

NARRATIVE REPORT
PERIOD FROM JANUARY 1, TO DECEMBER 31, 1966
HATCHIE NATIONAL WILDLIFE REFUGE
BROWNSVILLE, TENNESSEE

NARRATIVE REPORT

PERIOD FROM JANUARY 1, TO DECEMBER 31, 1966

HATCHIE NATIONAL WILDLIFE REFUGE

BROWNSVILLE, TENNESSEE

PERMANENT PERSONNEL

Samuel W. Barton Refuge Manager

Clyde A. Stewart Refuge Forester

Oneal (NMI) Hopper (TAPER) Maintenceman

TABLE OF CONTENTS - NARRATIVE REPORT
 HATCHIE NATIONAL WILDLIFE REFUGE
 BROWNSVILLE, TENNESSEE

	PAGE NO.
I. GENERAL	
A. Weather Conditions	1
B. Habitat Conditions	2
1. Water	2
2. Food and Cover	2
II. WILDLIFE	
A. Migratory Birds	3
B. Upland Game Birds	3
C. Big Game Animals	4
D. Fur Animals, Predators, Rodents and Other Mammals	4
E. Hawks, Eagles, Owls and Crows	5
F. Fish	5
G. Disease	5
III. REFUGE DEVELOPMENT AND MAINTENANCE	
A. Physical Development	5
B. Plantings	6
1. Aquatics and Marsh Plants	6
2. Trees and Shrubs	7
3. Upland Herbaceous Plants	7
4. Cultivated Crops	7
C. Collection and Receipts	7
D. Control of Vegetation	7
E. Fires	7
IV. RESOURCE MANAGEMENT	
A. Grazing	7
B. Haying	7
C. Fur Harvest	8
D. Timber Removal	8
E. Commercial Fishing	8
F. Other Use	8
V. FIELD INVESTIGATION OR APPLIED RESEARCH	
A. Progress Report	8
VI. PUBLIC RELATIONS	
A. Recreational Uses	8
B. Refuge Visitors	9
C. Refuge Participation	11
D. Hunting	11
E. Violations	11
F. Safety	12

TABLE OF CONTENTS - CONTINUED

VIII. OTHER ITEMS

A. Items of Interest

12

B. Photographs

13 - 26

FORMS: NR-1, NR-1A, NR-1B, NR-2, NR-3, NR-4, NR-5,
NR-6, NR-7, NR-8, NR-8a, NR-11, NR-12

NARRATIVE REPORT
PERIOD FROM JANUARY 1, TO DECEMBER 31, 1966

HATCHIE NATIONAL WILDLIFE REFUGE

BROWNSVILLE, TENNESSEE

- 0 -

I. GENERAL

A. Weather Conditions.

The month of January brought us 9.5 inches of snow and a reading of -5 degree temperature, a low for the year. We braced ourselves for a "dilly" of a February but it did not materialize.

Then in March, the weather warmed up and the farmers took to the fields, only to be delayed by a cold, wet spell during the months of April and May.

We had a record low for May 10. The temperature dropped to 36 degrees. Many crops had to be replanted.

During July we had six straight days of 100+ degree temperature, with 102 degrees recorded for the year's high.

Three and seventy-five hundredth inches of snow was received during the month of December, along with a low of 11 degree temperature.

The most noticeable part of the table below is that the rainfall was 10.65 inches below normal. Outside of a couple of incidents, I guess we had a normal year during 1966.

Month	Precipitation			Max. Temp.	Min. Temp.	Days Rain or Snow
	Snow	Rain	Normal			
January	9.5	3.52	6.52	57	-5	9
February	T	5.87	4.72	65	19	16
March	0	0.64	5.56	82	23	4
April	0	5.52	4.66	84	30	12
May	0	5.93	4.56	91	36	7
June	0	0.53	3.83	100	46	3
July	0	1.72	4.18	102	57	2
August	0	5.54	2.88	95	53	7
September	0	2.02	3.55	93	48	3
October	0	3.55	2.63	84	33	7
November	T	1.57	4.52	78	22	3
December	3.75	5.17	4.62	73	11	9
TOTALS AND EXTREMES:	13.25	41.58	52.23	102	-5	82

B. Habitat Conditions.

1. Water. The lack of water at the proper time played a disastrous role in our waterfowl use days the entire year. At the present time, Hatchie Refuge depends on the flood water from the Hatchie River to flood the bottomland hardwoods. Unless this flooding occurs during early winter, we do not have waterfowl.

Last winter the bottoms did not flood until February 11. By that time there were no waterfowl in the area to take advantage of the available mast. The February flood waters receded into the banks of Hatchie River on March 16. Then the second overflow occurred on April 29 and remained until June 1. By this time, all of the migrants had returned to or were en route to the far north.

The Hatchie River remained at a low water level during the summer and fall months. Only once, on December 29, did the river come close to overflowing into some of the timberland. An additional two feet would have provided 3,000 acres of flooded hardwood, thus making the area ideal for mallards.

The water level in the oxbow lakes became very low during the fall months. These lakes were used occasionally by resident wood ducks.

An earth fill was placed on Bear Creek, near Hatchie River, during the month of October. This provided additional water in Bear Creek and backed water into several small sloughs leading into Bear Creek, along with approximately 50 acres of timberland. As a result, we were able to attract a few mallards into the area during December.

Due to the heavy rain during the week of December 25, water was going over the top of the fill at the end of the year and it is certain that the plug will be "washed" out when the water level of the river drops.

2. Food and Cover. The natural foods, such as acorns, berries, hickory nuts and an abundance of wild millet in logical locations were adequate and available to the limited amount of wildlife presently on the Refuge.

A limited amount of agricultural crops were grown for wildlife purposes. Four acres of corn was left in the field for wildlife food along with five acres of milo maize.

Ideal cover exists on the Refuge for all types of native game, and when water is available, for waterfowl. Primary cover consists of bottomland hardwoods; mature, young growth, cut-over, and a variety of herbaceous plants preferred by various types of wildlife. Secondary cover consists of hedgerows, open fields and idle land.

I. WILDLIFE

A. Migratory Birds.

Migratory bird population remains small. The Refuge was activated 13 months ago and the waterfowl use days are following the same pattern as last season.

Until green timber reservoirs are constructed, or other means of getting early water on timberland areas, waterfowl use days will continue to be low.

The peak population was reached during the week of February 27 last spring. This peak number was 1713. There was no goose use on the Refuge.

The summer wood duck population was approximately 150 birds. Eleven broods were observed, ranging in number from 5 to 9 young.

An effort was made to band wood ducks during the fall and winter. We are still waiting to band the first duck. Nine floating and five conventional traps were placed throughout the Refuge on oxbow lakes and in shallow water in wooded areas. Yes, we find it difficult to band waterfowl when there is no waterfowl in the area.

The dove population appears to be down from last year. Doves are seen in small numbers in the area. Hunting in the vicinity was reported to be fair.

Shorebirds are seldom seen. The Refuge is minus attractive feeding and resting grounds for these birds.

