NARRATIVE REPORT

PRIME HOOK NATIONAL WILDLIFE REFUGE

JANUARY - DECEMBER, 1965

REFUGE DIV.
RECD
JAN 19 1966
NO. 5

PERMANENT PERSONNEL

Mrs. Adele S. Jones, Clerk-Steno (E.O.D. 5/17/65)

Administered from the Bombay Hook National Wildlife Refuge
Smyrna, Delaware

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH & WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES & WILDLIFE
SUSSEX COUNTY, DELAWARE

TABLE OF CONTENTS

Topic	Page
I. GENERAL	
A. Weather Conditions	1
B. Habitat Conditions	1
II. WILDLIFE	
A. Migratory Birds	2
B. Upland Game Birds.	6
C. Big Game Animals	6
D. Fur Animals, Predators, Rodents & other Mammals	6
E. Hawks.	6
F. Other Birds	6
G. Fish	7
H. Reptiles	7
I. Disease.	7
III. REFUGE DEVELOPMENT AND MAINTENANCE	
A. Physical Development	7
B. Planting	8
C. Collections and Receipts.	8
D. Control of Vegetation.	8
E. Planned Burning.	8
F. Fires.	8
IV. RESOURCE MANAGEMENT	
A. Grazing.	8
B. Haying	8
C. Fur Harvest.	8
D. Timber Removal	8
E. Commercial Fishing	8
F. Other Uses	8
V. FIELD INVESTIGATION OR APPLIED RESEARCH	
A. Progress Report	9

Topic	Page
VII. PUBLIC RELATIONS	
A. Recreational Uses	9
B. Refuge Visitors	9
C. Refuge Participation.	9
D. Hunting	10
E. Violations.	10
F. Safety	10
VIII. OTHER ITEMS	
A. Items of Interest	11
B. News Articles	13
C. Signature	13
Narrative Report Forms	Appended

NARRATIVE REPORT
PRIME HOOK NATIONAL WILDLIFE REFUGE
JANUARY - DECEMBER, 1965

I. GENERAL

A. Weather Conditions.

Month	Precipitation Snow	Precipitation Total	Precipitation Normal	Temperature Maximum	Temperature Minimum
Jan.	8.13	2.30	2.94	61	3
Feb.	3.00	1.64	3.50	66	2
Mar.	2.25	3.22	4.34	67	16
Apr.		1.89	3.29	79	24
May		2.45	2.93	94	45
June		2.12	4.14	94	47
July		3.48	5.74	95	52
Aug.		4.69	5.74	95	52
Sept.		4.18	3.69	89	42
Oct.		1.08	4.13	76	25
Nov.		.77	3.72	71	17
Dec.		.22	3.94	65	15
Total		28.04	47.18		
Extremes				95	2

These weather data were taken from USDC Weather Bureau Records for Lewes, Delaware approximately 4.5 miles south of the southern end of the refuge. The normal precipitation is based on a 9-year average (1954-1962) at Lewes.

B. Habitat Conditions.

1. Water. The refuge does not control enough land area to attempt any water level control.

   Precipitation in 1965 was about 19" below normal continuing the dry cycle of several years duration. Marshes within the refuge area were quite dry most of the year with water being held only in the larger, deeper potholes. Tides occasionally filled the potholes but evaporation and seepage into the dry marsh soils soon returned the marshes to the status quo - largely dry.

2. Food and Cover. The low numbers of waterfowl utilizing the refuge depended on croplands and the bay shore for the majority of their food. Drought conditions resulted in meager production of waterfowl foods on the marshes and this was largely unavailable due to continued drought and relatively high hunting pressure on the remaining water areas.

II. WILDLIFE

FORWARD. A Refuge Manager position was authorized in F. Y. 1965 but as of the close of this report period the position has not been filled. The refuge is administered from the Bombay Hook National Wildlife Refuge. Due to the lack of assigned field personnel, biological data, other than aerial waterfowl censuses, are largely restricted to incidental observations and have little validity in terms of total use, peak numbers, etc.

A. Migratory Birds.

1. Geese.

a. Canada Geese. During the freezing January wintering period the refuge population dropped from 600 to about 25 birds. With the inception of a mid-February thaw Canada geese returned and from 1000 to 2000 geese used the refuge until early April with its northward migrations caused a drop in numbers. By May only 20-30 geese remained - the remnants of, or free flying escapees from local private decoy flocks.

Fall migrant Canadas were first noted the last week in September when over 4000 geese arrived. Canada goose numbers rose to over 8000 in late October and remained quite stable until the inception of the hunting season the first week in November, the population then dropped down to zero. This exodus was due partially to drought and partially to heavy hunting pressure on the remaining water areas. Many of these "refuge geese" moved to nearby private sanctuary ponds and to the open waters of Delaware Bay. Feeding by geese was largely in agricultural fields off the refuge acquisition area.

Drought conditions and heavy hunting pressure soon drove geese out of the refuge area to nearby private sanctuary ponds and the open Delaware Bay, only about 200 birds regularly utilized the refuge area after the mid-November hunting season to the close of the period.

b. Snow Geese. Use of the refuge area during the winter and spring was very minor with a peak of 10 birds noted. Fall use by Snows was very minor, none were noted by refuge personnel but hunters, on occasion, report seeing a few Snows.

c. Ducks. The number of ducks wintering within the refuge marshes and creeks ranged from 100 to 1200, being largely mallards. Coincident with the spring thaws of early February, the duck population gradually increased to about 2800 birds by late March. As a result of northward migration, by early May only a hundred or so birds remained. The drought resulted in few post breeding birds concentrating on the marshes and also resulted in poor brood production. Production of an estimated 85 young occurred, 57 Black Duck and 28 Mallard.

Due to drought the fall duck population was disappointing, never exceeding a peak of 2400 birds. Hunting pressure beginning in early November, coupled with drought, further reduced duck numbers so that from early November to the end of the year the duck population never exceeded 500 birds.

CANADA GEESE

STATUS OF MANAGEMENT OBJECTIVE AND ACTUAL USE

GOOSE USE DAYS

	Objective Goals	Actual 1965 Use	Ratio Goal to Use
Spring 2/16-4/30	400,000	79,270	5 to 1
Summer 5/1-8/31	(5,000)	1,095	4.6 to 1
Fall Sept - Dec	(530,000)	265,818	2 to 1
Winter	Min(65,000)	15,225	4.3 to 1
TOTAL	1,000,000	361,408	2.8 to 1

GOOSE PEAK POPULATIONS

	Objective Peaks	Actual 1965 Peak	Ratio Goal to Use
Spring	-	2,000	-
Summer	-	35	-
Fall	12,000	8,150	1.5 to 1
Winter	-	900	-

Goose production: Not to be encouraged.

Geese produced: None except by privately owned decoy flocks in acquisition area.

DUCKS

STATUS OF MANAGEMENT OBJECTIVES AND ACTUAL USE

DUCKS USE DAYS

	Objective Goals	Actual 1965 Use	Ratio Goal to Use
Spring 2/16-5/15	800,000	126,267	6.3 to 1
Summer 5/16-8/31	400,000	15,592	25.6 to 1
Fall Sept - Dec	2,100,000	105,771	1.9 to 1
Winter Jan - 2/15	200,000	23,674	8.4 to 1
TOTAL	3,500,000	271,304	12.9 to 1

DUCK PEAKS AND PRODUCTION

	Objective Population	Actual 1965 Peaks	Ratio Goal to Use
Spring	20,000	2,500	
Summer	-	398	-
Fall	30,000	2,380	12.6 to 1
Winter	-	1,200	-

Duck production goal - 3,000
Actual production 1965 - 85
Ratio - Goal to Production - 35 to 1

B. Upland Game Birds. Bobwhite are the only native upland game bird found on the area. Verbal reports from hunters indicate the dry summer was conducive to high brood survival and excellent hunting resulted.

An estimated 200 quail occurred on the refuge.

Occasional ring-necked pheasants, escapees from a formal local private game farm, were seen on the acquisition area.

C. Big Game Animals. White-tailed deer are the only species of big game animal on the refuge. An estimated 40 deer use the acquisition area.

D. Fur Animals, Predators, Rodents and other Mammals. Muskrats did not do well this year. Fewer houses were noted on cursory observations, and local trappers report that trapping was very poor in December due to drought.

A family of otter (1 adult and 2 young) were observed.

Raccoon are known to be present and this population is estimated at 200 animals on the acquisition area. Skunk, Gray Squirrel, Cottontail Rabbits also were observed.

E. Hawks. Red-tailed Hawk, Marsh Hawk, Osprey, Short-eared Owl, Coopers Hawk, Sharp-shinned Hawk and Sparrow Hawk were observed as individuals or in small numbers.

F. Other Birds. A start has been made in compiling bird observations for a refuge bird list. The Delmarva Ornithological Society has started a Christmas Bird Count centered about the refuge. The December 23, 1965 count tallied 84 species in Areas A, B and C of the following map which includes the refuge area proper. Areas D, E and F lie entirely beyond the refuge boundaries. A table of species follows.

A noteworthy but unwelcomed item is the occurrence of a large blackbird roost on the refuge. This roost is located between the Prime Hook Beach and the Fowler Beach Roads along the edge of the marsh bordering Delaware Bay.

During the Christmas Bird Count 3 million birds (75% redwings, 20% grackles and 5% cow birds) were estimated to be utilizing this roost by three observers (Russell DeGarmo and John Linehan were the Bureau personnel involved).

