

BRANCH OF WILDLIFE REFUGES

NARRATIVE REPORT

ROUTING SLIP

DATE Sept. 17, 1952

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

Mr. DuMont \_\_\_\_\_

~~Mr. Krauss~~ ut

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

Section of Operations:

Mr. Ball \_\_\_\_\_

Dr. Morley \_\_\_\_\_

Mr. Regan \_\_\_\_\_

Section of Habitat Improvement:

Mr. Griffith \_\_\_\_\_

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

~~Dr. Bourn~~ WBS

Mr. Stiles WBS

Section of Land Management:

Mr. Ackerknecht \_\_\_\_\_

Mr. Davis \_\_\_\_\_

Stenographers:

gm \_\_\_\_\_

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REFUGE Bombay Hook National Wildlife Refuge

PERIOD May - August 1952

Bombay Hook National Wildlife Refuge

Narrative Report

May, June, July, August 1952

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Refuge Personnel

|                      |                                |
|----------------------|--------------------------------|
| David M. Hickok----- | Refuge Manager                 |
| John W. Parker-----  | Clerk                          |
| Henry S. Bush-----   | Maintenance Man                |
| Louis Steller-----   | Maintenance Man                |
| John I. Webb-----    | Dragline Operator              |
| James Reed-----      | Oiler                          |
| Ralph Carey-----     | Carpenter ( Temporary )        |
| Malcolm Carey-----   | Tractor Operator ( Temprary )  |
| John McBride-----    | Tractor Operator ( Temporary ) |

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Smyrna, Delaware

## Narrative Report

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## Narrative Report

### Bombay Hook National Wildlife Refuge

May, ~~June~~, July, and August 1952

#### I. General

##### A. Weather Conditions

| Month  | Snowfall | Precip. | Normal Precip. | Max. | Min. | Ave. | Normal Temperature |
|--------|----------|---------|----------------|------|------|------|--------------------|
| May    | --       | 4.61    | 3.81           | 84   | 39   | 61.0 | 62.8               |
| June   | --       | 2.52    | 4.02           | 99   | 51   | 73.4 | 71.8               |
| July   | --       | 7.40    | 4.49           | 98   | 50   | 78.4 | 75.9               |
| August | --       | 3.09    | 5.28           | 90   | 48   | 74.3 | 74.8               |

The above data ~~is~~ forwarded thru the courtesy of the U. S. Weather Bureau Station at Wilmington, Delaware, located forty miles north of the refuge.

May was the third successive month with precipitation well above normal. The wet weather, combined with below normal temperature in May, delayed farm operations.

June was the hottest on record since 1943. Several area deaths were attributed to the heat.

July had 17 days with temperatures above 90 degrees, the greatest number since 1896. Flash floods occurred on the 8th and 9th, when 6.24 inches of rain fell.

Although rain was well above normal, precipitation was spotty, and by the end of the month drought conditions existed in several areas of the State.

The refuge benefited from several coastal showers, and no drought conditions were experienced.

August has had fairly normal weather, the only departure being the new minimum temperature record for the date ( 59 years ) established on the 24th with a temperature of 48 degrees F.

From the 23rd through the 27th a period of 88 hours of cloudless sky was observed, an unusually long period for this area.

##### B. Water Conditions

Water conditions on the tidal marsh were normal. The level of Raymonds Pool was consistently well above normal during the period.

The Finis Pool was maintained near its maximum of 6.0' and only lowered when flash rains made it necessary.

### C. Fires

No fires occurred on or near the refuge during the period.

## II. Wildlife

### A. Migratory Birds

#### 1. Populations and Behavior

##### A. Waterfowl

By the beginning of the period most of the migrant ducks had left for the north, leaving a breeding nucleus of blacks, mallards, gadwalls, and wood duck.

Due to a cold wet spring and high water conditions breeding activity was late. A high percentage of reneesting was evident.

On Raymonds Pool the following broods were produced:

Black Duck ----- 3 broods; Ave. size 6.3; 19 young birds  
Mallard ----- 1 brood; Ave size 6; 6 young birds  
Gadwall ----- 1 brood; ave. size 6; 6 young birds  
Pied-billed grebe- 1 brood; ave. size 4; 4 young birds

Two of the three observed black ducks broods weren't seen until July 12th; the birds were then about 1 week old.

