Waterfowl have been rather scarce this period. Wood Ducks nested successfully on the refuge, but their numbers have been quite low. With new water conditions and only a limited amount of population history available at the refuge, we cannot tell if this species has shown an increase or decline. Both nesting sites and available habitat seem sufficient to support a much larger nesting population than is present.

Fifteen Canada Geese made an unexpected call at the refuge early in August. It would be a bit unusual for northern geese to be here that early, so we believe this may be a group that has stayed in the locality during the summer. Perhaps they are part of a Horseshoe Lake flock.

(b) Other Waterbirds

American Egrets are numerous on the shallow pool areas. They first appeared in July and have steadily increased in numbers since that time. As estimated 3,000 birds are now using the refuge.

Little Green Herons have been around all summer. We estimate the population to be about 500.

A few Great Blue Herons are also present, but they are less numerous here than on marsh areas farther north.

The food supply for Herons and Egrets is excellent. The receding shoreline is well populated with frogs and crawfish. Isolated pools also teem with trapped fish.



(c) Shorebirds

A variety of shorebirds began using the refuge early in August. Kildeer, sand pipers and plovers have been most abundant.

2. Food and Cover

Even with unfavorable weather conditions, our food supply will be plentiful. Four hundred bushels of corn was cribbed last spring to feed early migrants. In addition, between 4 and 5 hundred acres of corn will be left in the field this fall. Corn yields vary widely this fall, ranging from 5 to 70 bushel per acre. The yields of both corn and soybeans on the refuge are from 10 to 20 percent better than the county average. This is a result of green manure crops which have been plowed under and because the bottomlands on the refuge suffered less from the drought than did the surrounding hill farms. All of the soybeans will be harvested, as it has been our experience that they are not relished by ducks and other refuges have experienced trouble with beans, especially in dry fields.

Wild millet has made excellent growth in several areas on which the impounded water receded during mid-summer. Early growth of millet, for the most part, died during the drought, but stands which started growth in mid-July have done very well. Excellent stands are also present where the pool receded in late August, but this millet may not mature before frost.

Smartweed is widely scattered over large areas of the swamp. Rice, cut grass, and chufa will also be important this year.

It is still too early to determine how successful the mast



crop will be, but early indications are that it will be good. Holding a higher water level in the swamp has no doubt been helpful to the oaks during the drought.

Several crops not commonly grown in this area show promise of increasing our food potential. Plantings of buckwheat survived the drought and produced mature seed. Although the stands are not outstanding they do show that buckwheat can be raised here and can be considered as a possible mid-summer crop. A small field of milo did well in very dry soil. This crop shows the most promise of our experimental plantings on the uplands. It requires little care and is a heavy producer of seed. Next year we hope to induce several share croppers to begin raising this crop.

Domestic rice was also introduced on the refuge this summer and shows promise of being a valuable crop to both wildlife and permittees on our bottomland fields. An increased acreage is planned for next year. (See Experimental Plantings)

### 3. Botulism

No loss.

### 4. Lead Poisoning and Other Diseases

No loss.

## B. Upland Game Birds

### 1. Population and Behavior

Quail throughout the "bootheel" are noticeably on the downgrade. Several sportsmen's clubs are advocating a closed season. On the refuge this downward trend is not evident. In one six acre wheat

field we found two covies of young birds and three nests. An unusually large number of late nesters were found, this presumably has been caused by heavy nest predation.

Mourning doves began concentrating near several watering sites in mid-September. Dove hunting conflicts with local religious beliefs, and also these people are on the conservative side and do not see the point in shooting a 12 cent shell at several ounces of meat. T

The refuge population is probably higher than normal this fall, primarily because of a water scarcity in southeast Missouri.

## 2. Food and Cover

Cover has never been a problem here for upland birds, but some planning in making food patches will be helpful. The best combination appears to be scattered wheat fields followed by milo. Some hillsides too small or steep for hay could profitably be sowed down to Korean and Serecia lespedeza. Lespedezas do well even on the poorest and most eroded fields. We have noted however that caution must be taken in clipping of lespedeza late in the season in dry summer for many farmers have killed well established planting this way.

## 3. Diseases

None noted.

## C. Big Game Animals

### 1. Populations and Behavior

Little if any increase has been apparent in the deer herd.



The habitat seems quite ideal for a large herd and the only limiting factor in evidence is a large number of dogs trailing and pursuing all forms of animals on the refuge.

D. Fur Animals, Predators, Rodents and Other Mammals

Some of the mammal increases we expected are now noticeable. Raccoons, mink and muskrats are definitely more plentiful than a year ago.

The severe drought in Southeast Missouri has restricted water areas and caused a general movement of fur bearers to the refuge. Impoundment of water has also increased food supplies and habitat for most species. We expect a much better trapping season this winter because fur bearers are more abundant and local trappers are harder pressed for ready cash.

