

NARRATIVE REPORT
MARK TWAIN NATIONAL WILDLIFE REFUGE
LOUISA-KEITHSBURG DIVISIONS

1968

LOUISA-KEITHSBURG

DEPARTMENT OF THE INTERIOR
BUREAU OF SPORT FISHERIES AND WILDLIFE
MARK TWAIN NATIONAL WILDLIFE REFUGE
WAPELLO, IOWA

LOUISA-KEITHSBURG DIVISIONS

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I. GENERAL

A. WEATHER CONDITIONS

	<u>Month</u>	<u>Precipitation</u>		<u>Max. Temp.</u>	<u>Min. Temp.</u>
		<u>Normal*</u>	<u>Snowfall**</u>		
January	.66	1.51	7.10	54	-14
February	.31	1.30	1.10	51	- 3
March	1.34	2.44	5.50	80	14
April	2.85	3.12	----	81	28
May	2.11	3.98	----	88	38
June	4.14	4.40	----	93	48
July	2.00	3.45	----	93	52
August	3.65	3.34	----	99	50
September	6.86	4.28	----	90	43
October	1.61	2.54	----	82	30
November	3.07	2.10	----	79	24
December	1.91	1.40	5.30	41	-12
ANNUAL TOTALS	30.51	33.86	19.00	EXTREMES 99	-14

* Climate of Illinois, Bulletin 532, University of Illinois
Agriculture Experiment Station, P. 201.

** Snowfall data from U. S. Weather Observer in Wapello, Iowa.

Weather information, except for snowfall, was obtained from the U. S. Army Corps of Engineers at Lock and Dam No. 17, New Boston, Illinois.

January and February were of normal temperatures and below normal precipitation. The lowest temperature of the year (-14° F.) occurred on January 7.

In March, the weather turned warm and windy with little precipitation. Daytime temperatures rose above freezing every day of the month and ice-covered water areas thawed rapidly.

After mid-March, farmers were able to work in the fields nearly every day and by the end of the month, spring plowing was essentially complete. Local residents believe that spring plowing was completed earlier this year than ever before, but this was not an unmixed blessing. Bare soil, high temperatures and strong winds made for wind erosion. In some places visibility was so low from blowing dirt that highway traffic moved at a snail's pace.

The weather remained somewhat drier than normal until the last week of June, when the previously excellent farming conditions took a turn for the worse. Rain fell every day for a week. On the Louisa Division, run-off accumulated in low spots and crops in some parts of the fields suffered from standing water.

Weather conditions were normal until the last of August, when an eleven day period of dry weather and hot temperatures at corn-tassel time probably diminished yields. The hottest temperature of the year (99° F.) was recorded on August 20.

Rainfall during September was two and one-half inches above normal and the wet conditions hampered soybean harvest.

The first frost was noted on October 4 and 5, but a killing frost did not occur until October 29.

Above normal rainfall in November improved waterfowl habitat during the migration period. The first snow flurries of the season occurred on November 8.

In December, winter began in earnest. Most water areas on the refuge were frozen by December 7. Although last winter was the third in a row with little accumulation of snow, it does not appear that the trend will continue this winter. The ground was snow-covered from December 21 until the end of the year and the last day of the year was the coldest of the season, minus 12° F.

B. HABITAT CONDITIONS

1. WATER

LOUISA DIVISION: As the year began, water areas were frozen and few waterfowl were present. By the end of February, 500 Canada geese had arrived even though the water areas were still 90 per cent ice-covered. The birds spent much of their time on a patch of open water in the main pool of Lake Odessa.

During the first week of March, the ice thawed and the ducks arrived. The population buildup was unspectacular because the birds continued northward with warm weather and open water.

From March through June, pool levels were at planned elevations, the Mississippi River remained low and rainfall was subnormal.

On July 1, in response to pressure from cabin owners, boaters and fishermen the Iowa Conservation Commission raised Lake Odessa to 533.9, .4 higher than called for by our water management agreement. The inlet pipes were then closed, but rainfall plus seepage from an early July rise in the Mississippi River raised water levels further. By July 7, the water level in Fox Pond had reached 534.6, three feet higher than planned. The river was too high to allow release of water from Lake Odessa and since the new Fox Pond pump was not yet operable, we were unable to keep the water levels down. Crops suffered minor damage, primarily from run-off accumulation in low spots but also from the high water table.

On July 15, the 20,000 G.P.M. pump was placed into use and it ran continuously for fifty-six hours. On July 17, the pump was shut off for repairs. Two joints between the concrete sections of the intake pipe had come apart. The ensuing repairs made the pump inoperable for the rest of the year.

Fifty-six hours of pumping, however, lowered the Fox Pond - Prairie Pocket water level from 534.48 to 533.06. For the rest of the summer, the Fox Pond water level was held as low as possible by pumping with the electric pump. Prairie Pocket was allowed to remain at about 533.2. Because of the short drawdown period, some of the fields scheduled for buckwheat remained too wet to plant.

During September 24-27, the Iowa Conservation Commission raised Lake Odessa from 533.7 to 534.8 so they could more easily get boats

into the shallower areas for posting and other work which they were doing in preparation for duck season. The high water hampered corn and soybean harvest on the refuge and some crops in lower fields had to be left.

Fall flooding began on October 17, when the inlet pipes to Lake Odessa were again opened. The water quickly rose to 535.7 and remained there until December 4, when winter drawdown of the Lake began.