The pool produced 34 young birds this year against 45 last year, with a change in composition as follows:

| <u>Species</u>    | <u>Young this year</u> | <u>young last year</u> |
|-------------------|------------------------|------------------------|
| Black             | 19                     | 8                      |
| Mallard           | 6                      | 0                      |
| Gadwall           | 6                      | 34                     |
| Pied-billed grebe | 4                      | 3                      |
|                   | <u>34</u>              | <u>45</u>              |

From our observations here there was, on the refuge as a whole, certainly not the increase reported by other technicians on the coast.

Rather our estimate is one of approximately the same production as last year, with possibly a slight decrease.

I would attribute much of the reported brood increase this year not to increased actual production but to better or greater coverage by State technicians.

The first forerunners of the fall migration arrived during the closing days of the period.

Green-winged teal were first observed on August 14th. Three migrant



shovelers and seven migrant pintail were observed August 31, 1952.

#### B. Shore birds and Herons

Willetts, sandpipers, yellowlegs, and dowitchers were present during the period in their usual abundance.

The heron family was present in abundance, although somewhat less than last year.

American and snowy egrets, little blue and little green herons, black-crowned night herons and great blue herons, least and American bitterns all used Raymonds Pool constantly throughout the period.

One Louisiana heron was observed on August 27, 1952, on Raymonds Pool.

The total heron population was more diverse than last year in that the various species were more equally represented. Snowy, American and little blue herons were about half as abundant last year, but greater numbers of little green herons and bitterns were present.

#### 2. Food and Cover

Food and cover conditions in Raymonds and Finis Pools are excellent and have been throughout the period.

On the salt marsh several areas burned last winter have come into good stands of three-square. Particularly in those three-square marsh areas characterized by potholes and muskrat water areas has waterfowl usage been good.

#### 3. Botulism

None.

#### 4. Lead Poisoning & Other Diseases

None.

#### B. Upland Game Birds

##### 1. Populations and Behavior

There have been peak pheasant, quail, and mourning dove populations on the refuge during the period. Productions and brood success was high for all three species.

##### 2. Food and Cover

Food and cover conditions are good. The stage of our upland development has not yet advanced to a point where <sup>the</sup> much pheasant and quail cover has been removed in favor of waterfowl grazing. Rather present juxtaposition of croplands and brush country is excellent for upland species.

##### 3. Disease

None, known.

### C. Big Game

#### 1. Populations and Behavior

As frequently stated, the white-tail deer herd is continuing its increase. The birth rate is high; over 60% of the does' having twin fawns.

#### 2. Food and Cover

Range conditions are ideal. There is no overbrowsing. Antler development, a good criteria of range conditions, is excellent. Second-year bucks generally have six- or eight-point racks.

#### 3. Disease

None known.

### D. Fur animals, Predators, Rodents and other animals

Raccoon and red fox predation is on the increase.

Particularly have our banding traps been bothered.

The setting of #2 jump traps around the banding traps has taken several raccoon and locally discouraged this type of predation.

The overall problem is, however, increasing.

### E. Predaceous birds

No above normal bird predation was noted during the period.

## III. Refuge Development and Maintenance

### A. Physical Development

#### 1. Shearneck Dike project

During the period 13,000 cubic yards of fill were deposited on the Shearneck Dike with the Bucyrus Erie 22-B machine working from the pontoon barge.

Progress is still slow in terms of accomplishment, but when all matters of cave-ins, slide-ins, etc., are figured, progress is about par this period.

A new TD-9 bulldozer received this period is attempting to shape some of the dike where enough fill now exists.

A system of bench marks for the dike project was set up by Frank Hemming, Regional Office Cadastral Engineer, and the refuge manager.



## 2. Other dikes

The east dike of Raymonds Pool has been cleared and the center brought to grade. With the equipment on hand and the time we have been able to use it, we have not been able to haul sufficient fill in to build the slopes of the center portion out as desired.

The areas from which fill can be brought with the HD-14 and carry-all pan are also limited.

It is planned to build the slopes up on this dike section with the Bucyrus-Erie 22-B crane when that machine is taken from the barge in order to repaint the barge.

Two of the Super C Tournapulls from Brigantine were used for short periods on the job until needed again at Brigantine.

Practically all of the work has been done with the HD-14 and carry-all pan, TD-7 dozer, and Rome grader. The tournapulls only slowed the job down, as much time was spent repairing them before they worked properly.