The number of herons and egrets using the Refuge is small. The largest number of Great Blue Herons seen at any one time was four. Egrets are seldom seen.

B. Upland Game Birds.

The Tennessee Game and Fish Commission made an initial release of Eastern Wild Turkey on the Refuge last March. The release consisted of 9 hens and 1 gobbler. We were concerned about the residence and survival of these birds because of the flood waters during the month of May.

The sighting of two separate flocks, one consisting of 20 birds and the other of 9 in number is indeed encouraging. We hope that within a few years the area will have a good stocking of this giant bird.

The two flocks are using in the general vicinity of the release site, this being between State Highway 76 and Bear Creek drainage canal.

It is reported that the State plans to release additional birds in Hatchie bottoms as the birds become available through their trapping program.

Ample brood stock of Bob-white quail made it through last winter in good shape. The covey break-up was early last spring--in fact too early. The birds paired and began their nesting before the cold weather gave way to warm, summer-like days. The eggs spoiled due to cold, wet weather, and the nesting process had to be renewed. However, the second attempt was successful. We now have a goodly number of birds using the areas of suitable habitat.

C. Big Game Animals.

The number of white-tailed deer in Haywood County is small compared to some of the other West Tennessee counties. The county was stocked six years ago by the State.

Hatchie Refuge is carrying approximately 75 head at this time. This is an increase of 35 head over last year. All of the deer appear to be in excellent physical condition. We foresee a noticable increase in the deer population within the next three years. This is due to the large area of cut-over timberland on the Howard Powell tract, thus providing excellent browsing and cover.

D. Fur Animals, Predators, Rodents and Other Mammals.

The mink and muskrat population is low. Very few signs have been observed.

More and more beaver signs are beginning to "show up" along Hatchie River and Bear Creek. Although the beaver population is small, we feel the number is sufficient considering the type habitat found on the Refuge.

Raccoons are plentiful and eventually some type of control measure will have to be initiated to keep this predator in check. The corn yield was reduced by one-fourth due to this fur bearer.

Opossums are seen occasionally and the number is believed to be adequate.

The squirrel population on the Refuge is good. Some of the prime area for squirrel was destroyed due to the heavy timber cutting operation being carried on by the Powell Lumber Company.

Fox are present in adequate number on and off the Refuge. The adjoining county of Madison has reported the killing of several rabid fox during the past three months.

Bobcats are seen more often, indicating an increase over last year.

Feral hogs are present in Hatchie bottom in a noticeable number, and there was an increase in the number using the Refuge over the past year.

E. Hawks, Eagles, Owls and Crows.

Hawks. Red-tailed and marsh hawks are present in adequate numbers and are observed frequently.

Eagles. No known eagles using in this vicinity.

Owls. The owl population is large. The bottomland hardwoods seem to be an ideal spot for "hooting." Hatchie bottom becomes very noisy at night. Approximately 20 barred owls were seen during one five hour period along the Hatchie River.

Crows. The number of crows using the Refuge is down from last year. During the months of September and October, a large number of crows were working the timberlands for acorns.

F. Fish.

The oxbow lakes and borrow pits were opened last spring for public fishing. Hatchie Refuge was one of the areas selected to collect an Entry Fee. This fee greatly reduced the recreational activity on the Refuge by the fishermen. Bream provided most of the attraction, along with small catches of crappie, cat fish and large mouth bass.

G. Disease.

None.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development.

Since Hatchie Refuge is one of the youngest members in the Refuge System, we are short on development work due to the size of our staff and the amount of equipment at the present time. Much of our attention during the fall months was concentrated on road and trail work. A D-7 tractor, transferred from Noxubee Refuge, and a motor patrol, obtained from surplus sources, were used in reworking or establishing eight miles of roads and trails primarily on the west portion of the Refuge.

Two miles of fire breaks were constructed on the east portion of the Refuge in an area of cutover timberlands.

One temporary pole bridge was constructed across a drainage ditch to provide access to the west end of the Refuge during wet weather.

Fifty cubic yards of gravel was placed in badly needed spots on the Windrow Road.

In an attempt to improve wood duck breeding and rearing habitat, three earth fills were made during the year. We hope to trap the winter water and hold it until late spring. These earth fills were placed across small drainage ditches and required 400 cubic yards of dirt. One of the fills consists of a 24 inch, 16 foot length galvanized metal pipe with a flap gate.

A fourth earth fill, containing 165 cubic yards, was placed on Bear Creek near Hatchie River. This was done primarily to establish elevation lines from the water level at different stages. This should provide part of the needed information in establishing Green Timber Reservoirs in the future.

Sixty-two wood duck boxes were constructed. Fifty of these have been erected in good wood duck breeding areas. The others are to be erected as time permits.

Nine floating and five conventional banding traps were constructed and scattered on the oxbow lakes and in shallow water in the timbered area.

Clean-up work, consisting of removing old fence wire and post, picking up rubbish, repairing doors and windows and repainting a roof on one building on tract 31 was accomplished.

Thirty four miles of boundary posting was carried out. As the results of a boundary survey, conducted by the Division of Engineering, two miles of boundary markers had to be relocated.

Replacement of boundary markers was made as needed.

Signs were made and erected in logical places on roads and trails entering the Refuge and near oxbow lakes stating, "Public Fishing" and "Federal Entrance Permits Valid Here."

A metal Butler Building, 24' x 40' x 10', was purchased and is near completion at this time. This building was erected on the south side of the Refuge and will serve as a workshop and storeroom until other buildings can be built.

B. Planting.

1. Aquatics and Marsh Plants

None.

2. Trees and Shrubs.

None.

3. Upland Herbaceous Plants.

None.

4. Cultivated Crops.

All of the farming operation was done by cooperative farmers. Ninety-four acres made up the cultivated crops. Not only was the acreage low, but also the yield. Corn averaged 25 bushels per acre; soybeans, 13 bushels; and milo maize, 25 bushels per acre.

The weather was unfavorable for the farmers. March had the appearance of an early spring and farmers took to the fields. Some crops were planted in April and then cold, wet weather hit. Corn on the Refuge had to be replanted. All of the crops were planted during the month of June. The hot, dry days of August took their share of the yield, leaving the farmer very little to harvest.

C. Collection and Receipts.

None.

D. Control of Vegetation.

Eighteen acres of sericea was bush-hogged twice during the year to keep down the growth of woody plants and to improve cover for wildlife, along with twelve acres of idle land which will be put into some type of production next year.

E. Fires.

Hazardous fire conditions did not exist during the year. There were no fires on the Refuge.

IV. RESOURCE MANAGEMENT

A. Grazing.

None.

B. Haying.

None.

C. Fur Harvest.

None.

D. Timber Removal.

There was no timber removal on the Refuge through our negotiations.

During the condemnation proceedings concerning the Howard Powell and Sons (Tract No. 10, a, b and c) in February at Memphis, Tennessee, the Federal Judge handed down a decision giving the Powell Lumber Company five years to remove the merchantable timber from 4500 acres.