CAPE HENLOPEN - PRIMEHOOK
CHRISTMAS BIRD COUNT
A
B
C
D
E
F
DELAWARE BAY
BREAKWATER HARBOR
Roosevelt Inlet
LEWES
Fowler Beach
Shorts Beach
Broadkill Beach
PRIMEHOOK WILDLIFE AREA
PRIMEHOOK NECK
SLAUGHTER NECK
MILTON
Diamond Pond
Red Mill Pond
Overbrook
Nassau
Belltown
Wescoats Corner
Murrays Corner
Jimtown
Midway
Harbeson
Coal Spring
Gravel Hill
Reynolds Pond
Waples Pond
Hunt Millpond
GILLS NECK
PENNSYLVANIA
RAILROAD
FERRY

CHRISTMAS BIRD COUNT

PRIME HOOK NATIONAL WILDLIFE REFUGE

and Vicinity

December 23, 1965

Note: The Prime Hook Refuge constitutes roughly a third of three segments of the total area. The following totals are for the three segments; A, B, and C:

Common loon	1	Great horned owl	2
Red-thr. loon	27	Short-eared owl	14
Horned grebe	3	B. kingfisher	9
Pied-b. grebe	2	Y.-sh. flicker	21
Great-blue heron	8	Pileated woodpecker (not on refuge)	1
American bittern	1	Red-b. woodpecker	8
Canada goose	362	Yellow-b. sapsucker	1
Snow goose	1	Hairy woodpecker	2
Mallard	11	Downy woodpecker	16
Black duck	170	Horned lark	19
Wood duck	1	Blue jay	36
Canvasback	2	Common crow	56
Greater scaup	215	Carolina chickadee	33
White-w. scoter	31	Tufted titmouse	13
Surf scoter	49	White-br. nuthatch	11
Common scoter	230	Brown creeper	3
Common merganser	3	Carolina wren	5
Red-br. merganser	1	Mockingbird	39
Turkey vulture	43	Robin	250
Cooper's hawk	1	Hermit thrush	1
Red-tailed hawk	9	Golden-cr. kinglet	1
Red-sh. hawk	1	Ruby-cr. kinglet	1
Rough-legged hawk	4	Cedar waxwing	25
Marsh hawk	27	Loggerhead shrike	4
Sparrow hawk	20	Starling	1195
Bobwhite	69	Myrtle warbler	111
Virginia rail	1	House sparrow	438
Killdeer	10	E. meadowlark	369
Ruddy turnstone	3	Red-wing (Est. in roost)	2,250,000
Am. woodcock	1	Boat-t. grackle	1
Common snipe	5	Common grackle (Estimate in roost)	600,000
Least sandpiper	2		
Sanderling	57		
Gr. Blk-b. gull	20	Brown-hd. cowbird (Estimate in roost)	150,000
Herring gull	517		
Ring-b. gull	414	Cardinal	33
Black skimmer	1	Purple finch	5
Mourning dove	184		

Pine siskin	7	Tree sparrow	20
Amer. goldfinch	220	Field sparrow	5
R.s.-towhee	18	White-thr. sparrow	106
Ipswich sparrow	1	Fox sparrow	7
Savannah sparrow	15	Swamp sparrow	27
Slate-c. junco	5	Song sparrow	75

Number	3,005,736
Species	84

G. Fish. White perch, largemouth bass, carp, striped bass, blue crabs, etc. are known to occur within the refuge area. A heavy population of carp is present in the upper reaches of Prime Hook Creek.

There has been little fishing in the area except bank fishing for Blue Crabs near the public roads; largemouth bass sport fishing in Prime Hook Creek and small scale non-commercial net fishing for white perch and striped bass in Petersfield Ditch and other tidal creeks.

H. Reptiles. Snapping, diamond back, box and painted turtles were observed as were the eastern fence lizard and the black racer.

I. Disease. None observed or reported.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development.

1. Real Property Disposal. Six items of Real Property have been disposed of by off-site sale and 152 items of Real Property have been disposed of by refuge salvage.

   A total of 158 items of Real Property have thus been removed from the refuge and the building sites cleaned up.

   Three additional buildings on Real Property have been sold and are pending removal.

   Two additional items are pending issuance of off-site sale bids.

2. Fence and Post. 9240 feet of permanent exterior boundary fencing has been completed. This fencing entailed 8638 feet of clearing through timber and brush.

   Permanent exterior boundaries and public road side boundaries of acquired tracts totaling 34,320 feet, have been posted at 1/10 mile intervals with U. S. Govt. signs. These signs do not prohibit public trespass.

3. General Cleanup. Many individual private dump sites on acquired tracts have been cleaned up.

   The remains of several old, dilapidated buildings of no value that were not included under Real Property have been disposed of and their sites cleaned up.

4. Buildings. Four of the buildings on the Fisher Tract #77 have been retained as an interim work center and Manager's quarters. Electric wiring has been checked and renovated, some painting accomplished, a propane gas tank installed and general cleanup of the area instituted.

5. Office. A refuge office was established at Milford, Delaware under GSA lease of private space. Bombay Hook personnel moved in office furniture, files, etc. for the refuge. Engineer's office furniture was also moved from Dover into the refuge office in Milford.

B. Planting. None by refuge. Private landowners within the acquisition area continue to carry on normal farming practices. Small dairy and beef operations occur. Large acreages of corn, soybeans, lima beans, peas, and wheat were grown. Yields reduced by drought.

C. Collections and Receipts. None.

D. Control of Vegetation. None by refuge. Private farmers within the refuge acquisition area apply normal practice agricultural chemicals for the control of weeds and insects in cultivated crops.

E. Planned Burning. None.

F. Fires. None on refuge property.

IV. RESOURCE MANAGEMENT

A. Grazing. None on refuge property except under outstanding agricultural reservations. Some dairy and beef operations occur within the refuge boundary, being mainly beef on the Island Farm Tract and dairy on the Naylor Wells Tract.

B. Haying. None on refuge property. Some haying occurs on private lands within the refuge acquisition area. Yields were reportedly greatly reduced by drought.

C. Fur Harvest. Yields reportedly much reduced during fall and winter of 1964-65 by salt tide intrusion and further reductions caused by continued drought conditions.

D. Timber Removal. None on refuge property.

E. Commercial Fishing. None on refuge property.

F. Other Uses. Nine items of Real Property were sold by bid for off-site use during the year. Six have been removed from the refuge and 3 are pending.

V. FIELD INVESTIGATION OR APPLIED RESEARCH

A. Progress Report. None

VII. PUBLIC RELATIONS

A. Recreational Uses. The majority of public use within the acquisition area did not occur on tracts owned by the Government. Recreational use of the Delaware Bay beach front for fishing and swimming was moderate. Considering drought conditions, waterfowl hunting demand and use was high within the refuge acquisition area. Boat access was limited by a lack of water.

Non-commercial Blue Crab fishing from the banks of Slaughter Creek near the Slaughter Beach and the Fowler Beach Roads was very popular.

B. Refuge Visitors. Regional Office personnel from the Divisions of Realty and Engineering made frequent visits to the area in connection with lands acquisition. Personnel from the Bombay Hook Refuge conducted personal-contact public relations, aerial waterfowl censuses, etc.

Personnel from the Delaware office of the Division of Engineering were assigned space in the refuge rented Prime Hook office in Milford, Delaware.

Management and Enforcement personnel made frequent ground patrols through the area and assisted in aerial waterfowl counts. Various land owners, State personnel and other persons having business with the refuge contacted the office.

Mr. Radway	Asst. Regional Supervisor	Refuges	10/19/65
Mr. Sutherland	Asst. Regional Supervisor	Refuges	8/ 3/65
Mr. Horn	Regional Supervisor	Refuges	7/12/65
Mr. Abbiati	Regional Supervisor	Realty	9/23/65
Mr. Fermanich	Central Office	Refuges	7/12/65

The filling of the resident Refuge Manager position could greatly facilitate local public relations by virtue of increasing contacts, to say nothing of convincing more of the local landowners within the acquisition area that the refuge "is here to stay".

C. Refuge Participation. Refuge Manager Nightingale attended most of the Delaware Wildlife Federation's monthly meetings and informally discussed Prime Hook with leading sportsmen.

The Refuge Manager continued contacts with various landowners and interested parties in the Prime Hook Refuge area in regard to approved refuge boundaries, public hunting, trapping, cooperative farming, drainage, flooding, irrigation water, pollution loads, fishing, beach use, sale of surplus buildings, etc.

Contacts were made with the Sussex Levy Court (comparable to many states County Commissioners) in regard to the refuge's payment to the county under past and future laws and County certification of non-discrimination. The press was present at these formal Court meetings.

D. Hunting. No controlled hunting program on refuge lands. Private hunting and public hunting on the State Tract continues within the entire acquisition area.

E. Violations. None apprehended or witnessed by refuge personnel.

Two U.S. Govt. boundary signs have been mutilated by bird shot but vandalism generally non-existant in spite of some strong local opposition to the establishment of the refuge.

Uncontrolled roadside dumping within the refuge acquisition area is a problem and has been for years. The situation is aggravated by a lack of public dumps throughout much of Delaware. The average citizen must own enough property to have his own dump; travel many miles to a public dump; or do as many do, dump along the sides of secondary roads.

Game Management Agents Robert Halstead and T. R. Gallo made several routine migratory bird violation cases within the acquisition area. Drought conditions and low duck numbers greatly reduced opportunities for violations.

Bombay Hook's Refuge Manager Nightingale and Assistant Manager Coggeshall, assisted GMA Halstead in "staking out" and apprehending two Delaware Game and Fish personnel in illegally trapping and removing canvasback ducks (reportedly for sale and for political friends - but not proven). Both state employees were found guilty and fined - one is still employed. The case made headlines in state newspapers for weeks. The fact that refuge personnel were involved was not revealed because of possible complications in Prime Hook's public relations and land acquisition.

F. Safety. On 5/17/65 a Clerk-Steno, Mrs. Adele Jones, was the first, and as yet, the only staff member assigned to this refuge. Personnel are assigned on a day to day basis from the Bombay Hook Refuge to Prime Hook for work details.

No accidents have occurred at Prime Hook. Student Assistant Nugent attended several safety meetings at Bombay Hook on boat safety and other subjects pertinent to his summers employment.

VIII. OTHER ITEMS

A. Items of Interest.

1. Land Acquisition.

Reapproval of MBCC		June 24, 1964
Area		10,708
Ownerships		77 cases
Land Classification.	.19% Agricultural	(2071A)
	11% Timber & Brush	(1195A)
	68% Marsh & Water	(7272A)
	2% Beach land	(170A)

This reapproval reduced the previous (8/21/62) approval of 11,233 acres by 525 acres and adjusted land values.

Through adjustments in boundaries in purchase agreements and a reassessment of primary needs, the acquisition area objectives have been at least temporarily reduced to approximately 10,000 acres as follows:

Area (approx)		10,000 Acres
Ownerships		66 Cases
Land classification (approx.). . .	.15% Agricultural	(1533A)
	11% Timber & Brush	(1125A)
	73% Marsh & Water	(7272A)
	1% Beach Land	(70A)

Status of Land Acquisition as of December 31, 1965 in Relation to Current Objectives :

	Cases	Acres	% of area	% of cases
Optioned, Title & Paid	24	3812	38	36
Optioned & Title	24	3812	38	36
Optioned & Accepted	35	4205	42	55
Optioned	36	4211	42	55
Not Optioned	30	5789	58	45

