

KILLCOHOOK

NARRATIVE REPORT

JANUARY-DECEMBER 1964

Division of Wildlife Refuges

Narrative Report Routing Slip

Refuge KILLCOHOOK Year 1964

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NARRATIVE REPORT  
KILCOHOOK NATIONAL WILDLIFE REFUGE  
JANUARY - DECEMBER, 1964

PERMANENT PERSONNEL

NONE

Administered from the Bombay Hook National Wildlife Refuge,  
Smyrna, Delaware

UNITED STATES DEPARTMENT OF THE INTERIOR  
FISH & WILDLIFE SERVICE  
BUREAU OF SPORT FISHERIES & WILDLIFE  
SALEM, NEW JERSEY

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Narrative Report Forms 1, 1 (Continuation Sheet), R.O. Supplement #1, R.O. Supplement #2, 1-A, 2, 3, 4, 5, 6, 7, 8, 11, and 12 Appended

NARRATIVE REPORT  
KILLCOHOOK NATIONAL WILDLIFE REFUGE  
JANUARY - DECEMBER, 1964

I. GENERAL

A. Weather Conditions.

	Precipitation Inches		Snowfall Inches	Temperatures ° F	
	1964	Normal		Max.	Min.
January	4.13	3.40	6.7	62	1
February	3.37	2.95	14.9	55	11
March	2.20	4.02	9.5	76	21
April	5.97	3.33	T	83	25
May	.22	3.53	- -	92	43
June	1.02	4.07	- -	98	46
July	3.70	4.25	- -	96	56
August	1.83	5.59	- -	92	48
September	2.77	3.95	- -	94	42
October	1.29	2.91	- -	77	27
November	1.62	3.53	T	72	17
December	<u>4.70</u>	<u>3.03</u>	<u>1.6</u>	<u>70</u>	<u>13</u>
Total	32.82	41.03	32.7	Extremes 98	1

The above climatological data is taken from the USDC weather station at the Greater Wilmington Airport located across the river from Killcohook at New Castle, Delaware. Permanent weather records of this station are on file at headquarters, Bombay Hook National Wildlife Refuge, Smyrna, Delaware.

B. Habitat Conditions.

1. Water. Standing water at the southeast corner of the refuge within the dike work consists of approx. 3 to 4 acres. Another area of standing water is at the spillway located in the southwest corner of the refuge within dike work and is increased to approx. 5 acres at time of maximum pumping by the Corps of Engineers. In addition, a one-acre pond is located along the southeast boundary (Clinton Road). Estimated total water available is 10 acres.
2. Food and Cover. A very dense stand of phragmites covers 80% to 85% of the refuge. This area has not been burned for several years and a very thick tangle of decaying reed covers the ground. One sign of minor waterfowl use on the refuge was observed by the evidence of goose droppings on a portion

of freshly deposited spoils. The rest of the area supports a weed and brush-type cover. A small stand of hardwoods is found to the left of the road leading into the Finns Point National Cemetary.

## II. WILDLIFE

### A. Migratory Birds.

1. Waterfowl. Very little usage by waterfowl, i.e., little water, no planted crops, little natural food. An occasional Black, Mallard, and/or Teal can be observed in the south water area. Limited evidence of geese using the area is described in "Food and Cover".
2. Shore Birds and other Water Birds. An occasional Yellow-leg, Great Blue Heron, Bittern, Little Green Heron, or Glossy Ibis may use the area.
3. Doves. On and off refuge during migration.

### B. Upland Game Birds.

1. Bob-white Quail. Estimated 2 coveys using brushy, weedy portion of refuge. Estimated total is 30 - 35 birds at end of period.
2. Ring-necked Pheasants. Most common game bird of surrounding area. Wander on and off of refuge. Estimated population on refuge or that use refuge is 40 birds at end of period.

### C. Big Game Animals.

1. White-tailed Deer. Tracks of this animal found throughout the refuge in groups up to four. Observed on rare occasions.

### D. Fur Animals, Predators, Rodents, and other Mammals. Muskrat are found in the water area. Estimated population is 20. Fox, skunks, opossum, and raccoon visit refuge in their travels.

