

BLACKWATER

NARRATIVE REPORT

JANUARY - DECEMBER 1965

Blackwater National Wildlife Refuge

Narrative Report

1965

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U. S. Department of the Interior

Fish and Wildlife Service

Bureau of Sport Fisheries and Wildlife

Blackwater National Wildlife Refuge
R.F.D. #2 Cambridge, Maryland

Established January 23, 1933
Total Acreage - 11,216

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I. General

A. Weather Conditions.

January. The first month of the new year had very changeable weather as noted by the temperature extremes ranging from a high of 61 degrees on the 9th to a low of -7 degrees on the 18th. Water areas of the refuge froze up during the cold weather in the middle part of the month. Pond areas increased steadily in water depth throughout January. Heaviest snowfalls were on the 16th and the 30th; 3" falling on each day, while precipitation for the month totaled 3.22 inches.

February. Temperatures during February were again very variable, ranging from a high of 70 degrees on the 8th to a low of 10 degrees on the 1st and again on the 20th. Snowfall which amounted to 4.00 inches fell mostly during the middle part of the month. On February 25, stop logs in the Dieffenbach Pool unit were removed to facilitate drainage of agricultural fields and the area adjacent to the Visitor Center since the gauge readings were quite high. Total precipitation for the month was 2.82 inches which is below normal for the area.

March. Precipitation during March totaled 4.43 inches with a snowfall of 3" on the 20th. Temperatures ranged from a high of 63 degrees on the 1st to a low of 21 degrees on the 21st, while for the entire month temperatures averaged 5 degrees below normal. Draining of the Dieffenbach Pool unit continued for Spring and Summer plantings. Gauge readings in other refuge pool units remained at a high level.

April. Temperatures remained on the cold side during April with daytime temperatures averaging between 55 degrees and 60 degrees or 10 degrees below normal. High temperature for the month was recorded at 80 degrees on the 12th and low temperature was 25 degrees on the 1st. Precipitation during the month totaled 3.18 inches, slightly below normal. Soil moisture conditions were such that plowing was feasible on certain refuge agricultural fields during April.

May. While temperatures were near normal during May, precipitation at Blackwater was far below normal. Maximum temperature was recorded on the 27th at 90 degrees, with the minimum occurring on the 31st at 47 degrees. Precipitation for the entire month totaled only 0.43 inches. This lack of rainfall resulted in the fresh water ponds dropping to normal summer levels, and also brought about an ideal condition for corn planting early in the month. The Dieffenbach Pool unit was completely drained by the end of May.

June. Both temperatures and rainfall were near normal during June. Rainfall amounted to 3.28 inches occurring mainly during the first half of the month. A record low temperature of 49 degrees was set for the date June 15 at Blackwater. High for the month was 92 degrees recorded on the 29th. Fresh water pond levels remained approximately normal for this time of year.

July. Above normal precipitation characterized the month of July at the refuge, with a total rainfall of 5.47 inches. This amount was sufficient to hold water at good levels in the fresh water areas. Tides were mostly above normal due to the prevailing southwesterly winds. Temperatures were near normal with a high of 95 degrees on the 25th and a low of 52 degrees on the 21st.

August. Rainfall during August totaled 5.83 inches, above normal for the month. Temperatures however, averaged near normal with daytime highs near 90 degrees and nighttime lows around 65 degrees. Extreme temperatures were a high of 93 degrees on the 16th and a low of 49 degrees on the 30th. Tides for the second successive month have remained above normal due to prevailing winds from the south and southwest. Soil moisture was a bit high for the planting of buckwheat but with little difficulty the crop was on schedule.

September. Hot, dry weather would be an accurate summation of conditions at Blackwater during September. On several days the temperatures reached the 90's with a high of 92 degrees on the 19th. The month's low was 45 degrees on the 26th. Rainfall totaled 2.76 inches, below normal for the month, and the water levels in the fresh water pools began dropping near the end of September.

October. Drought conditions prevailed during the month of October with a total rainfall of but 1.25 inches. Temperatures averaged normal or slightly higher with highs in the 70's during the day and lows down to around 40 degrees at night. Temperature extremes were a high of 77 degrees on the 21st and a low of 26 degrees on the 30th. Fresh water pond levels continued dropping because of the lack of sufficient rainfall.

November. This was the driest November on record at the Blackwater Weather Station with only 0.27 inches of rainfall being recorded. Gauge readings in the fresh water impoundments began dropping much more rapidly with readings of 2.06 feet in Headquarters Pond #2 and 1.01 feet in Kuehnle Tract Pool at the end of the month. Seasonable temperatures occurred during most of November with extremes being a high of 73 degrees on the 7th and a low of 22 degrees on the 20th.

December. Dry conditions continued for the fourth consecutive month as only 0.80 inches of precipitation were recorded during December. Normal precipitation for October, November, and December is 13.89 inches while precipitation for these three months of 1965 shows only 2.32 inches or a deficit of 11.57 inches. These conditions have caused the fresh water impoundments to reach an extremely low level. Dieffenbach Pool #3 is completely dewatered while Headquarters Pond #2 read 1.96 feet and Kuehnle Tract Pool #4 read 1.00 feet at the end of December. Temperatures were on the mild side throughout most of the month with a change to more seasonal weather with a trace of snow on the 21st. High for the month was 68 degrees on the 31st, and low was 17 degrees on the 22nd.

<u>Precipitation</u>			<u>Max.</u> <u>Temp.</u>	<u>Min.</u> <u>Temp.</u>
<u>Snowfall</u>	<u>This Month</u>	<u>Normal</u>		
January	7.0	3.22	61	-7
February	4.0	2.82	70	10
March	3.0	4.43	63	21
April		3.18	80	25
May		0.43	91	47
June		3.28	92	48
July		5.47	95	52
August		5.83	93	49
September		2.76	92	45
October		1.25	77	26
November		0.27	73	22
December	T	0.80	68	17
Totals	14.0	33.74	95	-7

B. Habitat Conditions.

1. Water. Precipitation for the first nine months was near normal and all water levels in the fresh water ponds were sufficient for both nesting and resting waterfowl. However, as mentioned in the weather section above only 2.32 inches or a deficit of 11.57 inches was recorded for the remaining three months of the period. This factor caused the impoundments to reach extremely low levels and prevented the flooding of the Dieffenbach Pool unit bottom. This low water condition resulted in heavier waterfowl use of the marsh areas.

Pond and river tides were near normal except during the heavy northwest winds in the winter which dropped the tides abnormally. There were no damaging hurricanes to report during 1965. Ice conditions were present on all the ponds and rivers early in January and February when the low temperature reached -7 degrees. November and December were very mild with very little ice conditions present during the two month period. Snowfall for the year was 14.0 inches and was recorded in the first three months of the year.

2. Food and Cover. Excellent crops were present for wildlife use prior to the Fall migrations. Controlled burning was carried out in early January and provided additional food. The aquatics in our tidal marshes were in excellent supply and this natural growth provided food for many of the diving waterfowl which prefer the larger water areas. The following planted crops were available for waterfowl use in 1965: 77 acres Ladino clover, 136 acres buckwheat, 120 acres corn, 122 acres millet, 20 acres sorghum, 285 acres ryegrass and 57 acres wheat. An estimated 17,730 unharvested bushels of hot food were available for waterfowl and other wildlife. All the green browse and most of the hot food had been consumed by the end of the period due to the heavy waterfowl use during the fall migration. The mild weather of the Fall and winter resulted in only minor off-refuge feeding of waterfowl, and for the first time in many years large amounts of corn was left in the fields. Normally the waterfowl use these areas and pick the fields clean prior to the hunting season. This also resulted in the poorest hunting season for the area on record.

II. Wildlife

A. Migratory Birds. Waterfowl production was approximately equal in numbers to that of 1964. Individual species, however, showed some fluctuations. Mallard production was up 116 birds and Black Duck production was up 100 birds over the previous year; while 225 fewer Blue-Winged Teal were noted in 1965. An interesting fact is that one Canada Goose brood of 5 birds was observed, the first since 1962, when 2 broods were seen.

Populations of Canada Geese were higher this year at Blackwater during the Fall months than at the same period last year. The peak was reached at 80,000 early in December but a population of approximately 70,000 was held steadily from early October through mid-December. There was much less fluctuation in numbers of geese than there was in the Fall of 1964.

Both Snow Geese and Blue Geese showed a very large increase at the refuge with a peak of 350 Snows and 600 Blues early in December. This is about a three-fold increase over the 1964 peak.

Ducks reached their greatest numbers at Blackwater during the second week in December when 101,275 birds were counted. This number is about 10,000 less than the peak concentration in 1964, but total duck use-days of the refuge increased because large numbers stayed here over a longer period of time.

Mallards arrived in large numbers late in October and reached a peak of 45,000 birds in December. This species could frequently be observed feeding in the refuge grain fields right along with the geese. Our Mallard population at it's height was 25,000 birds over the largest number observed last year.

Another species that showed a large increase at Blackwater was the Black Duck. They arrived in large numbers a little later (due to the mild Fall) and reached a peak of 35,000 birds in December. Blacks much prefer the refuge marsh areas to the grain fields although they do feed in the fields occasionally. Last year the largest concentration of Black Ducks was 20,000, or an increase at the peak of 15,000 birds in 1965.

Pintails were not observed at the refuge in nearly as large numbers as the previous year. Two probable reasons for this was the lack of bad weather in the bays and large water areas and also the fact that the Dieffenbach unit where they usually are observed was dry the entire Fall. Peak concentration of Pintails during the Fall was 3,000 birds in late November compared to a peak of 20,000 last year.

Green-Winged Teal arrived early in October and built up to a peak concentration of 15,000 birds by November. Although this was 5,000 birds less than last year's peak, the Teal stayed at the refuge in large numbers much longer; there being 8,000 on the refuge through late December. The reason for this is believed to be the mild Fall weather this year. More Green-Winged Teal than usual showed up in hunter's bags this hunting season due to their prevalence and the lack of good hunting conditions for other species.

Blue-Winged Teal, an early migrant, was first observed in mid-August. The peak concentration was reached late in September (4,000) and by early November most of these birds had departed for points further south.

The American Widgeon or Baldpate hit a peak population of 10,000 early in November. Last years largest count of these birds was 20,000 or a decrease in peak numbers during 1965 of 50%.

Gadwall are usually observed on the refuge during their Fall migration but such was not the case this year. The dry conditions in the Dieffenbach bottom is a likely reason for their not stopping at Blackwater on their trip south.

Approximately 50 Wood Ducks, on the average, were present on the refuge this year, mainly observed during the Summer and early Fall. There was no significant change in numbers of wood duck from last year.