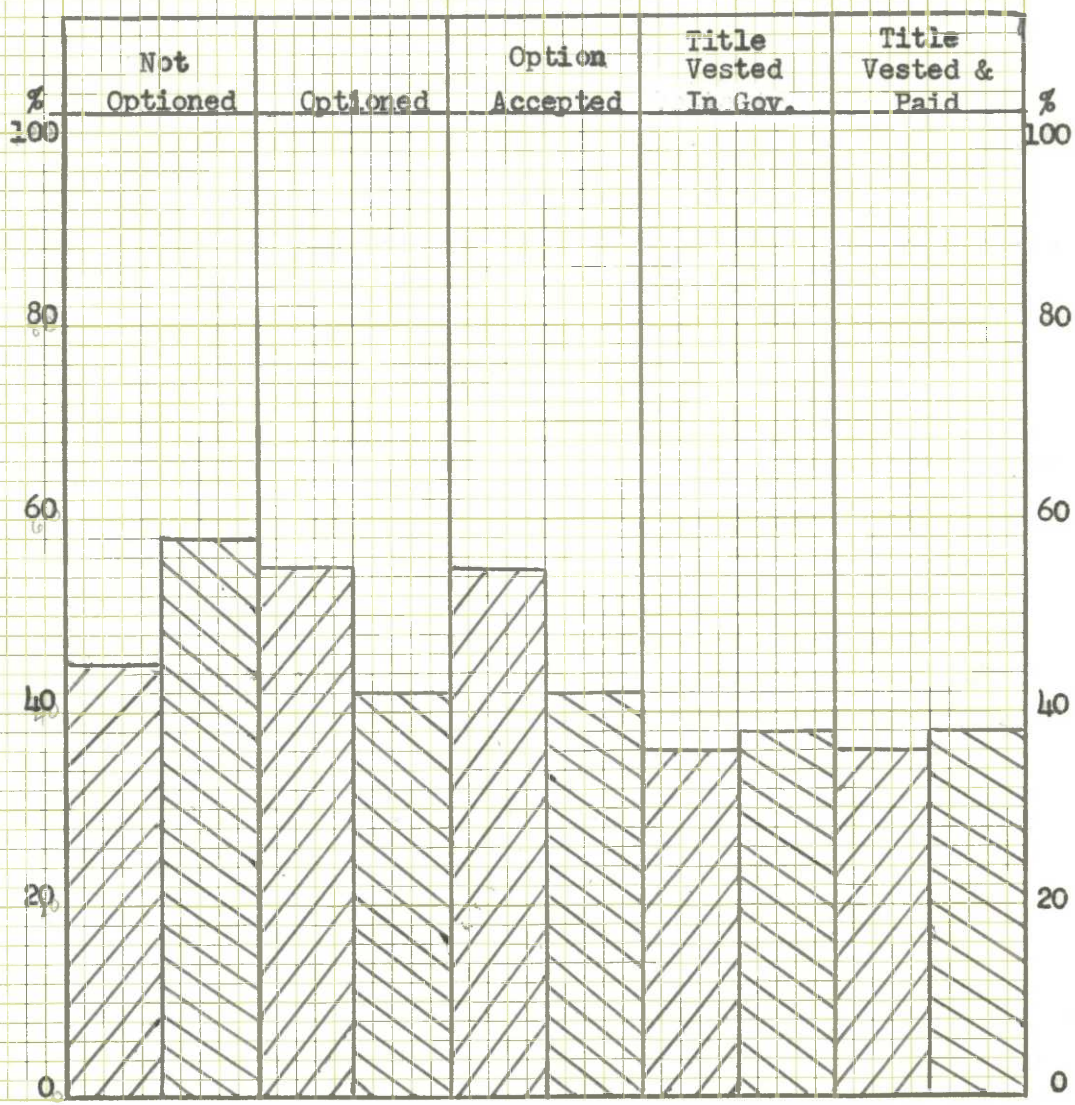
Eighteen cases representing 1623 acres were optioned this year. Acquisition has proceeded to the point where court action is probable in certain cases.

STATUS OF LAND ACQUISITION

under

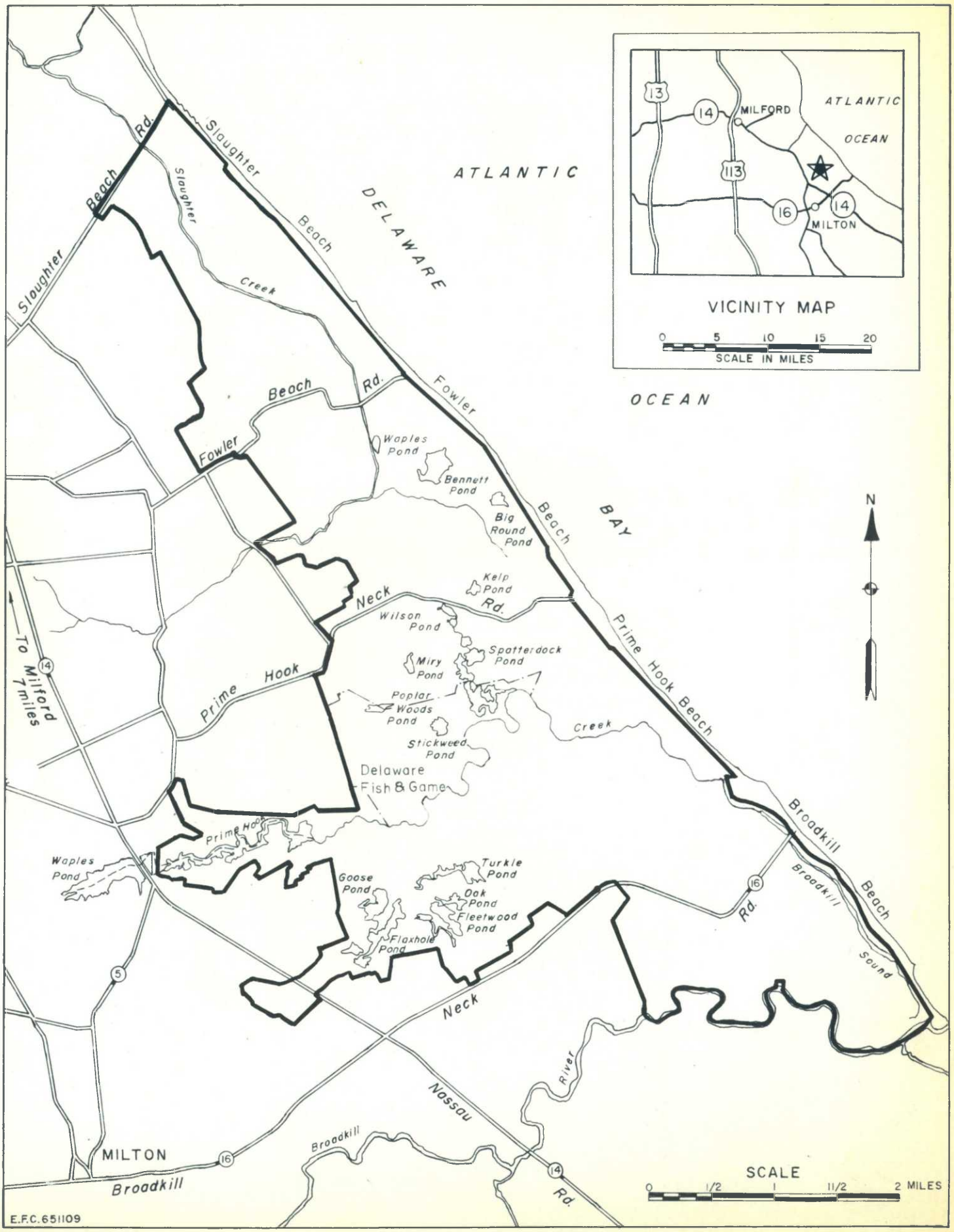
CURRENT OBJECTIVES

12/31/65



PRIME HOOK NATIONAL WILDLIFE REFUGE

SUSSEX COUNTY, DELAWARE



2. A Prime Hook Refuge office was established in Milford, Delaware, in GSA lease space, for three purposes:

   1. Establish a Refuge office to serve notice to the general public that the Bureau and the refuge are here to stay.
   2. Provide a work center close to the refuge for the Division of Engineering field personnel and Division of Realty, and
   3. Provide the refuge with an office where official business could be conducted, particularly that concerning the local public.

3. As a most necessary adjunct to the establishment of the office Mrs. Adele Jones was employed on May 17, 1965 as a Clerk-Steno. Mrs. Jones has served as clerk-steno not only to the refuge but also to the Engineering Survey Crews, Realty representatives, and the Mosquito-Wildlife Coordinator. Mrs. Jones has performed her duties well and is welcomed as a Bureau employee.

4. Student Assistant Richard F. Nugent was employed 6/7 - 9/3/65. Dick was a cheerful, willing worker. He worked with personnel detailed from Bombay Hook to Prime Hook on fencing and posting, Real Property cleanup and similar items. A portion of the Assistant's time was devoted to helping Engineering's Field Survey Crew in field survey work. Dick also worked alone on biological observations; charting part of the maze of navigable creeks; marsh soils soundings, water salinity determination and assisted Bombay Hook personnel at Bombay Hook in such jobs as herbicide applications.

   Student Assistant report, Prime Hook - 1965, has been previously submitted and a copy is on file at the refuge - the more pertinent in the report are soils soundings and water salinity determinations.

5. Credits. Bombay Hook personnel are credited with the preparation of the report as follows: Assistant Manager Clayton Hardy, part of NR forms and biological data; and Manager Nightingale, part of NR forms and text. Prime Hook Clerk-steno, Mrs. Adele Jones, typing text; Bombay Hook Clerk-steno, Mrs. Virginia Baughman, typing NR forms.

B. News Articles. Appended.

C. Signature.

Respectfully Submitted,

Gordon T. Nightingale

GORDON T. NIGHTINGALE
Refuge Manager

January 20, 1966

Jan 21, 1966 - Thomas Carlson

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

WATERFOWL

REFUGE Prime Hook National Wildlife Refuge MONTHS OF January TO April, 1965

(1) Species	(2) Weeks of reporting period 1/1 - 7 (1)	8-14 (2)	15-21 (3)	22-28 (4)	29- 2/4 (5)	5-11 (6)	12-18 (7)	19-25 (8)	26-3/4 (9)	5-11 (10)
Swans:										
Whistling						2	2			
Trumpeter										
Geese:										
Canada	600	600	25	25	25	900	1,700	1,600	2,000	1,200
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	1,000	1,000				100	150	150	800	500
Black	200	200	100	100	100	400	600	600	800	600
Gadwall										
Baldpate										
Pintail						20	20	100	100	1,000
Green-winged teal						160	160	100	400	400
Blue-winged teal										
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead							4			
Ruddy										
Other							7			
TOTAL	1,800	1,800	125	125	125	1,582	2,643	2,550	4,100	3,700

3-1750a

Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE Prime Hook National Wildlife Refuge MONTHS OF January TO April, 1965

(1) Species	(2) Weeks of reporting period: 12-18 11	19-25 12	26-4/1 13	2-8 14	9-15 15	16-22 16	23-29 17	30 18	(3) Estimated waterfowl days use	(4) Production: Broods seen	Estimated total
Swans:											
Whistling			7						77		
Trumpeter											
Geese:											
Canada	1,200	1,000	600	1,000	500	300	200	100	94,425		
Cackling											
Brant											
White-fronted											
Snow			10	-	-	-			70		
Blue											
Other											
Ducks:											
Mallard	300	100	80	50	50	30	20	20	30,330		
Black	400	200	150	100	100	100	50	50	33,650		
Gadwall			20	20	20	30	20	20	790		
Baldpate				50	20	20	10	10	710		
Pintail	800	400	800	200	100	50	30	30	25,370		
Green-winged teal	700	2,000	1,500	600	500	300	200	200	49,340		
Blue-winged teal		100	200	100	70	100	100	100	4,790		
Cinnamon teal											
Shoveler		20	50	100	50	50	30	30	2,130		
Wood	10	20	20	20	20	20	10	10	850		
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead									28		
Ruddy											
Other									49		
~~Coot:~~ TOTAL	3,410	3,840	3,437	2,240	1,430	1,000	670	570	242,609		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	77	7	
Geese	94,495	200	
Ducks	148,037	2840	
Coots	0		