### E. Predaceous Birds. Hawks are the most common of this group of birds observed. An occasional owl is heard and on rarer occasions seen. No eagles. Sparrow Hawks are common. Red-tail Hawk, Red-shoulder and Marsh Hawk also occur. Great Horned Owl and Short-eared Owl sighted rarely.

### F. Other Birds. Blackbirds observed in great numbers over the refuge flying west to roost in the Delaware-Chesapeake Canal

Area. No actual sighting of large roosts of these birds on the refuge this year.

- G. Fish. Carp in water area.
- H. Reptiles. Snapping turtles, black snakes, milk snakes in limited number?
- I. Disease. None

### III. REFUGE DEVELOPMENT AND MAINTENANCE

- A. Physical Development.
  - 1. Building. Routine maintenance of refuge buildings was completed. The Q-1 water system required some repairs. Quarterly Building Safety Inspections were accomplished.
  - 2. Posting. The annual exterior boundary check was completed in September in conjunction with the placing of the public hunting signs and information boxes in preparation for the public hunting program.
- B. Plantings. None
- C. Collections and Receipts. None
- D. Control of Vegetation. None
- E. Planned Burning. None
- F. Fires. None

### IV. RESOURCE MANAGEMENT

- A. Grazing. None
- B. Haying. None
- C. Fur Harvest. None
- D. Timber Removal. None
- E. Commercial Fishing. None

- F. Other Uses. An estimated 1,200 pounds of snapping turtles were removed by a trapper under refuge permit.

#### V. FIELD INVESTIGATION OR APPLIED RESEARCH

- A. Progress Reports. None

#### VI. PUBLIC RELATIONS

- A. Recreational Uses. Hunting.
- B. Refuge Visitors. Supervisory and work crews from the Bombay Hook Refuge inspected and performed the necessary management functions.
- C. On September 11, the Refuge Re-evaluation Team visited the refuge for the purpose of reappraising the value of the need for the refuge.
- C. Refuge Participation. None
- D. Hunting. During the fall of 1964, 40% of Killcohook National Wildlife Refuge was again open to public hunting. The open area comprised approx. 594 acres, all of which lay within New Jersey. The hunting area was open for the hunting of small game: rabbits, bob-white, and ring-necked pheasant. The season ran from November 7, through December 5, 1964.

The area was opened by publication in the September 29, 1964 edition of the Federal Register: Title 50, Chapter 1, Part 32, Section 32.22.



The open area was posted by personnel from Bombay Hook. Resident U.S.G.M.A. Leo Badger handled much of the limited public relations work and submitted the final hunter use and bag report.

