

NARRATIVE REPORT

MACKAY ISLAND NATIONAL WILDLIFE REFUGE

CALENDAR YEAR 1966

I. GENERAL

A. Weather Conditions

Less than 20 miles separate Back Bay Refuge's official weather station and Mackay Island Refuge. Weather conditions were similar. We did, however, get a few "delightful" August showers daily when we were attempting to put in goose browse and patches of Japanese millet and buckwheat. These rains never reached Back Bay where impoundments were low on water.

A rather dry July and lower tides were responsible for a poor crop of seed in the marsh. During the period when the marsh should have been green and flowering, it was yellow and dying or growth was stagnated.

B. Habitat Conditions

1. Water

Salinities early in April were 7.76 at the south end of Knotts Island channel, 4.50 in Buzzards Bay and about 7.00 just north of the refuge. (Salinities expressed in ‰ of sea strength). These salinities run higher when the pump just north of Back Bay Refuge is operating, but vary considerably under conditions of wind tides and fresh water runoff following rains.

Turbidity caused by frequent winds resulted in Secchi disc readings of 12 to 15 inches early in the year. Waters cleared fairly rapidly about April 1 and held clear the rest of the year except during 3 or 4 day spells of strong winds. Under clear conditions Secchi disc readings will run about 30-36 inches.

During the year several readings of water of over 1 foot above mean sea level were recorded. Generally these readings indicate a fair amount of water over a portion of the marsh. Readings were highest during May and the carp spawned. Unfortunately, no water control structures coupled with several ditches and ample nutria runs and tunnels, serve to drain all but the eatouts and some dug ponds. This drainage is quite rapid. This drainage coupled with low rainfall made for a hungry marsh.

One gauge was installed just northeast of the refuge on a Virginia owned boat launching ramp. This gives us some correlation between large open waters on the northeast and southwest corners of the refuge.

This fall and winter waterlevels have been fairly good and we have water in the lower hardwoods and wetter portions of the marsh. Ducks in the marsh don't have much to eat. In the timber blackgums and myrtles produced well, but the ducks haven't used these areas.

2. Food and Cover

A multitude of poor conditions previously mentioned resulted in poor production of marsh seeds. About the only plants which fruited were spike rushes (*Eleocharis* sp.). Some small smartweeds appeared to have produced about 10% of the expected yield.

Aquatics were good. The area east of the refuge including Knotts Island channel and ocean beach grew good crops of redhead grass, celery, *Najas*, *Sagittaria*, *Eleocharis* and muskgrasses. Around the edge of the refuge within the proclamation, the same held true. In refuge coves adjacent to big water the growth was similar. In the canals and smaller ponds a deep accumulation of muck generally prohibited root and growth of aquatics. Most eatouts, over 1 year old, in the marsh are vegetated with *Eleocharis* being the pioneer. The water depth seems to govern which species of *Eleocharis* will be found in the eatout.

Eurasian milfoil plants have been found nearly everywhere on the refuge. So far no patches have developed.

Rye browse at Live Oak Point was practically unused by the Canada geese. The rye and weeds were turned under in May as green manure. Oats were planted and timed for Canada goose arrival. The geese arrived but not on the oats. We planted 1 3/4 acres of Japanese millet and 2 acres of buckwheat in lower portions of the oats field. The buckwheat drowned out. The geese came in, ate up the millet in about a week and left. We tried prebaiting with corn to hold geese in the area of the millet patch with no luck. Next year more millet less oats.

It appears that these geese are getting their greens elsewhere and just want selected grains from us. Geese are funny folks.

II. WILDLIFE

A. Migratory Birds

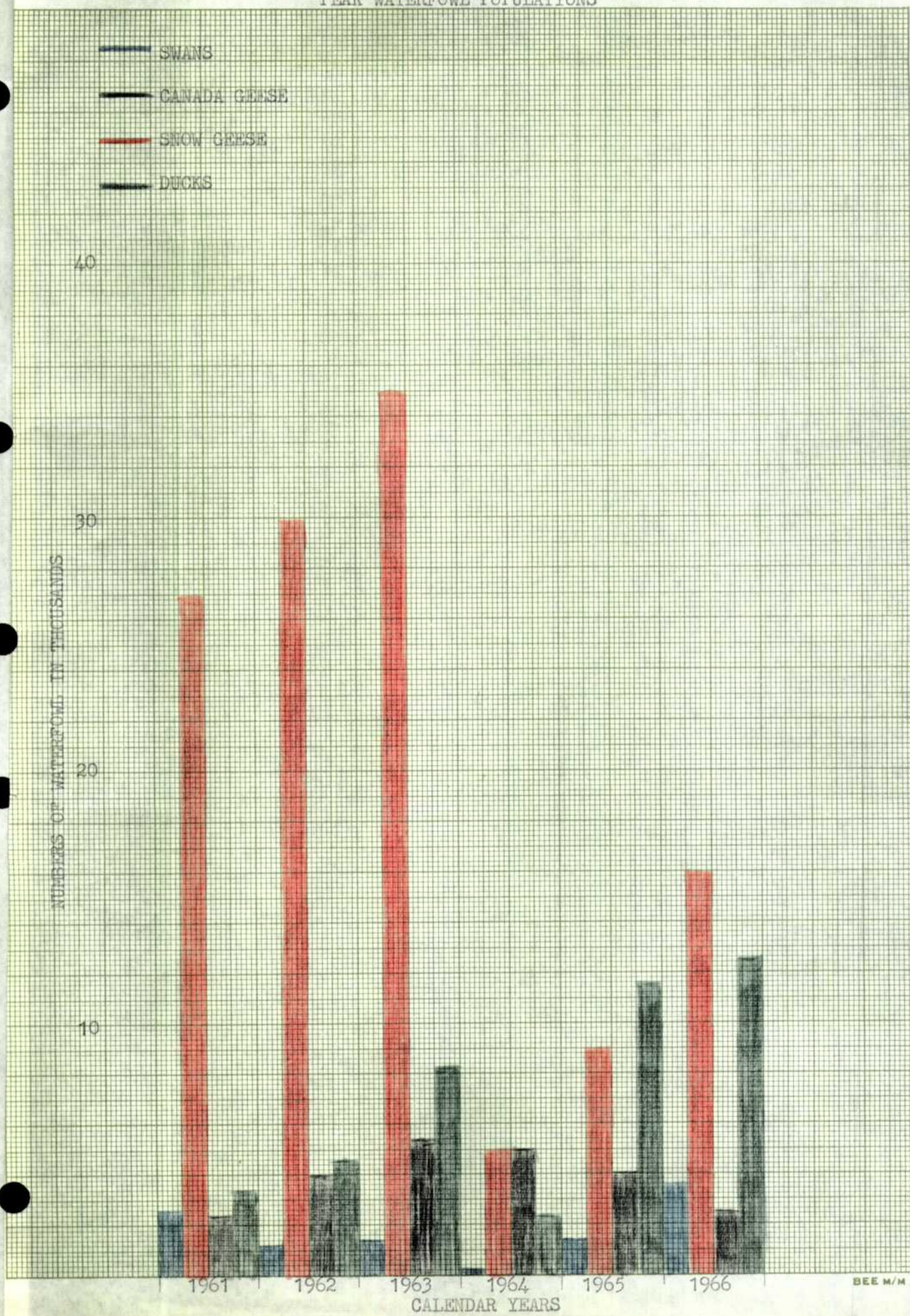
1. Waterfowl

Swan - A good hatch and a good growth of aquatics ended up giving us more swans and swan use than previously recorded during refuge tenure in this location. Swans started arriving about the first of November and peaked in the week ending 12/17. You should have heard the duck hunters cuss the grass gobbling swans. About 40% of the birds checked were immature. However, extensive studies of family groups or significant numbers were not attempted.