## 3. Building Construction

A. A tool and miscellaneous storage shed has been constructed at headquarters, using as a base the old cow shed formerly adjacent to Raymonds Pool.

B. The grain storage building in Dutch Neck has been completed. The building has 7 bins on two floors, with a capacity of 1433 bushels. Chutes from the 2nd floor bins lead down to a central bagger on the ground floor.

C. Two corn cribs are under construction, one in the Dutch Neck area, the other at Headquarters. Together they will have a cob corn capacity of approximately 2,000 bushels.

D. Work on a fire pond behind headquarters was begun.

### B. Soil and Moisture Development

During the period the following Soil & Moisture work was accomplished.

1. 62 acres of reverting brush lands were cleared.
2. 63 acres of cover crops were planted.
3. 274 acres of low classification land were fertilized, exclusive of our crop lands under rotational management.
4. 60 acres of land were put under rough tillage.
5. 2 acres of trees and shrubs were planted.

6. Weed control practices were instigated on 110 acres in connection with our corn crops. Amine 2,4-D was sprayed on corn land, prior to crop emergence.

7. 40 acres of crop lands were leveled for better drainage. The following is a summary of Soil and Moisture accomplishments during the fiscal year July 1, 1951, to June 30, 1952:

1. 600 acres of agricultural land have been put under operating schedule.

2. 124 acres of reverting brush lands were cleared.

3. 113 acres of cover crops planted and plowed under for green manures.

4. 410 acres low quality lands were fertilized, exclusive of lands under rotational management. ( The 410-acre figure indicates acres fertilized spring and fall; the actual acres treated is approximately 1/2 this figure, two applications having been made.)

5. Of the 600 acres under operating schedule, 316 have been put under rotational management.

6. 60 acres of land were put under rough tillage.

7. Forty-three acres of soil amendments ( lime 1 ton per acre ) were applied.

8. 2 acres of trees and shrubs were planted.

9. Weed control practices were applied on 110 acres.

10. 52 acres of crop land were leveled.

#### C. Maintenance Activities

##### 1. Repairs

A. Usual truck and boat maintenance jobs were done throughout the period.

B. The transmission, master clutch and steering clutches and brakes of one Super C tournapull from Brigantine Refuge were completely overhauled.

C. The Rome grader has been remodeled, put on rubber and otherwise repaired.

D. Boosters were installed on the steering brakes of the HD-14 tractor.

E. A new tagline was put on the Bucyrus-Erie crane.

F. The motor of the old Schramm air compressor was overhauled.

## 2. Equipment purchase, transfers and Construction

A. A new International TD-9 angle dozer has been received.

B. The Badger Crane has been transferred to the National Elk Refuge, Jackson Hole, Wyoming.

C. A six-row corn sprayer has been constructed to work in conjunction with the Bean-Sprayer.

D. 2 new welded frame banding traps have been constructed.

E. An old cultipacker received from the Branch of Game Fish and Hatcheries has been rebuilt. As yet nothing has been done with an old plow also received from the above branch.

F. The K-11 International tractor trailer unit made many trips throughout the period between the regions' refuges, transferring heavy equipment.

## B. Plantings

### 1. Aquatic and Marsh plants

Brasenia root stocks and seed received from Missisquoi Refuge were planted in Finis Pool.

### 2. Trees & shrubs

None

### 3. Cultivated Crops

In addition to the crops planted this spring under cooperative agreement ( reported last period ), the refuge put in the following crop acreages itself:

| <u>Field*</u> | <u>Crop</u> | <u>Acres</u> | <u>Remarks</u> |
|---------------|-------------|--------------|----------------|
| 5A            | corn        | 7            | To be left     |
| 5C            | corn        | 3            | To be left     |
| 5B.           | soybeans    | 10           | green manure   |
| 7A            | buckwheat   | 6            | To be left     |
| 7B            | soybeans    | 6            | green manure   |
| 7C            | wild millet | 5            | To be left     |
| 10            | soybeans    | 30(of)       | harvest        |
| 11            | soybeans    | 10           | green manure   |
| 18            | buckwheat   | 3(of)        | harvest        |
| 18            | wild millet | 2(of)        | harvest        |
| 22            | soybeans    | 10(of)       | green manure   |
| 22            | soybeans    | 15(of)       | harvest        |

\* #s on new development plan ~~107~~ acre total



At present refuge personnel are preparing 87 acres for winter grain crops and the cooperators 76 acres.