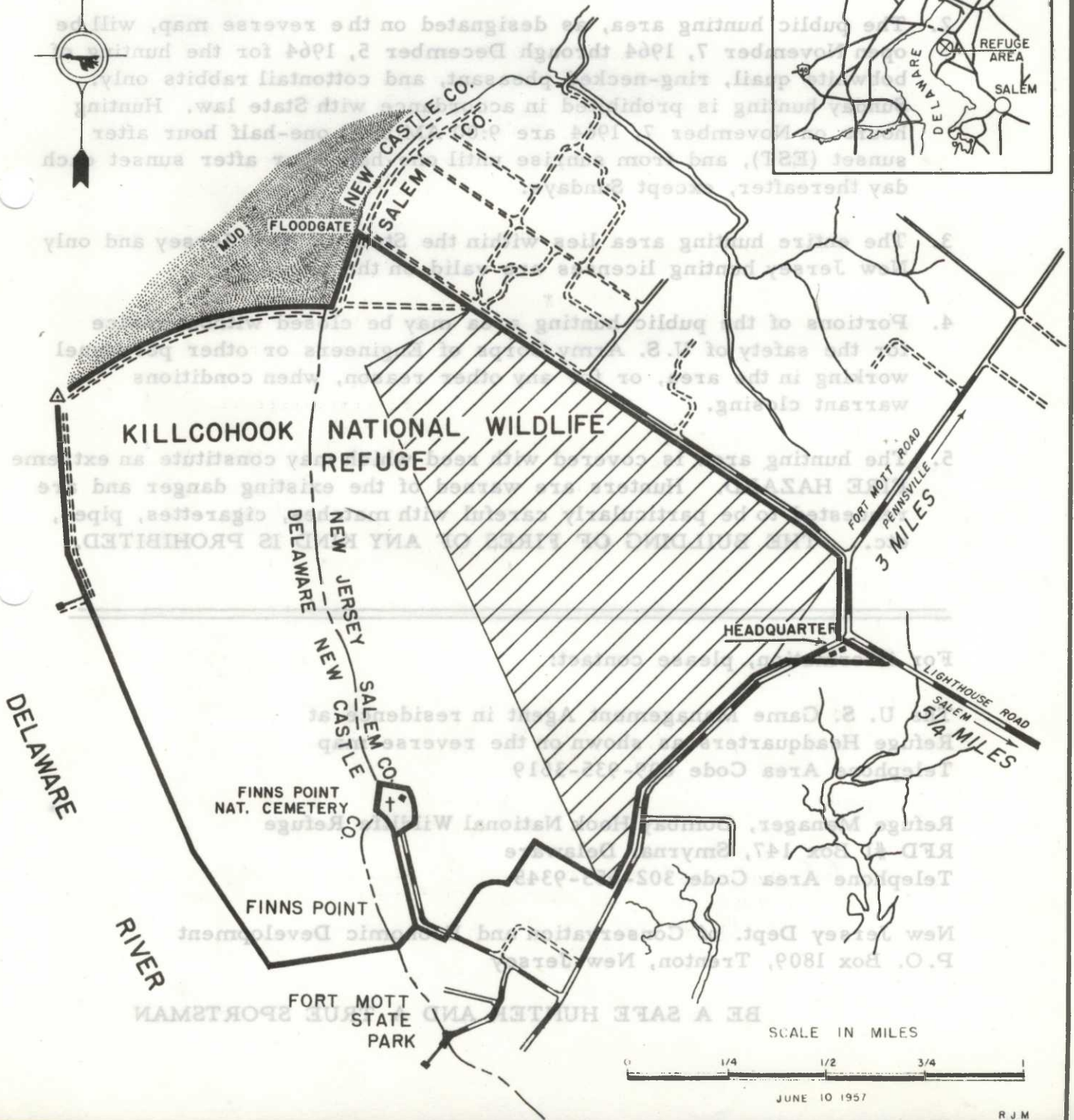
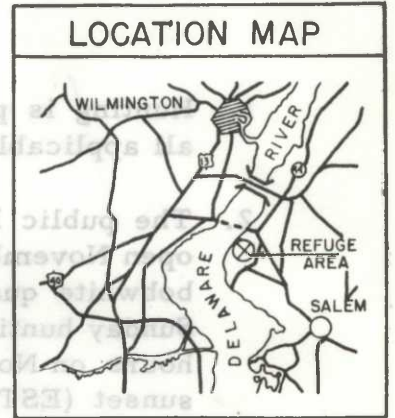
Agent Badger reported 150 men bagged 50 rabbits, 25 bob-white, and 30 ring-necked pheasants.

Dense stands of phragmites and mud conditions kept many hunters from using the area. It was possible that many of the birds killed were birds which had been stocked by New Jersey Game and Fish Commission on adjacent areas.

UNITED STATES DEPARTMENT OF THE INTERIOR  
 FISH AND WILDLIFE SERVICE  
 NEW CASTLE COUNTY, DELAWARE AND SALEM COUNTY, NEW JERSEY  
**KILLCOHOOK NATIONAL WILDLIFE REFUGE**  
**PUBLIC HUNTING AREA**  
**UPLAND GAME 1964**