Canada geese - Canada geese used Bulls Bay for an occasional resting site following the close of hunting early in 1966 and during the fall

MACKAY ISLAND NATIONAL WILDLIFE REFUGE

PEAK WATERFOWL POPULATIONS



MACKAY ISLAND NATIONAL WILDLIFE REFUGE
WATERFOWL USE DAYS

SWANS
CANADA GEESE
SNOW GEESE
DUCKS

MILLION USE DAYS

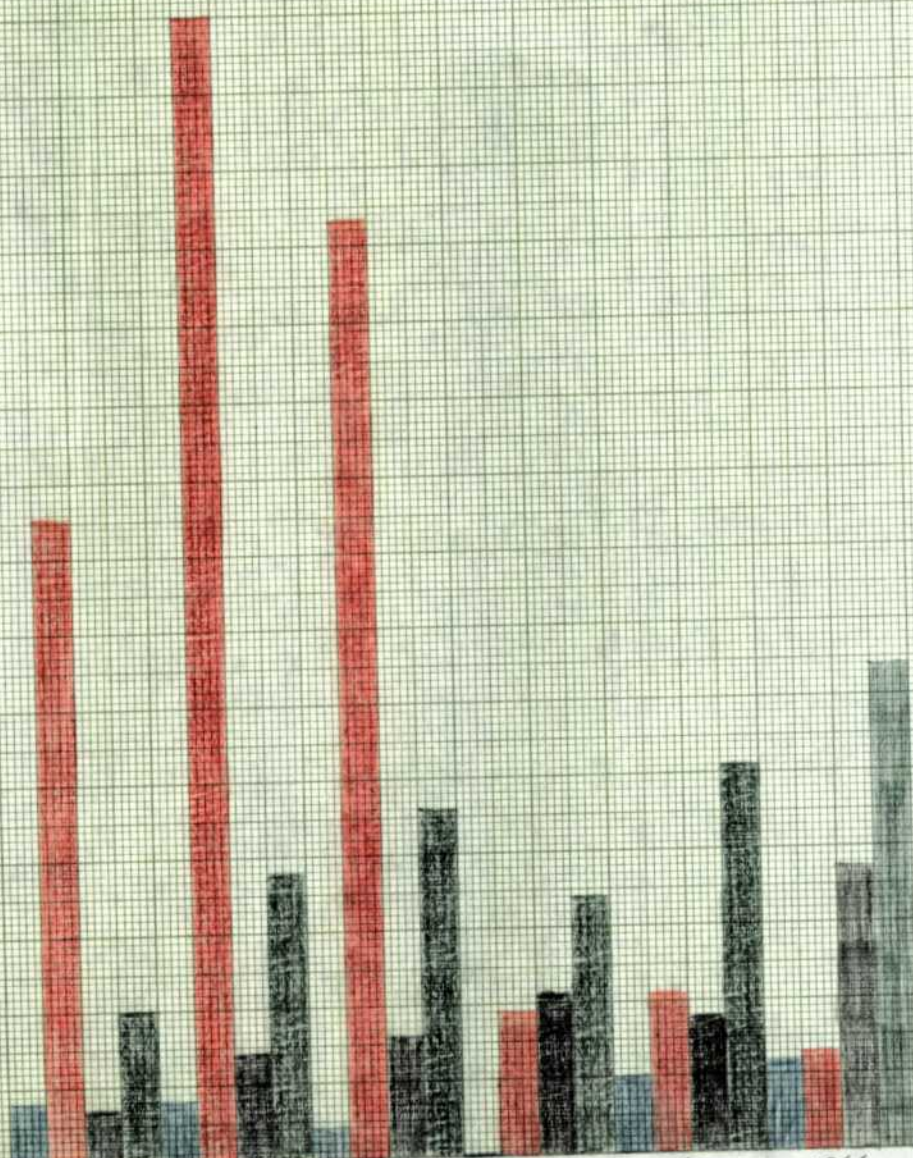
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1

1961 1962 1963 1964 1965 1966

CALENDAR YEARS

BEE M/H



fall and winter of 1966. Geese did some feeding on calery and Najas here during November and December 1966. A few geese also used Bellows and Buck Island coves for feeding and resting. Canada geese completely ate up 1 3/4 acres of Japanese millet and pulled perhaps 10 lbs. of oats browse at Live Oak Point. That was the extent of field feeding on Mackay Island Refuge. Canada goose use and numbers were down for the third consecutive year.

Snow geese - Snow geese scarcely used the refuge early in 1966. We burned about 850 acres of marsh north of the causeway during November and December and the maximum use was about 16,000 birds the last of December. Most snow goose feeding in this area is to the North along Back Bay's western shore and west and north up the North Landing River on private and state marshes in Virginia and North Carolina.

Snow goose reproduction seems to have been good judging from the numbers of immatures and family group composition. Age composition seems to be running about 40y/60a or a little better on the birds observed locally.

Ducks - The majority of our reported diving duck usage was composed of a three week stay by 10,000 ruddy ducks along the southern shore of the refuge in January 1966. A very few canvas, redheads and ringnecks sometimes show up in coves along the shore. Ringnecks are the most common with 500 being seen one week in Bulls Bay.

Black and mallard usage is confined primarily to vegetated snow goose eatouts through the marsh, and to the larger coves with aquatics. Our puddle duck usage would have been better with more food. Overall duck numbers are down from last year but usage is slightly improved.

Waterfowl nesting was worse than ever. We suspect 1 brood of wood ducks was raised on the refuge and locals driving to work reported 2 broods of blacks. We never saw a duck that we felt we had grown.

Coots - Coots on the refuge peaked out around 1,200 early in the 1966-1967 hunting season. The most ever in refuge history. In the area east of Knotts Island, more coots were around than normal. Some locals said that they had never seen so many before. The local hunger for coots helped to relieve that situation. Next to swan, coots are the favorite dish and the braver souls get over 100 by shooting them in a raft as soon as the lookouts let them know that the game wardens are gone. The fact that these birds swim ashore or within wading distance (50-80 yards) of public highways doesn't make it any better. Perhaps the more intelligent coots will survive.

2. Other Water Birds

We noticed a glossy ibis this spring. They have been present previously but never with regularity.

Cattle Egrets are becoming very common in the refuge vicinity.

Woodcocks were running around in the snow during January and February. An old woodcock and newly hatched chick were found on March 30. Wilsons Snipe are common. Following a hard freeze during early February, 4 dead Virginia Rail were found.

Shorebirds - Shorebirds seemed to be about normal.

Doves

Doves appeared about normal. Knotts Islanders shot 6 of the 24 doves we banded preseason.

B. Upland Game Birds

Quail are our upland game birds. They had a good year. We now have a known 8 coveys using on the refuge and nearby private holdings. Their habit of flying onto the refuge when flushed is endearing and allows the predators rather than hunters frequent quail meals.

C. Big Game Animals

Can't really tell how many deer we have. During January 1966 deer were in one group composed of 2 fawns, 2 does and 2 bucks. During the summer and fall of 1966 we saw 2 fawns, a doe and a 5-point buck. One deer was killed by an auto just off the refuge. Deer tracks are common around the goose bait on Live Oak Point and 4 were night-lighted on bait in October.