The above acreages are for lands under rotation; additional lands are under development and build up, and, weather permitting, will be planted to ~~grains~~ also this fall.

The cooperator grain harvest this summer was as follows:

| <u>Cooperator</u> | <u>Permit</u> | <u>Crop</u> | <u>Field</u> | <u>Acres</u> | <u>Total Yield</u>                            | <u>Refuge Share</u> |
|-------------------|---------------|-------------|--------------|--------------|---|---------------------|
| Arthur Carrow Jr. | 5-39          | wheat       | 5            | 20           | 250<br>( geese fed heavily on<br>this field ) | 50                  |
| Walter Carrow     | 5-40          | wheat       | 8            | 16           | 349   | 69.8                |
|                   |               | wheat       | 15           | 19.5         | 399   | 79.8                |

The following is a summary of this summer's refuge crop harvest.

| <u>Crop</u> | <u>Field</u> | <u>Acres</u> | <u>Total Yield</u> | <u>Remarks</u>  |
|-------------|--------------|--------------|--------------------|---|
| Rye         | 10           | 12.5         | 323 bu.            | 1 acre of low ground where<br>crop was very weedy left<br>uncut |
| Wheat       | 17           | 21           | 100 bu.            | Heavily grazed by geese only<br>7 acres cut                     |
| Wheat       | 56           | 10           | 100 bu.            | Ditto above only 7 acres cut                                    |

Total yield to refuge:

Wheat ---- 399.6 bushels  
Rye ----- 323 bushels

#### C. Collections

##### 1. Seed or other propaquals

None

##### 2. Specimen

None

#### D. Receipts of Seed & Nursury Stock

40 bushels of barley from Brigantine Refuge 7/9/52

#### IV. Economic Use of the Refuge

##### A. Grazing

None

##### B. Haying

None

##### C. Fur Harvest

None

##### D. Timber Removal

The following timber was removed for construction purposes:

|                    |      |            |
|--------------------|------|------------|
| White oak -----    | 5500 | Board feet |
| Red Gum -----      | 1006 | Board feet |
| Tulip Poplar ----- | 1200 | Board feet |
| Total              | 7706 | Board feet |

Of this, 5333 board feet were used for Brigantine mat timbers and 2373 board feet for this refuge's building construction work.

#### V. Field Investigation or Applied Research

##### A. Banding Program

The refuge banding program was reactivated on August 6, 1952. Activities are being carried on this year in cooperation with P.R. men of the Delaware State Game & Fish Commission.

From August 6, 1952, to August 31, 1952, the following birds were banded:

|                    |     |
|--------------------|-----|
| Black -----        | 184 |
| Mallard -----      | 47  |
| Little Blue Heron- | 6   |
| Blue-winged teal - | 1   |
| Total              | 238 |

In connection with banding activities blood smears of immature black ducks are being taken for Dr. Herman at Patuxent Research Refuge in connection with his Leucocytozoan studies.

From band returns received there is evidently a divergence in the northern migration above this coastal point.

Birds banded here have been following two courses—one maritime, up along the Atlantic coast to New Brunswick, and the other north westward through the Finger Lakes of New York along eastern <sup>Lake Ontario and Lake</sup> country of Quebec and Hudson Bay.

We still need many more band returns to trace this migration pattern accurately, but those now on hand do substantially indicate the above pattern.

An interesting band return was received for a Little Blue Heron banded here 8/14/51 and caught on the Island of Haiti on 1/23/52.

#### VI. Public Relations

A. During this past extremely hot, wet, humid and insect-ridden period, very few of the usual amateur ornithologists and nature organizations visited the refuge.

Most of the refuge visitors were crabbers and fishermen.

One party of "city slicker" crabbers coming from Delaware Bay found themselves lost of the salt marsh. After "slogging" in off the marsh, a neighboring farmer brought them to the refuge, and refuge personnel went after their boat.