As of December 31, approximately ten million board feet have been removed from 2,000 acres. As a result of this type of timber harvest, it will take a period of forty years to get the timber stand back to a good manageable stand.

E. Commercial Fishing.

None.

F. Other Use.

None.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report

Hatchie Refuge is going through the land acquisition phase. At the beginning of the year, the Bureau had 6,700 acres under administration. The Refuge now consists of 7,076 acres. This leaves approximately 4,000 acres yet to be acquired.

The proposed south boundary of the Refuge was surveyed by the Division of Engineering and corner markers and monuments were placed in appropriate locations.

VI. PUBLIC RELATIONS

A. Recreational Uses.

The recreational use of the Refuge was small. It consisted primarily of fishing the oxbow lakes. Other uses were sight-seeing, picnicing, or just to get "out-of-doors."

The number of Recreational Use Days were held to a minimum because of the "Entry Fee" placed on Hatchie Refuge through the Land and Water Conservation Fund Act.

A total of eighty-four \$7.00 Golden Passport Permits and forty-seven \$1.00 daily permits were sold.

B. Refuge Visitors.

- January 12 Mr. M. Anderson-Smith, G.S.A., Memphis, Tennessee - Negotiating for rental of Refuge office space.
- January 13 Mr. Don H. Orr, Jackson, Tennessee - District Biologist, Tennessee Game & Fish Commission - Visitation.
- January 17 Mr. Eugene Cypert, Tiptonville, Tennessee - Mississippi Flyway Biologist - Visit Refuge.
- January 17 Mr. William C. Ashe, Atlanta, Division of Realty - Land Appraisal.
- January 18 Mr. Ronald F. Tansill, Atlanta, Division of Realty - Land Appraisal.
- February 2 Mr. William C. Ashe, Atlanta, Division of Realty - Inspector of Howard Powell tract.
- February 2 Mr. Thomas Robinson, U. S. Attorney, Memphis, Tennessee - Inspection of Howard Powell tract.
- February 8 Mr. Eddie Reese, Soil Conservationist, Tennessee Refuge - Soil and Moisture Plan.
- February 16 Mr. Don H. Orr, Jackson, Tennessee, District Biologist, Tennessee Game & Fish Commission - Select site for turkey release.
- February 17 Mr. M. Anderson-Smith, G.S.A., Memphis, Tennessee - Negotiations for office space.
- March 22 Mr. R. E. Wilson, Administrative Assistant, Tennessee Refuge - Set up Refuge Files.
- April 14 Mr. Louis Bourne, Stanton, Tennessee, Assistant District Supervisor, Tennessee Game & Fish Commission - Law Enforcement.
- April 19 Messers Ronald Tansill and Kenneth Marek, Atlanta Division of Realty - Land acquisition

April 25 Mr. Dennie Holland, Refuge Manager, Holla Bend
Refuge - Visit.

May 5 Mr. James Ishmael, Brownsville, Tennessee, State
Conservation Officer - Law Enforcement.

May 16 Mr. M. F. Hudson, G.M.A., Nashville, Tennessee -
Law Enforcement.

May 25 Mr. David Hall, G.M.A., Memphis, Tennessee -
Law Enforcement.

June 23 Mr. M. Anderson-Smith, G.S.A., Memphis, Tennessee -
Office Space Inspection.

June 29 Mr. David Hall, G.M.A., Memphis, Tennessee -
Law Enforcement.

July 18 Mr. Kenneth Marek, Atlanta, Division of Realty -
Land Acquisition.

July 17 Messrs W. L. Towns and L. S. Hivens, Regional
Office, Atlanta - To visit and discuss Refuge
operations.

August 17 Mr. George Garris, Refuge Manager, Carolina Sandhills -
Visit.

August 23 Mr. L. M. McCuan, Dyersburg, Tennessee, State Public
Health Department - Mosquito control in ponds.

August 25 Mr. R. R. McMaster, Refuge Manager, White River
Refuge - Visit.

August 30 Mr. Mercer Brown, Atlanta, Division of Engineering -
Boundary Survey.

August 31 Mr. Earl Cunningham, Refuge Manager, Yazoo Refuge -
Visit and tour.

October 3 Mr. Louis Bourne, Stanton, Tennessee, Assistant
District Supervisor, Tennessee Game and Fish
Commission - Law enforcement.

October 4 Mr. M. F. Hudson, G.M.A., Nashville, Tennessee -
Law Enforcement.

October 5 Mr. David Hall, G.M.A., Memphis, Tennessee - Law
Enforcement.

- October 25 Mr. H. R. Williams, Atlanta, Division of Realty - Land Acquisition.
- October 31 Messers William Ackernecht, Central Office and C. J. Lankford, Regional Office - Visit and discussion of Refuge operations.
- December 6 Mr. Sharp, GSA, Atlanta, Office space - contract renewal.
- December 9 Mr. James McAdams, Brownsville, Tennessee., SCS - Discuss soil conservation practices.
- December 12 Mr. Ray Camp, Little Rock, Arkansas, Consulting Forester, Timber appraisal of Chanon Brothers tract.

C. Refuge Participation.

- January 26 Refuge Manager Barton attended a public hearing on Flood Control and Drainage on the Hatchie River at Bolivar, Tennessee.
- February 28 Refuge Manager Barton attended Supervisory Training Course at Arden Hills, Minnesota.
- March 25 Refuge Manager Barton attended the second public hearing on Flood Control and Drainage on the Hatchie River at Covington, Tennessee.
- April 6 Refuge Manager Barton attended the wood duck field trip conducted by Dr. Hester, Raleigh, North Carolina.
- August 10 Refuge Forester Stewart presented program of slides and lecture to Brownsville Rotary Club.

D. Hunting.

No hunting on Refuge. Hunting outside of Refuge - Fair.

E. Violations.

Billy T. Edmonds, Vildo Tennessee --
Target practicing on Refuge.
Letter from G.M.A. Hudson.

Herman F. Monroe, Toone Tennessee
Target practicing on Refuge
Letter from G.M.A. Hudson.

Earnest Freeman, Jr., Brownsville, Tennessee
Hunting on Refuge.
General Session Court - \$25.00 and cost.

Danny Giles Leath, Stanton, Tennessee
Age 13, Hunting on Refuge.
Appeared before G.M.A. Hudson for
corrective discussion - Dismissed.

F. Safety.

Regular monthly Safety Meetings were held throughout the year. All information and materials furnished by the Regional Office were read and discussed. Additional reading from the Safety Manual was assigned by the Manager.

Safety belts, first aid kits and fire extinguishers were purchased and placed in all vehicles.

Hard hats and gloves for protection against body injuries were provided for each employee, along with snake bite kits.

We have had 408 accident-free days and a total of 23,379 miles driven without accident, plus no lost time from accidents since the Refuge was activated in November, 1965. Total number of employee hours worked by all employees without accident is 5,226 hours.