We've estimated deer numbers at 28-30 with some feeding off the refuge with cattle. So far we've not suspected nor heard of any deer being legally or other wise taken on Knotts Island.

D. Fur Animals, Predators, Rodents and Other Mammals

One live muskrat was seen this year. A share trapping operation in January - March 1966 yielded one kit which was released. There was one road kill.

Nutria on the goose bait, nutria in the duck traps, nutria in the marsh, nutria in the goose browse and in the woods. At the present time, few nutria are seen on Knotts Island high land.

On the causeway this year, we have seen around 100 road kills. That doesn't include the ones killed, collected, and sold to the furbuyers for about \$1.00 each. Nutria are all over the marsh but seem to be thicker in places. One stand of three-square about 5 acres in size was found which had been completely eaten off, dug out and tromped into muck. The refuge share trapper reported trapping 520 nutria. Nutria are successfully

raising young year around in this area also. These nutria make paths through the marsh so that a slow fire won't jump the path and this hinders controlled burning. One encouraging fact about the beasts, they do eat almost anything but needle-rush and tend to leave some fair size openings in the marsh. One gets the impression that a poor duck trying to nest along a canal or pond would be apt to get tromped underfoot. Whether the beasts are more help than harm is questionable and a duck trap with 1 nutria and 3 or 4 water logged ducks together tends to bias the opinion of the more objective.

Mink are present. Their abundance is not easily evaluated. We have seen about a half dozen this year, both young and old, and perhaps 20 might be a fair estimate.

Otter are less prevalent than mink. We have probably got about 6 or 7. One gets the feeling that neither otter nor mink die of old age but refuge personnel only stretch so far. We do what needs to be done first, first.

Raccoon are reasonably plentiful. Share trapping removed 75, predator control 30. We finish the year with tracks common but not overly abundant.

Oppossums are seen occasionally. Road kills on the causeway amounted to 6. Refuge personnel killed 2 and probably poisoned 10 or 15 more. The population generally seems stable.

The local story is that grey squirrels were planted on the north and south ends of Knotts Island. Several were seen on the refuge. Two young were run over just off the refuge on the causeway. Knotts Islanders haven't started hunting squirrel yet although they could legally.

Cottontails are found on marsh edges and in agricultural fields and edges. We often see cottontails and marsh rabbits in the same areas especially along Mackay Island Road. It appears that cottontails use drier marsh. Little round balls tell us that marsh rabbits are scattered through the marsh. What portion of the refuge marsh or the preferred cover types is not precisely known and will bear checking. We recently discovered that they were using up to 700 more acres of refuge than we had previously thought. Nothing like that fieldwork. Production of both species was good judging from the number of young seen during late spring and summer. Predation is taking care of many of these unharvested rabbits judging from the looks of marsh hawks circling burned marsh and fields. Balls of rabbit fuzz found frequently on high ground lacking adequate cover indicate predation on cottontails.

We've seen tracks but no grey foxes. Chances are we don't have over 3 or 4 regulars.

E. Hawks, Eagles, Owls, Crows, Ravens and Magpies

No eagles were seen and none were reported in the vicinity.

Fish and common crows are present in adequate numbers. They ate eggs on our nesting predation study almost as fast as we put them out. Minimal cover enhanced crow feasting on the eggs and may indicate the true predation of nesting ducks in this area. Although there are not too many resident crows, visitors wander in frequently.

Osprey arrival on April 8 was followed by nesting. From 2 pairs nesting on the refuge only 1 bird was suspected to have been raised to flight stage. This young bird left the nest early and its survival is questionable. After the leaves fell off the trees we found another nest that looked as if it were recently constructed. Rough weather caused three unsuccessful attempts by the same pair of birds.

Screech owls are present on the refuge. Two were heard screeching from separate points. We later hit and killed one that flew up in front of the truck after dark one evening.

F. Other Birds

Nothing of consequence.

G. Fish

The species and size composition was about the same according to fishermen. Carp spawned in the marsh on a high wind tide in late May. Spawners were so plentiful that it sounded like hogs splashing in the marsh.

H. Reptiles

Cottonmouths are abundant. Refuge personnel killed an estimated 75 without hunting for them. These snakes are killed only along roads where we have to hand brush the roadside and in fishing areas along the roads. Apparently our fishermen taste bad because we know of no snake bite or even close calls and our fishermen aren't that careful. Snakes might be scared of folks too.

We let out two special use permits for snapping turtle trapping. One trapper in North Carolina did fairly well when he could keep nutria out of his traps. Our Virginia trapper spent one week-end and quit. Turtles brought about 15¢ per lb. locally but growth rates and movement of turtles seem to render trapping unprofitable if done much oftener than once in every four years. We may have lost some revenue but we darn sure lost some turtles.

I. Disease

No disease was noted. Lead poisoning in swans is apparent. One young swan examined had the remains of 35-40 shot in its gizzard.

We found 10 dead swan and estimate 25 have died on the refuge. Several of these were decomposed and actual cause of death is unknown. Since several live swan were seen showing symptoms common to lead poisoning we blamed all mortality on it. We are open-minded.

Four dead Virginia rails and 3 dead great blue herons we blamed on starvation. The rails were found during and after a hard freeze in February and 2 of the herons also perished then.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

Our causeway fire tower had a nice coat of green paint and sand added to the steps. The sides of the cab were painted. We haven't figured out how nor got nerve up to paint the top which is fairly flimsy and 100 feet above the ground.

Mackay Island Road, Hog Pen Point Road, and a trail toward Indian Creek were brushed by hand. A total of about 4 miles of trails and roads brushed with bush axes. There is an easier way.

About 100 loads of sand were loaded, spread and leveled on Mackay Island and Hog Pen Point roads.

Refuge posting was done on about 80 acres of newly acquired land, along the annual proclamation boundary and on the north portion of the refuge.

The remains of a half dozen buildings were cleaned up and dumped overboard along our eroding highland on Mackay Island proper.

New ground clearing with Soil and Moisture funds and Operating and Maintenance funds was nearly completed at the Live Oak Point area. Yet remaining are about 2 acres of clearing then the annual picking up of roots and rooting of stumps which surface overwinter.

B. Plantings

1. Aquatic and Marsh Plants

None

2. Trees and Shrubs

None

3. Upland Herbaceous Plants

None

4. Cultivated Crops

a. Refuge Farming

We planted 2 acres of buckwheat in some of our low farm ground. It drowned out when about 4 inches tall.

Millet production along side the buckwheat in an identical situation was good. Unfortunately we had only 1 3/4 acres and the Canada geese went through that in less time than it took us to plant it.

The majority of the Live Oak Point field (70 acres) and a few of the smaller fields on the upland (4 fields total 11 acres) were planted to oats browse or for green manure to hold down weed seed production.

Seventy acres of unseeded rye browse planted in 1965 were turned under for green manure.

b. Cooperative Farming

We had one cooperative farmer with a 14 acre weed patch which yielded about 160 bushels of corn.

Ten acres of wheat are in, planted by another farmer.

With some luck we should get about 55 acres planted in spring 1967. We need upland drainage, fence row clearing, and soil rehabilitation in the worst way. All we offer the farmer now is a slightly better than average chance to loose his shirt.