SUMMARY

Principal feeding areas _____

_____

Principal nesting areas _____

_____

Reported by _____

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

16242

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

Orig. RO 9/21/65

WATERFOWL

REFUGE PRIME HOOK MONTHS OF MAY TO AUGUST, 1965

(1) Species	(2) Weeks of reporting period: 10-16 (1)	17-24 (2)	15-21 (3)	22-28 (4)	29-4 (5)	5-11 (6)	12-18 (7)	19-25 (8)	26-2 (9)	3-9 (10)
Swans:										
Whistling						35	35	35		
Trumpeter										
Geese:										
Canada						35	35	35		
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard					10	16	16	16	12	12
Black	30	30	30	30	60	76	76	76	80	80
Gadwall	10	10	10	10	10	8	8	8	8	8
Baldpate	2	2	2	2						
Pintail										
Green-winged teal	4	4	4	4						
Blue-winged teal	40	40	40	40	10				8	8
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye	12									
Bufflehead										
Ruddy										
~~Other~~ Sub Total	98	86	86	86	90	100	100	100	108	108
Grand Total	98	86	86	86	90	135	135	135	108	108

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

WATERFOWL
(Continuation Sheet)

REFUGE PRIME HOOK MONTHS OF MAY TO AUGUST, 19 65

(1) Species	(2) Weeks of reporting period: 10-16 (11)	17-23 (12)	24-30 (13)	31-6 (14)	7-13 (15)	14-20 (16)	21-27 (17)	28,29,30,31 (18)	(3) Estimated waterfowl days use	(4) Production: Broods seen	(4) Production: Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada						20	20	20	1095		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	12	12	12	20	20	65	65	65	2276	2	28
Black	80	80	80	40	50	275	275	275	~~11236~~	4	57
Gadwall	8	8	8	10	10	5	5	5	~~1028~~		
Baldpate						1	1	1	74		
Pintail											
Green-winged teal									~~112~~		
Blue-winged teal	8	8	8	8	8	42	42	42	~~2998~~		
Cinnamon teal											
Shoveler											
Wood	4	4	4	6	6	10	10	10	~~348~~		
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye									~~84~~		
Bufflehead											
Ruddy											
~~Other~~ Sub Total	112	112	112	84	94	398	398	398	~~17496~~		
Coot:											
Grand Total	112	112	112	84	94	418	418	418	18591	6	85

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	0	0	0
Geese	1095	35	
Ducks	17496	398	85
Coots	0	0	0

SUMMARY

Principal feeding areas Salt Marsh

Principal nesting areas Salt Marsh

Reported by

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

16242

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

WATERFOWL

REFUGE Prime Hook MONTHS OF September TO December 31, 1965

(1) Species	(2) Weeks of reporting period 9/1-7	8-15	19-21	22 - 27	28 -10/5	6 - 12	13 - 19	20 - 26	27 - 11/2	11/3-9
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	5	5	12	12	4,350	4,350	4,590	8,150	8,150	8,150
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	45	45	65	65	600	600	100	275	275	275
Black	145	145	130	130	700	700	700	750	750	750
Gadwall	45	45	115	115			80			
Baldpate					200	200	150	4	4	4
Pintail			70	70			600	50	50	50
Green-winged teal	165	165	40	40	500	500	750	350	350	350
Blue-winged teal	190	190	70	70						
Cinnamon teal										
Shoveler										
Wood										
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
	595	595	502	502	6,350	6,350	6,970	9,579	9,579	9,579

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

WATERFOWL
(Continuation Sheet)

REFUGE Prime Hook MONTHS OF September TO December 31, 19 65

(1) Species	(2) Weeks of reporting period 11/10-16 11	17 -23 12	24-30 13	12/1-7 14	8-14 15	15-21 16	22-28 17	29-31 18	(3) Estimated waterfowl days use	(4) Production Broods seen	(4) Production Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	200								265,818		
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	225	225	225	225	10	10	10	10	22,955		
Black	85	85	85	85	100	100	100	100	39,080		
Gadwall									2,800		
Baldpate									3,934		
Pintail	65	65	65	65					8,050		
Green-winged teal	100	100	100	100					25,270		
Blue-winged teal									3,640		
Cinnamon teal											
Shoveler											
Wood		2	2	2					42		
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											
	675	477	477	477	110	110	110	110	371,589		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	0	0	
Geese	265,818	8,150	
Ducks	105,771	2,380	
Coots	0	0	

SUMMARY

Principal feeding areas Marshes near Prime Hook Creek.

Principal nesting areas Marshes near Prime Hook Creek.

Reported by Gordon T. Nightingale, 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).

Interior Duplicating Section, Washington, D. C.
1953

3-1751
Form NR-1A
(Nov. 1945)
5RF-10/64

MIGRATORY BIRDS
(other than waterfowl)

Refuge Prime Hook N. W. Refuge Months of January to April 19 65

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Great Blue Heron	Present all period total number not more than 6.									
II. Shorebirds, Gulls and Terns:										
Willet		4/25	100		100	4/30				100
Yellow-Legs (Ok)		4/1				4/30				50
Herring Gull	Present all period, total number not more than 100									
Ring-billed Gull	"	"	"	"	"	"	"	"		
Great Blk. Back Gull	"	"	"	"	"	"	"	"	60	

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Present all period, total number not more than 300				
White-winged dove					
IV. Predaceous Birds:					
Golden eagle					
Duck hawk					
Horned owl					
Magpie					
Raven					
Crow	Present all period total number not more than 200				
				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 Gruiiformes)
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 Prime Hook Months of May to August 31 1965

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Great Blue Heron	Present all period in small numbers up to						15			
Common Egret	Present all period in moderate numbers up to						300			
Least Bittern	Present in small numbers most of period, up to						15			
II. Shorebirds, Gulls and Terns:										
Willet	Present all period up to 100 birds									
Great Yellowlegs	Present all period up to 150 birds									

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. Doves and Pigeons:					
Mourning dove	Present all period on acquisition area up to 1200 by late August				
White-winged dove					
IV. Predaceous Birds:					
Golden eagle					
Duck hawk					
Horned owl					
Magpie					
Raven					
Crow	Present all period				

Reported by **Gordon T. Nightingale**

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 Gruiiformes)
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)
5RF-10/64

MIGRATORY BIRDS
(other than waterfowl)

Refuge **Prime Hook** Months of **September** to **December 31** 19 **65**

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Common Loon					1	12/23				
Red-throated Loon					27	"				
Horned Grebe					3	"				
Pied-billed Grebe					2	"				
Great Blue Heron					8	"				
American Bittern					1	"				
II. Shorebirds, Gulls and Terns:										
Herring Gull					517	12/23				
Gt. Blk. Bkd. Gull					20	"				
Foresters Tern					8	12/17				
Killdeer					10	12/23				
Common Snipe					5	"				
Least Sandpiper					2	"				
Ring-billed Gull					414	"				
Black Skimmer					1	"				
Virginia Rail					1	"				
Ruddy Turnstone					3	"				
American Woodcock					1	"				
Sanderling					57	"				

(over)

(1)	(2)	(3)	(4)		(5)	(6)
III. Doves and Pigeons:						
Mourning dove			184	12/23		
White-winged dove						
IV. Predaceous Birds:						
Golden eagle						
Duck hawk						
Horned owl			2	12/23		
Magpie						
~~XXXX~~ Fish Crow			1	8/28		
Crow			56	12/23		
Marsh Hawk			27	"		
Osprey			3	10/9		
Sharp-shinned Hawk			1	12/4		
Turkey Vulture			43	12/23		
Cooper's Hawk			1	"		
Red-tailed Hawk			9	"		
Sparrow Hawk			20	"		
Short-eared Owl			14	"		
Red-shouldered Hawk			1	Reported by		
Rough-legged Hawk			4	"		

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 Gruiiformes)
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 Prime Hook For 12-month period ending August 31, 19 65

Reported by G.T. Nightingale Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat Type	(2) Habitat Acreage		(3) Use-days	(4) Breeding Population	(5) Production
#1	Crops		Ducks	8,251		
	Upland	240	Geese	17,500		
	Marsh	1540	Swans	-		
	Water	70	Coots	-		
	Total	1850	Total	25,751		
#2	Crops		Ducks	22,224	20	26
	Upland	430	Geese	13,260		
	Marsh	1488	Swans	*		
	Water	150	Coots	-		
	Total	2068	Total	35,484	20	26
#3	Crops		Ducks	313,034	24	33
	Upland	400	Geese	190,055		
	Marsh	4346	Swans	77		
	Water	600	Coots	-		
	Total	5346	Total	503,166	24	33
#4	Crops		Ducks	29,516	20	26
	Upland	240	Geese	32,235		
	Marsh	1084	Swans	-		
	Water	120	Coots	-		
	Total	1444	Total	61,751	20	26
Totals	Crops		Ducks	373,025	64	85
	Upland	1310	Geese	253,050		
	Marsh	8458	Swans	77		
	Water	940	Coots	-		
	Total	10,708	Total	626,152	64	85
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			
	Crops		Ducks			
	Upland		Geese			
	Marsh		Swans			
	Water		Coots			
	Total		Total			

(over)

In process of acquisition - habitat acres gross approximation of total acquisition area.

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.

Interior Duplicating Section, Washington, D. C.

3-1750c
Form NR-1C
(Sept. 1960)
5RF-10/64

WATERFOWL HUNTER KILL SURVEY

Refuge Prime Hook

Year 19 65

(1) Weeks of Hunting	(2) No. Hunters Checked	(3) Hunter Hours	(4) Waterfowl Species and Nos. of Each Bagged	(5) Total Bagged	(6) Crippling Loss	(7) Total Kill	(8) Est. No. of Hunters	(9) Est. Total Kill
			N.A.					

(over

INSTRUCTIONS

(1) The first week of hunting begins with opening day and ends at the close of hunting 6 days later. Successive weeks follow the same pattern.

(2) The goal is to survey a minimum of 25 per cent of refuge hunters each week and to record data only from those who have completed their day's hunting. This information should be collected during each day of the week and in each area hunted in relative proportion to the hunter effort expended. When the 25 per cent goal cannot be achieved, particular care should be taken to collect representative data.

(3) Record the total number of hours the hunters spend hunting on the refuge.

(4) List waterfowl species in decreasing order of numbers bagged. Sample entry: Mallard (61), Pintail (36), Redhead (16), Gadwall (11), Widgeon (6), Coot (4), Canada Goose (3), Green-winged Teal (1).

(5) Record total numbers of waterfowl bagged.

(6) Record total numbers of waterfowl reported knocked down but not recovered.

(7) Total of Columns 5 and 6.