To facilitate repair of the intake pipe on the new pump, Fox Pond was held low by pumping with the electric pump until October 11. It was then allowed to rise gradually through seepage and rainfall to 534.7 on November 10. On November 12, the gates between Fox Pond and Lake Odessa were opened and the Fox Pond - Prairie Pocket level quickly reached that of the lake (535.7).

On November 26, the diversion structure was used to raise Fox Pond and Prairie Pocket higher but the Mississippi River stayed relatively low and the pools only rose an additional 0.2 foot.

The fall duck population reached a peak of 61,630 during this period, but freeze-up occurred December 7, and most of the birds moved out. The outlet to Fox Pond was opened on December 17, to begin the winter drawdown.

KEITHSBURG DIVISION: During January through April, the control gates were open and winter drawdown was in progress. In late May the gates were closed to hold out a rise in the Mississippi River. Unfortunately, the river level stayed above the refuge level until mid-August, and during this time rainfall and seep water raised the refuge water level from 530.3 to 530.7. Since the new 20,000 G.P.M. pump was not completed until the end of August, we were unable to pump the water out.

When the river finally dropped, all gates were opened (on August 15) and the pool level dropped rapidly to 529.2. On September 1, the gates were closed to hold out possible rises in the Mississippi River. They remained closed until October 16, when they were opened to raise the water for fall migration. Soon thereafter, the river cooperated nicely with a fall rise and by November 5, the refuge water level had reached 532.4.

Starting November 26, the water was raised further through pumping to a high fall level of 533.04, reached on December 6. Based on the habitat conditions at this time, it appeared that the optimum fall level would be somewhat higher yet (perhaps 533.7); but as freeze-up had occurred, it was pointless to raise the water further. The winter drawdown began on December 20.

MISSISSIPPI RIVER: Water levels were normal until late May when the river began to rise steadily. A reading of 5.95 was recorded on May 16, on the Keithsburg Division gauge. By July 10, the gauge read 11.36 and water stood five feet deep over the mudflats of May.

The river then dropped rapidly and stayed at normal levels until October when it began rising again. A gauge reading of 6.30 recorded at Keithsburg on October 10, had increased to 9.25 by November 5. The river then dropped rapidly and stayed low until the end of the year.

2. FOOD AND COVER

LOUISA DIVISION: Corn was available on the refuge when the spring migrants arrived, but was cleaned up by the time the birds left. Frequent feeding flights were made to private fields west of the refuge, even though early spring plowing rapidly eliminated the waste grain. Flocks of ducks and geese were often seen feeding on the plowed ground - presumably on insect larvae and other animal life.

Green browse (winter wheat) was sufficient for the spring goose population, although in a few places, heavy use the preceeding fall had killed it out completely.

During the summer, some stands of smartweeds developed in the low areas east of Fox Pond and stands of millet and smartweeds were also found scattered around the edges of Lake Odessa. The high water in early July eliminated any growth of moist soil plants on exposed mudflats and the high populations of carp and buffalo prevented growth of submergent vegetation.

The summer drawdown of Fox Pond exposed mudflats and provided excellent feeding areas for herons, egrets and shorebirds from mid-July to mid-October.

Crops were excellent this year. Corn averaged 100 bushels/acre, soybeans 25 bushels/acre and buckwheat about 15 bushels/acre. Seed corn, grown for the first time this year, averaged 50 bushels/acre. It was harvested in September and the waste grain was available for early migrants.

The abundant food was evidenced by an almost complete lack of feeding flights to private fields until late in November. Waterfowl left the area during the second week of December and it now appears that there will be more than enough food remaining for the coming spring migration.

Elm trees in this area have nearly all succumbed to Dutch elm disease. This has opened the canopy and as a result, understory vegetation has sprouted profusely. Deer habitat, therefore is much improved.

This was an excellent mast year for all species except pin oak. Bur oak acorns and hickory nuts covered the ground beneath large trees, but pin oak acorns were very rare.

KEITHSBURG DIVISION: This year, for the first time since 1964, agricultural crops (35 acres of corn) were grown. More would have been planted but high water in early summer curtailed farming operations. The yield was low but mallards fed heavily in the fields during late November and early December when portions of the fields became flooded through pumping.

Due to high water, growth of natural waterfowl foods was poor except for areas of higher ground next to the newly rebuilt levee. Here, apparently soil disturbance from construction work made conditions favorable and good stands of smartweeds and millet developed. Mallards and wood ducks utilized this food heavily as soon as fall flooding made it available. Submergents did not grow due to high carp and buffalo populations.

Brood habitat was excellent because of high water levels in early summer. Wood duck broods were seen in Spring Slough and in the ditches along both sides of the Mississippi River levee. These

areas typically had a luxuriant growth of duckweed and abundant terrestrial ground cover along the nearby banks.

Extensive stands of American lotus occurred and buttonbush produced a good seed crop. Mulberries were very abundant this year. They began to ripen on June 7, when a few purple berries were found. Only red (unripe) berries were seen the day before.

The pin oak acorn crop was almost a complete failure. This eliminated an important food source, as the pin oak is the only mast bearing species occurring in significant numbers on the Keithsburg Division.

BIG TIMBER DIVISION: Despite some loss to high water in early July, the corn crop was above average. Moist soil plants made good growth in the spring, but the high water in July killed most of them and retarded the growth of the rest. Consequently, when the fall migrants arrived they found little natural food in their normal back-water feeding areas.

Brood habitat was excellent while the water was high, but when it went down, cover was lacking for nearly two weeks until emergent vegetation along the edges began to recover. This points up the fact that fluctuations of the Mississippi River can produce some quick and drastic changes in the habitat along the banks, especially when large fluctuations occur during the growing season.