1. Grey Squirrels

Several corn storage cribs have been popular with the squirrels. Eleven were seen scurrying from one crib early in the morning. Cornfields are suffering increased squirrel damage each year and eventually a controlled hunt should be considered. The state season is open most of the summer, thus giving us an opportunity to select a period when disturbances would be at a minimum.

2. Foxes

Both red and grey foxes are found on the refuge. The principle problem concerning these species is the desire of fox hunters to pursue their sport on the refuge.

### 3. Raccoon

Raccoon tracks and paths are found everywhere. Eight were sighted crayfishing one evening along the waters edge in Section 13. Numerous trails lead through the swamp grass and along the spoil-banks.

Cornfields have been hard hit in the roasting ear stage. Small fields well back in the woods suffered the worst. Permittees seem to enjoy seeing squirrels and coons on the refuge most of the year, but we have found that this is not a good subject to bring up during July and August.

As on other refuges, it is difficult to get trappers enthusiastic about raccoons. A number of hunters are interested in getting 'coons with dogs, but this leads to complications.

### 4. Mink

Mink are the most profitable fur bearers on the refuge for the trappers. We are interested in seeing their numbers increase as they will provide the main attraction for trappers and some of our more undesirable species may be controlled once the trappers get started.

A number of mink tracks were seen on the mudflat kept under observation. Apparently, mink have moved into the refuge after surrounding streams and ponds dried up. Fish, frogs and crayfish trapped in shrinking ponds and ditches provide an easy living during the summer for both wet land mammals and birds.



5. Muskrats

Muskrats have not increased as rapidly as we hoped. The absence of vegetation in or near the pool is probably the answer. If bulrushes and sedges become established ahead of willows and buttonbushes on the fringe area, muskrats should thrive. Controlled burning, spraying, haying and occasional discing may be some of the controls which will have to be used to create "rat" habitat.

6. Opossum

Opossum irritate the trappers, who catch them frequently in their raccoon and mink sets. The value of their furs are so low that few trappers can be induced to skin them.

7. Bobcat

Four or five bobcats have been seen during the summer. No doubt, bobcats will be quite common as long as the rabbits are plentiful.

8. Rabbits

Both Cottontail and Swamp rabbits frequent the swamp. Swampers inhabit the wet bottomlands and Cottontails use the drier uplands. Crop damage caused by rabbits seems to be on the increase. Young beans are especially vulnerable.

E. Predaceous Birds, Including Crows, Ravens and Magpies

Crows destroyed several fields of early corn. Poisoning on farms outside of the refuge seemed to be very effective and stopped losses in the refuge as well as adjacent to it. We are keeping our fingers crossed in the hope that indiscriminate poison-

ing will not go too far.

#### F. Fish

Fishermen report that they have never seen so many fish while catching so few. Summer catches were usually small dogfish and bullheads. Thousands of bullheads can be seen in the ditches. Most of them are too small for the creel, averaging about 4 inches in length.

During a very warm period in August several hundred 2 and 3 pound White Perch died. The only explanation we could offer was lack of oxygen. A shower, followed by cooler weather stopped the die off.

Large Carp, Buffalo and Dogfish can be seen rising and splashing in the ditches. Sishing success on the larger fish has been poor. This is attributed to a plentiful food supply.

### III. REFUGE DEVELOPMENT MAINTENANCE

#### A. Physical Development

The summer drought has been a blessing for construction work and we have tried to take advantage of it. Not a single day has been lost, since June 1, because of rain. This is one for the records at Mingo.

##### 1. Boundary Fence

Posts and wire have been purchased for the Stoddard County boundary fence, but transportation is not nor available for a fencing crew so this work has been delayed. Cooler weather and moister soil will make better working conditions.



## 2. Road Construction

Approximately 35,000 cu. yds. of fill were moved during the period. Four and one half miles of road have been completed between Egypt and Rabbit Ridge. Two and a half miles has already been gravelled with a contract for the remainder to be let in the near future. Upon completion of the Ditch #6 road, the equipment was moved to the bluff road where over a mile has been built to grade. To speed up progress, the Lima Dragline has been operated 80 hrs. a week during the latter part of the period.

## 3. Parking Area At Ditch #15

A parking area for 300 cars was levelled at ditch #15. Graveling of the parking lot has been completed.

## 4. Renovation Of Agricultural Fields

Ninety acres of brush, trees and briars were cleared and bush and bogged twice. The field was then levelled with a heavy drag.

## 5. Terraces

Terraces were constructed and rebuilt on 20 acres of eroded hillside. Several other fields were sprouted, disced, levelled and limed.