C. Collections and Receipts

Forty bushels of ear corn was our share of the 1966 co-operative farming operation.

D. Control of Vegetation

None

E. Planned Burning

1. General

No burning was accomplished in the 1965-1966 burning season.

At the present, old eatouts in our marsh feed most of the puddlers that we attract and retain. These eatouts represent an interruption in vegetative succession to a needle rush (Juncus Roemerianus) dominant climax. Starting in the center of a typical eatout and going to the edge, the following plants would be found:

Constant water about 4 " deep Fluctuating damp to 2 " deep

Green algae	<u>Chara Vulgaris</u>	<u>Eleocharis acicularis</u>
<u>Submerged</u>	Lemnaceae duckweeds	Water pennywort (<u>Hydrocotyle</u> species)
	<u>Eleocharis parvula</u>	

Emergent { Mild water pepper (Polygonum hydropiperoides)
Saltgrass (Distichlis spicata)
Spike rushes mainly Eleocharis smallii

Higher Marsh { Cattails - T. latifolia, T. angustifolia and hybrids
Needlerush Juncus Roemerianus
Phragmites sp.
Spartina sp.

Burning can be counted on mainly for attracting snow geese through duff removal. The marsh is generally too wet to hope for a root burn.

2. Conditions Prior to Burning

The largest area proposed for burning had not been burned since refuge acquisition. It is composed of about 1,200 to 1,400 acres. This was the only area burned in CY 1966. We burned progressively and our three burns yielded about 850 acres of burned marsh. We started in November and finished in mid-December.

3. Conditions After Burning

A maximum of 16,000 big beautiful snow geese used the area. As expected, only a surface burn was accomplished. Portions of needlerush we had hoped to burn proved to be too sparse and wind would not carry fire through them. Unfortunately our "lousy" neighbors have now burned marsh and the temptation was too much for the snow geese. As of January 20, 1967 we're lucky to count 50 daily. Our second area proposed for burning won't. Needlerush won't accumulate duff in much less than 4 years it seems.

F. Fires

We had a 1/4 acre block of pines burned over on the mainland. The fire started as a trash fire set by a refuge neighbor. The kiddies with matches set three different groups of fires along the causeway but they either burned out or were put out by the Knotts Island Volunteer Fire Department. These fires burn off electric and telephone poles along the causeway and then we're really isolated. Otherwise we would wish them well since some of our marsh needs to be burned but can't be without running a chance of loose fires.

IV. RESOURCE MANAGEMENT

A. Grazing

None

B. Haying

None

C. Fur Harvest

Our cooperative trapper caught 520 nutria and 75 raccoons. Only one small rat was caught and it was released. Portions of the refuge trapped were the causeway and Mackay Island borrow ditches and adjacent marsh. Nutria and coons were sold in the round and brought about 90¢ for nutria and \$1.75 for coons.

D. Timber removal

None

E. Commercial Fishing

None on refuge

F. Other Uses

None

V. FIELD INVESTIGATIONS OR APPLIED RESEARCH

A. Banding

Banding was a little better than usual but slow. Species banded included: Blacks 68, Mallards 22, Green-winged teal 40 and Pintail 2. No quotas were exceeded or even approached closely.

Dove banding in July-August resulted in 24 banded of which 6 were later shot on Knotts Island.

B. Predator Egg Destruction Study

Two eggs were placed at each station along 3 miles of habitat consisting of marsh canal edge 1 mile, road bed through low lying timber 1 1/2 miles and marsh road bed edge 1/2 miles. Canal edges and road bed edges through the marsh are elevated above the general marsh and would appear to be sites preferred by nesting puddlers. The timbered road bed edge transects ran through typical green timber which is potentially floodable and along which we have a portion of our wood-duck nest boxes. The eggs were placed on March 28 and April first.

Shells were noticed along roads within 24 hours after eggs were placed. Then it appeared that crows were running our transect seeking out nests in the vicinity of each nest marking stake and sometimes sitting on the stake eating eggs.

We checked the nests at 18 and 35 days. The results were identical. Three nests survived beyond 18 days and were still intact at 35 days. These eggs had fallen either into needlerush clumps or into holes with leaves covering them. The total results on 3 miles of transect were:

<u>Fate of Eggs</u>	<u>Number of Nests</u>	<u>Percent of Nests</u>
Fragments Unidentified	11	13.6
Crows Destroyed	23	28.4
Eggs Gone, No Clue	41	56.1
Raccoon	3	3.7
Unmolested	<u>3</u>	<u>3.7</u>
	81	105.5

C. Mallard-Black and Wood Duck Nesting Structures

We made 10 of the basket type and 5 cylindrical nesting structures for mallard-black nesting attempts. These structures were placed in the marsh about evenly on the sides of pools and in the marsh near pools. There was no duck usage.

Our woodduck nest boxes were checked and rebbed where required. There was no use in any of them by wood ducks.

D. Marsh Transects

Marsh transects were run for the second year. No detailed analysis has been made although the general results are similar.

VI. PUBLIC RELATIONS

A. Recreational Uses

We have bream fishing year around along the causeway by about 4 families which we know well. During the season when the entire refuge is open to fishing, bass, bream, white perch, crappie and brackish water crabs are actively sought from the bank and canal both. The presence of the cottonmouth seems to retard bank fishing but little.

Several informal visits by birders have been noticed and snow geese concentrations sometimes visible from the causeway slow down the Sunday drivers some.

B. Refuge Visitors

See following pages.

MACKAY ISLAND NATIONAL WILDLIFE REFUGE

VIRGINIA BEACH, VIRGINIA

OFFICIAL VISITORS LOG

<u>NAME</u>	<u>ORGANIZATION</u>	<u>PURPOSE OF VISIT</u>	<u>Date</u>	
			<u>Arrived</u>	<u>Departed</u>
James Dawsey	RO, Engineering, Atlanta, Ga.	Master Planning	2/9	2/15
Wm. Venema	RO, Atlanta, Ga.	Acquisition & Appraisal	2/13	Same
Ben Schaffer	Washington, D. C.	" "	2/13	Same
Joe Covington	SCS, Edenton, N. C.	Soil Survey	3/8	3/18
Bill Reed	R. O. Atlanta, Ga.	Land Acquisition	5/18	5/19
Frank Veach	SCS, Camden, N. S.	SCS Mapping	5/24	Same
George Conner	SCS, Currituck, N. C.	" "	"	"
Claudie Denton	RO, Atlanta, Ga.	Safety Demonstration & Inspection	6/9	Same
Charles Miller	FBI, Elizabeth City, N.C.	Property Theft	7/12	Same
Joe Covington	SCS, Edenton, N. C.	Visit	8/9	Same
Charles Gilcrest	Va. Waterfowl Biologist	Visit	8/11	Same
Tom Olds	River Basins Office, Raleigh, N.C.	Brief inspection	9/16	Same
L. S. Givens	RO., Atlanta, Ga.	" "	"	"
Kenneth Marek	RO., Atlanta, Ga.	Acquisition	10/13	Same
Charles Gilcrest	Va. Waterfowl Biologist	Visit	10/28	Same
Kenneth Marek	RO., Atlanta, Ga.	Acquisition	11/18	11/22

C. Refuge Participation

On October 3, Mr. Ambrosen met with the Currituck County Commissioners to get a Civil Rights Statement of Assurance and to deliver a check to Currituck County, North Carolina.

Our maintenanceman James Pittman is a member of the Creeds Ruritan Club of Creeds, Virginia.