To the great delight of mushroom lovers all along the river, morels were numerous this spring in the bottomland forests.

Shagbark hickories, which are common on the Big Timber Division, produced a bountiful crop of nuts which were much appreciated by squirrels and people alike. Piles of hulls could be seen beneath nearly every tree. The elm trees on Big Timber have been killed by Dutch elm disease and many are beginning to decay and fall down. A dense understory of brush has sprouted up beneath the opened canopy. Stinging nettle was head-high beneath the timber during the summer and early fall and effectively discouraged public use during this part of the year.

II. WILDLIFE

A. MIGRATORY BIRDS

LOUISA DIVISION

1. CANADA GEESE

Thirty northbound Canada geese arrived the first week of February and the population increased to 500 by the third week of the month. The peak of 800 was reached the first week of March when temperatures in the mid-50's initiated the spring thaw. From then on, the refuge population declined as the birds moved northward and by the second week of April they were gone.

Seven Canadas were seen on the Louisa Division by the summer student, Marshall Wilharm, on July 24, but they were not seen again and their origin is unknown.

The first southbound migrants arrived on August 12, in a group of 47. This is the earliest that they have been known to arrive. The geese spent most of their time during the day feeding around the edges of Fox Pond. August planted winter wheat did not offer browse until the first week of September. At night, the geese roosted in the north end of Lake Odessa.

By September, the population had reached 200. Early in the month we managed to trap 17 via cannon net and night-lighting. Two of the geese captured were marked with yellow plastic leg bands. Another goose, similarly marked, was shot by a hunter in the vicinity. We learned later that the colored bands had been placed on the Canada geese during the summer at Necedah National Wildlife Refuge. The three records confirmed previous suspicions that the early arriving Canada geese at Louisa come from central Wisconsin. These are big birds and may belong to the giant race B.C. Maxima.

By the time goose season opened (September 28) the population had increased to 750. It continued to build until an all-time high of 2,000 was recorded during the first two weeks of November. Although hunting pressure was heavy, especially at the beginning of

the season, success was poor. With abundant food the birds simply did not leave the refuge. The kill is estimated at about forty.

The geese began to leave the refuge soon after freeze-up, but at year's end 500 still remained.

2. BLUE AND SNOW GEESE

In the spring, blue and snow geese were present from the middle of February until the first of April. They peaked at 500 during the middle of March. Flocks were often seen flying to private fields west of the refuge to feed.

In the fall they arrived on October 1 in a group of 25. By the first week in November, the population reached its peak of 3,000. Most of the time the birds stayed on Fox Pond and fed in nearby refuge cornfields. They seldom left the refuge and consequently, the hunting kill is estimated at about ten birds.

Many people enjoyed these geese, though. During the auto tours held this fall, snows and blues were often the most easily observed waterfowl. On occasions when an eagle or airplane got them up from Fox Pond, visitors were treated to the awe-inspiring sight and sound of a large flock of blues and snows immediately overhead.

At the end of November, 2,500 blue and snow geese still remained on the area, but when freeze-up occurred in early December, the birds left immediately.

Reproduction must have been exceedingly poor as at least 90 per cent of the flock were adult birds.

3. WHITE-FRONTED GEESE

Seventy white-fronted geese were present during the last week in March and ten still remained the following week. They were then absent from the refuge until October 7, when a group of fifteen was observed in Fox Pond. After a few days, they left and were not seen again the rest of the year. It is doubtful that hunters killed any since the geese were here such a short time.

4. DUCKS

During January, about 100 mallards were in the area and they moved between the refuge and the Mississippi River. During a short warm period in early February, 100 lesser scaup and 200 common mergansers arrived. They stayed only a few days and then left with colder weather.

The first migrant ducks, mallards, arrived during the last week in February. The next week was warm, the ice thawed and migration was in full swing. The peak spring duck population (9,520) occurred during this week, although only 200 were present the week preceeding. Migration continued in full force through the first week of April, after which it dropped sharply. Mallards, blue-winged teal and shovelers continued to trickle through until the end of April, when spring migration was essentially over.

The most numerous ducks in the spring were mallards and pintails. Populations of these peaked at 6,000 and 3,000 respectively during the first week of March.

During summer, the refuge population dropped to about 50 wood ducks, 10 mallards and 5 blue-winged teal. Hooded mergansers were assumed to be present also, but none were seen after spring migration.

On June 26, a group of 50 adult mallards were observed feeding in a flooded soybean field on the refuge. Only six drakes were seen. The origin of these birds is unknown, but apparently they were non-breeders.

Two broods of wood ducks were seen this year, one on Fox Pond, the other in the north end of Lake Odessa. Wood ducks roosted in small numbers in the buttonbush in Little Goose Pond.

Fall migration began during the week of August 18-24, when small numbers of mallards, black ducks and teal arrived. Migrating wood ducks arrived a week later. Peak numbers of baldpates and pintails occurred during the first weeks of November, but the peak mallard population of 60,000 did not occur until the first week of December, apparently because of the lack of cold weather in the north. Freeze-up occurred the following week and most of the ducks moved out.

Despite abundant food and good water conditions, duck use days this fall (2,382,935) were down considerably from last year. This was

probably due both to lower flyway populations and to good habitat and weather conditions farther north.

The ducks fed primarily on waste corn early in the fall. The seed corn harvest was completed in September and the rest of the corn was harvested in October, so the birds had a continuous supply of waste corn. Buckwheat was not used heavily until November and some was still available when the birds moved south. Very few feeding flights were made to the private fields west of the refuge. However, late in November birds were seen moving to the north and northeast.