VII. OTHER ITEMS

A. Items of Interest.

Oneal Hopper arrived for duty on February 14 to fill the position of Maintenceman.

G.S.A. found rental property in Brownsville, Tennessee to serve as Refuge Office. We occupied space on March 15.

A new sedan and a 4-wheel drive pickup were received during the year and were put to immediate use.

Clyde A. Stewart, Refuge Forester, was transferred from Carolina Sandhills, South Carolina, to Hatchie on June 27.

An employee of the Powell Lumber Company was fatally wounded while working in timber harvesting operations on the Refuge.

B. Photographs

(Pages 13 - 26)

Name: Samuel W. Barton
 Title: Refuge Manager
 Length of Service: 14 years
 Previous Stations:

Noxubee
 Sabine
 Tennessee



Name: Clyde A. Stewart
 Title: Forester
 Length of Service: 6 years
 Previous Stations:

Piedmont
 Carolina Sandhills

Name: Oneal Hopper
 Title: Maintenceman
 Length of Service: 5 years
 Previous Station:

Reelfoot





Maintenanceman Hopper constructing wood duck boxes in Forester Stewart's back yard. This operation received considerable attention in the neighborhood and numerous questions were asked. Sixty-two cypress boxes were built and fifty have been erected thus far.

7/66 - Hatchie R10-20-66



Wood duck boxes erected in one of the oxbow lakes. Predator shields will be or have already been erected for each box. Boxes were located at this height due to flooding conditions.

7/66 - Hatchie R11-66



Baiting one of the oxbow lakes in preparation for banding operations.
11/66 - Hatchie R12-3-66



One of the 10 oxbow lakes found on the Refuge. These lakes provided excellent fishing for the public during 1966.
7/66 - Hatchie R10-25-66



More Federal Entrance Permits were sold at Hatchie in 1966 than at any other refuge in Region 4. A total of 84 "Golden Passports" and 47 one dollar permits were sold.

6/66 - Hatchie R5-1-66



Floodwater in the Hatchie bottom during May.

5/66 - Hatchie R2-11-66



An "Old Monarch" (Cyprus) cut on the Howard Powell Tract during logging operations. Timber cutters have been encouraged to leave trees such as this, as they are worthless for timber.

7/66 - Hatchie R10-7-66

This majestic pin oak (Quercus plaustris) which was found on the Howard Powell Tract contained 1,696 board feet of lumber.
7/66 - Hatchie
R10-3-66





An aerial view of a portion of the Howard Powell Tract following timber harvesting operations.

12/66 - Hatchie R19-15-66



The above photo shows one of the farm fields in the Hatchie bottom being limed.

12/66 - Hatchie R15-1-66



Refuge Manager Barton and Maintenceman Hopper installing
pipe and flap-gate. 11/66 - Hatchie R13-6-66



This plug, if successful, will hold water in a large hardwood
flat during the spring and early summer, thus creating good
wood duck rearing areas. 11/66 - Hatchie R13-10-66



Earth fill made on Bear Creek in November.

11/66 - Hatchie R13-15-66



Hardwood flat flooded as result of above plug.

12/66 - Hatchie R18-17-66



9/66 - Hatchie 9-1-66



Eight miles of Refuge trails and two miles of firebreaks
were constructed or improved during the year.

12/66 - Hatchie R16-3-66



Butler building being erected. This building is
24' x 40' and will provide ample shop area.

12/66 - Hatchie R18-5-66



Same building as above. Total cost for this building is
\$3,514.

12/66 - Hatchie R18-6-66



Forester Stewart measuring stumps on the Howard Powell Tract
to make sure that timber cutters are abiding by regulations.
7/66 - Hatchie R6-14-66



One of the six sawmills which operated on the Refuge
during 1966. 12/66 - Hatchie R16-10-66



Hardwood stand on the Howard Powell Tract prior to cutting
operations. 12/66 - Hatchie R16-9-66



Hardwood stand on the Howard Powell Tract following harvesting
operations 12/66 - Hatchie R16-5-66



A lush stand of wild millet on power line right-of-way
which crosses the Refuge. 10/66 - Hatchie R14-6-66



Maintenanceman Hopper observing milo and soybeans planted
by a cooperative farmer. 7/66 - Hatchie 7-8-66



Interstate 40 crossing west end of Refuge.

12/66 - Hatchie R16-13-66

Submitted by:

Samuel W. Barton
Samuel W. Barton
Refuge Manager

APPROVED:

[Faint signature]

1067

3-1750a
 Cont. NR-1
 (Rev. March 1953)

WATERFOWL
 (Continuation Sheet)

REFUGE

MONTHS OF January TO April, 1966

HATCHER V. W. DEWINE

(1) Species	(2) Weeks of reporting period								(3) Estimated Production		(4) waterfowl: Broods: Estimated	
	11	12	13	14	15	16	17	18	days use	seen	total	
<u>Swans:</u>												
Whistling												
Trumpeter												
<u>Geese:</u>												
Canada												
Cackling												
Brant												
White-fronted												
Snow												
Blue												
Other												
<u>Ducks:</u>												
Mallard	800	300	100	50					26,485			
Black	10	10	1	2					1,158			
Gadwall	10								215			
Baldpate												
Pintail	26	12							611			
Green-winged teal												
Blue-winged teal					60	50	20		910			
Cinnamon teal												
Shoveler												
Wood												
Redhead	600	150	100	100	350	350	350	350	65,900	3	150	
Ring-necked	10								280			
Canvasback												
Scaup		25	10			8	7		350			
Goldeneye												
Bufflehead												
Ruddy												
Other												
<u>Hooded Merganser</u>	10	4							361			
<u>COOL:</u>												
					(Over)							

	(5)	(6)	(7)
	Total Days Use	Peak Number	Total Production
Swans	-	-	-
Geese	-	-	-
Ducks	96,303	1,713	150
Coots	-	-	-

SUMMARY

Principal feeding areas Flooded hardwood bottoms

Principal nesting areas Along Hatchie River and cxbow lakes.