The Assistant Manager joined the Knotts Island Volunteer Fire Dept. and helped with various festivals, work and programs sponsored by this organization. This is one of the easier methods to meet and know the more responsible citizens in this community since they are rather clannish. Refuge personnel assist informally on fires off the refuge in the refuge vicinity.

Other refuge participation was limited to Mr. Ambrosens speaking to various school and civic groups.

D. Hunting

There was no on-refuge hunting permitted.

Hunting in the refuge vicinity in southern Virginia and north-eastern North Carolina was characterized as being good with bad days rather than the reverse. Larger numbers of waterfowl were in the area throughout the season although there was very heavy hunting pressure all season. Following the opening day barrage, waterfowl generally used the large open water during the day and fed in the shallow areas after dark. This high waterfowl use and hunting success was clue both to increased numbers of ducks and the aquatics to attract and hold the birds in the Currituck Sound area.

The dove season was split. Hunter success during the first part of the season was good with shooting ability and wallet thickness the determining factors in the number of birds taken. The second season was poor with only limited wintering flocks and little hunting pressure.

E. Violations

10/17/66	T.R. Coward II & C. D. Moore	Charged: Out of season, no license possession 5 doves	Fined: \$22.00 each	Heard before: Manley West, JP Currituck Co.
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11/26/66	Allen E. White	Possession Firearms	Pending
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Just before hunting season hunters shot waterfowl, probably ducks, in Flynn's Folly and 2 - 16 gauge hulls were found in the Live Oak Point field. This buckshot was probably used on Canada geese but deer frequent the field.

On July 4th weekend a group started a TD-9 tractor at Live Oak Point and knocked a hole in bulkheading as well as taking blade scoops out of some of the driveways in that area.

On the following week-end two new batteries, \$50.00's worth, and a gas tank were stolen from a tractor locked inside of a barn at Live Oak Point. Fishermen (?) later found the gas tank and threw it on a canal bank along Mackay Island Road.

F. Safety

Regular staff and safety meetings were held with Back Bay Personnel at the refuge office. In addition, laborers were cautioned, threatened and instructed in the proper methods of doing work safely. Also we were lucky. No accidents this year.

Purchase of a 3/4 ton Max. rated hydraulic hoist for use on truck beds proved a wise investment. Oil drums and 2 and 3 bottom plows can be easily lifted and handled with the hoist.

VII. OTHER ITEMS

A new 1966 Chevy pickup replaced the one we had previously. This one has limited slip differential which is worthwhile. Perhaps my opinion could be changed when the rear-end goes bad and the truck won't move.

Assistant Manager Gil Aldridge transferred to Reelfoot NWR, Samburg, Tenn. January 3 and Roger Steiner entered on duty on January 5 from Tennessee NWR, Paris, Tenn.

The narrative and NR forms were written by Steiner, edited by Mr. Ambrosen and typed by Mrs. Ford, the lady that keeps this place going.

Respectfully submitted:

Date:

Jan. 26, 1967

Roger H. Steiner

Roger H. Steiner
Assistant Refuge Manager

APPROVED:

W. K. Ambrosen

DATE:

FEB 6 1967

Regional Office Approval (sgd) Lawrence S. Givens

Regional Refuge Supervisor

MAINTENANCEMAN - James Pittman



ASSISTANT REFUGE MANAGER - Roger Steiner





PLOWING UNDER GREEN MANURE ON LIVE OAK POINT FIELD.



NORTH CAROLINA HIGHWAY DEPARTMENT LENGTHENED THIS BRIDGE AND PROVIDED A WALKWAY FOR FISHING AT THIS POPULAR FISHING AREA

W A T E R F O W L

REFUGE MACKAY ISLAND

MONTHS OF January 1 TO April 30, 1966

(1) Species	(2) Weeks of reporting period									
	1/1	1/8	1/15	1/22	1/29	2/5	2/12	2/19	2/26	3/5
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling	750	1,000	250	50	50	10	12	100	40	
Trumpeter										
Geese:										
Canada	1,500	1,500	2,580	1,000	1,000	500	400	200	20	
Cackling										
Brant										
White-fronted										
Snow	500	500	10	10	100	20				50
Blue										
Other										
Ducks:										
Mallard	500	500	250	200	200	150	500	400	200	200
Black	900	900	900	800	900	600	1,000	950	600	500
Gadwall	5	20	10	10	10	5		4	4	4
Baldpate	100	100	100	75	75	25	25	20	20	10
Pintail	250	250	150	75	50	70	3,000	30	15	75
Green-winged teal	150	250	300	200	200	200	400	350	800	600
Blue-winged teal										50
Cinnamon teal										
Shoveler	5	5	5	5	5	10	10	5	10	5
Wood	20	20	20	20	20	5		4	5	5
Redhead										
Ring-necked										
Canvasback	250	250								
Scaup	200	200								
Goldeneye										
Bufflehead										
Ruddy	10,000	10,000	10,000		6,000			1,000		
Other										
Coots	25	25	25	25	20					

WATERFOWL
(Continuation Sheet)

REFUGE MACKAY ISLAND

MONTHS OF January 1 TO April 30, 1966

(1) Species	(2) Weeks of reporting period								(3) Estimated waterfowl: days use	(4) Production Broods: Estimated seen : total
	3/12 11	3/19 12	3/26 13	4/2 14	4/9 15	4/16 16	4/23 17	4/30 18		
Swans:										
Whistling	15	12							11,523	
Trumpeter										
Geese:										
Canada									51,900	
Cackling										
Brant										
White-fronted										
Snow									5,330	
Blue										
Other										
Ducks:										
Mallard	150	100	125	75	25	10	6	4	22,165	
Black	300	250	300	170	80	40	14	8	58,384	
Gadwall									474	
Baldpate									3,250	
Pintail	15	15							26,465	
Green-winged teal	175	500	300	300	200	150	30	6	34,872	
Blue-winged teal		300	100	100	60	90	10	10	5,040	
Cinnamon teal										
Shoveler		25		10	5				705	
Wood	5	5	5	5	5	3	2	2	972	
Redhead										
Ring-necked										
Canvasback									2,000	
Scaup									1,600	
Goldeneye										
Bufflehead										
Ruddy									199,000	
Other										
Coot:	5	5	2	2	2	10	4	4	928	
					(Over)					

	(5)	(6)	(7)	SUMMARY
	<u>Total Days Use</u>	<u>Peak Number</u>	<u>Total Production</u>	
Swans	<u>11,523</u>	<u>1,000</u>		Principal feeding areas <u>Wet marsh and protected bays</u>
Geese	<u>57,230</u>	<u>2,560</u>		
Ducks	<u>354,932</u>	<u>12,455</u>		Principal nesting areas _____
Coots	<u>928</u>	<u>25</u>		
				Reported by <u>Roger H. Steiner, Refuge Manager</u>

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).