(8) Estimate the total number of hunters who hunted on the refuge during the week, including hunters checked (Column 2).

(9) Kill sample projected to 100 per cent. Column 9 = $\frac{\text{Column 8}}{\text{Column 2}}$ x Column 7.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

Refuge **Prime Hook N. W. Refuge** Months of **January** to **April**, 19 **65**

(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.
This station is in the process of being acquired. There are no personnel stationed there, and no data are available. Bobwhite are known to be in the acquisition area.										

5RF-8-64

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 Prime Hook Months of May to August 31, 19 65

(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	Occur within the approved acquisition area and the total population is estimated to exceed 200 birds.									This area is in the process of acquisition. No full time field personnel yet assigned nor are acquisition acreages finalized.

5RF-8-64

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 **Prime Hook** Months of **September** to **December 31**, 19 **65**

(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									**200**	**Estimated population within acquisition area. Population was hunted but the number of removals is unknown.**

5RF-8-64

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.

3-1753
Form NR-3
(June 1945)

BIG GAME

Refuge Prime Hook Calendar Year 1965

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
Common Name	Cover types, total Acreage of Habitat	Number	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	Known to be present within the acquisition area. The Sussex County herd is reported to be in excellent condition. Deer were hunted within the acquisition area but the number of removals are unknown.												40	

Remarks:

Reported by Gordon T. Nightingale
Refuge Manager

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 <u>each species</u> 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 Prime Hook N. W. Refuge Year ending April 30, 1965

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs						(5) Total Population
								Share Trapping						
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re-stocking	For Re-search	Permit Number	Trappers Share	Refuge share	Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	
Muskrat	This Refuge is in the process of being acquired and no census work has been done on the tracts which have been acquired. This form serves only to list the small mammals known to be present.													
Raccoon														
Cottontail														
Opossum														
Fox (Red & Gray)														

* List removals by Predator Animal Hunter

REMARKS:

Reported by _____

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 headingslisted.

(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 unprimeness 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.

32/15

3-1755
Form NR-5

DISEASE

Refuge Prime Hook Year 19 65

Botulism

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 None noted.

Lead Poisoning or other Disease

Kind of disease _____

Species affected _____

Number Affected Species	Actual Count	Estimated

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks None noted.

INT.-DUP., D.C.- 53818-59

NR-6

Bureau of Sport Fisheries and Wildlife

PUBLIC RELATIONS

(See Instructions on Reverse Side)

Refuge Prime Hook

Calendar Year 65

1. Visits

a. Hunting 310 b. Fishing 350 c. Miscellaneous 1,580 d. TOTAL VISITS 2,240

1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl	210	1,700	*
Upland Game	50	400	*
Big Game	50	200	*
Other			

* Refuge owned not managed as yet

Number of permanent blinds --

Man-days of bow hunting included above --

Estimated man-days of hunting on lands adjacent to refuge 1,500

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

TYPE OF AREA	ACRES	MILES
Ponds or Lakes	--	--
Streams and Shores	--	1

1c. Miscellaneous Visits

Recreation 800 Official 200

Economic Use 580 Industrial --

2. Refuge Participation (groups)

TYPE OF ORGANIZATION	ON REFUGE NO. OF GROUPS	ON REFUGE NUMBER IN GROUPS	OFF REFUGE NO. OF GROUPS	OFF REFUGE 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		3	14
Other	0			

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Press Releases	1	Radio Presentations	0
Newspapers (P.R.'s sent to)	14	Exhibits	0
TV Presentations	0	Est. Exhibit Viewers	0

3-1756
(Rev. 4/63)

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

(1)

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

Refuge Prime Hook Year 19 65

	Collections and Receipts (Seeds, rootstocks, trees, shrubs)						Plantings (Marsh - Aquatic - Upland)						
Species	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

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

Remarks: _____

76148

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

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Prime Hook County Sussex State Delaware

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
			Harvested		Unharvested				
	Acres	Bu./Tons	Acres	Bu./Tons	Acres	Bu./Tons			
None on Refuge owned lands except under deeded agricultural reservations.									
								Fallow Ag. Land	

No. of Permittees: Agricultural Operations _____ Haying Operations _____ Grazing Operations _____

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				
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.

INT.-DUP. SEC., WASH., D.C.91767

3-1761
Form NR-11

TIMBER REMOVAL

Refuge Prime Hook Year 1965

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.....
Cords.....
Ties.....
.....

Method of slash disposal.....

3-1979 (NR-12)
(9/63)

Bureau of Sport Fi ries and Wildlife

ANNUAL REPORT OF PESTICIDE APPLICATION

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

Refuge	Proposal Number	Reporting Year
Prime Hook		1965

Dates of Application (1)	List of Target Pests(s) (2)	Location of Area Treated (3)	Total Acres Treated (4)	Chemical(s) Used (5)	Total Amount of Chemical Applied (6)	Application Rate (7)	Carrier and Rate (8)	Method of Application (9)
None								

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

5RF 8/64

Evening Journal, Wilmington, Del. • • • Friday, January 8, 1965

Inside Stuff

A Refuge Helps

By Ned Davis

IT'S BEEN SOME TIME since there has been any outcry out of Sussex County regarding that proposed federal wildlife refuge at Prime Hook.

That does not mean of course, that opposition to it has collapsed. I've been around Sussex County much too long to believe that retrenchment and strategic withdrawal mean the same as defeat.

But I do believe that the opposition is losing force because more and more they are beginning to understand the tremendous benefits the refuge at Bombay Hook has brought to Kent and New Castle Countians.

THE latest count of waterfowl in Delaware, made Jan. 5 by federal wardens, shows that there are 145,000 ducks and geese in Delaware waters this year compared with slightly over 100,000 a year ago. Last year's count was above that of 1963 and the pattern has been the same since the refuge's inception.

According to Robert Halstead, the chief federal warden in Delaware, the aerial count reveals that the birds are using inland waters with increasing frequency and to such an extensive range that they were spotted on ponds at Delaware's western border and in many areas of New Castle County where they never used to feed.

NOR is it just federal agents who attest to the meaningfulness of Bombay Hook. Nearly every waterfowler north of Milford has expressed the view that Delaware hunting is better than ever.

Admittedly, the Prime Hook refuge will take some good hunting spots out of circulation, but the improvement to those that remain will mean so much in the over-all picture that the gain will more than balance the loss.

It will also add many new hunting spots for those in western Sussex who now have to depend on jump-shooting for most of their sport. Ponds and streams that infrequently see ducks or geese will be covered with the birds because an increasing population must spread out in search of food and resting sites.

It is hard for us today to imagine just how much the new refuge will mean, but it is not stretching the imagination to foresee the substantial waterfowl population we now enjoy doubling or even tripling itself within the next few years.

Nor are all the birds that are pouring into Delaware in such numbers Canadian geese. The waterfowl survey shows that there are 10,000 more black ducks in Delaware than there were a year ago, and for the first time in recent memory scaups are in the state in huge flocks with more than 20,000 counted.

THE new refuge will mean that landlocked ponds deep within Sussex County will suddenly acquire new value and meaning. They will become much sought-after hunting sites that owners can use to have fun or rent to others to produce income.

And while the Bombay Hook policy of opening blinds to the general public did not work out to everyone's satisfaction this year, the government will persevere and try to improve the situation. Eventually the public hunting areas will provide plenty of recreation for those not fortunate enough to have a suitable site of their own.

In short, what it is beginning to mean in Kent and New Castle Counties is not that hunting areas have been removed from circulation. Rather, so many more have been developed that they more than make up for the few thousand acres occupied by the refuge. Without that refuge, Delaware's waterfowl population would not be a third of what it is. I haven't heard anyone dispute that.

B Hook
6-7-N

Outside Stuff

Duck, Geese Increasing

By Ned Davis

The waterfowl season in Delaware ended yesterday but the exciting prospects for better hunting on the western side of the state mean that activity, with the next season in mind, should be more pronounced than ever.

The latest count by the U.S. Bureau of Sports Fisheries, taken early this month, indicates that the duck and geese population in Delaware is around 150,000 this year compared to 100,000 at the same time in 1964.

It also shows that the birds are moving west, using ponds and fields where their presence was a rarity only a few years ago. To the imaginative mind the trend must mean prospects for unlimited opportunity. Farmers in the vicinity of the Delaware Bay long ago began developing hunting sites for both their own recreation and for commercial leasing to other sportsmen.

WITH the influx of more and more game birds and the development of another huge federal refuge at Prime Hook there will be no good reason within a very few years for anyone who owns several acres of land not to have good waterfowl hunting. The possibilities for the development of even small ponds are virtually limitless and the economic benefits will be proportionate.

Meanwhile, it should be reported that the last goose season was certainly the best ever enjoyed by Delawareans. There were very few days that at least a few geese weren't flying.

I seldom talk to a rabbit hunt-

EVENING JOURNAL
WILMINGTON DELAWARE
An independent newspaper published every afternoon except Sunday by the News-Journal Company
HENRY T. CLAUS, Chairman of the Board
FREDERICK WALTER, General Manager
CHARLES T. ALEXANDER, Managing Editor
Leslie E. Cansler, Day Managing Editor
CHARLES L. REESE JR., President and Editor
CHARLES M. HACKETT, Executive Editor
MARTIN A. KLAVER, Editorial Page Editor
Assoc. Editors: Anthony Higgins, Thomas R. Dew
Frederick W. Hartmann, City Editor

Let New Parks Go Forward

A PHILADELPHIA paper says "the administration of Gov. Charles L. Terry Jr., working with Democratic leaders, is cooking up a thoroughgoing reorganization" of the Delaware State Park Commission.

Gov. Terry's press secretary, Ned Davis, says that the governor is "unaware" of any such scheme.

But only too plausible is the report that two Sussex Democratic senators—Walter J. Hoey and Curtis W. Steen—are leading an effort to "enlarge" the commission from five to seven or even nine members "with a view to giving better representation to Kent and Sussex Counties." It would be no surprise if the two named senators were losing patience with a park executive—Peter Geldof Jr.—who has sometimes followed a course counter to what the senators would have the park department do in Sussex County.

Many will recall Sen. Hoey's effort last year to enlarge the state Game and Fish Commission so as to get its executive, Norman G. Wilder, fired, and the Prime Hook National Wildlife Refuge killed.

Fortunately, he failed.

On a state commission it is ability, not county of residence, that stands to be most important for a member. Even so, will anyone maintain that the present ratio of three from upstate and two from downstate is improper?

For our part, the ratio could be the other way round provided the downstate members were persons of distinctly greater competence in park and conservation fields than either Sen. Steen or Sen. Hoey.

Peter Geldof's record as a park administrator in Delaware, for the past decade, is a bright one of accomplishment in Sussex as well as in New Castle County.

We can only applaud a former Park Commission member (Rep. Robert N. Downs III, R-Christiana Hundred) who has made this trenchant observation: "It has been an education to be at the hearings of the Joint Finance Committee and witness the chairman (Sen. Hoey) just rip public servants to pieces. Then, denying them the tools to do the job, he has the audacity to criticize their competency!"