#### B. Refuge Visitors

During the period approximately 186 persons visited the refuge. Dates and purposes of Official visits are as follows:

| <u>Date</u> | <u>Visitors</u>   | <u>Purpose</u>                              |
|-------------|---|---|
| 5/5         | H.E. Whitley, Refuge Manager,<br>Brigantine N.W. Refuge                             | pick up tractor trailer                     |
| 5/13-14     | F. Hemmings R. O.<br>Cadastral Engineer   | Set up Bench marks                          |
| 5/14 - 5/17 | A. F. Miller, Regional Refuge<br>Supervisor   | Inspection                                  |
| 5/22        | A. F. Miller, Regional Refuge<br>Supervisor   | Inspection                                  |
| 6/24        | Laborers from Chincoteague  | for lumber                                  |
| 7/16-17     | <del>A. F. Miller, Regional Refuge Supervisor</del>                                 | <del>for lumber</del> Inspection            |
| 8/17        | E. Barry, Maryland State Game<br>Dep't.<br>N. Wilder, Delaware State Game<br>Dep't. | With conservation<br>Education Group<br>" " |
| 8/15        | Tom Stubbs, Parker River  | Pick up grains                              |

#### C. Refuge Participation

On August 12th the refuge manager went to the Prime Hook marsh at the request of Delaware State Game Official to advise on engineering problems facing them in the development of that marsh.

#### D. Violations

None



VII. Other Items

A. Items of Interest

Refuge clerk John Parker on August 25, 1952, became the proud father of a baby girl.

B. Photographs

A section of photograph on refuge activities follows:

Submitted by

*David M. Hickok*

David M. Hickok

Refuge Manager

September 10, 1952

Approved

*[Signature]*  
\_\_\_\_\_  
Regional Refuge Supervisor

*September 11, 1952*  
\_\_\_\_\_  
Date

\_\_\_\_\_  
Regional Director

\_\_\_\_\_  
Date

3-1750

Form NR-1

(Nov. 1945)

## WATERFOWL

Refuge Bombay Hook Months of May to August 1945

| (1)<br>Species<br><br>Common Name  | (2)<br>First Seen  |  | (3)<br>Peak Concentration |        | (4)<br>Last Seen |      | (5)<br>Young Produced          |  | (6)<br>Total   |
|--|--|--|---------------------------|--------|------------------|------|--------------------------------|--|--|
|  | Number   | Date   | Number                    | Date   | Number           | Date | Broods Seen                    | Estimated Total                        | Estimated for Period                                   |
| I. <u>Swans:</u><br>Whistling swan   | 3  | 5/10   | only observation          |        |                  |      |                                |  | 3  |
| II. <u>Geese:</u><br>Canada goose<br>Cackling goose<br>Brant<br>White-fronted goose<br>Snow goose<br>Blue goose  | present  |  | ---                       | ---    | 6                | 5/10 |                                |  | 100  |
| III. <u>Ducks:</u><br>Mallard<br>Black duck<br>Gadwall<br>Baldpate<br>Pintail<br>Green-winged teal<br>Blue-winged teal<br>Cinnamon teal<br>Wood duck<br>Red head<br>Ring-necked duck<br>Canvas-back<br>Scaup<br>Golden-eye<br>Buffle-head<br>Ruddy duck<br>Shoveller | Nesting<br>"<br>"<br><br>1<br>3<br>Nesting<br>Nesting<br><br><br><br>3 | <br><br><br><br>8/31<br>8/14<br><br><br><br><br>8/31 |                           |        |                  |      | 4<br>12<br>4<br><br><br>1<br>1 | 350<br>1200<br>200<br><br><br>40<br>30 | 500<br>1900<br>300<br><br>1<br>30<br>70<br>40<br><br>3 |
| IV. <u>Coot:</u><br>FLORIDA GULLINULE  |  | NESTING  |                           | (over) |                  |      | 1                              | 40                                     | 60   |

## SUMMARIES

### Total Production:

Geese.....0

Ducks.....1470

Coots.....0

Gallinules.....40

Total waterfowl usage during period.....3007

Peak waterfowl numbers.....2000

Areas used by concentrations.....-----

Principal nesting areas this season.....Raymonds Pool,

Finis Pool, Bear Swamp, Collins Island

Reported by.....D. W. H. H. H.

## INSTRUCTIONS

- (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) First Seen: The first refuge record for the species during the season concerned in the reporting period, and the number seen. This column does not apply to resident species.
- (3) Peak Concentration: 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 in the reporting period.
- (5) Young Produced: 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.
- (6) Total: Estimated total number of the species using the refuge during the period. This figure may or may not be more than that used for peak concentrations, depending upon the nature of the migrational movement.

Note: Only columns applicable to the reporting period should be used. It is desirable that the Summaries receive careful attention since these data are necessarily based on an analysis of the rest of the form.