W A T E R F O W L

REFUGE MACRAE ISLAND NATIONAL WILDLIFE REFUGE

MONTHS OF May 1 TO August 31, 1966

(1) Species	(2) Weeks of reporting period									
	5/7 1	5/14 2	5/21 3	5/28 4	6/4 5	6/11 6	6/18 7	6/25 8	7/2 9	7/9 10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	4	4	4	4	4	2	2	2	2	2
Black	3	4	4	4	4	4	4	4	4	4
Gadwall										
Baldpate										
Pintail										
Green-winged teal	6	6	4							
Blue-winged teal	10	10	5	5						
Cinnamon teal										
Shoveler										
Wood	2	5	3	3	20	20	20	20	20	20
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot	4	4								

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

WATERFOWL
(Continuation Sheet)

REFUGE WAGAH ZAVAD NATIONAL WILDLIFE RESERVE

MONTHS OF May 1 TO August 31, 1966

(1) Species	(2) Weeks of reporting period								(3) Estimated:	(4) Production
	7/16	7/23	7/30	8/6	8/13	8/20	8/27	8/31	waterfowl	Estimated
	11	12	13	14	15	16	17	4 days	days use	season total to
Swans:										Price Flight stage
Whistling										
Trumpeter										
Geese:										
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard	2	2	2	2	2	2	2	2	316	
Black	4	4	4	4	4	4	4	4	520	
Gadwall										
Baldpate										
Pintail										
Green-winged teal									112	
Blue-winged teal									210	
Cinnamon teal										
Shoveler										
Wood	20	20	20	20	20	20	20	20	2,061	4 12
Redhead										
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coot:									56	
					(Over)					

	(5)	(6)	(7)	SUMMARY
	Total Days Use	Peak Number	Total Production	
Swans				Principal feeding areas <u>Shallow flooded and weedy areas through</u>
Geese				<u>marsh and timber edges.</u>
Ducks	<u>3,219</u>	<u>30</u>	<u>12</u>	Principal nesting areas <u>Pine-hardwood timber areas</u>
Coots	<u>56</u>	<u>4</u>		
				Reported by <u>Roger H. Steiner, Refuge Manager</u>

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

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

WATERFOWL

REFUGE

MAINE ISLAND

MONTHS OF September 1 TO December 31, 19 66

(1) Species	(2) Weeks of reporting period									
	9/3 1	9/10 2	9/17 3	9/24 4	10/1 5	10/8 6	10/15 7	10/22 8	10/29 9	11/5 10
Swans:										10
Whistling										
Trumpeter										
Geese:				5		10	100	30	150	1,550
Canada										
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:	2	2	2		5	5	5	20	150	150
Mallard	4	4	3	3	15	30	75	200	500	600
Black										
Gadwall									200	150
Baldpate									40	50
Pintail										
Green-winged teal		5	10	20	50	75	100	300	400	400
Blue-winged teal								25	25	20
Cinnamon teal										
Shoveler	20	20	15	20	20	20	50	5	5	5
Wood										
Redhead									150	200
Ring-necked										
Canvasback										
Scaup										
Goldeneye										
Bufflehead										
Ruddy										
Other										
Coots								60	130	240

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

WATERFOWL
(Continuation Sheet)

REFUGE WISKEY RUN

MONTHS OF October 1 TO December 31, 1966

(1) Species	(2) Weeks of reporting period								(3)	(4)
									Estimated:	Production
	11/12 11	11/19 12	11/26 13	12/3 14	12/10 15	12/17 16	12/24 17	12/31 18	waterfowl: days use	Broods: Estimated seen : total
Swans:										
Whistling	120	1,000	1,600	2,500	2,300	3,700	1,000	2,500	107,170	
Trumpeter										
Geese:										
Canada	2,300	900	1,900	400	450	1,100	400	1,200	72,415	
Cackling										
Brant										
White-fronted										
Snow			5,500	300	4,000	13,000	15,450	16,000	365,750	
Blue										
Other										
Ducks:										
Mallard	350	625	600	700	700	700	200	400	31,954	
Black	600	1,045	1,050	1,300	1,300	1,300	600	1,100	73,657	
Cadwall							2		14	
Baldpate	1,000	900	600	300	200	110	10	30	24,500	
Pintail	40		75	30	40	40	20	20	2,135	
Green-winged teal	500	400	400	500	500	500	500	400	120,240	
Blue-winged teal	20								1,925	
Cinnamon teal										
Shoveler					5	5	5		105	
Wood	10	35	30	20	10	10	10		2,055	
Redhead										
Ring-necked	500	100	80	30	30	20	10	10	2,910	
Canvasback										
Scaup										
Goldeneye										
Bufflehead				2				2	20	
Ruddy	75			50	300	200	100	100	5,775	
Other Common Loonanser					4				20	
Coot:	350	650	650	1,200	1,100	900	400	300	41,360	
					(Over)					

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	107,170	3,700	0	Principal feeding areas _____
Geese	438,165	17,250	0	_____
Ducks	283,326	3,539	0	Principal nesting areas _____
Coots	41,860	1,200	0	_____

Reported by Roger E. Steiner, Refuge Manager

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

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

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

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge MACRAY ISLAND

Months of January 1 to April 30 19 66

(1) Species Common Name	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. Water and Marsh Birds:										
Pied Billed Grebe	Remaining		25	Jan-Feb.	10	Remaining				1,000
Great Blue Heron	Resident		10	2/25	4	Remaining				450
Cattle Egret	1	4/20	2	4/15-30	2	Remaining				5
American Egret	Resident		15	1/15-2/15	2	Remaining				180
Green Heron	20	4/10	30	4/20	10	Remaining				100
American Bittern	1	3/20	2	4/1	1	4/30				12
Ring Rail	Resident	Occasional sightings								
Virginia Rail	"	"	"	"						
Sora Rail	"	"	"	"						
Florida Gallinule	1	2/8	Only one seen							
Glossy Ibis	8	4/12	8	4/12	2	4/25				10
II. Shorebirds, Gulls, and Terns:										
Killdeer	Remaining		12	1/18	Remaining					25
Woodcock	1	2/10	10	March	2	Remaining		1 known	1 known	20-30
Common Snipe	Resident		50	Jan-Feb.	10-20	Resident				500
Greater Yellow legs	Remaining		10	Jan-Mar 15						40
Herring Gull	Remaining		5	Jan-Mar						20
Ring billed gull	"		35	" "						100
Great black back gull	"		5	" "						20

(over)

(1)	(2)	(3)	(4)	(5)	(6)	
III. <u>Doves and Pigeons:</u> Mourning dove White-winged dove	Remaining	20	April	Remaining	25	
IV. <u>Predaceous Birds:</u> Golden eagle Duck hawk Horned owl Magpie Raven Crow						
Osprey	Remaining 2	300 4	March 4/12	100 4	Resident * Resident 0	500 3
Sparrow Hawks	Remaining	15	Jan-Feb.	4	Resident	15
Marsh Hawks	Remaining	5	Jan-Feb 15	2	Resident	10

* Crows use refuge and adjacent areas.

* Crows use refuge and adjacent areas.