Canvasbacks were noted only twice during the year. Five were seen during the second week of March and twenty were present during the last week of October.

KEITHSBURG DIVISION

The spring duck population was low. A peak of only 1,010 was recorded at the end of March.

Wood duck production appeared to be good as broods were seen almost every time the area was visited.

The fall duck population was much lower than last year's. It peaked at 6,870 during the last week of November. The peak occurred at the time that water was beginning to spread out over the fields because of pumping.

Most of the waterfowl use occurred along the west side of the refuge. The birds fed heavily on natural foods near the levee at first and then, as the water got higher, moved to flooded cornfields. The flooded portions of fallow fields also received good use. The eastern half of the refuge was used very little, mainly because of a lack of natural foods in this area.

No geese or canvasbacks were seen or reported at Keithsburg this year.

BIG TIMBER DIVISION AND TURKEY ISLAND PUBLIC HUNTING AREA.

Censusing of these areas was done irregularly during the spring and fall. Most of it was done in conjunction with other field work. During the summer, the areas were visited more often because of nest box checks and wood duck trapping.

The peak spring population was 2,290 compared to a fall peak of 1,510. The lower fall peak is due to the influence of hunting.

Wood duck production was above normal along this part of the Mississippi River based on observations by refuge personnel and others familiar with the river. Production from Big Timber and Turkey Island was estimated at 20 broods.

No evidence of production by other waterfowl species was observed.

5. OTHER WATER BIRDS

a. EGRETS

American egrets were common but much less numerous this year than last. A peak of 200 was recorded on the Louisa Division in early September. No nesting colonies were found on any of the refuge units. Other species of egrets were not observed.

b. GREAT BLUE HERONS

These big birds were seen regularly on all of the refuge units. The largest population occurred on the Big Timber Division, where a peak of 30 was recorded.

c. GREEN HERONS

Green herons occurred in small numbers throughout the summer. A peak of 20 was reported for the Big Timber Division. The other refuge areas had smaller numbers.

d. RAILS

Sora rails were heard calling on the Louisa Division on one occasion (September 28). The population was estimated at 50 that day. Observations are so difficult to make on this bird that large numbers could migrate through unnoticed.

e. GREBES

Populations of pied-billed grebes were very low this year. The peak number recorded was ten on the Big Timber Division in spring.

f. CORMORANTS

Cormorants were seen in both spring and fall. Most were observed on the Louisa Division, twenty were present on April 20.

g. BLACK-CROWNED NIGHT HERONS

These birds were present for only a short time during late July and early August. There were probably no more than ten on any of the refuge units.

6. SHOREBIRDS, GULLS AND TERNS

The largest concentration of shorebirds occurred on the mudflats of Fox Pond during the summer draw-down period. Spotted sandpipers, solitary sandpipers, yellow-legs, least sandpipers and killdeer were observed. Two killdeer nests were found on the crushed-rock surface of Louisa Division roads.

Herring, ring-billed and Franklin's gulls were recorded on all refuge units, as were black terns. Caspian terns were seen in small numbers on the Fox Pond mudflats during September and October.

7. MOURNING DOVES

Doves are abundant on the Louisa Division during the summer. A peak of 300 was reported in late June. Much nesting took place along the bluff on the west side of the refuge.

Their favorite loafing spots are areas of bare sandy soil with open perching places, such as dead tree limbs, nearby. The sand levee and dead elm trees along the east side of the refuge provide an abundance of this kind of habitat and most of the refuge dove population occurred in this area.

Doves were also common at the Keithsburg and Big Timber Divisions, but in fewer numbers than at Louisa. At Keithsburg the dove population will probably increase when additional farming provides more areas of bare soil.

B. UPLAND GAME BIRDS

No pheasants were seen on any of the refuge units this year.

Bob-white quail had an excellent production year. At the Keithsburg Division, many were seen in summer along the Mississippi River Levee. Apparently, the first year growth of annual weeds on the rebuilt levee provided good habitat. Noticeably fewer birds were seen after the fall dispersal period and only 30 were estimated to be present at year's end. The fall flooding may cause some birds to move out.

At Louisa, quail were seen occasionally throughout the summer. Some were caught in traps set for mourning doves. At year's end, the population is estimated at 20 birds.

C. BIG GAME ANIMALS

White-tailed deer were seen frequently on the Louisa Division and tracks were everywhere. This fall, Mr. William McDowell who lives near the north boundary of the refuge reported seeing forty at one time in the refuge field behind his house.

It is likely that deer concentrate on the refuge and in the timbered river bottoms during the fall when crop harvest removes most of the cover elsewhere. The state hunting season probably has an additional concentrating effect. On the refuge, therefore, deer populations are much higher in early fall than in late summer. The summer population this year was estimated at 20 animals. In fall, the population was placed at 50.

Few deer were observed on the Keithsburg or Big Timber Divisions. The fall populations were estimated at five and ten respectively.

D. FUR ANIMALS, PREDATORS, RODENTS AND OTHER MAMMALS

1. MUSKRATS

The highest populations of muskrats occur on the Louisa Division and on Turkey Island. During the winter of 1967-68, the trapping permittee caught 669 on these two areas. Only four were taken this winter due to poor trapping conditions and lack of interest by the trapper.

2. MINK

One large mink was taken by the trapper on Louisa this fall and mink tracks were seen around the water control structure on the Keithsburg Division. The population is probably no more than ten for both divisions.