3-1751

Form NR-1A  
(Nov. 1945)MIGRATORY BIRDS  
(other than waterfowl)Refuge Bombay HookMonths of May to August 19452

| (1)<br>Species                          | (2)<br>First Seen |      | (3)<br>Peak Numbers |      | (4)<br>Last Seen |      | (5)<br>Production  |                  |                | (6)<br>Total        |
|---|-------------------|------|---------------------|------|------------------|------|--------------------|------------------|----------------|---------------------|
| Common Name                             | Number            | Date | Number              | Date | Number           | Date | Number<br>Colonies | Total #<br>Nests | Total<br>Young | Estimated<br>Number |
| I. <u>Water and Marsh Birds:</u>        |                   |      |                     |      |                  |      |                    |                  |                |                     |
| Pied-billed grebe                       | Nesting           |      | 10                  | 5/27 | Present          |      | 1                  |                  | 4              | 20                  |
| Great Blue Heron                        | "                 |      | 50                  | 7/15 | "                |      |                    |                  |                | 80                  |
| Little Blue Heron                       | 10                | 6/2  | 200                 | "    | "                |      |                    |                  |                | 300                 |
| Eastern Green Heron                     | Nesting           |      | 250                 | "    | "                |      |                    |                  |                | 250                 |
| Snowy Egret                             | 2                 | 6/2  | 100                 | "    | "                |      |                    |                  |                | 300                 |
| American Egret                          | 7                 | 6/9  | 150                 | "    | "                |      |                    |                  |                | 400                 |
| American Bittern                        | Nesting           |      | 200                 | "    | "                |      |                    |                  |                | 500                 |
| Least Bittern                           | "                 |      | 75                  | "    | "                |      |                    |                  |                | 200                 |
| Clapper Rail                            | "                 |      | 800                 | "    | "                |      |                    |                  |                | 800                 |
| Louisiana Heron                         | 1                 | 8/21 | only observation    |      |                  |      |                    |                  |                | 1                   |
|   |                   |      |                     |      |                  |      |                    |                  |                |                     |
| II. <u>Shorebirds, Gulls and Terns:</u> |                   |      |                     |      |                  |      |                    |                  |                |                     |
| Willet                                  |                   |      | 2500                | July |                  |      |                    |                  |                | 2500                |
| Greter Yellowlegs                       |                   |      | 2000                | "    |                  |      |                    |                  |                | 2000                |
| Lesser Yellowlegs                       |                   |      | 2000                | "    |                  |      |                    |                  |                | 2000                |
| Killdeer                                |                   |      | 500                 | June |                  |      |                    |                  |                | 800                 |
| Herring gull                            |                   |      | 20                  | "    |                  |      |                    |                  |                | 50                  |

(over)

| (1)                               | (2)     | (3) | (4)  | (5) | (6) |
|-----------------------------------|---------|-----|------|-----|-----|
| III. <u>Doves and Pigeons:</u>    |         |     |      |     |     |
| Mourning dove                     | Nesting | 250 | 8/30 |     | 250 |
| White-winged dove                 |         |     |      |     |     |
| IV. <u>Predaceous Birds:</u>      |         |     |      |     |     |
| Golden eagle                      |         |     |      |     |     |
| Duck hawk                         |         |     |      |     |     |
| Horned owl                        |         |     |      |     |     |
| Magpie                            |         |     |      |     |     |
| Raven                             |         |     |      |     |     |
| Crow                              |         |     |      |     |     |
| Bald Eagle                        |         |     |      |     | 200 |
| Osprey                            |         |     |      |     | 6   |
| Marsh Hawk                        |         |     |      |     | 10  |
| Red-tailed Hawk                   |         |     |      |     | 25  |
| Red-shouldered Hawk               |         |     |      |     | 4   |
|                                   |         |     |      |     | 2   |
| Reported by <u>D. M. H. H. H.</u> |         |     |      |     |     |