Diving ducks such as Canvasback, Redheads, Ringnecks and Scaup were noted in approximately the same numbers as previous years. Other species observed in small numbers include Goldeneye, Bufflehead, Ruddy, Swan and Coot.

The total waterfowl use days on the refuge was 16,293,995 for the 12 month period ending August 31, 1965. This was 1,626,460 more than the same period in 1964.

Mourning Doves reached a peak of 1,000 birds during September. They feed mostly in the grain fields of corn, buckwheat, and soybeans. Hunting success was fair for this species adjacent to the refuge.

B. Upland Game Birds.

The refuge continued to support a large number of Bob-White Quail (*Colinus virginianus virginianus*), during 1965. We estimate the population at 1,000, found primarily in the Dieffenbach Pool unit and the wooded areas of Kentucky Swamp. Excellent food crops grown at Blackwater plus good cover at all times have resulted in this large Quail population. The Bob-White is not a heavily hunted species in this area of Maryland.

C. Big Game Animals.

A sizeable increase in numbers of White-Tailed Deer (*Odocoileus virginianus*) was noted during the year at Blackwater. The State had a week of Buck hunting and a two day Doe season this year with one deer of either sex being the hunter's limit. A total of 492 Buck and 168 Doe were taken in Dorchester County, however few deer were taken adjacent to the refuge. There were fewer hunters trying for deer in this area this year than last. The deer sighted in the refuge area appear to remain in fine physical condition, a probable result of good food and habitat available to them on the refuge. Numerous deer trails and signs throughout the marsh and woodland areas lead the refuge staff to estimate the population at the end of the period to be 250 animals.

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

1. Muskrat. Population was estimated at 6,800 on the refuge marshes during the annual survey in November, 1964. A total of nine trapping units were recommended and approved for trapping. 1,388 muskrats were removed during the 1965 season. A survey conducted in November, 1965 showed the population to be approximately 7,000 and the same areas have been recommended and approved for trapping during the 1966 season beginning January 1. It has been found that for the past several years that areas adjacent to the dikes and roads show substantial populations each year although under heavy trapping pressure and a good harvest. We believe this is due to the protection the muskrat gain in the dikes and roads from predators, storms and other weather conditions. Excellent food and cover is present on all the marsh areas. See tabulation of removal by units under Section C of Resource Management.

2. Raccoon. Raccoon (*Procyon lotor*) population remains very dense with an estimated 700 present on the refuge. The animals are scattered throughout all refuge areas, however the largest concentrations are in the Kuhnle Tract, Kentucky Swamp, McGraw's Island, and Headquarters areas.

This predaceous animal destroyed several duck nests at Blackwater during the nesting period in May and it is felt that the refuge's concentration of raccoon is too large for the refuge area at the present time.

3. Red Fox. The Red Fox (*Vulpes fulva*) population, an estimated 60 animals, continues at a relatively high level on the refuge. The Dieffenbach Pool, Kuehnle Tract, and Marsh Island areas are the favorite haunts of the Red Fox at Blackwater. Population estimate of the fox was made by observing tracks, droppings, waterfowl kills, and some animals killed by auto on the road areas.

4. Squirrel. Three species of squirrel are found at Blackwater, the Flying Squirrel (*Glaucomys volans*), the Gray Squirrel (*Scuirus carolinensis*) and the Delmarva Peninsula Fox Squirrel (*Scuirus niger bryanti*). The Bryant Fox Squirrel is a rare subspecies known only to this type locality on Maryland's Eastern Shore. Its numbers have been declining in recent years, and at present we estimate 100 to be present on the refuge along with 200 Gray squirrels. Habitat at Blackwater for squirrels is good and the acorn crop in the forest appears adequate to their needs. Presently the Refuge Timber Mgt. Program is being studied in order to attempt to modify it to fit the needs of the Fox Squirrel.

5. Rabbit. The Cottontail Rabbit (*Sylvilagus floridanus mallurus*) population has not appreciably changed at Blackwater from its status of last year. An estimated 500 rabbits were using the refuge at the end of the year. It is believed that the refuge has sufficient food and cover to support this size population.

6. Skunk. The Skunk (*Mephitis nigra*) population is relatively low on the refuge now compared with five years ago. We continue to estimate 70 animals and have made very few sightings of skunk in the past year.

7. Miscellaneous Fur Bearers.

1. Opossum. The Opossum (*Didelphis virginiana*) remains on the refuge in approximately the same numbers as last year (170 animals). Occasionally one is seen crossing the refuge roads at night or is seen killed on the roads.

2. Otter. The Otter (*Lutra canadensis*) population is quite high at Blackwater. We estimate 40 Otter use the refuge and an unusual sighting of 7 Otter at one time was made in the new dike barrow pit area recently. Heavy Otter activity is also noted in the Kuehnle Tract, Harpers Pond, and Keens Ditch areas of the refuge.

3. Nutria. The Nutria (*Myopotanus coypii*), an introduced animal to this area, increased slightly during the last year. At the end of December, we estimated 200 animals on the refuge with most of these concentrated in certain areas, such as Harpers Pond, Round Pond and Kuehnle Tract.

No major management problem is presented by this species at this time, but we will make every effort, as in past years, to trap as many as possible and hope that severe winter conditions will further reduce numbers of Nutria. Complete eradication is impossible by trapping methods on the refuge, because there is an influx from neighboring private marshes.

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

1. Hawks. The Hawks are usually most plentiful during the Fall and Winter months with the Marsh Hawk the most numerous. The other hawks, listed in accordance with their abundance, include the Sparrow Hawk, Red-Tailed, Red-Shouldered, Coopers and Sharp-Shinned Hawk. The Pigeon Hawk was also recorded.
 2. Eagles. The Bald Eagle was observed throughout the year on the refuge at a relatively even population of 9 birds. With the heavy use of the dike system during the summer and fall months, due to the construction on the Old Mill Road, the eagles moved from their usual resting area near the dikes but returned shortly after the construction was completed and the dikes closed to traffic. No nesting of the Bald Eagles has been observed on the refuge during the year, but it is suspected that a pair are now attempting to nest on the refuge near the Kuehnle Tract. The Golden Eagle was observed on several occasions during the Fall months.
 3. Owls. The Barn Owls are the ones most observed on the refuge and the nesting of this species still takes place each year in one of the buildings at the Headquarters complex. Other owls observed on the refuge during the year included the Great Horned Owl, Short-eared Owl and the Screech Owl.
 4. Crows. Crows are common on the refuge throughout the year with a peak concentration of 700 recorded in May. This population dwindled to some 300 during the Fall, but rose to approximately 500 by the end of December.
- F. Other Birds. No report.
- G. Fish. Two commercial permits were issued during the period to local fishermen. The population of Carp seem to be numerous.
- H. Reptiles. Several large Snapping Turtles were observed in and around the Headquarters Pool.
- I. Diseases. None to report.

III. Refuge Development and Maintenance

A. Physical Development.

Blackwater:

Work continued on the Visitor Center with additional landscaping, installation of new signs, construction of Visitor Register, purchase of draperies, installing exhibit panels, widening of roadway, marking of parking area and planting of numerous shrubbery and plants prior to the "Open House" on November 21.

Repairs have been performed on several of the roads and dikes during the year. Slag was placed on the Kuehnle Tract dike roadway.

Maintenance of the Dieffenbach Pool and West Side Dike was performed with reseeding the edges after the placing of fill and top soil on a portion of these areas.

Repairs have been performed and daily maintenance carried out on much of the farming equipment, floating equipment and vehicles used in the varied management activities of the refuge.

A new heating unit was purchased and installed in Quarters #3.

Reposting of refuge boundaries was performed prior to the annual hunting season.

Refuge lawns and grounds have been mowed at intervals until killing frost arrived late in October. The addition of the grounds at the Picnic Area, Visitor Center, and new office requires many man hours to keep in first class shape.

Eastern Neck:

A new domestic water well complete with pump and conditioner was installed at Eastern Neck tenant house.

Exterior of the Club House was given a coat of paint and varnish.

Both the exterior and interior of the tenant house was painted. New septic system has been installed, old pipes replaced, and storm windows and screens installed.

Grounds were kept mowed regularly during the warm months by Blackwater Refuge personnel.

Road into Eastern Neck tenant house was given a coat of gravel during the Spring.

Martin:

A new bulkhead and docking facilities was constructed replacing the old facilities at Ewell.

A new heating unit was installed in the Government owned residence. Three chimneys were replaced and some painting has also been performed.

Recreation area at Martin had maintenance performed by clearing and grading area.

The area around the new boathouse/office was graded and lawn planted.

LCM Barge was hauled on the railway and necessary painting and maintenance performed.

Electric power line to Martin Headquarters was begun with the installation of the poles. Line will be completed when weather permits.

Susquehanna:

Maintenance work has been performed on the Patrolman's cabin with repairs to the roof and light plant. A general cleanup of the grounds of the island included the removal of trash and other debris caused by extremely high tides.

Closed water areas of the refuge were reposted with poles and boundary signs prior to the start of the annual waterfowl hunting season in November.

B. Plantings.

1. Aquatics and Marsh Plants. None this period.

2. Trees and Shrubs. Several shrubs were ordered and planted around the Headquarters building during the Beautification Week. Other shrubs and trees were ordered and planted around the Visitor Center as part of an approved landscaping plan for that area. At present all the plantings seem to have survived the dry period at Blackwater Refuge.

3. Upland Herbaceous Plants. None planted.

4. Cultivated Crops. Total refuge acreage under cultivation during 1965 was 875. Green browse and cover crops follows: Ladino clover 77 acres, ryegrass 285 acres, wheat 57 acres, and soybeans 47 acres plowed down as green manure.

Cultivated hot foods were as follows: Buckwheat 136 acres, corn 120 acres, millet 122 acres and sorghum 20 acres. Blackwater experienced an excellent growing season for Spring and Summer crops with only one dry month which was May. Fall growth of wheat and ryegrass was below normal due to the extreme drought conditions. Corn yields were above 100 bushels per acre, sorghum estimated at 80 and buckwheat at 30 bushels per acre. Millet planted in the bottom lands showed a yield of 25 bushels per acre which is only fair. Heavy rainfall during the early growth period of July and August resulted in some damage to the millet root system and caused hardening of the soil after the runoff. Ladino clover made an excellent growth due to the sufficient rainfall and regular mowings during the Spring and Summer. It was found that the Georgia 615 grain sorghum was bird resistant and no damage was observed. However, we also planted a Kentucky Dekalb variety and bird damage was estimated at 60% of the crop. It was also noted that the average yield per acre was 80+ on the Georgia 615 whereas the Kentucky variety was estimated at 50 bu./ac. We are sold on the Georgia 615 and feel we can plant a larger acreage since both the ducks and geese picked the field clean.