It is true that the state park agency at last has funds to start equipping Delaware with a good park system. This opportunity deserves a strong commission to work up a program of purchase and operation to be executed by an administrator of proven competence. The people will expect the governor and the legislature to ensure this kind of progress in Delaware.

For Conservation Writing

Wilm Evening Journal 4/28/65

Editor Wins $500 Award

Anthony Higgins, associate editor of the Evening Journal, has been named winner of a $500 Edward J. Meeman Conservation Award.

The awards, totaling $5,000, were made by the Scripps-Howard Foundation to 17 newspapermen in recognition of outstanding work in the cause of conservation published in United States newspapers during 1964.

Higgins, one of the few editorial writers among the winners, was one of six second-place winners in the contest. The award was the latest of several won by Higgins in the conservation field.

IN selecting Higgins, the judges cited his campaign to "nail down, for the acquisition of green space," some of the windfall the state is receiving from the Du Pont Co. divestiture of General Motors stock.

"Success came when the legislature authorized $3.2 million from the fund to buy lands, waters and marshes," the judges noted.

They also cited Higgins' efforts to make Assateague Island a national seashore park "for the many instead of a private development for the few" and his support of efforts of the federal government to acquire 12,000 acres for a wildlife refuge at Prime Hook.

Anthony J. Higgins
For Green Space

The judges said Higgins successfully resisted attempts to inject politics into the Game and Fish Commission and said he "is found giving light and battle on every conservation front."

FIRST prize of $1,000 went to Stuart O. Hale, outdoor writer for the Providence (R.I.) Journal and Evening Bulletin, for his successful appeal to the people of Rhode Island to approve a $5 million green acres bond issue.

Other second-place winners were Fred V. H. Garretson, Oakland (Calif.) Tribune; Marvin Garrett, Fort Worth Press; Fred Jones, Pittsburgh Press; James W. Kimball, Minneapolis Tribune, and William Steif, Scripps-Howard Newspaper Alliance.

In February Higgins was cited by the Maryland-Delaware Press Association for writing the best editorial among dailies in its competition. The editorial was entitled: "Assateague Seashore in Sight."

LAST September, Higgins was given the Conservation Trophy by the executive committee of the 1964 Delaware Junior Fishing Rodeo. In March 1961 and in May 1963, he was honored by the National Wildlife Federation and was cited in June 1962 for his conservation editorials by the American Association for Conservation.

Higgins, 59, has been an editorial writer for the News-Journal papers since 1946. His fondness for waterfowl hunting goes back to his boyhood on a farm near Delaware City.

He is the author of "New Castle, Delaware, 1651-1939," and numerous articles on Delaware history and folklore. He was in the Navy during World War II.

Evening Jour. Wilm

Hoey Wants Road, Shies At Price

3/10/65

From the Dover Bureau

DOVER—A highway department estimate to build a road along the beach southeast of Milford was termed "idiotic" yesterday at a budget hearing.

Sen. Walter J. Hoey, D-Milford, chairman of the Joint Finance Committee, said other roads had been built in the area for nowhere near the $2.3 million estimated to build the road he had requested.

Ernest A. Davidson, director of operations for the department, said the estimate had been for construction of a relatively maintenance-free and permanent road.

He said there is six or seven feet of mud under the road — which Hoey wants to run from Fowler Beach to Prime Hook— and that this would have to be removed and replaced with stable material. Also, he said, the road would have to be raised to prevent high water from washing over and flooding it.

Hoey said that simple black top roads had been "successful" washed out by the March 1962 in the area, although some were storm.

Davidson said he would be glad to go over the estimate with Hoey and that while it would be possible to build a cheaper road there would be problems to it.

Hoey Hot Over Price Tag on Road Along Bay

By JACK SMYTH

Various proposals advanced by four individual members of the 123rd General Assembly for the consideration of the State Highway Department received mixed treatment yesterday.

Sen. Curtis W. Steen (D-Dagsboro) and Sen. Louise Conner (R-Wilmington), both appearing in person, obtained assurances their problems are getting proper consideration.

But a road building project advanced some months ago by Sen. Walter J. "Doc" Hoey (D-Milford) was quickly swept under the rug when Highway Director of Operations Ernest A. Davidson reported it would cost $2,360,000.

And a request from Rep. Carlton Clifton (D-Milford) that all trees along Route 14 between Milford and Rehoboth be removed in the interest of safety was tabled.

Sen. Hoey reacted sharply when informed last night of what an engineering study showed to be the estimated cost of a 5.7-mile stretch of dirt road along Delaware Bay between Slaughter Beach and Broadkill Beach.

"That is a ridiculous estimate," the Senator shouted.

"I've never heard of anything so idiotic in my life. It would never cost anything like that—and Davidson knows it. There is only one reason he would make such a brainless statement—and that is because he doesn't want to be bothered with it. He has no right to treat this project in this manner."

Sen. Hoey, who is chairman of the Joint Finance Committee, said the proposal had been advanced before. Many people believe it would be possible for such a road to be built along the bay to Lewes. The terrain, Hoey claims, is not near as difficult as the report indicates. But it would mean leveling off sand similar to the road between Dewey Beach and Indian River. It would be built over private land and the owners have indicated they would turn it over to the state, the veteran legislator pointed out.

"The most difficult road of this type should cost no more than $5,000 a mile—not any $400,000 a mile. I intend to go right back to the Highway Commission and get this straightened out. They haven't heard the last from me on this," the Milford senator declared.

It was during the five-hour-long session of the highway commissioners, the first regular meeting presided over by Henry Price, newly appointed chairman, that Davidson revealed the report on the project Sen. Hoey had personally brought to their attention about six months ago.

The director of operations indicated because of the cost and the likelihood of little traffic that the project could not be justified. He recommended, instead, that the proposal be turned over to federal authorities as a possible part of their scenic highway program.

Delaware State News

Dover, Del., Thursday, July 8, 1965

Downstate Road Work OK'd

Kent, Sussex Share Of Melon Is $1.6 Million

The State Highway Department yesterday cut up a $3.5 million road melon given to it by the General Assembly, and the Kent and Sussex Counties' slices added up to $1,636,000.

The General Assembly voted a blank check to the department for so-called "non-corridor" projects in the $35 million annual bond bill, instead of earmarking the funds for specific projects.

Yesterday the road commissioners haggled over the allocations behind closed doors for more than an hour, then finally approved the recommendations of Ernest A. Davidson, director of operations.

The downstate slice, plus federal aid funds, will provide for road improvments of $2,135,000 in addition to corridor and primary projects specified in the bill.

Here's where the state funds would go:

Reconstruction of Walker Road in Dover from N. State Street to Saulsbury Road, $225-000 state funds, $150,000 federal.

Improvements to Little Creek streets, $100,000 all state.

Widening and resurfacing Delaware 10 from U. S. 13 to Rising Sun, $250,000 all state.

Improvements from Fowler Beach to Prime Hook, $300,000, all state; widening and resurfacing Delaware 26 from Dagsboro to Clarksville, $450,000 state, $300,000 federal; raising elevation of the roadway at Broadkill Beach approach, $60,-000 all state; reconstruction of Main Street, Bridgeville, $200,-000, all state; and improvements to Main Street, Selbyville, $50,000, all state funds.

Evening Journal, Wilmington, Del. * * * Wednesday, Oct. 27, 1965

Schools to Get Cash for Refuge Land

From the Sussex Bureau

GEORGETOWN — A recently enacted federal bill and Levy Court action yesterday may result in Milton and Milford School Districts sharing $4,000 in federal funds.

The federal measure provides that three-fourths of the base value of a federal wildlife refuge be turned over to the county in which a refuge is located, earmarked for school or highway purposes.

Gordon Nightingale, manager of the proposed Prime Hook refuge in northeastern Sussex County, explained the law's provisions to Levy Court yesterday and commissioners signed the federal nondiscrimination agreement necessary to start the program.

LEVY Court must decide how the funds are to be distributed. Yesterday commissioners leaned toward school support, especially for the Milton and Milford districts, where the tax-exempt refuge will be located.

The first check will be received by Levy Court in September 1966, Nightingale said.

The explanation of the program momentarily stunned Levy Court.

"We're not even responsible for roads and schools," said Commissioner Martin W. Johnson Jr.

In leaning towards giving the funds to Milton and Milford, commissioners agreed that those districts are primarily "the big losers" in tax revenue not obtained from the federal lands.

A PORTION of the funds may be diverted to other districts in the county, however. Nightingale estimated that Milton loses about $618 in revenue because of the federal land and Milford about $500.

From $3,000 to $4,000 will be available at first, he said and the amount will grow as the size of the refuge increases.

Plans now call for 10,700 acres to be turned over to the refuge by the time it is completed. Nightingale told commissioners that about 4,500 acres have been purchased or optioned so far.

Evening Journal * * * 9
Wilmington, Del. June 17, 1965

Prime Hook Refuge Growing

From the Sussex Bureau

PRIME HOOK — Gordon Nightingale, manager of the proposed 10,700 - acre federal Prime Hook Wildlife Refuge, reports about one-third of the total land area has been purchased or optioned.

He said a portion of the area will be opened to waterfowl hunting, but not before a manageable block — 3,000 to 4,000 acres — is obtained. The largest single area now a part of Prime Hook is about 1,000 acres in size, the manager said.

An office was opened two months ago at 15 N. Walnut St., Milford, for Nightingale and refuge, realty and engineering personnel.

The rate of land acquisition has been favorable for the past two months or so, according to Nightingale, although there has been some opposition to land purchases.

Two years ago, there was heavy opposition to the Prime Hook project.

Land purchases for the Prime Hook area, situated between Slaughter Beach Road and Broadkill Creek, are now being handled for the U.S. government by Donald Bredernitz, who succeeded James G. Carr.

Carr had purchased about 2,500 acres before he left in April 1964 for a federal position in Ohio. Since that time an additional area of 1,000 acres has been purchased or optioned.

Nightingale is also manager of the Bombay Hook Refuge and will continue to head both areas, according to Thomas C. Horn, regional refuge supervisor. Horn said Nightingale's staff will be expanded "as personnel ceilings permit."

B Hook

EVENING JOURNAL
WILMINGTON DELAWARE
An independent newspaper published every afternoon except Sunday by the News-Journal Company
HENRY T. CLAUS, Chairman of the Board
FREDERICK WALTER, General Manager
CHARLES T. ALEXANDER JR., Managing Editor
Leslie E. Cansler, Day Managing Editor
CHARLES L. REESE JR., President and Editor
CHARLES M. HACKETT, Executive Editor
MARTIN A. KLAVER, Editorial Page Editor
Assoc. Editors: Anthony Higgins, Thomas R. Dew
Frederick W. Hartmann, City Editor

Mr. McDowell Follows Mr. Layton

SELECTION of Ray C. McDowell for the Game and Fish Commission's Republican vacancy left by Rodney M. Layton will be applauded by good sportsmen in Delaware even as they salute Mr. Layton for 10 years of devoted service on the board.