#### 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 Bombay Hook Months of May to August, 19452

| (1)<br>Species          | (2)<br>Density                           |                      | (3)<br>Young<br>Produced     |                    | (4)<br>Sex<br>Ratio | (5)<br>Removals |                     |                 | (6)<br>Total                           | (7)<br>Remarks   |
|-------------------------|--|----------------------|------------------------------|--------------------|---------------------|-----------------|---------------------|-----------------|--|--|
| Common Name             | Cover types, total<br>acreage of habitat | Acres<br>per<br>Bird | Number<br>broods<br>obs'v'd. | Estimated<br>Total | Percentage          | Hunting         | For Re-<br>stocking | For<br>Research | Estimated<br>number<br>using<br>Refuge | Pertinent information not<br>specifically requested.<br>List introductions here. |
| Ring-necked<br>Pheasant | Upland or Marsh<br>400 acres             | 5                    |                              |                    | 40% male            |                 |                     |                 | 80                                     |  |
| Bob White Quail         | Upland or Marsh<br>400 acres             | 2.75                 |                              |                    | 50% male            |                 |                     |                 | 150                                    |  |



## 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.

3-1570  
NR-8a

REFUGE GRAIN REPORT

Refuge Bombay Hook

Months of May thru August 1945

| (1)<br>VARIETY | (2)<br>ON HAND<br>BEGINNING<br>OF PERIOD | (3)<br>RECEIVED<br>DURING<br>PERIOD | (4)<br>TOTAL | (5)<br>GRAIN DISPOSED OF |          |         |          | (6)<br>ON HAND<br>END OF<br>PERIOD | (7)<br>PROPOSED USE |        |        |
|----------------|--|-------------------------------------|--------------|--------------------------|----------|---------|----------|------------------------------------|---------------------|--------|--------|
|                |  |                                     |              | TRANS-<br>FERRED         | SEEDED   | FED     | TOTAL    |                                    | SEED                | FEED   | SURP.  |
| Corn (shelled) | 275 bu.                                  | ---                                 | 275 bu.      | 72 bu.                   | ---      | 153 bu. | 225 bu.  | 50 bu.                             | ---                 | 50 bu. | ---    |
| Soybeans       | 350                                      | ---                                 | 350          | 60                       | 200 bu.  | 5 bu.   | 265      | 85                                 | ---                 | ---    | 85 bu. |
| Wheat          | ---                                      | 400 bu.                             | 400          | 20                       | ---      | ---     | 20       | 380                                | 250                 | ---    | 130    |
| Rye            | ---                                      | 323                                 | 323          | ---                      | ---      | ---     | ---      | 323                                | 200                 | ---    | 123    |
| Barley         | ---                                      | 40                                  | 40           | ---                      | ---      | ---     | ---      | 40                                 | 40                  | ---    | ---    |
| Buckwheat      | 105                                      | ---                                 | 105          | 89                       | 14       | ---     | 108      | 2                                  | ---                 | 2      | ---    |
| Wild Millet    | 1500 lbs.<br>(cleaned)                   | ---                                 | 1500 lbs     | ---                      | 1200 lbs | ---     | 1200 lbs | 300 lbs                            | 300 lbs             | ---    | ---    |
| Mixed Grasses  | 400 lbs                                  | ---                                 | 400 lbs      | ---                      | ---      | ---     | ---      | 400 lbs                            | 400 lbs             | ---    | ---    |

- (8) Indicate shipping or collection points Clayton, Delaware
- (9) Grain is stored at Refuge hdqts. and Dutch Neck grain bldg.
- (10) Remarks \_\_\_\_\_



NR-8a

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 lbs., Corn (ear)--70 lbs., Wheat--60 lbs., Barley--50 lbs., Rye--55 lbs., Oats--30 lbs., Soy Beans--60 lbs., Millet--50 lbs., Cowpeas--60 lbs., and Mixed--50 lbs. In computing volume of granaries, multiply the cubic contents (cu. ft.) by 0.8 bushels.

- (1) List each type of grain separately: Corn, wheat, proso millet, etc. 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 breakdown by varieties of grain listed in Column 6.
- (8) Nearest railroad station for shipping and receiving.
- (9) Where stored on refuge: "Headquarters grainary", etc.
- (10) Indicate here the source of grain shipped in, destination of grain transferred, data on condition of grain, unusual uses proposed.