<u>Name of Crop</u>	<u>Field No. or Name</u>	<u>Acreage</u>
Buckwheat	A,E,L,O,Y,NC-1	136
Corn	B,D,F,J,R,S	120
Ladino Clover	C,I,P,Q,T,U,V,A-1,A-3	77
Millet	M,N,X,Z	122
Ryegrass	H,NC-2 (aerial seeding row crops)	285
Sorghum	NC-10, Bottom 10	20
Wheat	K,Kuehnle Tract	57
*Soybeans	Kuehnle Tract	47
Fallow	G	11
Total		875

*Soybeans plowed downed as green manure under Soil and Moisture Program and planted in winter wheat.

C. Collections and Receipts.

1. Seed or Other Propagules. Approximately 200 bushels of mixed grain was received from the U. S. Grain Appraisers, Baltimore, Md. during the year. 5,000 bushels of corn harvested from Eastern Neck Refuge as the refuge share under the Co-Operative Farming Agreement. 1,000 bushels transferred to Game Management Division, 1,000 bushels to Chincoteague Refuge and 400 bushels to Presquile Refuge in connection with the banding program.

The following seed was purchased and planted in refuge fields during the year.

Buckwheat.....	160	Bushels
Corn.....	22	"
Ladino Clover.....	4	"
Soybeans.....	100	"
Millet.....	150	"
Sorghum.....	1	"
Ryegrass.....	237	"
Wheat.....	100	"

D. Control of Vegetation. Broad leaved weeds in the refuge corn fields B, D, F, H, R, & S were sprayed during 1965. Target pests for the spraying were mainly Pig Weed (*Amaranthus retroflexus*), Rag Weed (*Ambrosia artemisaefolia*), (*Ambrosia trifida*) and Morning Glory (*Ipomoea lacunosa*). Treatment dates were June 4, 7, 8, and 9 when corn was 4" - 6" high. Chemical used was 2,4-Dichlorophenoxyacetic Acid with water as a carrier, applied at a rate of $\frac{1}{2}$ pint of 2,4-D and 8 gallons of water per acre by use of tractor mounted sprayer.

Cost Breakdown

Labor.....	\$150.00
Materials.....	50.00
Equipment.....	50.00
Total.....	<u>\$250.00</u>

A 90% kill estimate was made after the above treatment. Spraying increased the yield to over 100 bushels per acre whereas approximately 60 bushels per acre would have been realized if the fields had not been sprayed. No adverse effects were observed.

The co-operative farmer at Eastern Neck Island Refuge carried out approved spraying of 147 acres of corn for control of broad leaved weeds, mostly Pig Weed, Rag Weed and Morning Glory. Period of application was May 3 through May 7, with corn growth 2" to 8". Chemical used was Atrazine 80W applied at a rate of 2 lbs. per acre with 20 gallons of water as the carrier. A tractor mounted sprayer was used.

Cost Breakdown

Labor.....	\$100.00
Materials.....	700.00
Equipment.....	100.00
Total.....	<u>\$900.00</u>

An estimated 90% kill on weeds and 80% kill on grass was reported in the corn fields treated. No adverse effects were noted.

E. Planned Burning.

1. General. Control burning program during January and February 1965 consisted of 1,965 acres of marsh. They were units number 1,2,3,4,5,8,10,12,14,16,17,36,37,38 or a total of 1,965 acres. Although heavy ice conditions were present early in January and continued until late February, waterfowl were able to feed in these areas at intervals. More extensive use was noted of the areas during March and April at which time regrowth of green shoots begin to develop.

2. Condition Prior to Burning. Excellent growth of three-square (*Scirpus olineyi*) and small patches of bend grass and cattail were present on the areas burned. Marsh was very dense and ranged in height from 2 to 3 feet on an average. Waterfowl use was only minor due to heavy growth prior to burning.

3. Condition following Burning. Estimated burn was 80% since there are many ponds, creeks and guts located in the approved area. Units were burned at intervals to help supply supplementary feeding for the large concentrations of waterfowl present. All the burned marsh units were used and at times as many as 10,000 to 15,000 ducks and geese could be observed on the marsh units. Unit No. 3 adjacent to the Dieffenbach Pool continues to receive more extensive use.

F. Fires. There were no uncontrolled fires on the refuge during 1965. The fire index remained low for the first eight months, however the drought periods of September thru December raised the index to one of the highest on record. Heavy precipitation is needed to relieve this fire danger.

IV. Resource Management

A. Grazing. None to report.

B. Haying. None to report.

C. Fur Harvest. Annual fur removal program for 1965 was approved on December 18, 1964. One local trapper was issued a permit to trap an unlimited number of muskrats from Units No. 2,3,8,9,16,17, 18,19, and 36 adjacent to roads and dikes to eliminate possible damage to outside structure caused by the tunneling and burrowing of these animals. The local trapper removed 1,388 muskrats from the nine areas. Listed is a tabulation of the trapping results by units.

<u>Trapper</u>	<u>Lic. No.</u>	<u>Permit No.</u>	<u>Unit No.</u>	<u>Muskrat Catch</u>	<u>Nutria</u>
Ray Willey	86455 (MD)	T-6624	2	246	
			3	254	3
			8	79	
			9	321	
			16	62	3
			17	94	
			18	98	
			19	85	
			36	149	
Totals				1,388	6

Total share to the Government was 694 muskrats. Trapper share was 694 muskrats and 6 nutria. Government share was shipped to the New York Auction Company on April 6, 1965. Total receipts for the 647 pelts sold amounted to \$12.15. 47 were partlotted and no returns have been received as of the writing of this report.

The trapper sold his share locally and received \$903.10 for the 694 pelts. Average price received was \$1.45 per Black Pelt and \$1.19 per Brown Pelt, compared with the 1964 prices this represented a decrease since Black Pelts sold for \$1.75 to 1.90 and Brown Pelts from \$1.35 to 1.45 per pelt.

There were no raccoons or foxes removed by the local trapper in 1965. The six nutria were destroyed since there was no market for this animal.

Blackwater's Fur Management Plan has been amended to permit the sale of the muskrat pelts locally if the prices appear to be higher than those received from the New York Auction Company.

D. Timber Removal. None to report during 1965.

E. Commercial Fishing. Permits issued to local fishermen to catch fish by use of gill nets netted an estimated 1,000 pounds of carp, 800 lbs. White Perch, 200 lbs. Herring, 50 lbs. Stripped-Bass and 500 lbs. of miscellaneous types. No fishing is permitted during the waterfowl hunting season and only stipulated on the permit to guarantee no interference with the nesting of waterfowl.

F. Other Uses. None to report.

V. Field Investigation or Applied Research

A. Progress Report. A total of 4,568 waterfowl were banded during the three month program in 1965. Banding operations began January 4, 1965 and continued through March 31, 1965. A breakdown by number and species of waterfowl banded follows:

Canada Goose.....	1,196
Snow Goose.....	1
Mallard.....	2,913
Black Duck.....	402
Pintail.....	50
Ringneck.....	6
Total	<u>4,568</u>

Analyzing the cost of the Blackwater Banding Program, the breakdown follows:

1,040 Man-Hours.....	\$3,101.00
2,020 Bushels Corn.....	1,010.00
Miscellaneous (Mileage, depreciation, cost of materials).	535.26
Total.....	<u>\$4,646.26</u>

The above figures result in a cost of \$1.02 per bird banded.

Weather conditions were not the best for goose trapping this year. Temperatures were up and down with several warm periods when geese failed to use the baited sites or used them in small numbers resulting in small catches. The best condition for cannon net trapping is a long dry, cold period without rain or snow. The refuge staff received a letter of commendation on the work done in connection with the banding program in 1965.

VI. Public Relations

A. Recreational Uses. The public recreational activities of the refuge during this report period consisted of photography, bird watching, picnicking and the use of the new Visitor Center facilities.

The Visitor Center had its "Open House" on November 21 attracting some 3,000 persons. The visitors viewed the displays, watched movies and took guided tours about the refuge. The refuge personnel received many compliments that revealed their impressiveness with the new Center and their desires to learn more about wildlife and its management.

Locally, the new Center is called The Community Center where the people of the surrounding area can come to ask questions and learn about this renewable resource - Wildlife. Much interest has been shown in this new facility as an educational source.

B. Visitors. The Official visitors during the calendar year 1964 included:

(1). Mr. David Hall, Assistant Refuge Manager, Chincoteague N.W. Refuge, concerning Visitor Center displays and other matters connected with refuge activities.

- (2). Mr. Gale Monson, Washington Office, and Mr. and Mrs. P. N. Humphreys of Cumbran Monmouthshire, England visited the refuge in March and were given a tour of the Refuge.
- (3). Mr. Clark Webster, Washington Office, and Mr. Herbert Troester, Assistant Refuge Manager Lower Souris N.W. Refuge, toured the area in March.
- (4). Mr. Daniel Ogden, Bureau of Outdoor Recreation, Washington visited the refuge in April.
- (5). Mr. Robert Young, Branch of Realty, Regional Office, visited the refuge in May in connection with land acquisition at Eastern Neck Island Refuge.
- (6). Mr. Luther Goldman, Washington Office, visited the refuge in June to obtain photographs, for the new book "Birds and You".
- (7). Agent Ralph Harris and family of Little Rock, Ark. stopped off on his vacation to see the refuge and personnel.
- (8). Mr. Don Pfitzer, Education Coordinator, Regional Office, visited the refuge several times during the year to help set up displays at the new Visitor Center and take photographs.
- (9). Representatives of the Cambridge Jaycees visited the Refuge to discuss "Open House" plans for the new center.
- (10). Mr. Hill and one other representative of the Nature Conservancy, visited in August concerning possible acquisition of a 100 acre tract of land adjacent to the refuge.
- (11). Mr. James Lankford, Regional Office, visited the Blackwater refuge and Eastern Neck Island Refuge in connection with Soil and Moisture operations.
- (12). Mr. Rudolph, Regional Office, visited the refuge in August to appraise land adjacent to the refuge in connection with the Delmarva Peninsula Fox Squirrel.
- (13). Mr. Givens and Mr. S. Dow visited the refuge and inspected the Blackwater and other refuges.
- (14). Mr. Givens also visited the refuge again in November to attend the "Open House".
- (15). Mr. Ballou, Mr. Britt, Mr. Clark Webster and Mr. Verlon Carter visited the refuge in connection with timber management and the Delmarva Peninsula Fox Squirrel.

Other official visitors of the refuge included Dick Lingman, Branch of Realty, Regional Office, Dave Smith and Marvin Myers of the

Maryland Department of Game and Inland Fisheries, Edward Tennyson Visitor Center Manager at Moosehorn N.W. Refuge and others from Patuxent Research Center, State Forest Service and the Soil Conservation Service.