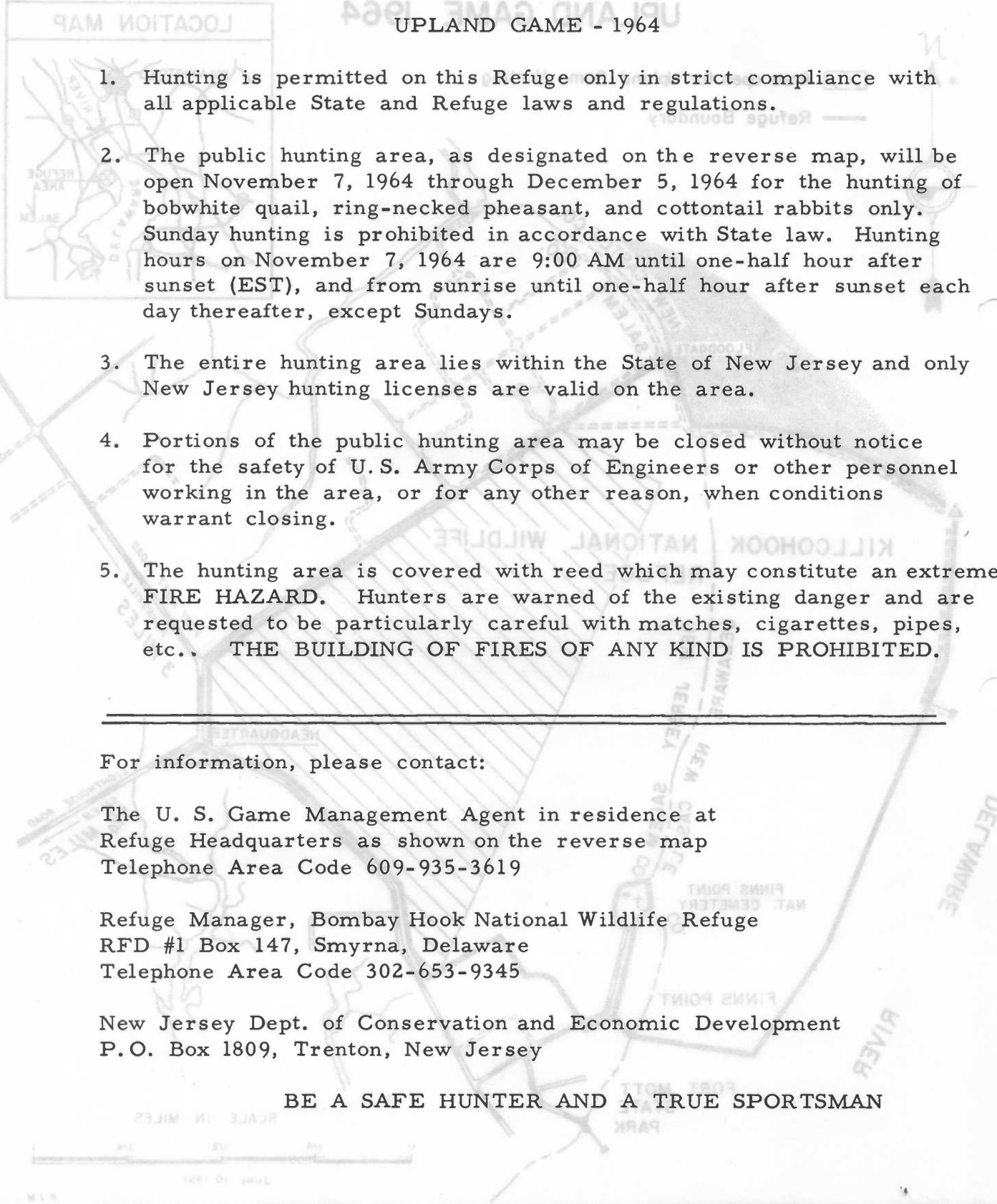
-  Area open for Upland Game Hunting
-  Refuge Boundary



U. S. DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
BUREAU OF SPORT FISHERIES AND WILDLIFE

KILLCOHOOK NATIONAL WILDLIFE REFUGE  
SALEM, NEW JERSEY

UPLAND GAME - 1964

- 
1. Hunting is permitted on this Refuge only in strict compliance with all applicable State and Refuge laws and regulations.
  2. The public hunting area, as designated on the reverse map, will be open November 7, 1964 through December 5, 1964 for the hunting of bobwhite quail, ring-necked pheasant, and cottontail rabbits only. Sunday hunting is prohibited in accordance with State law. Hunting hours on November 7, 1964 are 9:00 AM until one-half hour after sunset (EST), and from sunrise until one-half hour after sunset each day thereafter, except Sundays.
  3. The entire hunting area lies within the State of New Jersey and only New Jersey hunting licenses are valid on the area.
  4. Portions of the public hunting area may be closed without notice for the safety of U.S. Army Corps of Engineers or other personnel working in the area, or for any other reason, when conditions warrant closing.
  5. The hunting area is covered with reed which may constitute an extreme FIRE HAZARD. Hunters are warned of the existing danger and are requested to be particularly careful with matches, cigarettes, pipes, etc.. **THE BUILDING OF FIRES OF ANY KIND IS PROHIBITED.**