## 6. Dike Protection

Nine hundred and forty bales of straw were cut and stocked. Part of this was used to straw the  $2\frac{1}{2}$  miles of dike slope which has been limed, fertilized and sown with grass. Additional straw was used to cover slopes on the ditch #6 road. The remainder will be

used for slope protection and on newly built terraces.

#### 7. Equipment Repairs

Mr. Paulson supervised an overhaul job on the ~~Luna~~ Dragline and inspected the Marion Dragline. Minor repairs were made on the three D-7's and scraper. The motor on the Gallion grader was rebuilt. Minor repairs ~~were~~ made on the Dodge ambulance, Jeep and a new block was installed in the Ford pickup.

#### 8. Goose Pen Repairs

Thirty-five posts were cut and set to strengthen the goose pen. New wire replaced rusted wire for 1,500 feet. The area was broken, rolled, fertilized and sown with wheat. An island in the pond was cleared and sown in blue grass.

### B. Plantings

#### 1. Trees and Shrubs

Few of the Chinese chestnuts have survived the drought. Multiflora rose has fared better but the loss has been large.

#### 2. Cultivated Crops

Despite the drought, refuge crops are better than the crop yields reported early in the refuge program. It is evident that the use of fertilizer, green manure crops and drainage is showing crop improvement. Corn yields are expected to vary from 10 to 70 bushel per acre. The average yield will be about 25. Soy beans are short and many were cut for hay. Those remaining will average 7 or 8 bushel per acre.

Fifty acres of spring pasture plantings failed to survive



and will have to be replanted. The dry summer also caused a total loss to alsike clover and lespedeza green manure plantings.

A definite start has been made toward soil improvement and erosion control, but the problem is so large and complex that it will take years of hard work to get the results we desire. This community is poor, with a minimum of new equipment and capital. Permittees do not have the means or the desire to change their farming practices rapidly. Our program must be one of demonstration, education and eventually better farming practices.

### 3. Soil Capability Survey

Soils mapping of the refuge has been completed. A start was made on the farm planning phase, but the S.C.S. technicians became burdened down with other duties shortly before the beginning of the period and have not been able to work with us.

Soils tests were made on fields to be sown to permanent pasture to determine liming and fertilizer requirements.

### C. Collections

Most of the seed harvest will occur during the following period. We expect to harvest milo, rice, wild millet and smartweed.

To date, 1,250 pounds of Japanese millet has been combined and stored.

## IV. ECONOMIC USE OF REFUGE

### A. Grazing

Farmers have been hard pressed for both pasture and water.

In order to open up some timber tracks and to create farmer goodwill, 100 head of cattle were turned into a large grazing unit. The cattle ate out much of the undergrowth, which will make the mast crop more available to all forms of wildlife.

The cattle did not show a gain in weight during the grazing period, but the farmers were happy to get them through the summer and hope to find enough feed to make the winter.

#### B. Haying

A few permittees cut poor quality hay in section 13. The sprouts were thick and the hay consisted mostly of weeds, sedges and vines. In normal years no one would be interested in this poor quality hay.

Hay cutting during the past two summers has controlled brush on many acres that would have been difficult for us to clear otherwise.

### V. FIELD INVESTIGATIONS OR APPLIED RESEARCH

#### A. Progress Report

We have been interested in following the progress of an 9.5 acre experimental plot of domestic rice as rice is a new crop to this community. It soon became evident that our 3" worn out centrifugal pump would be insufficient. Crab Orchard helped us out with another small pump, but even with the two pumps, we spent most of our week ends and many evenings watching water pumps. Without proper equipment, rice farming can be a headache, but after borrowing a large pump from the state, our water problems ceased.



The water was removed from the field early in September. When the field dried sufficiently, the rice was cut and bound with a binder. With no grain drying facilities in the locality, thrashing seemed to be our cheapest and surest means of getting dry seed.

For the benefit of the farmers who may read this report, the field used 6.5 pounds of twine per acre. The growth of rice, wild millet and smartweed on the plot could hardly have been thicker or more luxuriant.

From 500 to 1,500 blackbirds fed heavily on the field for a period of 6 weeks. We believe they reduced the yield from 10 to 20 bushel per acre. Since thrashing has not been accomplished at the writing of this report, the yield will have to be reported later. We are hoping for 500 bushel of rice and considerable wild millet and smartweed from the plot.

It was encouraging to note that many forms of wildlife were attracted to the rice field. During the summer, Quail and Doves watered there. Song birds, such as blackbirds, flycatchers and field sparrows made extensive use of the flooded field for feeding and resting.

During the harvest, we found five cottontail rabbits, between 15 and 20 Sora Rails and evidence of heavy use by raccoons and mink. Enough rice is left after cutting to be attractive to waterfowl.