Certainly there are few citizens with a record equal to Mr. McDowell's in wildlife conservation work in Delaware. When president of what is now the Delaware Wildlife Federation of outdoor clubs and groups, he worked with commissioners and legislators on improving the game and fish laws. In 1953 this paper said: "To him more than any other person belongs the credit for the good new wildlife laws of the past three legislatures."

Most of those laws still stand as part of the code in this field.

Mr. Layton, an appointee of Gov. Boggs, served as president of the three-man commission when he was one of the two Republican members. Early and late he has been a fighter for modern wildlife management and a supporter of the grade-A professionals on the staff. Back in 1959 he said, for example:

"Only by wise action now can our state continue to offer a healthy outdoor heritage to coming generations. What can we do? Acquire more land for hunting and access to public waters, develop more lakes and ponds, grow more food and cover for wildlife, expand our research and educational programs, arrest more violators."

In 1963 Mr. Layton did a service by leading the board to present a solid front endorsing the new Prime Hook National Wildlife Refuge in Sussex. The board did so in the face of the most spirited local opposition led by State Sen. Walter J. Hoey of Milford. Last spring Mr. Layton minced no words about the wild-duck trapping scandal in the Assawoman Wildlife Area. He was outraged that a refuge warden employed to protect the waterfowl, and convicted for trapping them, should be retained in the commission's employ at the behest of some Sussex County political wheels.

Rodney Layton's decade of service has been a bright one for Delaware sportsmen and for conservation. Let us hope that Mr. McDowell can take up vigorously where Mr. Layton leaves off. The fight to keep political patronage out of the services of the Game and Fish Department must be carried on to eventual success.

Temporary Office Set Up For New Wildlife Refuge

The Department of the Interior's Bureau of Sport Fisheries and Wildlife has opened an office in Milford as temporary headquarters for the new Prime Hook National Wildlife Refuge.

Located at 15 North Walnut Street, the Bureau's office will be open from 8 a.m. to 4:30 p.m., Monday through Friday.

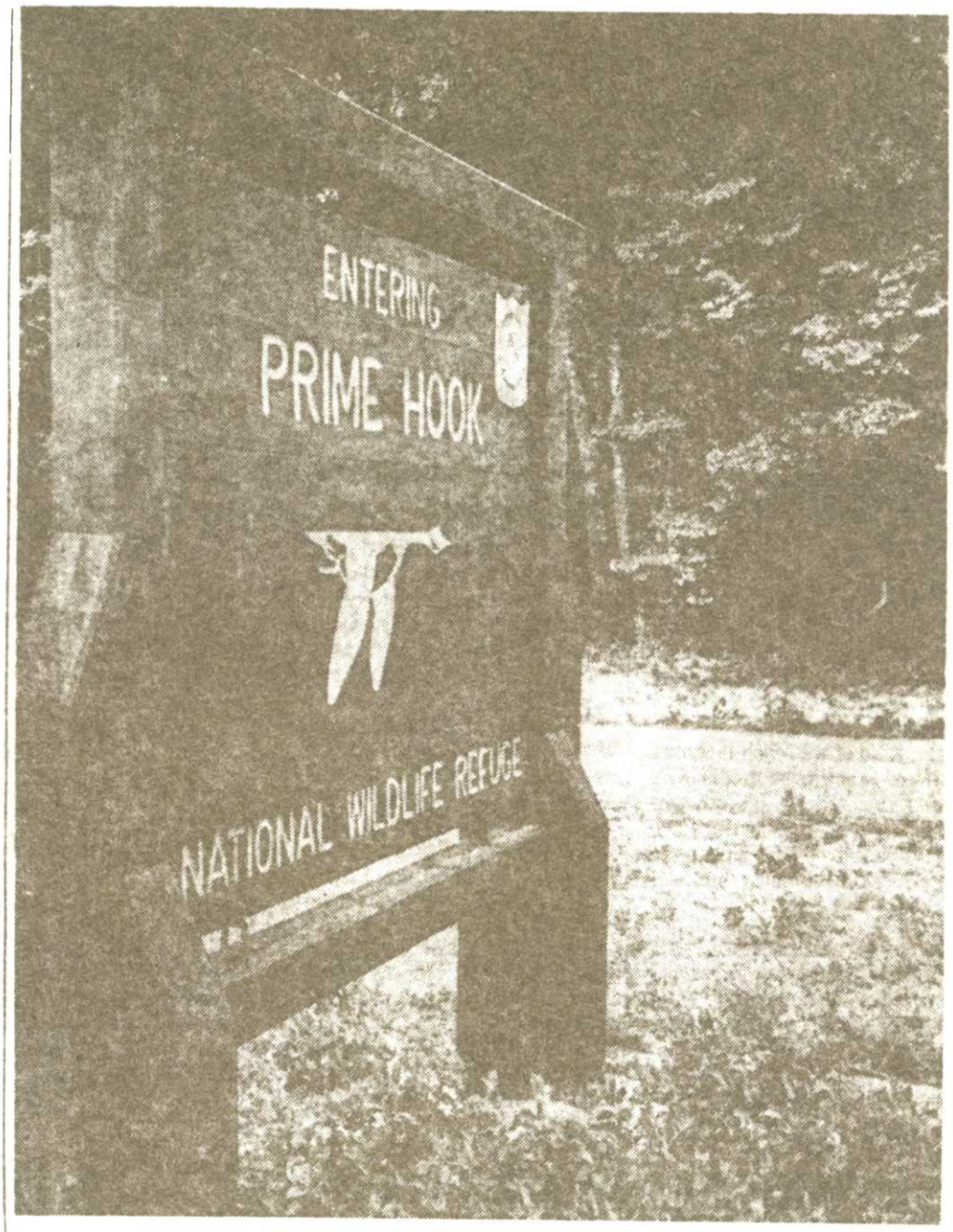
Bureau personnel staffing the new office include engineering specialists, realty negotiators, and a biologist assigned to mosquito management.

Negotiations have been completed for more than a third of the authorized acreage. Among recent properties deeded to the federal government as part of the new Refuge, is a 1,070-acre tract formerly owned by J. Howard Issac. The most recent purchase agreement negotiated covers some 317 acres owned by Draper Foods, Inc.

State News, Dover, Del., Friday, June 18, 1965—19

EVENING JOURNAL
Peninsula

22 Wilmington, Del. * * * Monday, July 12, 1965



Dover Bureau Photos by Chuck McGowen

New Refuge Open

This sign on Delaware 236, off Broadkill Beach Road, marks the entrance to Prime Hook Wildlife Refuge in Sussex County. The property is now open to the public. Later, when other land is added to the refuge, trespass signs will be posted but some sections will still be open to visitors, according to Gordon Nightingale, refuge manager. The federal government has acquired about one-third of the 10,000 acres it wants for the refuge.

Dover Bureau Photos by Chuck McGowen

Cooling Dip Helps Beat Weather

Cattle at Prime Hook Refuge in Sussex County use their own method of getting relief from the summer heat wave. Just standing in the water seems to give the animals that air-conditioned feeling that human beings seek in the hot season.

EVENING JOURNAL Peninsula

18 Wilmington, Del. * * * Saturday, July 10, 1965

Morning News, Wilmington, Del. — Sat., July 19, [illegible]

DUDLEY LANT

The Prime Hook Wildlife Refuge

The extensive area of wetlands known as Prime Hook Marsh is located in the northeastern corner of Sussex County. With the towns of Milford to the northwest and Milton to the southwest, these marshes lie back from the shores of Delaware Bay between Cedar Creek on the north and Broadkill Creek on the south. Here a new wildlife refuge is fast emerging. The target is 10,700 acres, or the greater part of the wetlands, of which 4,000 acres have already been acquired either outright or by binding options. The headquarters of this new refuge has recently been opened in the town of Milford.

The Prime Hook National Wildlife Refuge is thus a fact of signal import today in the Delaware country and to all Delawareans.

There are two creeks that drain these wetlands and roughly they mark off a northern and southern sector of the marsh. The former, comprising the watershed of Slaughter Creek, which conjoins first Cedar Creek and then the Mispillion River where it enters the Bay, has a high degree of salinity and hence possesses the characteristics of a salt marsh. The latter is drained by Prime Hook Creek, which, rising in the upland as Sowbridge Branch and winding on down through Reynolds and Maples Ponds, has a much lesser degree of salinity. It is thus, in large degree, a fresh water marsh.

It is a fact worthy of careful note that as both of these meandering creeks reach the bank of the Bay, instead of passing through, they turn—Slaughter Creek north and Prime Hook Creek south—and run for considerable distances parallel to the shore before entering the Bay. This was once true also of Duck Creek, now called Smyrna River, which, before a thoroughfare was cut through to the Bay alongside Thoroughfare Neck in 1676, wandered in sinuous curvings for 13 miles downstream through what is now the Bombay Hook National Wildlife Refuge, before entering the Bay.

Now, what is noteworthy in this is that each of these wandering streams drains literally innumerable marsh ponds, potholes, sloughs and wet spots. And it is this characteristic of the wetlands on the western shore of Delaware Bay that makes them outstanding as a habitat for migratory birds, and particularly waterfowl, both in migration and nesting. For here in abundance is water, food, cover, and, on the wild wastes of the marshes, the security of seclusion. Hence, by a parity of reasoning, these marshes are preeminently proper sites for wildlife refuges and sanctuaries.

How to get there? As you run down the Kenhoth Road (Route 14), after leaving Milford there are several black-top roads that take out on your left. These lead respectively to the beaches on the shore of the Bay—Slaughter, Fowler, Prime Hook and Broadkill, all of which, save Fowler, where no cottages exist, are not to be within the refuge. All of these roads traverse the Prime Hook marshes.

The other afternoon, I turned off on the Broadkill Road and thence again to the left on a dirt road that lead into Ford's Landing on the bank of Prime Hook Creek. In company with Gordon Nightingale, the manager of the Bombay Hook and this refuge, I was about to enjoy the privilege of a tour of the Prime Hook Marshes, and this will be the subject of my next piece.

The Waters of Prime Hook Wildlife Refuge: II

I was enjoined to put on a black rubber life belt—government regulations you know—and then we shoved out into the dark waters of Prime Hook Creek with my companion poling in the stern. There was an outboard motor, but we did not use it. We did not want to scare out any birds at a distance.

The luxuriance of the wild growth along and back from the banks was surprising. It was impenetrably thick. No man could walk the marsh, I thought, and I was not surprised to learn that all transportation is by boat. Also, there was a considerable amount of dry-kil. This had been caused, I was told, by the great storm of '62, when the salt water of the Bay washed up into the marsh. All this wetland area is low—not more than six feet above sea level on the average, the highest point being some 15 feet. Hence that '62 storm put most of the area under water and killed much of the vegetation dependent on fresh water.