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For information, please contact:

The U. S. Game Management Agent in residence at  
Refuge Headquarters as shown on the reverse map  
Telephone Area Code 609-935-3619

Refuge Manager, Bombay Hook National Wildlife Refuge  
RFD #1 Box 147, Smyrna, Delaware  
Telephone Area Code 302-653-9345

New Jersey Dept. of Conservation and Economic Development  
P.O. Box 1809, Trenton, New Jersey

BE A SAFE HUNTER AND A TRUE SPORTSMAN

Copies of the hunting area map are appended.

- E. Violations. None reported.
- F. Safety. Building Fire Inspections were carried out during the period by personnel from Bombay Hook Refuge. No accidents were reported at this refuge during the period.

## VII. OTHER ITEMS

### A. Items of Interest.

1. The Corps of Engineers deposited spoils on the refuge sometime during the middle of the reporting period. The exact date, I do not know. The retaining dike height was raised approx. 3 feet along the northwest and north portion of the dike by the Corps of Engineers. It is within this area that the years spoils were placed.
2. The Refuge Reappraisal Team, composed of Messrs. E. Crawford, Hughlett, and J. Sincock, accompanied by Regional Refuge Supervisor Thomas C. Horn and Refuge Manager Gordon T. Nightingale visited Killcohook Refuge on September 11, 1964, for the purpose of considering field level recommendation to dispose of all Bureau interests in this refuge within the near future.

The present situation of first priority going to the Corps of Army Engineers for depositing dredge spoils from the Delaware River, offering virtually no waterfowl nor Bureau value, is expected to continue indefinitely.

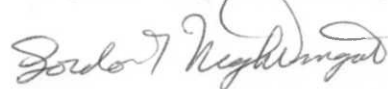
3. Maintenceman Kenneth C. Liehr is credited with the drafting of sections I. B., II. A. - I., III. B. - E., V., VI. C., and VII. A. 1.

Sections I. A., VI. D., and NR forms were completed by Wildlife Biologist Clayton M. Hardy. Assistant Refuge Manager Dale T. Coggeshall added notes on sections III. A., IV. F., V. E., and VII. A. 2. and 3. Typing of the report was accomplished by Carol S. Cooper, Clerk-Typist. Editing of the report was accomplished by the Bombay Hook office staff.

- B. Photographs. None

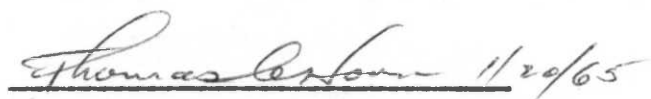
C. Signature.

Respectfully submitted,



Gordon T. Nightingale  
Refuge Manager

January 18, 1965



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NARRATIVE REPORT  
JANUARY - DECEMBER, 1964  
KILLCOHOOK NATIONAL WILDLIFE REFUGE

3-1750  
Form NR-1  
(Rev. March 1953)

WATERFOWL

REFUGE KILLCOHOOK

MONTHS OF JAN. TO APR., 1964

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
<u>Swans:</u>										
Whistling										
Trumpeter										
<u>Geese:</u>										
Canada	No pumping by Corps of Engineers, cold weather, etc.-----no birds until March.									
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										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
<u>Coot:</u>										

3 -1750a

Cont. NR-1  
(Rev. March 1953)

WATERFOWL  
(Continuation Sheet)

REFUGE KILLCOHOOK

MONTHS OF Jan. TO Apr., 1964

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total		
	11	12	13	14	15	16	17	18				
<b>Swans:</b>												
Whistling												
Trumpeter												
<b>Geese:</b>												
Canada												
Cackling												
Brant												
White-fronted												
Snow												
Blue												
Other												
<b>Ducks:</b>												
Mallard	25	20	15	10	10	5	5	605				
Black	40	40	30	30	30	20	20	1370				
Gadwall												
Baldpate												
Pintail												
Green-winged teal	20	20	20	20				560				
Blue-winged teal												
Cinnamon teal												
Shoveler												
Wood												
Redhead												
Ring-necked			50					350				
Canvasback												
Scaup												
Goldeneye												
Bufflehead												
Ruddy												
Other												
<b>Coot:</b>												
LACK OF PUMPING BY U.S.ARMY CORPS OF ENGINEERS RESULTED IN LIMITED WATER & SUBSEQUENTLY WATER FOWL POPULATIONS WERE LOW, AND DID NOT EXCEED THE ABOVE NUMBERS.												
(over)												