Reported by Rose H. Steiner, Refuge Warden

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

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

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

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge MACRAY ISLAND

Months of May 1

to August 31

19 66

(1) Species	(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Used days
I. <u>Water and Marsh Birds:</u>										
Pied Billed Grebe	Remaining		10	5/10	1	8/5				440
Great Blue Heron	Resident		4	5/10	1	8/31				400
American Egret	Resident		50	8/7	Remaining					1,140
Little Blue Heron	4	5/10	16	8/20	Remaining					940
Green Heron	Remaining		12	7/19	Remaining					2,500
Black Crowned Night Heron	1	8/2	1	8/2	1	8/2				10
King Rail	Resident	Occasional sightings						10	30	1,200
Virginia Rail	Resident	Occasional sightings						10	30	1,200
Cattle Egrets	Remaining		19	7/22	Remaining					175
Glossy Ibis	Remaining		3	8/10	3	8/10				150
II. <u>Shorebirds, Gulls, and Terns:</u>										
Kill Deer	Remaining		5	5/8	1	8/25				120
Woodcock	Resident		3	5/10	1	7/15		2	4	300
Common Snipe	Resident	Occasional sightings only						3	10	50
White Rumped Sandpiper	Remaining		10	8/20	Remaining					200
Laughing Gull	7	5/8	7	5/8	1	8/20				20
Common Tern	4	6/1	20	8/1	2	8/24				210

(over)

	(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>						
Mourning dove	Remaining	200	8/31	Remaining	40	100
White-winged dove						12,000
IV. <u>Predaceous Birds:</u>						
Golden eagle						
Duck hawk						
Horned owl						
Magpie						
Raven						
Crow	Resident	20	7/10		10	30
Osprey	Remaining	5	7/10	1	3	1
Screech Owl	Resident	1	6/10	Remaining		
						4,200
						360
						240

Reported by Roger H. Steiner, Refuge Manager

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

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

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

MIGRATORY BIRDS
(Other than Waterfowl)

Refuge WACHUX TOWARD

Months of September 1 to December 31 19 66

(1) Species		(2) First Seen		(3) Peak Concentration		(4) Last Seen		(5) Production			(6) Total
Common Name		Number	Date	Number	Inclusive Dates	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Use
I. Water and Marsh Birds:											
Pied Billed Grebe	Remaining			25	12/23/66	12	12/31				1,200
Horned Grebe	1	11/10		1	11/10	1	11/10				5
American Egret	Remaining			12	9/15	Remaining	12/31				950
Little Blue Heron	Remaining			10	9/10	5	11/5				300
Green Heron	Remaining			2	9/10	2	9/10				30
Great Blue Heron	Remaining			12	12/31	12	12/31				900
Black-crowned Night Heron	Remaining			25	11/15-12/8	12	12/20				1,000
Cattle Egrets	Remaining			10	11/20	1	11/30				450
King Rail	Resident		Occasional Sightings								500
Sora Rail	Resident		"		"						500
Virginia Rail	Resident		"		"						500
American Bittern				5	9/1-11/1						600
II. Shorebirds, Gulls, and Terns:											
Killdeer	Remaining			5	9/7	4	9/30				150
Woodcock	Remaining			2	12/23	1	12/31				600
Common Snipe	Remaining			7	11/1	6	12/31				4,500
White Rumped Sandpiper	Remaining			5	9/5	5	9/5				25
Common Tern	Remaining			12	10/1	12	10/1				300
Laughing Gull	Remaining			20	9/7	Remaining					1,200
Great Black-backed gull	2	10/7		25	11/19	10	12/31				1,350
Sanderling	14	9/15		40	12/10	20	12/20				2,000
Greater Tallowlegs	1	9/15		5	11/19	2	12/20				600

(over)

	(1)	(2)	(3)	(4)	(5)	(6)	
III. <u>Doves and Pigeons:</u>							
Mourning dove	Remining		63	9/1	20	12/31	4,000
White-winged dove							
IV. <u>Predaceous Birds:</u>							
Golden eagle							
Duck hawk							
Horned owl							
Magpie							
Raven							
Crow	Resident		70	12/20	60	12/31	4,000
Osprey	Remining		2	9/15	1	9/30	45
Screech Owl	Remining		2	9/15	2	9/15	30
Red Tail Hawk	2	12/20	2	12/20	2	12/20	2
Marsh Hawk	1	9/1	7	12/1-30	5	12/31	620
Sparrow Hawk	1	9/15	4	11/15	2	12/31	360
Red shouldered Hawk	1	9/1	1	9/10-12/20	1	12/20	120

Reported by Roger E. Schaner, Refuge Manager

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

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first migration record for the species for the reporting period.
- (3) Peak Numbers: Estimated number and inclusive dates when peak population of the species occurred.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated species days use (average population X no. days present) of refuge during the reporting period.

3-1750b
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 NECKAI ISLAND

For 12-month period ending August 31, 19 66

Reported by Major H. Stainer

Title Refuge Manager

(1) Area or Unit Designation		(2) Habitat Type Acreage		(3) Use-days	(4) Breeding Population	(5) Production
Figures on water- fowl use include 756 acres water closed adjacent to Mackay Island Refuge.		Crops	164	Ducks	729,393	8
		Upland	1,216	Geese	327,810	12
		Marsh	5,022	Swans	31,178	
		Water	720	Coots	2,534	
		Total	7,122	Total	1,090,915	12
		Crops		Ducks		
		Upland		Geese		
		Marsh		Swans		
		Water		Coots		
		Total		Total		
		Crops		Ducks		
		Upland		Geese		
		Marsh		Swans		
		Water		Coots		
		Total		Total		
		Crops		Ducks		
		Upland		Geese		
		Marsh		Swans		
		Water		Coots		
		Total		Total		
		Crops		Ducks		
		Upland		Geese		
		Marsh		Swans		
		Water		Coots		
		Total		Total		
		Crops		Ducks		
		Upland		Geese		
		Marsh		Swans		
		Water		Coots		
		Total		Total		
		Crops		Ducks		
		Upland		Geese		
		Marsh		Swans		
		Water		Coots		
		Total		Total		

(over)

INSTRUCTIONS

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

- (1) Area or Unit: A geographical unit which, because of size, terrain characteristics, habitat type and current or anticipated management practices, may be considered an entity apart from other areas in the refuge census pattern. The combined estimated acreages of all units should equal the total refuge area. A detailed map and accompanying verbal description of the habitat types of each unit should be forwarded with the initial report for each refuge, and thereafter need only be submitted to report changes in unit boundaries or their descriptions.
- (2) Habitat: Crops include all cultivated croplands such as cereals and green forage, planted food patches and agricultural row crops; upland is all uncultivated terrain lying above the plant communities requiring seasonal submergence or a completely saturated soil condition a part of each year, and includes lands whose temporary marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) Breeding
Population: An estimate of the total breeding population of each category of birds for each area or unit.
- (5) Production: Estimated total number of young raised to flight age.

3-1752
Form N-2
(April 1946)

UPLAND GAME BIRDS

Refuge MACKAY ISLAND

Months of January 1

to April 30

, 1966

(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	No. broods obs'd.	Estimat- ed Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob-White Quail	Agricultural Fields, Edges open hardwoods	18			Est. 50/50	0	0	0	70	

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 N-2
(April 1946)

UPLAND GAME BIRDS

Refuge MACRAY MARSH

Months of May 1 to August 31, 1966

(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	no. broods obs'd.	Estimat- ed Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob White Quail	1,380 acres of croplands, cutover timber and pine thickets	3.3	5	350	60% M 40% F	0	0	0	420	Broods brought off during spring and summer without undue harsh weather

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 MALIBU ISLAND

Months of September 1 to December 31, 19 66

(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'd.	Estimated Total	Percentage	Hunting	For Re- stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Bob white quail	Timber & brush 200 acres Croplands and fallow 130 acres Edges, fence rows etc. 50 acres		2	70	Est. 50/50	0	0	0	150	Range of some coveys include non-refuge lands. Survey method - covey count. Total range of quail has not been determined and quite possibly we don't know about all of them.