A total of some 50,000 persons visited the Refuge during the year. See NR-6 for breakdown.

C. Refuge Participation. Refuge personnel participated actively in personal contact with the general public and in giving talks and tours to various groups on and off the refuge.

D. Hunting and Fishing. No hunting or fishing is allowed on the refuge.

E. Violations. One deer was killed on the refuge and the violator apprehended by the State Game Warden off the refuge through the cooperative efforts of refuge personnel.

Two Washington officials, from another department, were apprehended for camping on the refuge.

As the public use of the refuge increases problems are arising and new methods of control must be sought out and applied.

F. Safety. There was no lost time accidents at this station during the calendar year. The number of calendar days since the last lost time accident was 2,010. The total number of employee hours worked since the last lost time accident was 27,457. The date of the last motor vehicle accident was August 17, 1955.

Monthly safety meetings were held throughout the year with all refuge personnel participating actively in a safety conscious work program.

VI. Other Items

A. Items of Interest.

Mr. Vernon McCarter was appointed as the new Clerk-Typist and reported for duty on July 26th. Mr. McCarter worked at Blackwater during the APW Programs and held a temporary appointment until October, 1964.

Mr. Paul D. Daly, Assistant Refuge Manager GS-5, reported for duty on September 9, 1965. Mr. Daly is a native of Fayson Lakes, New Jersey and held the rank of 1st Lieutenant in the U. S. Army. Mr. Daly has a degree in Wildlife Management from the University of Maine.

Assistant Refuge Manager Daniel Dudak, GS-5, resigned during May, 1965 to accept a teaching position in Pennsylvania. Mr. Dudak reported for duty during November, 1964.

On November 1, 1965 Maintencemen Franklin A. Hughes and John S. Marshall were appointed to full-time positions. Mr. Hughes had been with the service since 1955 on a temporary appointment. Mr. Marshall is a native of Ewell, Maryland and had been assigned to Martin Refuge since 1958, also on an intermittent basis.

Assistant Refuge Manager Ervin McIntosh attended the 5 week Basic Refuge Manager's Course at Minneapolis, Minn. during the Spring. He stated that the course was excellent and recommends that every Refuge Manager and trainee have the opportunity to attend.

Mr. Oden B. Keen, a retired maintenanceman of Blackwater, Back Bay and Susquehanna Refuges passed away at Havre de Grace, Md. on September 21. Mr. Keen retired six years ago at the age of 70.

During the period July 5 thru 19, Mr. Leo A. Levereault and several students from the University of Michigan recorded vibrations of the off-shore explosions of sinking several ships. Equipment was placed on the edge of the Dieffenbach Pool dike to record the vibrations in connection with a Defense Department Project.

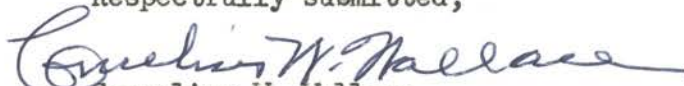
Mr. McIntosh cooperated with the Soil Conservation Service, Maryland Department of Game and Inland Fish and County Agent in a demonstration of pot-hole blasting for marsh improvement in Dorchester County, Md. The final report of the effects of the blasting has not yet been received, but it is the opinion of Mr. McIntosh that the demonstration was not a complete success. Too many charges did not go off on initial blast and there was no hard bed to force the blast upward. The holes created were too deep. The misfires were due to the professional blaster's neglect and attitude.

Those assisting in the preparation of this report are as follows:

Refuge Manager - Cornelius W. Wallace
Asst. Refuge Manager - Ervin W. McIntosh
Asst. Refuge Manager - Paul D. Daly
Biological Technician - Guy W. Willey
Clerk-Typist - Vernon F. McCarter, Jr.

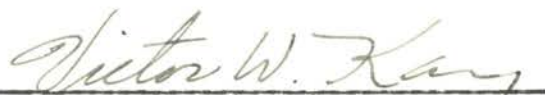
B. Photographs. Attached.

Respectfully submitted,


Cornelius W. Wallace

CWWallace;vfm

Acting


Regional Refuge Supervisor

Regional Director

FEB 18 1966

Date

Date

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

WATERFOWL

REFUGE Blackwater N.W. Refuge

MONTHS OF January TO May, 1965.

		(2)									
		Weeks of reporting period									
(1)		1	2	3	4	5	6	7	8	9	10
Species											
Swans:											
Whistling Trumpeter		6	6		3	3	3	25	25	25	30
Geese:											
Canada		30,000	20,000	20,000	25,000	25,000	25,000	25,000	25,000	20,000	12,000
Cackling											
Brant											
White-fronted											
Snow		52	52	52	52	52	52	52	62	62	200
Blue		18	18	18	18	18	18	18	52	58	600
Other											
Ducks:											
Mallard		15,000	10,000	10,000	10,000	10,000	10,000	10,000	20,000	10,000	10,000
Black		5,000	3,000	3,000	3,000	3,000	3,000	3,000	9,000	4,500	3,000
Gadwall											
Baldpate		500									
Pintail		1,000	500	500	2,000	2,000	5,000	5,000	5,000	15,000	8,000
Green-winged teal		500									50
Blue-winged teal										50	100
Cinnamon teal											
Shoveler											
Wood											
Redhead											
Ring-necked		3,000	500	500	500	500	500	500	500	500	500
Canvasback		500									
Scaup											25
Goldeneye											
Bufflehead											25
Ruddy		100									25
Other Merganser		150	150	150	150		175	175	75	75	150
Goot		100	50	50	50	50	50	50	50	50	50

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

WATERFOWL
(Continuation Sheet)

REFUGE **Blackwater National Wildlife**

MONTHS OF January TO May, 1945.

(1) Species	(2) Weeks of reporting period								(3) Estimated: waterfowl: days use	(4) Production: Broods: seen	Estimated total
	11	12	13	14	15	16	17	18			
Swans:		15							987		
Whistling Trumpeter											
Geese:											
Canada	20,000	20,000	15,000	15,000	10,000	10,000	5,000		2,254,000		
Cackling											
Brant											
White-fronted											
Snow	15	15	15	1	1	1	1		5,159		
Blue				1	1	1	1		5,880		
Other											
Ducks:											
Mallard	10,000	5,000	5,000	3,000	1,000	1,000	1,000		987,000	2	16
Black	3,000	2,000	2,000	2,000	500	500	500		322,000		
Gadwall											
Baldpate		500	500	500	200	100	100		16,800		
Pintail	1,000	2,000	1,000	1,000	500	100			368,200		
Green-winged teal	500	500	1,000	500	500	200	500		29,750		
Blue-winged teal	500	500	2,000	1,000	1,000	1,000	500		46,550		
Cinnamon teal											
Shoveler	10	10		25					315		
Wood		25	100	25	25	25	25		1,585		
Redhead											
Ring-necked	500	500							59,500		
Canvasback									3,500		
Scaup	25	25	25						700		
Goldeneye				25					175		
Bufflehead	25								350		
Ruddy	25	25							1,225		
Other Merganser	150	150	25	25	25	25			10,550		
Coot:											
	50	25							4,375		
					(Over)						

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	987	30	
Geese	2,265,039	30,070	
Ducks	1,843,200	30,575	16
Coots	4,375	100	

SUMMARY

Principal feeding areas Refuge grain fields, Dieffenbach Pool Unit, Headquarters Pond #1 and 2 and burned marsh areas.

Principal nesting areas Headquarters Pond Area.

Reported by G.W. Wallace, R.W. McIntosh, & G.W. Willey

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).

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

WATERFOWL

REFUGE Blackwater National Wildlife

MONTHS OF May TO September, 19 65

[illegible]

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

WATERFOWL
(Continuation Sheet)

REFUGE **Blackwater National Wildlife**

MONTHS OF May TO September, 1965

(1) Species	(2) Weeks of reporting period								(3) Estimated: waterfowl: days use	(4) Production Broods: seen	Estimated total
	11	12	13	14	15	16	17	18			
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	205	205	205	205	205	205	205	205	112,280	1	5
Cackling											
Brant											
White-fronted											
Snow											
Blue											
Other											
Ducks:											
Mallard	1,800	1,850	2,000	2,000	2,000	2,000	2,000	2,000	208,950	115	975
Black	1,100	1,150	1,200	1,200	1,200	1,200	1,200	1,200	117,775	87	700
Gadwall											
Baldpate											
Pintail									1,400		
Green-winged teal									7,000		
Blue-winged teal	675	675	700	700	700	800	900	1,500	87,500	31	175
Cinnamon teal											
Shoveler											
Wood	30	30	50	50	50	50	50	50	4,270	1	5
Redhead											
Ring-necked											
Canvasback											
Scaup											
Goldeneye											
Bufflehead											
Ruddy											
Other											
Coot:											

(Over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans			
Geese	112,280	5,000	5
Ducks	426,895	4,750	1855
Coots			

SUMMARY

Principal feeding areas Headquarters Ponds, Deadwoods, McGraws Island area, Kuehnle Tract Areas, Sunken Islands, Meekins Creek, Harpers Ponds.

Principal nesting areas Headquarters Pond #1 & #2, Dieffenbach Pool #3 and West Side Area Dike.

Reported by C. W. Wallace, G. W. Willey, E. W. McIntosh
W. O. Richardson

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).

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

W A T E R F O W L

REFUGE Blackwater N.W.R.