3. BEAVER

During the 1967-68 trapping season, a total of 19 beavers were taken from the Louisa Division and Turkey Island. The removals reduced the population to a less troublesome number and this year at Louisa they caused no problems.

The story was different at Keithsburg. Last year, beaver trapping went unrewarded, and consequently, we spent much time in the spring clearing out beaver dams from the culvert on the access road and from the water control structure. A dam removed during the day would often be rebuilt that night. We hope the trapper will be more successful this year!

Spring beaver populations were estimated at 20 for Louisa and 40 for Keithsburg.

4. RACCOONS

Raccoons were seen frequently this year but their populations do not seem to be increasing. Twenty-seven were trapped last winter on Louisa and Turkey Island. The total population for all units is about 70.

5. SKUNKS AND WOOD CHUCKS

Skunks were not seen nor smelled on any of the refuge units this year. They may occur in very limited numbers.

Wood chucks are not numerous. A few dens are present on both the Louisa and Keithsburg Divisions.

6. FOX

Red foxes probably occur on all of the refuge areas except the islands in the Mississippi River. No gray foxes or coyotes were seen.

Foxes were noted regularly near the Mississippi River levee at the Louisa Division. Some dens were dug in the levee and young foxes were seen several times nearby. The foxes raided mourning dove traps set in this area.

On one occasion in early December, a red fox was seen carrying a mallard drake across an open corn field. Whether the fox killed the duck or found it dead is unknown.

Foxes appear to be on the increase in this region, judging from the observations and comments of local people. Some foxes seen were thin and mangy.

This fall, fox pelts brought a good price (about \$10.00) and interest in trapping them picked up.

7. SQUIRRELS

All of the refuge units have good populations of squirrels. Fox squirrels are abundant and gray squirrels are also present, but less numerous. Corn is a major food source, especially in winter. Except for pin oaks, mast-bearing trees are in short supply.

This year for the first time, the Keithsburg Division was opened to public squirrel hunting from September 14 through October 15. Few hunters took advantage of the opportunity and the total kill was probably less than twenty. Apparently, there is enough hunting territory elsewhere to meet the demand. In future years the number of hunters may increase as more people learn that squirrel hunting is permitted.

8. RABBITS

Cottontails are scarce on all refuge units, even though much habitat for them is available. They are abundant in upland areas near the refuge. Apparently, the floods of 1965 and 1966 wiped most of them out and populations have not yet recovered.

E. HAWKS, EAGLES, OWLS, VULTURES AND CROWS

1. HAWKS

Red-tailed hawks were present all year while rough-legged hawks were seen only in the fall. Red-shouldered hawks were not seen or heard this year. A pair of sparrow hawks nested in a hole in a dead tree on the Louisa Division.

An osprey was seen on the Louisa Division several times during the fall, but none were noted during the rest of the year.

One goshawk was observed on the Keithsburg Division on September 14.

Hawk migration movements were not striking, but a noticeable increase in the population occurred during the week of September 8-14.

2. EAGLES

Only one golden eagle was seen this year. It was present on the Louisa Division during the last half of March.

The peak bald eagle population at Louisa was ten, recorded in the spring. In the fall, the most seen at any one time was four. This is the third year in a row in which the fall eagle population at Louisa has declined. Perhaps the decline is related to lower waterfowl populations and/or fewer crippled ducks each year.

3. OWLS

Barred owls were seen and heard often. Great-horned owls and screech owls were present but were rarely observed.

4. VULTURES

Turkey vultures arrived in early April. The peak number seen was twenty at Keithsburg. Black vultures were not noted.

5. CROWS

The fall crow population was much lower than last year's. This year, the peak at Louisa was 300 compared to 6,000 last year. A similar drop was recorded for Keithsburg.

Reasons for the decline are obscure. Crows roosted at both Louisa and Keithsburg, but the roosts did not get very large. The large flights to and from the roost at Louisa last year passed over the headquarters site, but this year no such flights were observed.

F. OTHER BIRDS

Blackbirds began to flock together and feed on milk-stage corn during the last week of July. The flock roosting in the marshy area east of Fox Pond on the Louisa Division increased to a peak of 200,000 by November. After that the flock declined gradually and by December 15, most of the birds were gone. No formal damage complaints were received this year, although many derogatory comments were heard.

The swallow migration began in early August, when about 1,000 bank swallows arrived at the Louisa Division. Two weeks later, 1,000 tree swallows and 50 bank swallows arrived. The birds stayed around in dwindling numbers until November 11, when a light snowfall drove them south. They often were seen sitting in dense flocks on bare soil.

At sundown on the evening of November 1, a large movement of robins was noted at the Big Timber Division. At least 2,000 birds were seen coming from the east in a steady stream and entering the south end of the area. This was during a time when the Mississippi River was rising and in places water was beginning to cover the ground beneath the timber. Perhaps such habitat provides good feeding areas for robins during migration.

G. FISH

Carp and buffalo are abundant in all refuge waters. Sport fishes consist mostly of catfish, bluegill, crappie and largemouth bass. Fishing is a very popular pastime, but success was generally poor on the refuge units.

H. REPTILES

In spring, many red-eared turtles were seen sitting on logs along the Mississippi River. Snapping turtles are uncommon.

I. DISEASE

Mange on red foxes seemed prevalent this year.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. PHYSICAL DEVELOPMENT

1. LAND ACQUISITION

In May, a tract containing 4.6 acres was added to the Keithsburg Division. It was purchased with \$11,500 of the Land and Water Conservation Fund money and included a house, six small cabins, and an old garage, all in poor repair. A deep ditch on the south end of the tract was formerly used as the city dump of Keithsburg.