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans				Principal feeding areas _____
Geese				_____
Ducks	2985	130	<del>288</del>	Principal nesting areas _____
Coots				_____
				Reported by _____
				C.M.Hardy

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).

WATERFOWL

REFUGE Killcohook National Wildlife Refuge

MONTHS OF May TO Aug. 31, 1964

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
<b>Swans:</b>										
Whistling Trumpeter										
<b>Geese:</b>										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
<b>Ducks:</b>										
Mallard	5	5								
Black	30	30	28	25	22	22	20	20	20	20
Gadwall										
Baldpate										
Pintail										
Green-winged teal										
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										

Records are based on periodic observations, and interim data are projections of actual observations.

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

WATERFOWL  
 (Continuation Sheet)

REFUGE Killcohook National Wildlife Refuge

MONTHS OF May TO Aug. 31, 19 64

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total		
	11	12	13	14	15	16	17	18				
<b>Swans:</b>												
Whistling												
Trumpeter												
<b>Geese:</b>												
Canada												
Cackling												
Brant												
White-fronted												
Snow												
Blue												
Other												
<b>Ducks:</b>												
Mallard									70			
Black	15	10							183 1/2	2	20	
Gadwall												
Baldpate												
Pintail												
Green-winged teal												
Blue-winged teal												
Cinnamon teal												
Shoveler												
Wood												
Redhead												
Ring-necked												
Canvasback												
Scaup												
Goldeneye												
Bufflehead												
Ruddy												
Other												
<b>Coot:</b>									190 1/2	2	20	

(over)

	(5)	(6)	(7)		SUMMARY
	Total Days Use	Peak Number	Total Production		
Swans	0	0	0	Principal feeding areas	Spoil area with rain water pools.
Geese	0	0	0		
Ducks	1904	30	20	Principal nesting areas	Edges of rain water pools.
Coots	0	0	0		

Reported by C. M. Hardy

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).

Interior Duplicating Section, Washington, D. C.  
1953



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

WATERFOWL  
 (Continuation Sheet)

REFUGE Killcohook National Wildlife Refuge

MONTHS OF September 1 TO December 31, 1964

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl days use	(4) Production Broods: Estimated seen : total		
	11	12	13	14	15	16	17	18				
<b>Swans:</b>												
Whistling												
Trumpeter												
<b>Geese:</b>												
Canada												
Cackling												
Brant												
White-fronted												
Snow												
Blue												
Other												
<b>Ducks:</b>												
Mallard	10	10	10							770		
Black	15	15	15	10	10	5				1,575		
Gadwall												
Baldpate												
Pintail												
Green-winged teal										350		
Blue-winged teal												
Cinnamon teal												
Shoveler												
Wood												
Redhead												
Ring-necked												
Canvasback												
Scaup												
Goldeneye												
Bufflehead												
Ruddy												
Other												
<b>Coot:</b>												

These figures are estimates based on occasional reports and observations.

2,695

(over)

	(5)	(6)	(7)
	Total Days Use	Peak Number	Total Production
Swans	0	0	0
Geese	0	0	0
Ducks	2,695	80	0
Coots	0	0	0

SUMMARY

Principal feeding areas Small rain-filled pools and wet areas caused by Army Engineers pumping.

Principal nesting areas \_\_\_\_\_

Reported by C.M. Hardy

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).