MONTHS OF September, 1965 TO January, 1966

(1) Species	(2) Weeks of reporting period									
	1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada	205	205	205	205	10,000	50,000	70,000	70,000	70,000	60,000
Cackling										
Brant										
White-fronted										
Snow					1	20	20	20	55	70
Blue					1	25	25	20	25	75
Other										
Ducks:										
Mallard	2,000	2,000	2,000	2,000	6,500	7,000	15,000	20,000	30,000	30,000
Black	1,200	1,200	1,200	1,200	4,000	4,500	10,000	12,000	12,000	12,000
Gadwall										
Baldpate			200	200	1,000	1,000	5,000	7,000	7,000	10,000
Pintail			100		1,800	2,000	2,000	2,000	2,000	500
Green-winged teal				500	1,000	1,500	2,500	5,000	15,000	15,000
Blue-winged teal	1,500	1,500	2,000	4,000	4,000	3,500	3,500	2,000	1,000	500
Cinnamon teal										
Shoveler										
Wood	50	50	50	50	50	50	50	50	50	50
Redhead										
Ring-necked									50	50
Canvasback										
Scaup								50	50	50
Goldeneye										
Bufflehead										
Ruddy									50	50
Other Merganser										25
Coot					1		500	250	250	250

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

WATERFOWL
(Continuation Sheet)

REFUGE **Blackwater N.W.R.**

MONTHS OF **September, 1965** TO **January**, 19**66**

(1) Species	(2) Weeks of reporting period								(3) Estimated: waterfowl: days use	(4) Production Broods: Estimated seen : total
	11	12	13	14	15	16	17	18		
Swans:										
Whistling	7	50	40	18		50		15	1,260	
Trumpeter										
Geese:										
Canada	67,000	75,000	75,000	80,000	80,000	70,000	50,000	40,000	6,074,740	
Cackling										
Brant										
White-fronted										
Snow	75	110	125	350	350	350	200	110	12,992	
Blue	130	270	300	450	600	600	400	125	21,322	
Other										
Ducks:										
Mallard	30,000	30,000	30,000	35,000	45,000	45,000	30,000	30,000	2,740,500	
Black	20,000	25,000	25,000	25,000	35,000	30,000	20,000	30,000	1,885,100	
Gadwall										
Baldpate	10,000	10,000	12,000	8,000	8,000	8,000	5,000	1,000	653,800	
Pintail	1,000	1,000	2,000	3,000	1,000	3,000	3,000	1,500	181,300	
Green-winged teal	15,000	10,000	8,000	5,000	10,000	8,000	8,000	1,000	738,500	
Blue-winged teal					100	100			165,900	
Cinnamon teal										
Shoveler				25	25	25	25		700	
Wood	50								3,850	
Redhead					500	1,000	1,000	1,000	24,500	
Ring-necked	100	500	500	500	500	500	500	500	25,900	
Canvasback			1,000	1,000	500	1,500	1,500	1,500	49,000	
Scaup	100	100					500	500	9,450	
Goldeneye			500	500	100	100	25	25	8,750	
Bufflehead							25	25	350	
Ruddy	100	100	200	200	100	100	100	100	7,700	
Other Merganser	50	100	400	450	450	650	650	650	23,975	
Coot:	250	100	100	100		1	25	25	12,964	
					(Over)					

	(5) Total Days Use	(6) Peak Number	(7) Total Production	SUMMARY
Swans	<u>1,260</u>	<u>50</u>		Principal feeding areas <u>Dieffenbach Pool, Headquarters</u>
Geese	<u>6,109,054</u>	<u>80,950</u>		<u>Pond #1 & #2, Kuhnle Tract Pool, Agricultural Fields</u>
Ducks	<u>6,519,275</u>	<u>101,275</u>		<u>of the Refuge, marsh areas of the Refuge.</u>
Coots	<u>12,964</u>	<u>500</u>		Principal nesting areas _____
				Reported by <u>Mgr. Wallace, Ass't Mgrs. McIntosh and Daly,</u>
				<u>Biol. Tech. Willey.</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).

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge Blackwater N.W. Months of January to May 1946.

(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. <u>Water and Marsh Birds:</u>										
Great Blue Heron	2	1/1/65	30	4/30/65						30
Common Loon	2	4/15/65	30	4/30/65						30
Snowy Egret	3	4/15/65	50	4/30/65						50
Little Blue Heron	1	4/1/65	25	4/30/65						25
Louisiana Heron	3	3/15/65	30	4/30/65						30
Cattle Egret	1	4/19/65	4	4/20/65	4	4/20/65				4
II. <u>Shorebirds, Gulls and Terns:</u>										
Killdeer	10	1/1/65	400	4/30/65						400
Herring Gull	100	3/15/65	600	4/30/65						600
Laughing Gull	100	4/1/65	500	4/30/65						500
Yellowlegs (lesser)	25	1/1/65	300	4/30/65						300
Yellowlegs (greater)	25	1/1/65	300	4/30/65						300
Semi-palmated Sandpiper	20	4/16/65	300	4/30/65						300
Sanderling	5	4/1/65	200	4/30/65						200
Virginia Rail	20	4/1/65	2200	4/30/65						200

(over)

(1)	(2)	(3)	(4)	(5)	(6)
III. <u>Doves and Pigeons:</u>					
Mourning dove		300	4/30/65		300
White-winged dove					
IV. <u>Predaceous Birds:</u>					
Golden eagle		1	1/1/65	1	1
Duck hawk					
Horned owl		50	4/30/65		50
Magpie					
Raven					
Crow		700	4/1/65		700
American Bald Eagle		15	1/1/65		15
Red-Tailed Hawk		25	1/1/65		25
Sparrow Hawk		50	3/15/65		50
Barn Owl		25	4/30/65		25
E.W. McIntosh, C.W. Wallace, & G.W. Willey Reported by.....					

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 (Columbiformes to Ciconiiformes and Gruiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

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

MIGRATORY BIRDS
(other than waterfowl)

Refuge.. Blackwater N.W.

Months of May

thru 10
xx August 1951 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. <u>Water and Marsh Birds:</u>										
Great Blue Heron	30	5/1/65	100	8/31/65	100	8/31/65				8,820
Black Crowned Night Heron	5	5/25/65	60	8/31/65	60	8/31/65				3,780
American Egret	25	6/1/65	500	8/15/65	300	8/31/65				37,800
Snowy Egret	25	6/1/65	200	8/15/65	180	8/31/65				12,600
Little Blue Heron	25	5/1/65	300	8/31/65	300	8/31/65				20,160
Little Green Heron	10	5/22/65	100	7/15/65	1	8/27/65				6,300
Louisiana Heron	25	6/15/65	50	8/1/65	10	8/25/65				3,150
Least Bittern	5	7/1/65	5	7/1-8/31/65	5	8/31/65				630
II. <u>Shorebirds, Gulls and Terns:</u>										
Killdeer	400	5/1/65	700	8/1/65	600	8/31/65				75,600
Lesser Yellowlegs	300	5/1/65	800	7/15/65	500	8/31/65				63,000
Greater Yellowlegs	300	5/1/65	600	7/15/65	300	8/31/65				50,400
Wilson Snipe	200	6/1/65	400	8/31/65	400	8/31/65				31,500
Sanderlings	200	5/1/65	700	7/15/65	300	8/31/65				44,100
Least Sandpiper	300	6/1/65	600	8/15/65	200	8/31/65				37,800
Virginia Rail	250	5/1/65	600	8/31/65	600	8/31/65				50,400
Clapper Rail	25	6/15/65	200	8/31/65	200	8/31/65				12,600
King Rail	150	6/15/65	500	8/31/65	500	8/31/65				37,800
Herring Gull	500	5/1/65	1000	6/25/65	300	8/31/65				56,700
Laughing Gull	600	5/1/65	1200	7/1/65	300	8/31/65				75,600
Semi-Palmated Sandpiper	300	5/1/65	500	6/15/65	150	8/31/65				25,200

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. <u>Doves and Pigeons:</u>										
Mourning dove	300	5/1/65	800	8/31/65	800	8/31/65				75,600
White-winged dove										
IV. <u>Predaceous Birds:</u>										
Golden eagle										
Duck hawk										
Horned owl										
Magpie										
Raven										
Crow	700	5/1/65	700	5/1/65	400	8/31/65				63,000
American Bald Eagle	9	5/1/65	9	5/1-8/31/65	9	8/31/65				1,134
Red Tailed Hawk	5	5/1/65	15	8/15/65	10	8/31/65				1,260
Broad Winged Hawk			10	8/31/65	10	8/31/65				630
Barn Owl	5	5/1/65	39	8/31/65	39	8/31/65				2,520
Reported by.....										

INSTRUCTIONS

- (1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and National significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiformes)
 II. Shorebirds, Gulls and Terns (Charadriiformes)
 III. Doves and Pigeons (Columbiformes)
 IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)
- (2) First Seen: The first refuge record for the species for the season concerned.
- (3) Peak Numbers: The greatest number of the species present in a limited interval of time.
- (4) Last Seen: The last refuge record for the species during the season concerned.
- (5) Production: Estimated number of young produced based on observations and actual counts.
- (6) Total: Estimated total number of the species using the refuge during the period concerned.

3-1751

Form NR-1A

(Aug. 1952)

MIGRATORY BIRDS

(Other than Waterfowl)

Refuge Blackwater N.W.R.Months of September, 1965 to January 1966

(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. <u>Water and Marsh Birds:</u>										
Great Blue Heron	100	9/1	100	10/15	15	12/31				9,450
Black Crowned Night Heron	60	9/1	60	9/1	5	11/15				3,780
American Egret	300	9/1	300	9/1	10	12/1				12,600
Snowy Egret	200	9/1	200	9/1	5	11/13				10,080
Eastern Least Bittern	5	9/1	50	10/15	30	12/31				3,780
Little Green Heron	1	9/1	25	9/15	3	10/15				1,260
II. <u>Shorebirds, Gulls and Terns:</u>										
Killdeer	700	9/1	700	9/1	20	12/31				37,800
Lesser Yellowlegs	400	9/1	500	9/30	35	11/15				20,160
Wilson Snipe	400	9/1	500	10/15	5	12/31				50,400
Sanderlings	600	9/1	600	9/1	50	12/31				63,000
Virginia Rail	600	9/1	600	9/1	10	12/1				23,800
King Rail	500	9/1	500	9/1	5	12/1				18,900
Clapper Rail	200	9/1	500	10/15	15	12/1				37,800

(over)

(1)	(2)		(3)		(4)		(5)			(6)
III. <u>Doves and Pigeons:</u>										
Mourning dove	800	9/1	1,000	9/15	100	12/31				75,600
White-winged dove										
IV. <u>Predaceous Birds:</u>										
Golden eagle										
Duck hawk										
Horned owl										
Magpie										
Raven										
Crow	300	9/1	500	12/31	500	12/31				50,400
American Eagle	9	9/1	9	9/1-12/31	9	12/31				1,134
Red-Tailed Hawk	15	9/1	15	9/1	15	12/31				1,890
Marsh Hawk	5	9/1	100	12/1	75	12/31				6,300
Sparrow Hawk	5	10/1	50	11/15	5	12/31				3,780
Barn Owl	39	9/1	39	9/1	5	12/31				1,260
Pigeon Hawk	1	12/25	1	12/25	1	12/25				14
Reported by <u>Mgr. Wallace, Ass't Mgr. McIntosh</u> and <u>Daly, Biol. Tech. Willey</u>										

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 Blackwater N.W.