Reported by

Samuel W. Boston
Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species 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.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1750a
 Cont. NR-1
 (Rev. March 1953)

WATERFOWL
 (Continuation Sheet)

REFUGE **HATCHIE N.W. REFUGE**

MONTHS OF ~~May~~ TO ~~August~~, 19**66**

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production: Broods seen	(4) Estimated total
	11	12	13	14	15	16	17	18			
<u>Swans:</u>											
Whistling											
Trumpeter											
<u>Geese:</u>											
Canada											
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
<u>Ducks:</u>											
Mallard											
Black											
Gadwall											
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal											
Cinnamon teal											
Shoveler											
Wood											
Redhead	110	110	125	125	125	125	125	125	18,490	10	175
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
<u>Coot:</u>											

(Over)

	(5)	(6)	(7)	
	<u>Total Days Use</u>	<u>Peak Number</u>	<u>Total Production</u>	<u>SUMMARY</u>
Swans	_____	_____	_____	Principal feeding areas <u>Oxbow Lakes and Hatchie River</u>
Geese	_____	_____	_____	_____
Ducks	<u>18,190</u>	<u>300</u>	<u>175</u>	Principal nesting areas <u>Along Hatchie River and Oxbow Lakes</u>
Coots	_____	_____	_____	_____

Reported by Samuel W. Bester
Refuge Manager

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species 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.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1750a
 Cont. NR-1
 (Rev. March 1953)

WATERFOWL
 (Continuation Sheet)

REFUGE HATCHIE N.W. REFUGE

MONTHS OF September TO December, 1966

(1) Species	(2) Weeks of reporting period								(3) Estimated	(4) Production	
	11	12	13	14	15	16	17	18	waterfowl	Broods	Estimated
									days use	seen	total
<u>Swans:</u>											
Whistling											
Trumpeter											
<u>Geese:</u>											
Canada											
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
<u>Ducks:</u>											
Mallard	60	50	35	10	60	80	85	100	4,004		
Black	5	4	5	5	8	10	10	10	442		
Gadwall			4	2					56		
Baldpate											
Pintail											
Green-winged teal											
Blue-winged teal									70		
Cinnamon teal											
Shoveler											
Wood	180	180	150	150	150	160	170	160	20,035	11	210
Redhead											
Ring-necked		6	5	4	6	4	6	8	273		
Canvasback											
Scaup		10	6	10	12	10	5	2	385		
Goldeneye											
Bufflehead											
Ruddy											
Other											
<u>Coot:</u> <u>Hooded Merganser</u>							4	6	70		
					(Over)						

	(5)	(6)	(7)
	Total Days Use	Peak Number	Total Production
Swans	_____	_____	_____
Geese	_____	_____	_____
Ducks	25,335	436	212
Coots	_____	_____	_____

SUMMARY

Principal feeding areas Lake, sloughs, and Hatchie River

Principal nesting areas lateral cavities in hardwood timber

in Hatchie bottom.

Reported by

Samuel W. Boster

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

- (1) Species 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.
- (2) Weeks of Reporting Period: Estimated average refuge populations.
- (3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.
- (4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.
- (5) Total Days Use: A summary of data recorded under (3).
- (6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.
- (7) Total Production: A summary of data recorded under (4).

3-1751
Form NR-1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge _____ Months of _____ to _____ 19__

UNITED N. S. REFUGES

January

April

66

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. <u>Water and Marsh Birds:</u>										
Pied-billed Grebe	2	3/3/66	25	3/13/66	3	3/11/66	Scattered			310
Great Blue Heron	2	3/17/66	12	3/15/66	2	3/28/66	*			210
American Egret	1	3/19/66	4	3/29/66	2	3/29/66	*			50
Green Heron	3	3/21/66	15	3/21/66	2	3/29/66	*			300
American Bittern	1	3/21/66	5	3/29/66	2	3/21/66	*			85
II. <u>Shorebirds, Gulls, and Terns:</u>										
Killdeer	2	3/2/66	80	3/30/66	11	3/29/66	Scattered	25	10	2,100
Wilson's Snipe	2	3/16/66	24	3/13/66	1	3/23/66				210
American Woodcock	1	3/21/66	8	3/28/66	2	3/21/66				60

(over)

	(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>						
Mourning dove						
White-winged dove	10	1/5/66	210	1/15/66	25	1/26/66
					Scattered	12
						75
						8,000
IV. <u>Predaceous Birds:</u>						
Golden eagle						
Duck hawk						
Horned owl						
Magpie						
Raven	1	2/3/66	12	1/30/66	1	1/21/66
Crow						
	60	1/5/66	200	1/15/66	18	1/29/66
Barred owl	1	2/3/66	18	1/11/66	1	1/11/66
Red-tailed hawk	2	2/13/66	24	1/30/66	1	1/29/66
Marsh hawk	1	1/5/66	30	2/1/66	2	3/22/66

Reported by

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (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 migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

3-1751
Form NR-1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge HATCHER

Months of May

to August

19 66

(1) Species Common Name	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. <u>Water and Marsh Birds:</u>										
Pied-billed Grebe	2	5/20	4	5/20	2	5/20	None	None	None	24
Great Blue Heron	1	5/20	8	6/3	1	6/5	None	None	None	150
American Coot	1	6/18	3	6/18	2	7/29	None	None	None	96
American Bittern	2	5/9	6	6/18	1	6/24	None	None	None	210
Green Heron	4	5/13	15	5/13	2	8/1	None	None	None	360
II. <u>Shorebirds, Gulls, and Terns:</u>										
Killdeer	3	5/3	65	6/30	2	8/30	Scattered	-	-	2,000
Wilson's Snipe	1	5/24	10	5/24	1	5/24	Scattered	-	-	80
American Woodcock	2	5/10	15	5/10	2	5/10	Scattered	-	-	120

(over)

	(1)	(2)	(3)	(4)	(5)	(6)				
III. <u>Doves and Pigeons:</u>										
Mourning dove	12	5/ 2	220	7/31	26	8/31	scattered	18	30	12,250
White-winged dove										
IV. <u>Predaceous Birds:</u>										
Golden eagle										
Duck hawk										
Horned owl	3	5/ 3	1	7/ 8	2	7/26	-	-	-	-
Magpie										
Raven										
Crow	8	5/ 2	350	8/31	11	7/31	-	-	-	-
Parred w/	9	5/26	32	6/21	3	8/23	-	-	-	-
Red-tailed hawk	2	5/ 1	30	6/21	1	8/30	-	-	-	-
Marsh hawk	1	6/ 3	25	7/ 8	3	7/ 8	-	-	-	-

Reported by

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (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 migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

3-1751
Form NR-1A
(Aug. 1952)

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge HATCHIE N.W. REFUGE

Months of September to December 1966

(1) Species Common Name	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total Estimated Use
	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	
<u>I. Water and Marsh Birds:</u>										
Great Blue Heron	2	9-2-66	10	10-14-66	1	12-9-66	--	--	--	300
American Egret	1	9-2-66	3	10-10-66	2	11-10-66	--	--	--	30
Little Blue Heron	1	10-4-66	1	10-4-66	1	10-4-66	--	--	--	5
<u>I. Shorebirds, Gulls, and Terns:</u>										
Killdeer	6	9-3-66	150	9-1-66	1	12-6-66	--	--	--	7,500
Wilson's Snipe	2	11-23-66	25	12-31-66	1	12-23-66	--	--	--	1,500
American Woodcock	1	12-2-66	10	12-31-66	1	12-26-66	--	--	--	450

(over)

(1)	(2)		(3)		(4)			(5)			(6)
III. <u>Doves and Pigeons:</u>											
Mourning dove	32	9-5-66	250	9-26-66	1	12-27-66	--	--	--	10,000	
White-winged dove											
IV. <u>Predaceous Birds:</u>											
Golden eagle											
Duck hawk											
Horned owl	2	7-14-66	30	12-30-66	1	12-30-66	--	--	--	12,000	
Magpie											
Raven											
Crow	150	9-5-66	300	10-6-66	22	12-9-66	--	--	--	10,000	
Barred Owl	3	7-11-66	200	10-21-66	2	12-31-66	--	--	--	10,000	
Red-tailed hawk	1	9-10-66	25	11-10-66	2	12-12-66	--	--	--	2,000	
Marsh Wren	1	9-2-66	1	12-15-66	2	12-22-66	--	--	--	2,000	

Reported by

INSTRUCTIONS (See Sec. 7532, Wildlife Refuges Field Manual)

- (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 migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (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 species days use (average population X no. days present) of refuge during the reporting period.