Interior Duplicating Section, Washington, D. C.  
1953

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

MIGRATORY BIRDS  
(other than waterfowl)

Refuge.....KILLCOHOOK..... Months of..... Jan. to Apr. ....195<sup>64</sup>

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. <u>Water and Marsh Birds:</u>	<p>WATER, MARCH, AND SHOREBIRDS DID NOT USE THE AREA THIS PERIOD DUE TO LACK OF WATER (NO PUMPING) BY CORPS OF ENGINEERS.</p> <p>THE INFREQUENCY OF OBSERVATIONS OF OTHER SPECIES OF BIRDS IN CATEGORIES I &amp; II RENDER TABULATION MEANINGLESS.</p>									
II. <u>Shorebirds, Gulls and Terns:</u>										

(over)

(1)	(2)	(3)	(4)	(5)	(6)
<u>Doves and Pigeons:</u>					
Mourning dove	5	Jan 1	5	all period	5
White-winged dove					4/31
<u>Predaceous Birds:</u>					
Golden eagle					
Duck hawk					
Horned owl					
Magpie					
Raven					
Crow					
	Present all period in numbers not exceeding 10 individual birds.				
Sparrow Hawk	2	Jan 1	2	-	2
					4/31
					1 nest at Hqs. in Wood Duck box
					Reported by..... C. M/ Hardy

#### 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.

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

MIGRATORY BIRDS  
(other than waterfowl)

Refuge Killcohook National Wildlife Refuge months of May to Aug. 31 1964

(1) Species  Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total Estimated Number
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	
<b>I. Water and Marsh Birds:</b>										
<b>Great Blue Heron</b>	<b>Present all period in numbers up to 6.</b>									
<b>II. Shorebirds, Gulls and Terns:</b>										
<b>Killdeer</b>	<b>Seen occasionally along rain pools in small numbers up to 8.</b>									
<b>Gt. yellow-legs</b>	<b>Seen occasionally along rain pools in small numbers up to 8.</b>									

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove					
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow  <b>Sparrow Hawk</b>	<b>Present all period in numbers up to 4.</b>				
				Reported by..... <b>G.M. Hardy</b> .....	

#### 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.

3-1751

Form NR-1A  
(Nov. 1945)

## MIGRATORY BIRDS

(other than waterfowl)

Refuge Killechook National Wildlife Months of September 1 to December 31 1956

(1) Species  Common Name	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total Estimated Number
	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	
<b>I. Water and Marsh Birds:</b>  Great Blue Heron American Bittern Glossy Ibis	<b>All three species present on the refuge during early fall. With no personnel on the refuge to gather data, estimated numbers of birds would be meaningless.</b>									
<b>II. Shorebirds, Gulls and Terns:</b>  Herring Gull Ringed-bill Gull Laughing Gull	<b>All three present on the refuge and on surrounding areas.</b>									

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	<b>Present all period in numbers not to exceed 50 birds.</b>				
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow	<b>Crows were present in small numbers (not more than 50) all period.</b>				
					Reported by..... <b>C.M. Hardy</b>

#### 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.

3-1750b  
Form NR-1B  
(Rev. Nov. 1957)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
BUREAU OF SPORT FISHERIES AND WILDLIFE

WATERFOWL UTILIZATION OF REFUGE HABITAT

Refuge Killocohook N.W. Refuge For 12-month period ending August 31, 1964

Reported by C. M. Hardy Title Wildlife Biologist (Mgt.)

(1) Area or Unit Designation	(2) Habitat Type      Acreage	(3) Use-days	(4) Breeding Population	(5) Production
Upland outside of dike bordering Delaware River	Crops	Ducks		
	Upland	Geese		
	Marsh	Swans		
	Water	Coots		
	Total	160	Total	
-----				
Headquarters Fields	Crops	Ducks		
	Upland	Geese		
	Marsh	Swans		
	Water	Coots		
	Total	50	Total	
-----				
Diked area	Crops	Ducks	8569	20
	Upland	Geese	1050	
	Marsh	Swans		
	Water	Coots		
	Total	1,142	Total	9619
-----				
Wooded area surrounding hilly upland outside dike bordering Finn's Cemetery	Crops	Ducks		
	Upland	Geese		
	Marsh	Swans		
	Water	Coots		
	Total	10	Total	
-----				
Total	Crops	Ducks	8569	
	Upland	Geese	1050	
	Marsh	Swans		
	Water	Coots		
	Total	1,362	Total	9619
-----				
	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 flooding facilitates use of non-aquatic type foods; 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.