For 12-month period ending August 31, 1965

Reported by C. W. Wallace

Title Refuge Manager

(1) Area or Unit Designation	(2) Habitat		(3) Use-days	(4) Breeding Population	(5) Production
	Type	Acreage			
Entire Refuge Area	Crops	564	Ducks 8,756,545	525	1871
	Upland	1098	Geese 7,489,367	25	5
	Marsh	6816	Swans 1,008		
	Water	2738	Coots 47,075		
	Total	11216	Total 16,293,995	550	1876
	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 flooding facilitates use of non-aquatic type foods; marsh extends from the upland community to, but not including, the water type and consists of the relatively stable marginal or shallow-growing emergent vegetation type, including wet meadow and deep marsh; and in the water category are all other water areas inundated most or all of the growing season and extending from the deeper edge of the marsh zone to strictly open-water, embracing such habitat as shallow playa lakes, deep lakes and reservoirs, true shrub and tree swamps, open flowing water and maritime bays, sounds and estuaries. Acreage estimates for all four types should be computed and kept as accurate as possible through reference to available maps supplemented by periodic field observations. The sum of these estimates should equal the area of the entire unit.
- (3) Use-days: Use-days is computed by multiplying weekly waterfowl population figures by seven, and should agree with information reported on Form NR-1.
- (4) Breeding
Population: An estimate of the total breeding population of each category of birds for each area or unit.
- (5) Production: Estimated total number of young raised to flight age.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge Blackwater N.W. Months of January to May, 1945.

(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.
Quail <u>Colinus</u> <u>virginianus</u> <u>virginianus</u>	600 acres of cropland and 250 acres second growth.	1+			60% Male	0	0	0	1,000	Largest number on record. Nesting underway near end of period.

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)

Blackwater N.W.

UPLAND GAME BIRDS

May

thru
XXX August

65.

1613

Refuge _____ Months of _____ to _____, 194__

(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.
Quail	600 acres of crop land and 250 acres second growth.	1+			60% Male	0	0	0	1,000	Remains static.

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

1613

Refuge Blackwater N.W. R.

Months of September, 1965 to January, 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	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.
<u>Quail</u> <u>Colinus</u> <u>virginianus</u> <u>virginianus</u>	600 acres of cropland and 250 acres second growth	1+	0	0	60% Male	0	0	0	1,000	Increase over last year and represents the largest number on record for this station.

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 Blackwater N.W.R.

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 <u>Opocolieus</u> <u>virginianus</u>	Mixed hardwood-softwood swamps and woodlots com- prised about 3/4 of the deer habitat. The remainder is composed of marshlands.	80	0	0	0	0	0	0	0	0	0	December	250	60% Male	

Remarks: Deer population shows an increase over last year with December the period of greatest use due to hunting pressure adjacent to the refuge lands.

Reported by Wallace, Willey, Baly, McIntosh

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.

116000

3-1754
Form NR-4
(June 1945)

SMALL MAMMALS

Refuge Blackwater N.W.

Year ending April 30, 1965.

(1) Species	(2) Density	(3) Removals	(4) Disposition of Furs							(5) Total Popula- tion			
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	(S)
							Permit Number	Trappers Share	Refuge share				
Muskrat	9,692 Acres marsh and ponds	1	1388				1-6624	694	694	694	0	0	6,800
Bryant Fox Squirrel													100
Grey Squirrel													200
Raccoon													550
Fox (Red)													50
Otter													40
Nutria (S.A. Beaver)							1-6624	6	0	0	0	39	150
Opossum													170
Skunk													70
Cotton Tail Rabbit													500

* List removals by Predator Animal Hunter

* List removals by Predator Animal Hunter

REMARKS: From observations it appears the squirrel population continues to decline compared with 1962 and 1963. An increase was noted in the Nutria population in the early spring and this increase is believed to result from heavy populations on adjacent marshes and this animal continues to migrate although trapping was carried out by refuge personnel on refuge marshes in efforts to eradicate if possible.

Reported by G.W. Willey, C.W. Wallace, E.W. McIntosh

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.

DISEASE

Refuge Blackwater N.W.R. Year 19 65

Botulism None To Report

Lead Poisoning or other Disease None

Period of outbreak _____

Period of heaviest losses _____

Losses:

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

Number Hospitalized	No. Recovered	% Recovered
(a) Waterfowl	_____	_____
(b) Shorebirds	_____	_____
(c) Other	_____	_____

Areas affected (location and approximate acreage) _____

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

Condition of vegetation and invertebrate life _____

Remarks _____

Kind of disease _____

Species affected _____

Number Affected
Species

Actual Count

Estimated

_____	_____	_____
_____	_____	_____
_____	_____	_____

Number Recovered _____

Number lost _____

Source of infection _____

Water conditions _____

Food conditions _____

Remarks _____

PUBLIC RELATIONS
(See Instructions on Reverse Side)

Refuge Blackwater N.W.R.Calendar Year 1965

1. Visits

a. Hunting None b. Fishing None c. Miscellaneous 50,000 d. TOTAL VISITS 50,000

1a. Hunting (on refuge lands) None

TYPE	HUNTERS	ACRES	MANAGED BY
Waterfowl			
Upland Game			
Big Game			
Other			

Number of permanent blinds NoneMan-days of bow hunting included above NoneEstimated man-days of hunting on lands adjacent to
refuge _____

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

None

TYPE OF AREA	ACRES	MILES
Ponds or Lakes		
Streams and Shores		

1c. Miscellaneous Visits

Recreation 44,950 Official 5,000
Economic Use 50 Industrial None

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	1	40	1	80
Bird and Garden Clubs	3	102		
Schools	7	221	1	70
Service Clubs				
Youth Groups	10	218		
Professional-Scientific	6	872		
Religious Groups	2	80		
State or Federal Govt.	54	197	37	130
Other	1	35	2	50

3. Other Activities

TYPE	NUMBER	TYPE	NUMBER
Interviews			
Press Releases	12	Radio Presentations	
Newspapers (P.R.'s sent to)	12	Exhibits	1
TV Presentations	3	Est. Exhibit Viewers	3,000

INSTRUCTIONS

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

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

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

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

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

Other - INCLUDE crow, fox, and similar hunting.

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

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

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

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

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

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

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge Blackwater N.W. Year 1965

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	Date of Planting	Survival	Cause of Loss	Remarks
Ilex						100%		
crenata hetzi	Office	4			Aug '65			
cornuta burfordi	Office	2			Aug '65			
aquifolium	Office	2			Aug '65			
opaca	V. Center	1			Oct '65			
helleri	V. Center	6			Oct '65			
Juniper	Office &							
pfitzer	V. Center	13			Oct '65			
andorra	Office	3			Aug '65			
(Blue Haven)	Office	2			Aug '65			
Taxus								
browni	Office	3			Aug '65			
grandifolia	V. Center	12			Oct '65			
hicksi	V. Center	2			Oct '65			
Viburnum sp.	Office	1			Aug '65			
Pyracantha sp.	Off. V.C.	36			Oct '65			
acer dasycarpum	V. Center	1			Oct '65			
cornus florida	V. Center	1			Oct '65			
quercus phellos	V. Center	1			Oct '65			

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....
Hedgerows, cover patches.....
Food strips, food patches.....
Forest plantings.....

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

Fish and Wildlife Service Branch of Wildlife Refuges

CULTIVATED CROPS - HAYING - GRAZING

Refuge Blackwater N.W.R.

County Dorchester

State Maryland

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			
Buckwheat					136	4,080	136	Ladino Clover	77
Corn			30	2,400	90	9,000	120	Ryegrass	285
Millet					122	3,050	122	Wheat	57
Sorghum					20	1,600	20	Soybeans	47
								Fallow Ag. Land	11

No. of Permittees: Agricultural Operations None Haying Operations None Grazing Operations None

Hay - Improved (Specify Kind)	Tons Harvested	Acres	Cash Revenue	GRAZING	Number Animals	AUM'S	Cash Revenue	ACREAGE
None	None	None	None	1. Cattle	None	None	None	None
				2. Other	None	None	None	None
				1. Total Refuge Acreage Under Cultivation				875
Hay - Wild	None	None	None	2. Acreage Cultivated as Service Operation				875

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 Blackwater N.W.R.

Months of September, 1965 through December, 1965

(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
Buckwheat	0	160	160	0	160	0	160	0	0	0	0
Corn	5,224	7,423	12,647	2,400	23	4,189	6,612	6,035	0	6,035	0
Ladino Clover	0	4	4	0	4	0	4	0	0	0	0
Mixed Grain	0	200	200	0	0	200	200	0	0	0	0
Soybeans	0	100	100	0	100	0	100	0	0	0	0
Millet	0	150	150	0	150	0	150	0	0	0	0
Sorghum	0	1	1	0	1	0	1	0	0	0	0
Ryegrass	0	237	237	0	237	0	237	0	0	0	0
Wheat	0	100	100	0	100	0	100	0	0	0	0

(8) Indicate shipping or collection points Cambridge and Chestertown, Maryland

(9) Grain is stored at Refuge in corn bins. Harvest from Eastern Neck stored at P.M. Brooks Co., Chestertown, Maryland.

(10) Remarks 1,000 bushels transferred to Game Mgt. Division, 1,000 bushels to Chincoteague Refuge and 400 bushels to Presquille Refuge, Va. 5,000 bushels harvested at Eastern Neck under cooperative farming agreement. Other from Blackwater Refuge. 6,035 bushels on hand to be used in 1966 and early 1967 banding programs.

*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.

3-1761
Form NR-11
(2/46)

TIMBER REMOVAL

Refuge.....**Blackwater N.W.R.**

Year 19**65**

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 This Period)								

Total acreage cut over.....

Total income.....

No. of units removed B. F.

Method of slash disposal.....

Cords.....

Ties.....

.....

ANNUAL REPORT OF PERSTICIDE APPLICATION

Proposal Number

1

Reporting Year

1965

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)
Weekly June 1 - Sept. 15	Mosquitoes (all types)	Headquarters area including grounds around office, Equipment Buildings Quarters #2, 2, 3 and 4 and Picnic area, Visitor's Center grounds at Dieffenbach Pool Units.	10	Malathion Dibrom	1 1/2 gallons Malathion 1 1/2 gallons Dibrom	1 Gallon Malathion 1 Gallon Dibrom	Water 98 gals. per 100 gallon tank.	Mist Type Sprayer

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

Spraying performed by the County approved by the Maryland Mosquito Control Division. a total of 1 1/2 sprayings during the period June 1 thru Sept. 15. Control of the mosquitoes resulted in more use of the Refuge recreational facilities and also benefitted the personnel and their families. No adverse effects were noted.

ANNUAL REPORT OF PERSTICIDE APPLICATION

Proposal Number

2

Reporting Year

1965

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)
June 4 June 7 June 8 June 9	Pigweed Ragweed Morning Glory Dock	Refuge Corn Fields B, D, F, H, R, and S.	120	2,4 Dichlorop- henoxyacetic Acid	5 Gallons	1/2 pt. or 8 ozs. per acre	Water 8 gals. per acre	Tractor Mounted Sprayer

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

Spraying increased corn yield at Blackwater by eliminating 90% of the pest weeds listed above under (2). Corn yield averaged in excess of 100 bushels per acre whereas if no spraying had been done under normal conditions, the yield would have been approximately 60 bushels per acre. No adverse effects were observed.