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 GA

Refuge MACKAY ISLAND

Calendar Year 1966

(1) Species	(2) Density	(3) Young Produced	(4) Removals				(5) Losses			(6) Introductions		(7) Estimated Total Refuge Population		(8) Sex Ratio
			Hunting	For Re- stocking	Sold	For Research	Predation	Disease	Winter Loss	Number	Source	At period of Greatest use	As of Dec. 31	
White Tail deer	Most timber areas Pine hardwood All fields and edges Over 1,000 acres of marsh	8	0	0	0	0	0	0	0	0	0	30	23	Est. 2/50

Remarks: Population estimate based on tracks and sighting of 6 different deer in 1 group in January 1966. Two young probably twins, seen fall of 1966. The areas under covertypes are those areas in which deer tracks have been seen. Usage of the marsh seems rather limited. Actual marsh usage and extent of usage bears checking.

Reported by Roger H. Steiner, 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 each species on the refuge at period of its greatest abundance and also as of Dec. 31.
- (8) SEX RATIO: Indicate the percentage of males and females of each species as determined from field observations or through removals.

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge

Year ending April 30, 1945

(1) Species	(2) Density		(3) Removals					(4) Disposition of Furs					(5) Total	
Common Name	Cover Types & Total Acreage of Habitat	Acres Per Animal	Hunting	Fur Harvest	Predator Control *	For Re- stocking	For Re- search	Share Trapping			Total Refuge Furs Shipped	Furs Donated	Furs Destroyed	Popula- tion
								Permit Number	Trappers Share	Refuge share				
Badger	Marsh & woods, 5,000 acres	20		75	30			1-5-34	75	0				200
Beaver	Marsh & flooded timber 4,500 acres	3		520				1-6-34	520	0				1,500
Bobcat	Marsh & woods 7,000 acres	700							None	None				10
Coon	Marsh & timber 200 acres	500			1									4
Jackrabbit	Isolated shrub marsh 300 acres	30							None	None				10
Gray Squirrel	Agricultural edges and timber 100 acres	10												10
Opussum	Marsh & woods 7,000 acres	100												100
Skunk	Marsh, agricultural edges 150 acres	1.5												100
Marsh Rabbit	Marsh, timber edges 250 acres	1.7												150
Otter	Marsh, woods 720 acres	72												7

* List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS:

Reported by Robert A. Steiner, Refuge Manager

INSTRUCTIONS

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

- (1) SPECIES: Use correct common name. Example: Striped skunk, spotted skunk, short-tailed weasel, gray squirrel, fox squirrel, white-tailed jackrabbit, etc. (Accepted common names in current use are found in the "Field Book of North American Mammals" by H. E. Anthony and the "Manual of the Vertebrate Animals of the Northeastern United States" by David Starr Jordan.)
- (2) DENSITY: Applies particularly to those species considered in removal programs. Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottom land hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.
- (3) REMOVALS: Indicate the total number under each category removed since April 30 of the previous year, including any taken on the refuge by Service Predatory Animal Hunter. Also show any removals not falling under headings listed.
- (4) DISPOSITION OF FUR: On share-trapped furs list the permit number, trapper's share, and refuge share. Indicate the number of pelts shipped to market, including furs taken by Service personnel. Total number of pelts of each species destroyed because of 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.

Refuge PACIFIC ISLANDYear 1966

Botulism

Period of outbreak None

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	_____	_____

(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 _____

Lead Poisoning or other Disease

Kind of disease Lead poisoningSpecies affected Whistling Swan, fall & winter 1966

Number Affected

Species	Actual Count	Estimated
Whistling Swan	10	25
_____	_____	_____
_____	_____	_____

Number Recovered UnknownNumber lost Counted 10 dead on refuge, est. 25Source of infection Off refuge, shoals and shallow waterWater conditions Water levels variable (normal)Food conditions Generally good on aquatics perimeter of refuge.

Remarks Injured lead off refuge, died on refuge. One immature found with remains of about 40 shot in gizzard. Only 1 swan dissected. Numerous others showed symptoms of lead poisoning. Total mortality during this period of mild weather should be low from causes other than poisoning.

PUBLIC RELATIONS
(See Instructions on Reverse Side)

Refuge ACOMI IslandCalendar Year 1966

1. Visits
 a. Hunting 0 b. Fishing 3,000 c. Miscellaneous 20,325 d. TOTAL VISITS 23,325

1a. Hunting (on refuge lands)

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl	0		
Upland Game	0		
Big Game	0		
Other	0		

Number of permanent blinds 0Man-days of bow hunting included above 0
 Estimated man-days of hunting on lands adjacent to
 refuge 5,000

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

TYPE OF AREA	ACRES	MILES
Ponds or Lakes	453	
Streams and Shores		

1c. Miscellaneous Visits

Recreation 20,300 Official 25
 Economic Use 90 Industrial 0

2. Refuge Participation (groups)

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

3. Other Activities

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

INSTRUCTIONS

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

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

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

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

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

Other - INCLUDE crow, fox, and similar hunting.

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

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

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

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

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

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

NONAGRICULTURAL COLLECTIONS, RECEIPTS, AND PLANTINGS

(1)

Refuge

MIDWAY ISLAND

Year 1966

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
FOUR													

- (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: _____

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

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge WACHAMUN ISLAND County Currituck State North Carolina

Cultivated Crops Grown	Permittee's Share Harvested		Government's Share or Return				Total Acreage Planted	Green Manure, Cover and Water- fowl Browsing Crops Type and Kind	Total Acreage
	Acres	Bu./Tons	Harvested		Unharvested				
			Acres	Bu./Tons	Acres	Bu./Tons			
Rye, browse	0	0	0	0	70	105 tons	70	70 acres rye and woods green manure 1.5 tons per acre	70
Corn, hybrid yellow	10.5	120 bu.	3.5	40 bu.	0	0	14		
Japanese millet	0	0	0	0	1.5	37 bu.	1.5	Japanese millet 37 bu.	1.5 acres
								Fallow Ag. Land	39

No. of Permittees: Agricultural Operations 1 Haying Operations 0 Grazing Operations 0

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
				1. Cattle				
				2. Other				
				1. Total Refuge Acreage Under Cultivation				85.5
Hay - Wild				2. Acreage Cultivated as Service Operation				71.5

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

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

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

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

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

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

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

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

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

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

REFUGE GRAIN REPORT

Refuge MCCRAY ISLAND

Months of January 1 through December 31, 1951 66

(1) VARIETY*	(2) ON HAND BEGINNING OF PERIOD	(3) RECEIVED DURING PERIOD	(4) TOTAL	(5) GRAIN DISPOSED OF				(6) ON HAND END OF PERIOD	(7) PROPOSED OR SUITABLE USE*		
				Transferred	Seeded	Fed	Total		Seed	Feed	Surplus
Yellow hybrid ear corn	0	40	40			20	20	20	0	0	0

* (8) Indicate shipping or collection points Refuge production, share cropping

(9) Grain is stored at Live Oak Point barn, Mackay Island Refuge

(10) Remarks Is used and required for waterfowl banding bait.

*See instructions on back.

REFUGE GRAIN REPORT

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

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

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

Refuge HOLLOMAN FLATS Year 1956

Total acreage cut over.....

Total income.....

No. of units removed B. F.

Method of slash disposal.....

Cords.....

Ties.....

(9/63)

Bureau of Sport Fisheries and Wildlife

Refuge

MCMY ISLAND

ANNUAL REPORT OF PESTICIDE APPLICATION

Proposal Number

Reporting Year

1966

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

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

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