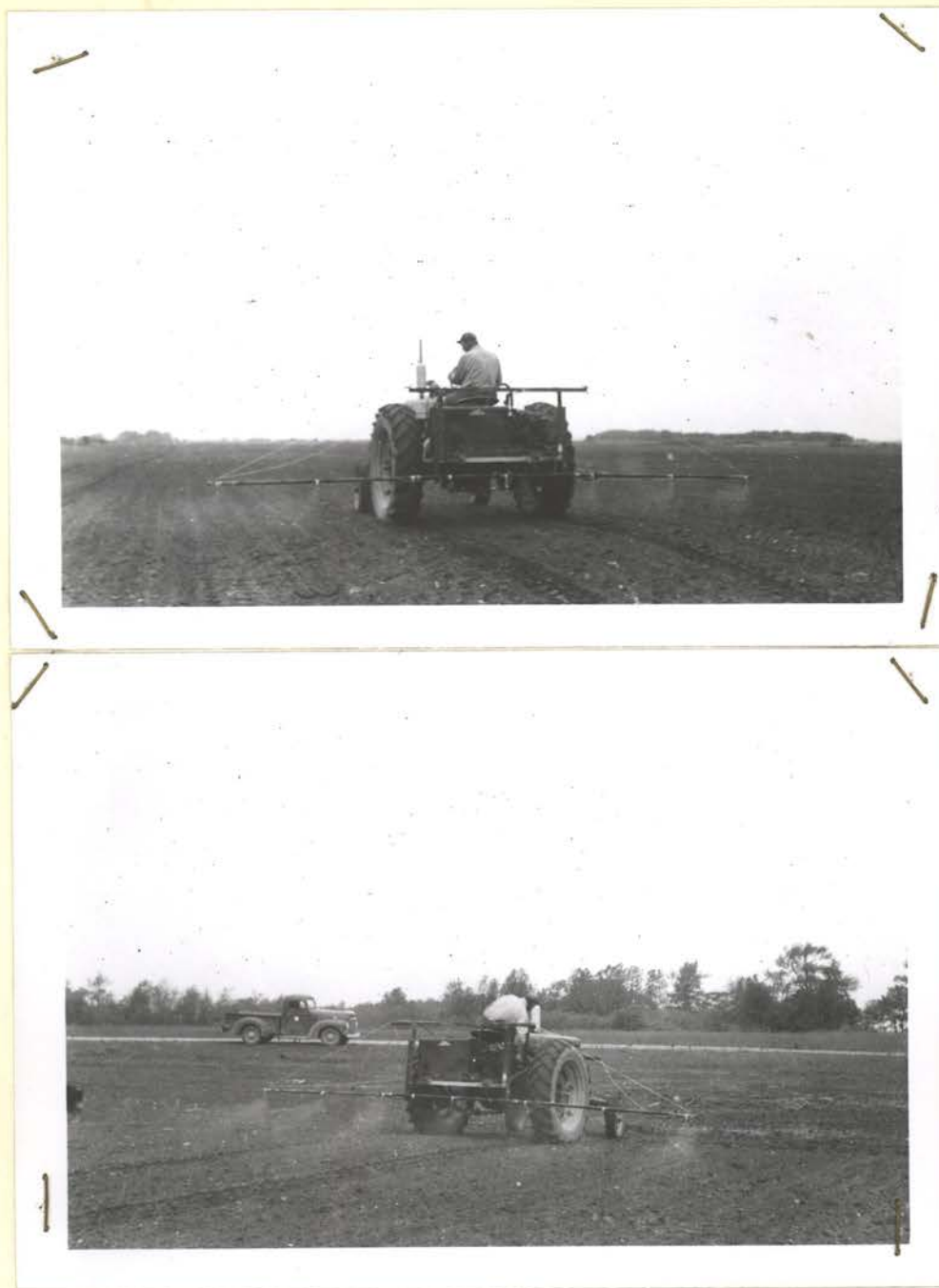


Two views of operations building up and reshaping the east dike of Raymonds Pool.

HD-14 with carryall pan and TD-9 dozer in use.



Permittee: John Shetzler with 2 Snappers weighing 30 and 26 pounds respectively. These are two of some 50-odd snapping turtles removed from refuge pools.



Two views of refuge-constructed, 6-row corn sprayer. A frame was made to hold our Bean Power Sprayer on the rear of the Farmall. To this a three-section spray boom was attached. The unit is adjustable to from a few inches above ground level to 3 feet above ground level.





Above: View of old cow shed formerly adjacent to Raymonds Pool, brought to headquarters and remodeled into a tool and miscellaneous storage shed.

Below: View of framing of new headquarters corn crib. Crib will have rat wire siding and 3 roof hatches for filling. Capacity will be approximately 1000 bushels.