Prime Hook Creek is a sluggish stream, almost a deadwater, and we trended down its curving course at a snail's pace. Across the stream in front of us, out of the thick brush on one side and into the equally thick growth on the other, there were birds in constant passage—the golden flight of a yellow warbler; the flashing flames of red-winged blackbirds; seven black-crowned night herons that got up around a bend downstream and spotted the sky; and an osprey circling high over the marsh—"flying up there for his dinner," was the comment from the stern as the bird fell like a dropped rock until he was lost to sight behind the growth on the shore. Once a wood duck got up just ahead of us and, in swerving

flight, flashed out of sight through the low trees.

On this stretch of Prime Hook Creek, its northerly bank forms the bounds of a 600-acre tract that is a wildlife area of the State of Delaware. Along here, we soon came to an opening gut and the blunt end of the little boat turned up into it. Up we went, to where it soon opened out into a pond. There, well placed on a point, was a duck blind and shelter for the boat. The while my companion was explaining that on the marsh there were literally hundreds upon hundreds of such ponds as these, large and small, all connected by a network of natural and man-made thoroughfares. A hunter, he said, has to know this marsh like the inside of his hand in order to get around without getting lost.

There is duck feed galore—duck potato with its starchy roots, dwarf spike rush, widgeon grass, and duck corn—the sight of which evoked a comment from the stern that this part of the marsh was an "excellent waterfowl habitat right now, without doing a thing to improve it."

Soon we were again in slow motion in the main flowage of Prime Hook Creek, with our passage heralded by the swirling wakes of carp, the withdrawal of the heads of snapping turles and the pumping pinions of the wild *Ardea herodias*, the Great Blue Heron. Here, too, a little Least Bittern flushed to the top of the grass and lit out just above it, as is their wont.

But in the southern quarter, the sky was beginning to lower, black at the base and gray at the zenith. The sunlight commenced to pale and the overcast to extend until at length all was gray above. Then the rain commenced, scattered drops dimpling the dark surface of the creek. I could see the shower—a great dark wall of rain—coming across the marsh, stalking toward us. So the boat was poled over into the lee of the alders and maples on the south bank and here we rode it out, getting [illegible] to the skin.

[illegible] experience was the event of the after[illegible] Prime Hook Marsh.

Morning News, Wilmington, Del. — Sat., July 24, 1965

DUDLEY LUNT

Prime Hook Refuge: III

Now came the second chapter of my tour of the Prime Hook Refuge, this time around its periphery, into several of its significant spots, and through the salt marsh drained by Slaughter Creek. The proposed bounds of the refuge are very uneven, running in jogs and dog-legs at every turn, the general design being to keep to a minimum any disruption of the existing farms.

At one point, as the car rolled slowly along a dirt road, I was interested to glimpse, all but hidden by a thicket of underbrush growing in an open field, the corner of a gravestone. Here was an old abandoned family cemetery that, as the work of establishing the refuge progresses, will be tidied up and properly fenced in once again. This led me to ask how much arable acreage would be included within the bounds, and I was told that it would be less than 20 per cent of the total, the great bulk of the refuge being conceived to comprise wild wetland and the adjacent woodland. And, when driving into one of the points of access to the State Wildlife Area, we passed through the cool shade of a stand of timber that is reputed to be one of the finest tracts of woodland left standing in the state.

There was evidence of considerable activity along the bounds. Long "vistos" — this is the language of the Mason and Dixon line — were being bulldozed, and, on the principle that "good fences make good neighbors," men were at work along them, digging post holes and erecting wire fences, barbed where there was livestock to be fenced in, otherwise smooth, and all this without expense to the abutting landowner. Signs were in evidence — the familiar flying goose of the U.S. Wildlife Service — and, interestingly enough, there had been painted out the phrase — No Trespass — save where they were affixed to structures. Considerable work was also in progress in the removal of old buildings and the cleaning up of old dumps and other unsightly areas.

After a bit, we were running down alongside Slaughter Creek, which for some distance forms a part of and then runs parallel to the boundary. Here, the vegetation along the banks comprised the grasses customarily found on a salt marsh, in vivid contrast to the luxuriant growth that I had seen along the course of Prime Hook Creek earlier in the afternoon. This road led us out to Slaughter Beach, where a single line of cottages, which are outside the refuge, front the broad surface of Delaware stretching away from the sandy strand. At the lower end of this small summer settlement, a high pile of sand and dirt by the side of one of the numerous potholes rises a good 15 feet above the surrounding terrain. Here I was invited to climb.

From this vantage, there is presented to the eye a panoramic view of Prime Hook Marsh—a wide spreading of wetlands spotted by numerous ponds and connecting thoroughfares, with the wide grass-grown expanse of salt marsh on the right hand and northern sector, and the luxuriantly overgrown fresh-water marsh on the left and southern sector, the whole fenced in by distant tracts of dark woodlands and the broad acres of the farms on the gently sloping upland.

With this pleasing prospect, my tour of the Prime Hook Marsh and Refuge came to its end.

Wilmington Morning News
Opinion
Wilmington, Delaware Monday, July 26, 1965 Page 14

positions are even more ca

DUDLEY LUNT

The Prime Hook Wildlife Refuge: IV

At the present time the management of the new Prime Hook Refuge falls under the surveillance of the manager of the refuge at Bombay Hook. However, as the purchase of contiguous wetlands results in the merging of a single manageable tract, it is anticipated that a resident manager with a regular staff will be installed.

Undoubtedly the policies that have been established and found to be successful at Bombay Hook will be substantially followed at Prime Hook. This will include cooperative farming with the local farmers in the production of game crops and the cultivation of what are called "goose pastures." Also, while the primary aim and purpose of a wildlife refuge is to provide wetland habitat and sanctuary for migrating wildfowl, it is confidently expected that, again as at Bombay Hook, a portion of the refuge, not to exceed 40 per cent, will be opened to public hunting. In this connection, very fortunately the portion of the Prime Hook Refuge that will lie along the course of Prime Hook Creek is particularly adapted to use by experienced wildfowlers who know how to handle themselves on a difficult marsh. This will leave the amateurs and the skybusters to enjoy themselves in field blinds and goose pits. Portions of the refuge, of course, will never be shot over, and, from the point of view of good hunting, this is all to the good. A sanctuary on a marsh is essential to keeping the birds in the area. Why, I know of a gun club on the Illinois River that now dates back for near a century, a sizable portion of which is known as "the Sanctuary" and has never in the life of the club been shot over. The result—good shooting all through the season.

An innovation is planned at Prime Hook, the results of which will be watched with considerable interest. Due to unwise and indiscriminate ditching in the past, the water level in the salt marsh bordering Slaughter Creek has been seriously impaired and the marsh badly damaged. The plan is to recreate, by the use of dynamite, clusters of pot-holes, to connect them by thoroughfares, and to assure their being filled with water by the construction of low dams which will permit the influx but retain much of the outflow of the tides. This, it is confidently believed, will do much to restore and reclaim the northerly end of the Prime Hook wetlands without raising marsh water levels as blocking major drains.

A word may be said about the effect of the refuge upon the lands adjacent to it. Landowners in the area are beginning to realize what has been the experience around Bombay Hook, namely that the existence of the refuge is a stabilizing factor. It gives to surrounding land values the stability that comes with permanence of tenure for a given purpose. It provides a certain amount of work for local residents. It will undoubtedly call into being on adjacent farm lands opportunities for the rental of goose pits. Already the residents of summer cottages along the three beaches—Slaughter's, Prime Hook and Broadkill—have come to realize that the line of the refuge running at the rear of them is a certain assurance that the overcrowding of the narrow strip of sand by filling in the marsh at the rear, with the consequent depreciation of existing land values, cannot occur.

Indeed, in my own view, there is a larger lesson in this that impinges on the lives of all Delawareans. In any area so small and compact as the Delaware country, the basic land use policy is of determinative importance for the future. Thus the preservation of Delaware's greatest natural resource—the extensive wetlands that border it—in their natural state as wild and wilderness areas will provide the greatest possible assurance of the future conservative development of the upland. For behind that bulwark, forever available as recreation areas as in the past, there will continue to exist in the forseeable future a country side where men and women may live amid healthy and civilized conditions.

DEPARTMENT OF THE INTERIOR
UNITED STATES
FISH AND WILDLIFE
BUREAU OF SPORT FISHERIES
WASHINGTON, D.C. THE DIRECTOR

Marsh war against bugs poses puzzle

Morning News, Wilmington, Del. — Fri., July 23, 1965

By RALPH S. MOYED
Dover Bureau

DOVER—How do you wage a war without disturbing the terrain or the native population?

That, in essence, is the problem faced by W. Russell DeGarmo, the man in charge of the federal government's newly declared war on Delaware's salt marsh mosquitos.

"WE want to keep the salt marshes the way they are, the way some of them have been for millions of years," he said. "What I'm here to do is to coordinate wildlife and mosquito control programs on the federal lands."

Then he added: "You know, a lot of mosquito programs are harmful to wildlife."

DeGarmo, headquartered in Milford, officially assumed his new post with the U.S. Fish and Wildlife Service only this month. And while he has been here occasionally on an unofficial basis since May, he has not gotten beyond the paperwork preliminaries to field experiments.

The decisions on what weapons the federal government will use to control mosquito growth on its Bombay Hook and Prime Hook Wildlife Refuges are a long way off.

"BUT," DeGarmo said, "we are going to take a biological approach. The experiments will involve siccing fish and other predator animals on the mosquitos.

By experience and assignment, DeGarmo is a wildlife man.

While he is in charge of the mosquito control program for the Fish and Wildlife Service's northeastern region, his title still is "wildlife biologist."

For more than two decades, that's what he has been, as head of the Maine and West Virginia game agencies and for three years with the Fish and Wildlife Service.

His present assignment is region-wide, but he will spend about 80 per cent of his time in Delaware and New Jersey because that's where the mosquitos are.

THE decision to set up headquarters in Milford was reached because of Delaware's new $2-million mosquito control program.

When Delaware set up its program, the U.S. Interior Department committed itself to its own war on mosquitos on federal tidal marshes.

DeGarmo said he has been working closely with Delaware officials in charge of the state's war on mosquitos, but is taking a slower approach and one more closely concerned with wildlife.

Charles D. Murphy Jr., superintendent of the State Highway Department's Mosquito Control Division, outlined the state's attitude this week when he said, "Mosquitoes first; other considerations later."

DEGARMO noted that the initial phase of the state's program involves mostly ditching. That, said DeGarmo, could alter the wildlife patterns in the salt marshes.

The purpose of the ditching, as well as what DeGarmo has in mind, is to keep the tidal water moving so that the predator animals will be able to get at mosquito larvae before they hatch.

He plans experiments with champagne pools from which ditches radiate to mosquito breeding grounds. The fish thus can get to the mosquitos before they get on the wing.

HE also plans to build high-level impoundments that would keep the breeding grounds covered with fish-filled waters, and has some other tests up his sleeve but won't discuss them.

"Under any circumstances," he said, "we are trying to avoid a full flow. We don't want the marshes to dry out.

"Some of them have been there for hundreds of years, even millions of years."

W. Russell DeGarmo

. . . heads war on mosquitos