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 FISH AND WILDLIFE SERVICE
 BUREAU OF SPORT FISHERIES AND WILDLIFE
 WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge HATCHIE N.W. REFUGE For 12-month period ending August 31, 1966

Reported by Samuel W. Barton Title Refuge Manager
New Station, First Report - Beginning October 1965

(1)	(2)		(3)	(4)	(5)
Area or Unit Designation	Habitat		Use-days	Breeding Population	Production
	Type	Acreage			
Unit # 1 (West End)	Crops	20	Ducks	58,110	10
	Upland	1558	Geese		
	Marsh	0	Swans		
	Water	25	Coots		
	Total	1603	Total		15
Unit # 2 (Middle)	Crops	0	Ducks	36,850	30
	Upland	1910	Geese		
	Marsh	0	Swans		
	Water	20	Coots		
	Total	1930	Total		20
Unit # 3 (East End)	Crops	74	Ducks	62,330	60
	Upland	3022	Geese		
	Marsh	0	Swans		
	Water	60	Coots		
	Total	3156	Total		70
Grand Total	Crops	94	Ducks	157,290	130
	Upland	6190	Geese		
	Marsh	0	Swans		
	Water	105	Coots		
	Total	6689	Total	157,290	130
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		
	Crops		Ducks		
	Upland		Geese		
	Marsh		Swans		
	Water		Coots		
	Total		Total		

(over)

INSTRUCTIONS

All tabulated information should be based on the best available techniques for obtaining these data. Estimates having no foundation in fact must be omitted. Refuge grand totals for all categories should be provided in the spaces below the last unit tabulation. Additional forms should be used if the number of units reported upon exceeds the capacity of one page. This report embraces the preceding 12-month period, NOT the fiscal or calendar year, and is submitted annually with the May-August Narrative Report.

- (1) **Area or Unit:** A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.

- (2) **Habitat:** Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.

- (3) **Use-days:** Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.

- (4) **Breeding Population:** An estimate of the total breeding population of each category of birds for each area or unit.

- (5) **Production:** Estimated total number of young raised to flight age.

HATCHIE NATIONAL WILDLIFE REFUGE

DESCRIPTION OF HABITAT TYPES OF REFUGE UNITS

Hatchie National Wildlife Refuge was activated in November 1965. The Refuge is located in Haywood County in western Tennessee. The area is bounded on the north and west by the Hatchie River. The east and south boundaries extend out in parts to the foothills of the Hatchie River bottom.

UNIT # 1.

This unit consist of 1,603 acres lying west of State Highway 76 which bisects the western portion of the refuge along with Interstate 40. Upon completion of land acquisition this unit will contain 2,173 acres.

The land elevations range from a low of 286 mean Gulf Sea Level to 292 feet. Approximately 100 percent of this unit lies in the flood plain of the Hatchie River. The area consist of 95 percent bottomland hardwoods. Primary species are willow, water, pin, cherrybark, overcup and swamp chestnut oaks, sweet gum and hickory. Normally the area floods annually during the months from December through March. Bear and Poplar Creeks run through the unit and numerous low areas and small drains are present. This unit is ideal for a green timber reservoir that would attract thousands of ducks each winter.

There are three oxbow lakes in this unit ranging from 1 to 4 acres in size and one 10 acre borrow pit near Interstate 40. These areas could be made into good wood duck nesting sites. Presently there is one 20 acre field, near Bull Pen Lake, that is cultivated by a cooperative farmer to help provide food for wildlife.

UNIT # 2.

Unit two is located east of State Highway 76 and extends to the east fork of the Bear Creek drainage canal. The Bureau presently controls 1,930 acres in this unit. The acreage will increase to 3,018 acres upon completion of acquisition.

Elevations range from a low of 293 to 300 feet. Poplar and Bear Creeks drain across the southwest corner. This area, like unit # 1, is subject to annual flooding during the winter and spring months and contains some of the best bottomland hardwoods in this section of the state.

This unit was formerly owned by the Powell Lumber Company, upon acquisition the Federal Courts granted them five years to remove the merchantable timber from the 1,930 acres. Several years will be required for this unit to recover from the timber harvesting operations and become an attraction to waterfowl.

Two oxbow lakes are on this unit and provide limited breeding sites for resident wood ducks during the summer and a resting area for winter migrants.

HATCHIE NATIONAL WILDLIFE REFUGE

DESCRIPTION OF HABITAT TYPES OF REFUGE UNITS

Page: 2

There is no cropland on this unit at the present time. Other lands to be acquired will consist of a small amount of cultivable lands.

This area is also suitable for impoundment of water during the winter months, however, because of the timber harvesting operations it will be several years before a sufficient amount of mast for waterfowl can be produced.

UNIT # 3.

The east end (unit 3) of the refuge, consisting of lands east of the east fork of Bear Creek drainage canal, is presently divided by private holdings. This unit is composed of 3,156 acres, mostly bottomland hardwoods, but will eventually total 5,865 acres.

Ninety percent of this unit is in the flood plain of the Hatchie River. Because of the elevation of this unit flood waters do not stand here as long as on units one and two. The elevations range from 296 to 302 feet in the timbered bottomlands to 370 feet in the hills along the south boundary.

Like units one and two, unit three is mostly timbered land with the oaks, gum and hickories being predominant. Two thousand one hundred and fifty acres of this unit will be cut over by the Powell Lumber Company, leaving only the small trees and culls remaining.

This unit has no creeks nor running streams. The only water source is from rainfall, surface run-off from the adjacent hillsides and flood waters from the Hatchie River. In an effort to attract waterfowl this area would be favorable for small green timber impoundments if water could be made available when needed.

Lands which are suitable for row crops are limited. Forty acres of the 7 $\frac{1}{2}$ acres of croplands listed are located on sloping hill land. To retard further erosion this land will be planted in a cover crop during 1967.