Rice farming offers many new possibilities at Mingo. A large acreage of wetland, with little value to the refuge or the

community can probably be made to produce valuable crops and excellent wildlife food. Most of the rice fields visited in Arkansas during the summer are expected to yield a gross receipts of over \$150.00 per acre. Few fields of soybeans and corn will gross more than \$30.00 per acre this year.

Local farmers have shown an unexpected interest in rice farming. Most of them haven't the capital with which to convert and purchase the necessary equipment, but at least they are interested. Two farmers are going all out for rice farming with 360 acres of refuge land leased for this purpose. They intend to increase their acreage if successful next year.

## VI PUBLIC RELATIONS

### A. Recreational Use

Most of the visitors came to satisfy their curiosity. For the most part, they were interested in seeing the rice field, an American Egret roost and new developments. A great many southeast ~~Missourians~~ are interested in the refuge and want to keep abreast of our program.

### B. Refuge Visitors

The following is a list of the more distinguished visitors and does not include numerous calls by permit farmers and fishermen:

<u>Date</u>	<u>Name</u>
5-7-53	George Brakage, Superentendant Public Shooting Area
n	Arthur Bernard, County Game Agent
	A. Hoskins, Missouri Conservation Commission
6-11-53	Forrest A. Carpenter, Regional Refuge Supervisor
	J. Clark Salyer, II, Chief Branch of Wildlife Refuges
7-7-53	Dr. R. E. McDormott, Missouri University, Forest Service
7-14-53	E. Fletcher, Missouri University, Forest Service



#### C. Refuge Participation

Two joint speaking engagements were made, one at the Southeast Missouri Sportsmen Club at Cape Girardeau, Missouri and the other at the Perryville Chamber of Commerce at which George Breakage, Superintendent of the State Area and the Refuge Manager explained the two projects.

Other speaking engagements included the Fuxico Chamber of Commerce and the Fuxico Federation of American Women.

#### D. Fishing

Not much interest was taken in fishing during the unusually hot summer in the low and rather offensive smelling water. Both fishing pressure and fishing success picked up near the close of the season, when cooler weather brought more people away from the fans.

#### F. Violations

Very little time was available for patrol work during the period. No game violations were brought to our attention and it is unlikely that many occurred. Evidence of some night use of the 'lovers lane' variety ~~was noted~~ was noted and should be stopped.

#### VII OTHER ITEMS

Snake hunting has been exceptionally good this summer. A 59 inch timber rattler was killed by one of the refuge employees and sent to the Regional Office by way of Mr. Wright. We understand that it got devoured, but never found out anything about the after effects. Several weeks later a "grand daddy" timber rattler measuring 66 inches with 16 rattlers and a button was captured and sent to the St. Louis Zoo. Two

snake collectors have removed 66 snakes during the period. Most of these were water snakes, Cottonmouths, and rattlers.

Date Completed: October 15, 1953

Approved: SA [signature]

Respectfully Submitted

Lyle J. Schoonover

[signature]



# WATERFOWL

	First Seen		Peak Concentration		Young Produced	Total Days Use
Canada goose	7	8/3	15	8/12	None	140
Mallard	2	9/21	25	9/30	None	375
Blue-winged teal	1	9/26	45	9/30	None	450
Wood duck			250	9/30	100	15,000

3-1751  
Form NR-1A  
(Nov. 1945)

MIGRATORY BIRDS  
(other than waterfowl)

Refuge Mingo

Months of May to August 1945.

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>										
Kildeer			450	8/15						600
American Egret			3,000	8/20						5,000
Breat Blue Heron			500	8/20						600
Little Green Heron			500	8/20						600
II. <u>Shorebirds, Gulls and Terns:</u>										

(over)



(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>					
Mourning dove		600	9-30		1000
White-winged dove		<del>500</del>	<del>8-29</del>		
IV. <u>Predaceous Birds:</u>					
Golden eagle					
Duck hawk					
Horned owl					
Magpie					
Raven					
Crow		300	9-30		600

Reported by Lyle J. Schoonover

## INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)  
II. Shorebirds, Gulls and Terns (Charadriiformes)  
III. Doves and Pigeons (Columbiformes)  
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.



3-1752  
Form NR-2  
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Mingo

Months of May to August, 19453

(1) Species	(2) Density	(3) Young Produced	(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks	
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'y'd. Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specificioally requested. List introductions here.
Bob-White Quail			6					1,000	An unusually large number of late nests were found. The population seems to be about the same or slightly higher than a year ago. The estimated number using the refuge is decreased this period because it is felt that some of the earlier estimates were a little high.

\* Only columns applicable to the period covered should be used.



# INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.\*

- (1) SPECIES: Use correct common name.
- (2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.
- (4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.
- (5) REMOVALS: Indicate total number in each category removed during the report period.
- (6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.
- (7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

\* Only columns applicable to the period covered should be used.





Rice, shortly before heading



Nearing the end of the ditch #6 road