3-1752  
Form NR-2  
(April 1946)

UPLAND GAME BIRDS

Refuge KILLCROOK

Months of Jan. to Apr., 19 64

(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'vd.	Estimated Total		Hunting	For Re- stocking	For Research		
Bob-white Quail	1,242 acres phragmites and woody edges.	155			M:F Percentage 50-50				Estimated number using Refuge 8	Pertinent information not specifically requested. List introductions here.
Ring-necked Pheasant	Same	21			12-48				60	

3-1752  
Form NR-2  
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Killcohook National Wildlife Refuge months of May to Aug. 31, 1964

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks	
	Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	M : F Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite		1,242 acres phragmites and woody edges	20.7	-	52	50 - 50				60	
Ring-necked Pheasant		Same	16.6	-	60	20 - 80				75	

## 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 Killcohook National Wildlife Months of September 1 to December 31, 19 64

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bobwhite	Phragmites and wooded edges 1,242 acres	25				25			50	No birds were stocked on the Refuge, but the State did stock the adjacent areas.
Ring-necked Pheasant	Same	12				30			100	Same as above.

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 Nc. 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.

3-1753  
Form NR-3  
(June 1945)

BIG GAME

Refuge Killcohook National Wildlife

Calendar Year 1964

(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	
White-tailed Deer	Entire Refuge 1,362 acres										6	6	unkn.

Remarks: These deer are not full time residents of the refuge, but move off and on the refuge from the surrounding area.

Reported by C.M. Hardy

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 KILLCOHOC

Year ending April 30, 1964

(1) Species  Common Name	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total Popula- tion	
	Cover Types & Total Acreage of Habitat	Acres Per Animal	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				
Cottontail Rabbit	1242 Acres phragmites & edges.	12	50											100
Opossum		124												10
Raccoon		62												20
Red Fox		310												4
Skunk		120												10

\* List removals by Predator Animal Hunter

REMARKS:

Reported by C.M. Hardy.

DISEASE

Refuge Killecohook National Wildlife Refuge Year 1964

Botulism None Noted or Reported

Lead Poisoning or other Disease

Period of outbreak \_\_\_\_\_

Period of heaviest losses \_\_\_\_\_

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 Killcohook National WildlifeCalendar Year 1964

## 1. Visits

a. Hunting 150 b. Fishing 0 c. Miscellaneous 25 d. TOTAL VISITS 175

## 1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl	0		
Upland Game	150	594	Refuge
Big Game	0		
Other	25		

Number of permanent blinds 0Man-days of bow hunting included above 0Estimated man-days of hunting on lands adjacent to  
refuge 1,000

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

TYPE OF AREA	ACRES	MILES
Ponds or Lakes	0	
Streams and Shores		0

## 1c. Miscellaneous Visits

Recreation \_\_\_\_\_ Official 25

Economic Use \_\_\_\_\_ Industrial \_\_\_\_\_

## 2. Refuge Participation (groups)

TYPE OF ORGANIZATION	NO. OF GROUPS	NUMBER IN GROUPS	NO. OF GROUPS	NUMBER IN GROUPS
Sportsmen Clubs	0			
Bird and Garden Clubs	0			
Schools	0			
Service Clubs	0			
Youth Groups	0			
Professional-Scientific	0			
Religious Groups	0			
State or Federal Govt.	0			
Other	0			

## 3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	0	Radio Presentations	0
Newspapers (P.R.'s sent to)	0	Exhibits	0
TV Presentations	0	Est. Exhibit Viewers	0

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 Intercoastal 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.

Refuge Killcohook National Wildlife Refuge Year 19 64

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
NONE													

- (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 Killcohook National Wildlife Refuge County Salem State New Jersey

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			
NONE									
								Fallow Ag. Land	

No. of Permittees: Agricultural Operations N.A. Haying Operations N.A. Grazing Operations N.A.

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
NONE				1. Cattle	NONE			
				2. Other	NONE			
				1. Total Refuge Acreage Under Cultivation				
Hay - Wild				2. Acreage Cultivated as Service Operation				

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.

TIMBER REMOVAL

Refuge Killcohook National Wildlife Refuge Year 1964

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
NONE								

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

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

**ANNUAL REPORT OF PERSTICIDE APPLICATION**

**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)
NONE								

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