Four oxbow lakes, containing approximately 20 acres, are located on this unit and one slough which holds water during part of the year. These lakes, along with Hatchie River, provides the only habitat for wood duck production on this unit.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge WALTER W. W. REFUGE Months of January to April, 19 66

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
			Number broods obs'v'd.	Estimated Total		Hunting	For Re- stocking	For Research		
Common Name	Cover types, total acreage of habitat	Acres per Bird			Percentage				Estimated number using Refuge	Pertinent information not specificoally requested. List introductions here.
Bob-white Quail	800 acres of habitat	5	None	-	-	-	-	-	160	
Turkey	6,000 acres of bottomland hardwoods.	600	None		1 gobbler 9 hens	-	-	-	10	Tennessee Game and Fish Commission released 10 birds on Refuge March 17, 1966

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.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge WATERBURY W. R. REFUGES Months of May to August, 19 66

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total		Percentage	Hunting	For Re-stocking		
Bob-white Quail	500 acres	1	3	26	-	-	-	-	200	Pertinent information not specifically requested. List introductions here.
Turkey	6,000 acres	200	1	22	-	-	-	-	30	

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.

3-1752 .
 (Form NR-2)
 (April 1946)

MISSISSIPPI D.S.

UPLAND GAME BIRDS

September

December

66

Refuge _____

Months of _____ to _____, 19____

(1) Species	(2) Density		(3) Young Produced			(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
			Cover types, total acreage of habitat	Acres per Bird	Number broods observed		Estimated Total	Percentage	Hunting		
Common Name									Estimated number using Refuge		
Bob-white Quail	900 acres	3	6	60	- -	-	-	-	300		
Turkey	3000 acres	107	2	26	- -	-	-	-	32		

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.

Form NR-3
(June 1945)

BIG GAME

Refuge HATCHIE N.W. REFUGE

Calendar Year 1966

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
			Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White-tailed Deer	6,200	30	-	-	-	-	-	-	-	-	-	75	65	35-65

Remarks:

Reported by Samuel W. Barton

INSTRUCTIONS

Form NR-3 - BIG GAME

- (1) SPECIES: Use correct common name; i.e., Mule deer, black-tailed deer, white-tailed deer. It is unnecessary to indicate sub-species such as northern or Louisiana white-tailed deer.
- (2) DENSITY: 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 total number of young produced on refuge.
- (4) REMOVALS: Indicate total number in each category removed during the year.
- (5) LOSSES: On the basis of known records or reliable estimates indicate total losses in each category during the year.
- (6) INTRODUCTIONS: Indicate the number and refuge or agency from which stock was secured.
- (7) TOTAL REFUGE POPULATION: Give the estimated population of each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge HOUSTON, TEXAS Year ending April 30, 1966

(1) Species Common Name	(2) Density Cover Types & Total Acreage of Habitat	Acres Per Animal	(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion	
			Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated		Furs Destroyed
								Permit Number	Trappers Share	Refuge share				
Bobcat	6,000 acres bottom- land hardwoods & 500 acres pasture & fence rows.	52											12	
Fox, Gray	Same as above.	133											15	
Fox, Red	Same as above.	325											26	
Skunk	6,000 acres bottom- land hardwoods.	120											26	
Masked	6,000 acres bottom- land hardwoods.	30											200	
Opossum	6,000 acres bottom- land hardwoods.	75											30	
Rabbit	6,500 acres bottom- land hardwoods.	8											800	
Raccoon	6,000 acres bottom- land hardwoods.	20											300	
Squirrel, Fox	6,000 acres bottom- land hardwoods.	5											1,200	
Squirrel, Gray	6,000 acres bottom- land hardwoods.	5											1,500	
Beaver	1,000 acres along river & drainage ditches	10											25	

* List removals by Predator Animal Hunter

REMARKS:

Reported by Samuel W. Barton

INSTRUCTIONS

Form NR-4 - SMALL MAMMALS (Include data on all species of importance in the management program; i. e., muskrats, beaver, coon, mink, coyote. Data on small rodents may be omitted except for estimated total population of each species considered in control operations.)

- (1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)
- (2) DENSITY: Applies particularly to those species considered in removal programs. 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, bottom land 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) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headings listed.
- (4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of unprime-ness or damaged condition, and furs donated to institutions or other agencies should be shown in the column provided.
- (5) TOTAL POPULATION: Estimated total population of each species reported on as of April 30.
- REMARKS: Indicate inventory method(s) used, size of sample area(s), introductions, and any other pertinent information not specifically requested.

DISEASE

Refuge HATCHER N.W. REFUGE Year 19 66

Botulism

Lead Poisoning or other Disease

Period of outbreak ~~No outbreak of diseases occurred during~~

Period of heaviest losses ^{year.} _____

Losses:

	Actual Count	Estimated
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Number Hospitalized No. Recovered % Recovered

(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Areas affected (location and approximate acreage) _____

Water conditions (average depth of water in sickness areas, reflooding of exposed flats, etc.) _____

Condition of vegetation and invertebrate life _____

Remarks _____

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated
_____	_____	_____
_____	_____	_____
_____	_____	_____

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

PUBLIC RELATIONS
(See Instructions on Reverse Side)

Refuge WATKINS N. REFUGECalendar Year 1966

1. Visits
 a. Hunting 0 b. Fishing 2760 c. Miscellaneous 25,045 d. TOTAL VISITS 27,805

1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl
Upland Game
Big Game
Other

Number of permanent blinds 0Man-days of bow hunting included above 0Estimated man-days of hunting on lands adjacent to
refuge 3,500

1b. Fishing (area open to fishing on refuge lands)

TYPE OF AREA	ACRES	MILES
Ponds or Lakes	<u>100</u>	
Streams and Shores		

1c. Miscellaneous Visits

Recreation 1,300 Official 45Economic Use 12,000 Industrial 30

2. Refuge Participation (groups)

TYPE OF ORGANIZATION	On Refuge		Off Refuge	
	NO. OF GROUPS	NUMBER IN GROUPS	NO. OF GROUPS	NUMBER IN GROUPS
Sportsmen Clubs
Bird and Garden Clubs
Schools
Service Clubs	<u>1</u>	<u>50</u>
Youth Groups
Professional-Scientific
Religious Groups
State or Federal Govt.
Other

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	<u>7</u>	Radio Presentations	
Newspapers (P.R.'s sent to)	<u>9</u>	Exhibits	
TV Presentations		Est. Exhibit Viewers	

~~*Includes timber harvesting operations~~

INSTRUCTIONS

Item 1: Total of a, b, and c, equal d.

"Visit" - definition. Any person who is on refuge lands or waters during a day or part thereof for the purpose of: hunting, fishing, bird-watching, recreation, business or economic use, official visit, or similar interest. INCLUDE - those who stop within the refuge while traveling on a public highway because of an interest in the area. EXCLUDE - persons engaged in oil or other industry not directly related to the refuge, persons using refuge as most direct route or principal avenue of traffic, and those boating on navigable rivers or the Intercostal Canal, unless they stop to observe wildlife on the refuge.

Computing visits. Where actual counts are impractical, "sampling" is used with midweek and weekend samples varied by season or weather. A conversion factor of 3.5 (of passengers per car) is used when accurate figures are not available. Each refuge will develop a conversion factor for boats based on range of usage. Count a camper once for each 24-hour period or fraction thereof.

Item 1a: Acres - of refuge open for each type of hunting.