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

Bureau of Sport Fisheries and Wildlife

Refuge **Eastern Neck Island N.W.R.**
c/o Blackwater N.W.R.

ANNUAL REPORT OF PERSTICIDE APPLICATION

Proposal Number	Reporting Year
1	1965

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)
May 3 thru 7	Pigweed Ragweed Morning Glory	Corn fields on The Wickliffe and Ingleside Farms	147	Atrazine 80W	294 lbs.	2 lbs. per acre	Water 20 Gals. per acre	Tractor Mounted Sprayer

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

Results of the above spraying were not as good as in previous years (probably due to drought conditions) yet there was still a 90% kill on weeds and approximately 80% kill on all grass. This helped increase corn yields for both the service and the cooperative farmer. No adverse effects were noted.



Photo. #1 - Biological Technician Willey setting Thermograph for recording temperatures - part of daily weather and gauge reading necessary in management of Blackwater Refuge. # 42-669



Photo. #2- Draining Dieffenbach Pool for Summer planting of
Jap millet. # 42-670



Photo. #3 - Headquarters Pond during nesting season. #42-671



Photo. #4 - Loafing islands in headquarters Pool -# 42- 672



Photo. #5 - Moulting mallards on loafing sight at headquarters Pool. #42- 673



Photo. #6 - Minnows provide food for colonial birds in headquarters Pond. #42-674



Photo. #7- Canada geese feeding on ryegrass and clover during fall migration. #42-675



Photo. #8 - Canada geese landing in ryegrass and walking in
standing corn. #42-676



Photo. #9 - Canada geese feeding on Japanese millet. #42-677



Photo. #10 - This type of habitat is heavily used by Delmarva
 Peninsula Fox Squirrels. #42-678

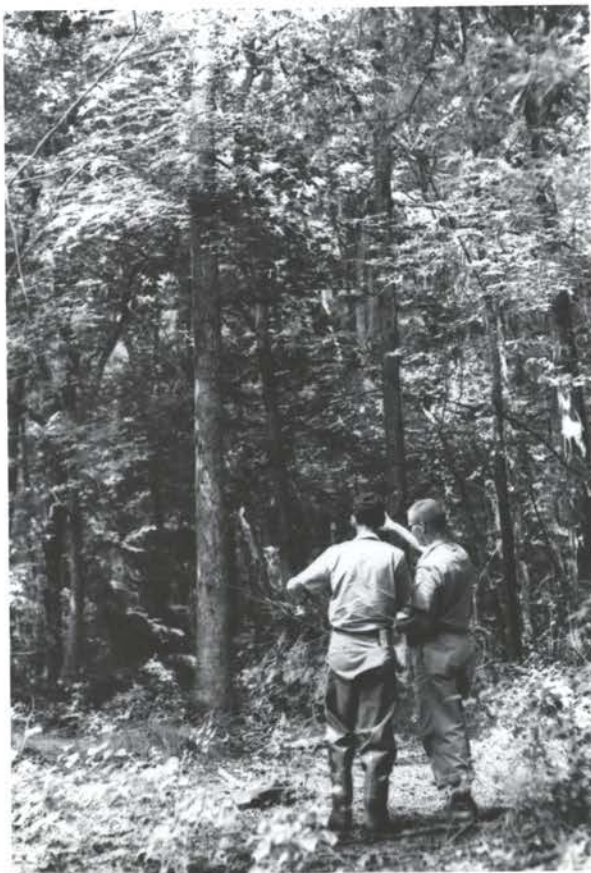


Photo. #11 - Survey of Fox Squirrel habitat for possible
 acquisition. #42-679



Photo. #12 - Discussing habitat
of fox squirrel.
#42-680

Photo. #13- Surveying fox
Squirrel habitat. #42-681





Photo. #14- The Least Tern frequents headquarters Pond during
summer. #42-682



Photo. #15- Canada geese on headquarters Pond during summer
months. #42- 683



Photo. #16 - Canada geese on headquarters Pond during fall migration. #42-684



Photo. #17- Waterfowl have easy access to corn field from headquarters Pond. #42-685



Photo. #18- Waterfowl frequents equipment sheds seeking
corn. #42-686



Photo. #19- Smile you're on candid camera. #42-687



Photo. #20 - Deer production good at Blackwater. #42-688



Photo. #21 - Does and fawns feed on dikes regularly. #42-689



Photo. #22- Young fawn drops to ground as photographer approaches. #42-690



Photo. #23- Refuge mascots fake battle. #42-691



Photo. #24- Delmarva Peninsula Fox Squirrel. #42-692.



Photo. #25- Delmarva Peninsula Fox Squirrel feeding on scattered corn. #42-693



Photo. #26- Nest of Delmarva Peninsula
Fox Squirrel. #42-693

Photo. #27 - Delmarva Peninsula
Fox Squirrel.
#42-694





Photo. #28- Delmarva Peninsula Fox Squirrel. #42-695



Photo. #29- Delmarva Peninsula Fox Squirrel. #42-696



Photo. #30 - Delmarva Peninsula Fox Squirrel. #42-697



Photo. #31 - Gray Squirrel is also found on the refuge along with the fox squirrel and flying squirrel. #42-698



Photo. #32- The snapping turtle.... a predator of waterfowl on the Blackwater Refuge.



Photo. #33 - Cleaning Bush-Hog Mower.

#42-700



Photo. #34 - Maintenance on P H Dragline.

#42-701



Photo. #35 - Choosing the correct tools for the job is an important safety practice. #42-702



Photo. #36 - Maintenance on Vehicles. #42-703



Photo. # 37 - Preparation for
mounting mud flaps
on dump truck.
#42-704

Photo. #38- Approximately 10,000
gasoline are consumed
during the year for
equipment operation.
#42-705





Photo. #39 - Posting boundaries
of refuge is a major operation
during fall. #42-706

Photo. #40 - #42-707
Creosote posts are used
in timbered areas.





Photo. #41 - Metal posts are used for posting
the marsh & open Areas. # 42-708



Photo. #42- Shrubbery is planted during Beautification Week. #42-709



Photo. #43 - Such plantings enhance the beauty of the new buildings and draws excellent comments from many visitors. #42-710.



Photo. #44- Flowing for summer planting of buckwheat. #42-711



Photo. #45 - Discing..... preparing seed bed. #42-712



Photo. #46 - Using the Mulchmonster to refine soil in preparation for planting seed. #42-713.



Photo. #47- Grain drill used in planting crops. #42-714.



Photo. #48- Mowing of dikes, road edges and clover fields is a major operation. #42-715



Photo. #49 - Early growth of soybeans planted under Soil & Moisture Program. # 42-716



Photo. #50 - Inspecting soybeans before plowing under as
green manure. # 42-717



Photo. #51 - More than 100 bushels of corn per acre produced in
refuge fields. #42-718



Photo. #52 - Buckwheat crop recorded
photographically by refuge personnel.
#42-719

Photo. #53 - Volunteer buckwheat
grows in stand of corn -field
aerial seeded by ryegrass also.
#42-720.





Photo. #54 - A control program has been approved for Johnson grass a pest plant at Eastern Neck Refuge.



Photo. #55- Deer damage to corn crop at Eastern Neck.



Photo. #56 - Timber Management programs discussed in relation
to Fox Squirrel Habitat. #42-723.



Photo. #57- The Fox Squirrel Habitat will be a major factor in
the timber management program at Blackwater. #42-724



Photo. #58- Hauling fill to widen entrance road to Visitor Center. #42-725.



Photo. #59 - Fill hauled and leveled on Visitor Center Lawn. #42-726



Photo. #60- Soil Conservation Service aids in sloping lawn.
#42-727.



Photo. #61- Lawn prepared for planting ryegrass as winter
cover crop. #42-728



Photo. #62- Soil Conservation Service is very cooperative in S&M projects on the refuge.
#42-729.



Photo. #63- Drainage ditches constructed and spoil used as fill for Visitor Center lawn.
#42-730



Photo. #64 - Soil Conservation
Service preparing flags for marking
slopes. #42-731

Photo. #65- Flags placed to
guide equipment operator in
sloping ditches. #42-732.





Photo. #66. Old Mill Road prepared for paving. #42-733



Photo. #67- Paving the Old Mill Road added to success of Visitor Center
"open house" #42-734



Photo. #68 - Soil Conservation Service checking drainage of ditch.
#42-735.



Photo. #69- Refuge Manager, Regional Supervisor and Biologist discuss
Visitor Center. #42-736



Photo. # 70 - Refuge Manager constructing registration desk for Center.
#42-737



Photo. #71 - Assistant Mgr. McIntosh does artwork on displays. #42-738.



Photo. #72- Bureau personnel
and Jaycees ready for Visitor
Center "Open House".

Photo. #73 - President of Jaycees
watches as first couple registers
during "Open House" at Visitor Center.
#42-740.