The area is near Keithsburg and is adjacent to the Great River Road. It will be developed as an access, public use area and rest-stop for highway travelers. The tract has been posted and all of the buildings on it have been sold (for a total price of \$266.35). As yet, none of the buildings have been removed from the area and no development work has been done.

2. CONTRACT WORK

With the completion of two major contracts during the year, water management facilities at both the Louisa and Keithsburg Divisions are greatly improved. Both contracts were financed with funds specially appropriated for repair of the damage caused by the "Big Flood" on the Mississippi River in 1965. A summary of each contract follows.

LOUISA DIVISION LOW LEVEL DIKE AND PUMPING STATION CONTRACT NO. 14-16-0003-12,464 - \$55,904.11

The low-level dike extends for three and one-half miles around the main cropland area of the Louisa Division. It is designed to protect the cropland from the fluctuating water levels of Lake Odessa. A 20,000 GPM pumping station installed at the south end of Fox Pond will be used for summer drawdowns of the diked-off area.

Work on the misfortune ridden contract began on May 25, 1967. The job was finally accepted as complete on July 11, 1968 - after 146 days of overrun on the contract performance time. The pump was put into use on July 15. It ran two days and then the intake pipe fell apart. Two concrete sections of the pipe came unjointed and the pump began pulling sand through the crack, causing the pipe to be undermined. The pump was shut down and for the next three and one-half months, the contractors struggled with making repairs. Much of the difficulty resulted from the shifting, water-filled sand (almost quicksand) upon which the pipe was being laid.

Finally, in a desperate effort to get the job finished before the water level had to be raised for fall migration, maintenance man McNeil and the refuge motor crane were placed on the job to help. Twelve days later (on October 18) the pipe was back in place and all leaks were stopped. Due to high water, no further work could be done and at the year's end, the job is still not completely finished. Some piling remains to be removed and backfilling completed. Also, because of incorrect design, the inlet ditch will have to be doubled in width and rip-rapped again before the pump can be operated at full speed.

Total cost of this contract was \$55,904.11. Liquidated damages totaling \$10,950.00 have been assessed against the contractor for the overrun on contract performance time.

KEITHSBURG DIVISION LEVEE REPAIR AND PUMPING STATION
CONTRACT NO. 14-16-0003-12,511 - \$121,100.35

This contract called for three main items as follows:

- (a) 30,000 yards of dirt fill to repair breaks in the Mississippi River Levee.
- (b) A 150-foot concrete spillway built into the levee to let water into the refuge during large floods. This will equalize water pressure on both sides of the levee and hopefully, prevent future washouts.
- (c) A 20,000 GPM pumping station located on the levee to pump water either into or out of the refuge.

Work began on August 8, 1967. It progressed satisfactorily and the job was completed on August 29, 1968 at a total cost of \$121,100.35. The pump was used this fall for a total of 192 hours and performed well despite one breakdown.

3. OTHER DEVELOPMENT

Construction work on the oil house and office-service building at Louisa headquarters was completed in December, 1967. The buildings have since proven to be very satisfactory and have vastly improved the image (as well as the working conditions) of the Mark Twain Refuge.

This year, much of the development work under force account centered around the headquarters area to provide the rest of the "trimmings" needed.

Installed tool and boot racks, cabinets, bulletin boards and an air compressor in the service building. Installed storage shelves in the oil house.

Sloped the ditch bank along the county road in front of the headquarters. Hauled seventy loads of dirt to fill low spots around the buildings and then leveled, fertilized and seeded the lawn area.

Hauled one hundred tons of crushed rock to the headquarters courtyard.

Razed an old corn crib on the bluff at the headquarters site and made an overlook parking area in its place. This involved hauling fifty-seven tons of crushed rock, installing parking lot posts, and erecting a roof-sheltered bulletin board.

Constructed a brick-veneered sign standard for a headquarters entrance sign.

Erected a flagpole made of surplus aluminum pipe.

Early in the year, the old existing water well and pump system which had been hooked up to the new service building went defunct. A new six and one-quarter inch well was drilled under purchase order at a cost of \$1,775.00. The well is 355 feet deep. Installation of a submersible pump and other related work remains to be completed.

Other force account development work included the following items:

Completed a loading ramp in the Louisa bottoms.

Built two field approaches off the new Louisa levee.

Widened the dike road at the south end of Fox Pond to accommodate four or five parked cars. This greatly improved the traffic congestion at this spot during the Louisa auto tours.

Erected a large routed recognition sign along the Port Louisa road and erected several smaller information-type signs at both Louisa and Keithsburg.

Erected a chain-link fence around the new pumping station at Keithsburg.

Cut and burned dead elm trees at the Big Timber Access, cut out the stumps with a "stump cutting machine" and smoothed the area to make ready for crushed rock surfacing.

B. MAINTENANCE

Routine maintenance and servicing was performed on vehicles, heavy equipment, roads, buildings and fences as required.

C. PLANTINGS

1. AQUATIC AND MARSH PLANTS

Nothing to report.

2. TREES AND SHRUBS

Nothing to report.

3. UPLAND HERBACEOUS PLANTS

The pool side of the rebuilt levee at the Keithsburg Division was seeded to Kentucky 31 Fescue to prevent erosion. Generally, a good stand resulted, except in a few places where dry, sandy soil was present.

The lawn area at Louisa headquarters was fertilized and seeded to a mixture of bluegrass and perennial rye-grass and a good stand was obtained.