Managed hunts require check in and out of hunters, issuance of permits, or assignment of blinds.

Other - INCLUDE crow, fox, and similar hunting.

Lands adjacent to refuge. Normally considered within 1 mile or less of boundary, unless established sampling procedures cover a wider area. For big game hunting, the distance may be greater.

Item 1b: Acres of streams open to fishing, if practical; otherwise just miles open. Information on "shores" is primarily for coastal fishing.

Item 1c: Recreation. INCLUDE photography, observing wildlife, picnicking, swimming, boating, camping, visitor center use, tours, etc. TOTAL Recreation, Official, and Economic Use visits under Item 1.

Industrial. INCLUDE persons engaged in industry, i.e., oil industry or factories. EXCLUDE these from Item 1.

Item 2: INCLUDE the "On Refuge" groups in Items 1c and 1. In "Off Refuge" column include only those group meetings in which refuge employees actually participate. EXCLUDE these from Items 1c and 1.

Item 3: Exhibits - INCLUDE displays, fairs, parades, and exhibits OFF the refuge; EXCLUDE those ON.

3-1757
 Form NR-7
 (Rev. June 1960)

(1)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge HATCHIE N.W. REFUGE Year 19 66

Species	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
	Amount (Lbs., bus., etc.)	(2) C or R	Date	Method or Source	Cost	(3) Total Amount on Hand	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount and Nature of Propagules	Date	Survival	Cause of Loss
No collections, receipts nor plantings occurred during year.													

- (1) Report agronomic farm crops on Form NR-8
- (2) C = Collections and R = Receipts
- (3) Use "S" to denote surplus

Remarks: _____

Total acreage planted:
 Marsh and aquatic _____
 hedgerows, cover patches _____
 Food strips, food patches _____
 Forest plantings _____

3-1758
Form NR-8
(Rev. Jan. 1956)

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge HATCHER N.S. REFUGE County HAYWOOD State TENNESSEE

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water-fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested		Unharvested				
			Acres	Bu./Tons	Acres	Bu./Tons			
Soybeans	35	1,097 bu.	--	--	--	--	35	Fescue & Clover	4
Corn	--	--	--	--	4	100 bu.	4		
Wilo Maize	--	--	--	--	5	125 bu.	5		
						4 T			
								Fallow Ag. Land	36

No. of Permittees: Agricultural Operations 2 Haying Operations 0 Grazing Operations 0

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
---	-----	-----	-----	1. Cattle	-----	-----	--	--
				2. Other	-----	-----	--	--
				1. Total Refuge Acreage Under Cultivation				128
Hay - Wild				2. Acreage Cultivated as Service Operation				0

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS - HAYING - GRAZING

Report Form NR-8 should be prepared on a calendar-year basis for all crops which were planted during the calendar year and for haying and grazing operations carried on during the same period.

Separate reports shall be furnished for Refuge lands in each county when a refuge is located in more than one county or State.

Cultivated Crops Grown - List all crops planted, grown and harvested on the refuge during the reporting period regardless of purpose. Crops in kind which have been planted by more than one permittee or this Service shall be combined for reporting purposes.

Permittee's Share - Only the number of acres utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. Report all crops harvested in bushels or fractions thereof except such crops as silage, watermelons, cotton, tobacco, and hay, which should be reported in tons or fractions thereof.

Government's Share or Return - Harvested - Show the acreage and number of bushels harvested for the Government of crops produced by permittees or refuge personnel. Unharvested - Show the exact acreage and the estimated number of bushels of grain available for wildlife. If grazing is made available to waterfowl through the planting of grain, cover, green manure, grazing or hay crops, estimate the tonnage of green food produced or utilized and report under Bushels Unharvested column.

Total Acreage Planted - Report all acreage planted, including crop failures.

Green Manure, Cover and Waterfowl Grazing Crops - Specify the acreage, kind and purpose of the crop. These crops and the acreage may be duplicated under cultivated crops if planted during the year, or a duplication may occur under hay if the crop results from a perennial planting.

Hay - Improved - List separately the kinds of improved hay grown. Annual plantings should also be reported under Cultivated Crops, and perennial hay should be listed in the same manner at time of planting.

Total Refuge Acreage Under Cultivation - Report total land area devoted to agricultural purposes during the year.

REFUGE GRAIN REPORT

Refuge HATCHER N. W. REFUGE

Months of September through December, 1956

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Spring wheat, Knox	0	30 bu.				15		15	No	X	

(8) Indicate shipping or collection points _____

(9) Grain is stored at Block building on Refuge

(10) Remarks Grain unfit for planting - Being used to bait wood duck banding traps.

*See instructions on back.

REFUGE GRAIN REPORT

This report should cover all grain on hand, received, or disposed of, during the period covered by this narrative report.

Report all grain in bushels. For the purpose of this report the following approximate weights of grain shall be considered equivalent to a bushel: Corn (shelled)—55 lb., corn (ear)—70 lb., wheat—60 lb., barley—50 lb., rye—55 lb., oats—30 lb., soy beans—60 lb., millet—50 lb., cowpeas—60 lb., and mixed—50 lb. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately and specifically, as flint corn, yellow dent corn, square deal hybrid corn, garnet wheat, red May wheat, durum wheat, spring wheat, proso millet, combine milo, new era cowpeas, mikado soy beans, etc. Mere listing as corn, wheat, and soybeans will not suffice, as specific details are necessary in considering transfer of seed supplies to other refuges. Include only domestic grains; aquatic and other seeds will be listed on NR-9.
- (3) Report all grain received during period from all sources, such as transfer, share cropping, or harvest from food patches.
- (4) A total of columns 2 and 3.
- (6) Column 4 less column 5.
- (7) This is a proposed break-down by varieties of grain listed in column 6. Indicate if grain is suitable for seeding new crops.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters granary," etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.

TIMBER REMOVAL

Refuge..... HATCHIE W.M. REFUGE Year 1956..

Permittee	Permit No.	Unit or Location	Acreage	No. of Units Expressed in B. F., ties, etc.	Rate of Charge	Total Income	Reservations and/or Diameter Limits	Species Cut
<p>No timber removal occurred through Refuge negotiations.</p>								
<p>Howard Powell Lumber Company was granted a five year period to remove merchantable timber from 4,500 acres of Refuge lands as a result of a Federal Court ruling during land acquisition condemnation trial.</p>								

Total acreage cut over..... Total income.....

No. of units removed B. F. Method of slash disposal.....
 Cords.....
 Ties.....

ANNUAL REPORT OF PERSTICIDE APPLICATION

Proposal Number

Reporting Year

1966

INSTRUCTIONS: Wildlife Refuges Manual, secs. 3252d, 3394b and 3395.

Date(s) of Application	List of Target Pest(s)	Location of Area Treated	Total Acres Treated	Chemical(s) Used	Total Amount of Chemical Applied	Application Rate	Carrier and Rate	Method of Application
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	"NOT APPLICABLE"							

10. Summary of results (continue on reverse side, if necessary)