Photo. #74 - Visitors await bus to tour Blackwater Refuge during
"Open House". #42-741



Photo. #75 - Approximately 3,000 Visitors attended the "Open House"
at the Refuge. #42-742



Photo. # 76- Francis C. Gillet,
Chief, Division of Wildlife Refuges,
Washington, D.C. attends "Open
House". #42-743

Photo. #77- Walt Ettleman,
Bureau Training Officer,
attends "Open House".
#42-744





Photo. #78 View of Center Display panels. #42-745

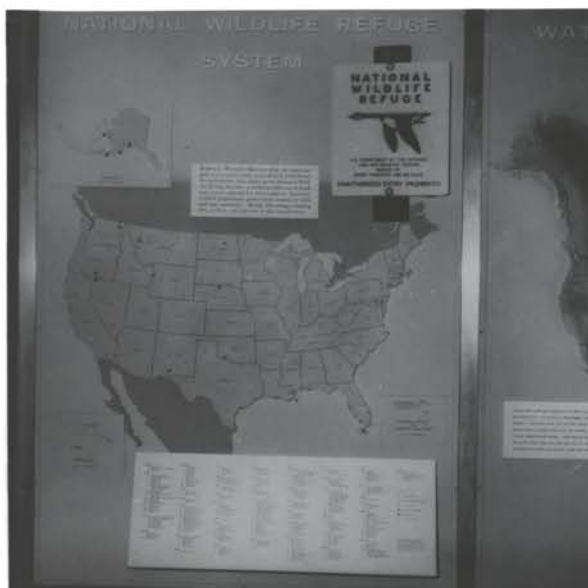


Photo. #79 Panel No. 1. #42-746



Photo. #80 - Panel No. 2

#42-747



Photo. #81 - Panel No. 3

#42-748

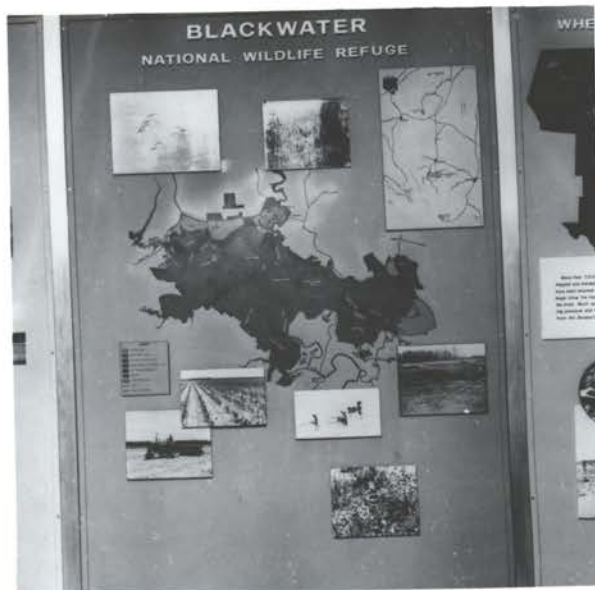


Photo. # 82 - Panel No. 4

#42-749



Photo. #83 - Panel No. 5

#42-750

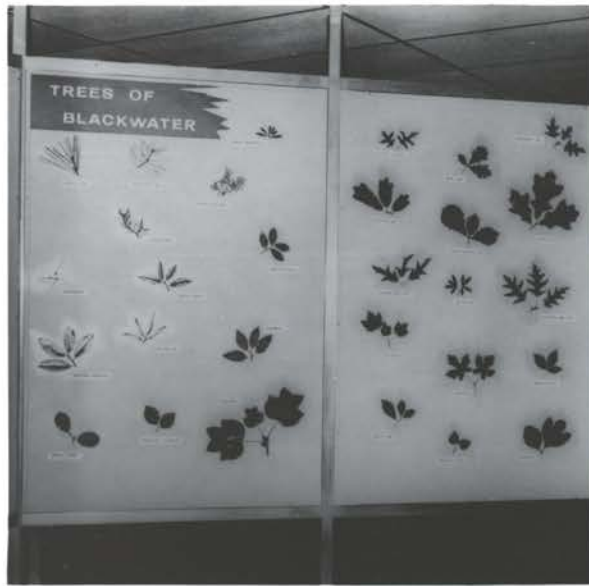


Photo. #84 - Panel No. 6 & 7

#42-751



Photo. #85- Panel No. 8

#42-752



Photo. #86 - Panel #9

#42-753

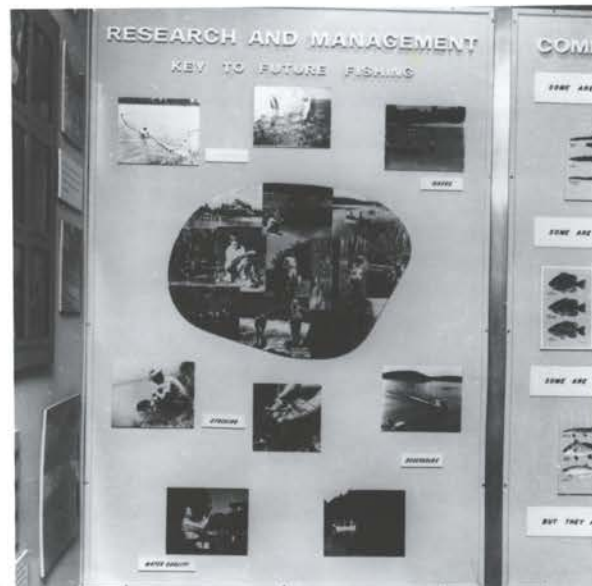


Photo. #87 Panel #10

#42-754

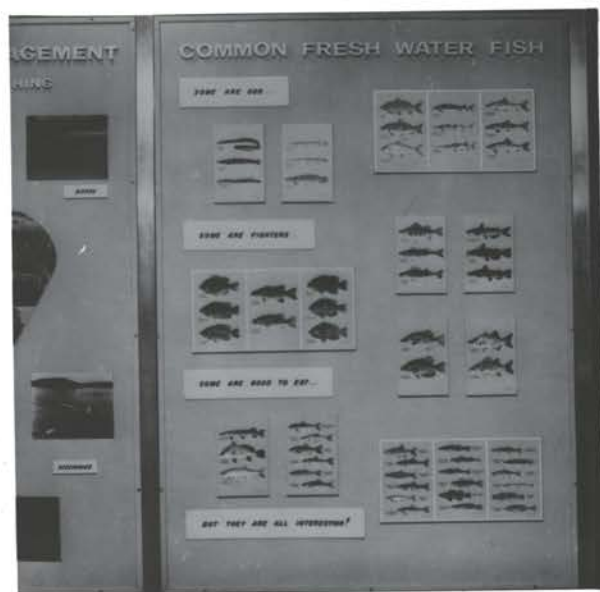


Photo. #87 - Panel No. 11

#42-755



Photo. #88

Panel No. 12 & 13

#42-756



Photo. #89

Panel No. 14

#42-757



Photo. #90 -

Panel No. 15 & 16

#42-758

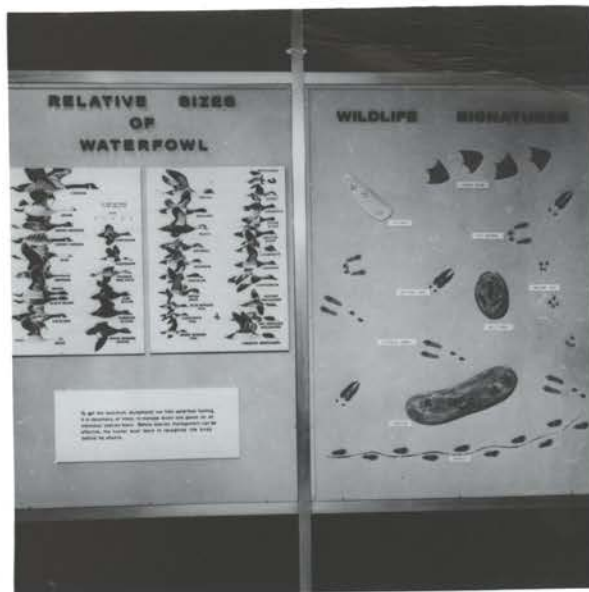


Photo. #91

Panel No. 17 & 18

#42-759



Photo. 92

Panel 19 & 20

#42-760



Photo. #93 - Panel No. 21 & 22

#42-761



Photo. #94 - Display Case #1

#42-762



Photo. #95. - Display Case #2

#42-763



Photo. #96- Display Case #3

#42-764



Photo. #97 - Waterfowl food plants display. #42-765.

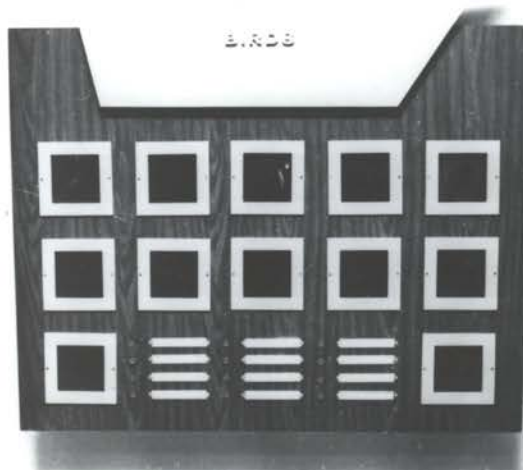


Photo. #98 - Back-lighted displays most attractive to children. #42-766.



Photo. #99 - Blackwater Picnic Area available for public
use and enjoyment. #42-767.



Photo. #100 - Large groups make use of Picnic Area. #42-768

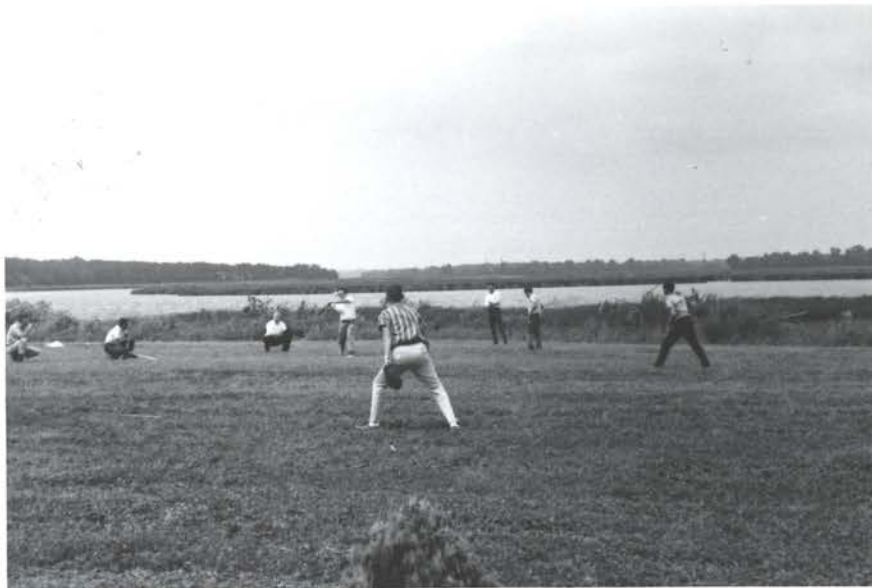


Photo. #101 - A short game of softball during group picnic
on Refuge. #42-769



Photo. #102- School groups enjoy a field trip to the refuge.
#42-770



Photo. #103- Assistant Mgr. McIntosh participated in a pot-hole demonstration put on by the SCS. #42-771



Photo. #104- Pot-hole blasting with ammonium nitrate and diesel fuel mixture, triggered with dynamite. #42-772



Photo. #105 -

Blast created hole 10' deep and 20 feet wide.....too deep. #42-773



Photo. #106- The refuge cooperated with the U. of Michigan in recording vibrations of off-shore explosions. #42-774



Photo. #107 - Preparing equipment for recording vibrations from explosions originating in the Atlantic ocean. #42-775.



Photo. #108- The recording equipment was set up on a dike at the Blackwater Refuge. #42-776.



Photo. #109- The local work unit of the SCS should be commended for their excellent cooperation in Soil and Moisture projects on the refuge. #42-777



Photo. #110 -Safety meetings such as this helps create Safety-conscious work habits. #42-778