4. CULTIVATED CROPS

A total of 872.7 acres were planted on the Louisa Division, including 334.4 acres of hybrid corn, 110 acres of seed corn, 218.3 acres of soybeans, 84.5 acres of winter wheat and 125.5 acres of buckwheat.

Yields were very good. Hybrid corn averaged 100 bushels/acre, soybeans 25 bushels/acre, and buckwheat about 15 bushels/acre. In some fields, buckwheat yields were diminished by early-arriving Canada geese which fed heavily on the milk stage grain in late summer.

Seed corn was tried this year on an experimental basis. Holden Foundation Seeds, Inc., Williamsburg, Iowa, requested permission to grow it. They explained that the cropland at Louisa is somewhat isolated from other cropland because of Lake Odessa on the south and west, and the Mississippi River on the east. Seed corn grown here would, therefore, be less subject to extraneous pollen.

The corn was grown in Fields 9, 11 and 21 on ground farmed by Bob and Bill Walker, refuge permittees. Holden, Inc. furnished seed, fertilizer and herbicides and paid the Walker Brothers \$5,000.00 to plant, care for and harvest it. The Walker brothers agreed to this because they received nearly as much income from the fields as they ordinarily would and yet they did not have to invest money in seed and fertilizer, etc.

The corn was planted with three "female" rows alternating with two "male" rows. Holden, Inc. harvested the three female rows and left the two male rows as the refuge share.

Cost of growing the corn was tremendous. Fertilizer, complete with trace elements, was applied at the rate of 850 pounds per acre. Groups of teenagers were hired to remove weeds and unwanted corn plants by hand. For the 110 acres, growing costs were placed at \$40,000.

As a result of the intensive care, the yield was about 50 bushels/acre, which is about maximum for this type of corn. The value of the company's share of the crop was an estimated \$100,000.

From the refuge point of view, the main advantage of seed corn growing was the early harvest (September). The waste grain provided abundant food for early fall migrants and they utilized it heavily.

There were several disadvantages:

- (a) The yield per acre was only half that of regular hybrid corn.
- (b) Flexibility in the cropping program was reduced because the seed corn had to be kept widely separated from other corn.
- (c) All refuge permittees did not want to participate in the seed corn growing and some friction developed between the permittees.
- (d) The permittees who grew the seed corn were supervised by two different organizations - the seed corn company and the refuge. This caused no problems this year, but it is a likely area for conflict, especially in view of the high value of the crop and the high cost of growing it.
- (e) Although the large quantity of fertilizer used was a benefit this year, it could possibly become detrimental if it continued for several years and an excess of nitrate developed.

A change was made in the farming agreements at Louisa this year to make the crop division fairer. The cooperators now receive one extra acre of corn or soybeans in return for planting five acres of winter wheat or four acres of buckwheat for the refuge. Before, they received two acres of corn or beans for each acre of buckwheat or wheat. The change was based on custom rates for plowing, disking, etc. and on average yields at Louisa.

At Keithsburg, crops were planted for the first time since 1964. Thirty-five acres of corn were grown which yielded about 50 bushels/acre. The low yield was due primarily to a lack of nitrogen. The cooperator was unable to apply anhydrous ammonia because of wet conditions.

At Big Timber the corn crop was good, despite some loss due to high water in the Mississippi River. The yield averaged nearly 80 bushels/acre. All of the refuge share of this corn was picked and stored in the refuge corn crib.

D. COLLECTIONS AND RECEIPTS

1. SEED OR OTHER PROPAGULES

Nothing to report.

2. SPECIMENS

Nothing to report.

E. CONTROL OF VEGETATION

The farming cooperators at the Louisa and Big Timber Divisions applied the following herbicides on corn and soybeans.

<u>HERBICIDE</u>	<u>CROP</u>	<u>ACRES</u>	<u>RATE</u>	<u>RESULTS</u>
Atrazine	Corn	329.4	3 lbs/acre	Excellent
2,4-D	Corn	142.0	2 lbs/acre	Good
Treflan	Soybeans	100.0	1.5 lbs/acre	Good

No herbicides were applied to the corn cropland at the Keithsburg Division.

During July and August 2,4-D was sprayed by the refuge staff to control willow, silver maple and other brush along roadsides, levees and marsh edges at the Keithsburg Division. Twenty acres were sprayed at an estimated rate of one pound per acre. The river side of the Keithsburg Levee was sprayed twice. The other areas received only one application.

Control of broadleafed weeds was excellent as was control of willow and box elder. Control of most other brush species was fair to poor.

At the Louisa Division a total of twenty-two acres were sprayed with 2,4-D along roadsides, ditch banks and levees. This was done during July and August and was mostly spot spraying. Rate of application was one pound per acre. Here, as at Keithsburg, the best control was on broadleafed weeds, willow and box elder. It was noted that most of the silver maple sprayed last year sprouted again this spring and seemed to have suffered very little from the effects of last year's spraying. Willow, however, was killed down to the roots. A few new sprouts were noted at the base of some of the larger willow trees, but in general, control was excellent.

No mechanical control was done this year except for mowing along roadsides.

F. PLANNED BURNING

At the Louisa Division a burn was made in the marshy area east of Fox Pond on March 27. This area is covered with a dense stand of head-high marsh vegetation. The burn obtained was very spotty, due partly to the burning conditions that were less than ideal, and partly to the openings in the vegetation caused by muskrats. Only about twenty-five acres were burned.

Roadsides on the Louisa Division, five acres, were burned to control woody brush encroachment. Field No. 27 (two acres) was burned by the cooperator to remove an accumulation of litter.

At the Keithsburg Division all of the fields except Nos. 1 and 6 were burned on March 4, to remove an accumulation of litter and control woody encroachment. An excellent burn was obtained and much of the brush was killed to the roots. Most has since resprouted.

It is evident that these bottomland fields cannot be kept open for very many years by burning alone. Enough brush has survived burns during the past four years that in some places it is now high enough and thick enough to shade out the grass and weeds beneath it. Fires, therefore,

will no longer carry through the brush patches because of a lack of dead grass and weeds for fuel.

G. FIRES

Nothing to report.

IV. RESOURCE MANAGEMENT

A. GRAZING

Nothing to report.

B. HAYING

Nothing to report.

C. FUR HARVEST

During the 1967-68 trapping season the following species were taken on the Louisa Division including Turkey Island. Muskrats-669, raccoons-27, beaver-19, and fox-1. The Government's share was 25 per cent of the muskrat pelts which were sold for \$112.33.

A problem arose when the state warden apprehended the refuge trapper on the Louisa Division with a muskrat in his possession (in his car). At the time, the state muskrat trapping season had been closed for more than ten days, but the beaver trapping season was still open. The muskrat was taken in a trap set for beaver.

According to Iowa law, a person may not possess furbearers except during the trapping season and for ten days thereafter. Unauthorized species found dead in traps are to be left in the immediate vicinity. However, Item 4 on the back of the refuge trapping permit (Form 3-1726) states that such unauthorized species shall be immediately turned over to the refuge manager or his representative.

The trapper was clearly in violation of state law; but conceivable, he could have been on his way to refuge headquarters to give the muskrat to the refuge manager when he was apprehended. Though this was unlikely, the state decided to drop charges. The state wardens were understandably upset by this, and the district warden supervisor even made a few comments concerning the legality of the refuge receiving a share of the "state-owned" (because furbearers are resident game) pelts.

The conflict was resolved for the 1968-69 season by a special condition on the refuge trapping permit which stated "any unauthorized birds or mammals found in the traps shall be left near the trap where taken and the refuge manager notified".

On the Keithsburg Division a total of 14 muskrats and 1 mink were taken during 1967-68. The Government's share totaled \$4.85 for 25 per cent of the muskrats and 50 per cent of the mink.

D. TIMBER REMOVAL

Timber rights are retained by the U. S. Army Corps of Engineers. This spring, they cleared the timber off the Mississippi River Levee at Louisa Division from near the south refuge boundary down to Lock and Dam No. 17.

E. COMMERCIAL FISHING

The only commercial fishing was on Big Timber and Turkey Island. No records are kept on this activity.

F. OTHER USES

A special use permit was issued to trap turtles at the Louisa Division. To date, we have not received a report of the catch. The permittee trapped for only a short time and it is doubtful that many were taken.

V. FIELD INVESTIGATIONS OR APPLIED RESEARCH

A. WOOD DUCK BANDING

Because of the fluctuating water levels in the Mississippi River this summer, local wood duck banding was a flop. Each time that the birds began to use the bait, the river would either rise or fall and the ducks would move elsewhere. Eight floating traps were used, which were set in shallow water in places that, in past years, have been good trapping sites. However, only five ducks were caught - one local and one immature male and three local females. Cost per bird banded was exorbitant - \$86.20 each, not including twenty hours of donated time.

We were not authorized to band wood ducks, other than locals, this year so no fall cannon net trapping was attempted.

B. MALLARD BANDING

Only post-season (January) banding was authorized this year. Since few birds were present, no trapping was attempted.

C. CANADA GOOSE BANDING

Since we know little about the Louisa Canada goose flock, banding of this species was heavily stressed. When the birds began arriving in mid-August, cannon net traps were set up on two sites and baited with corn. Cannon nets have been unsuccessful in the past because the birds refuse to use the bait, but we hoped things would be different this year.

The geese did not use the bait at all until September 1, when a few were noted on the Fox Pond site. The following evening (September 2) a shot was made and twelve were taken. Ten of the geese were females of which six were young of the year. The other two birds were an adult male and a young of the year male. One of the geese was wearing a yellow plastic leg band in addition to a regular aluminum band.

The geese were seen on the bait only one time after that and a shot was attempted, but only one cannon fired and none were caught. Snow and blue geese, as well as ducks, used the Fox Pond site heavily throughout the fall and gave us problems in keeping the site supplied with bait.

We also tried night-lighting in the north end of Lake Odessa on two occasions. On the first night only a few birds were seen and none were taken. On the second night (September 11) three were caught and one of these was wearing a plastic leg band like the one recovered previously. A third band, of similar type, was reported to us by a hunter who had killed the goose in the vicinity. We later learned that the plastic bands were placed on the birds this summer at Necedah National Wildlife Refuge. The three records support previous beliefs that the early-arriving Canada geese at Louisa come from the Necedah area.

Now we need to learn where the late-arriving geese come from and where they go from here.

D. MOURNING DOVE BANDING

Although dove trapping at Louisa was not as successful as last year, the summer student still did well. A total of 173 were banded toward our quota of 200. The table below shows sex and age of the birds trapped.

TABLE I.
MARK TWAIN NATIONAL WILDLIFE REFUGE
DOVE BANDING - LOUISA DIVISION - 1968

	<u>Adult-Male</u>	<u>Adult-Female</u>	<u>Adult-Unknown</u>	<u>Immature-Unknown</u>	<u>TOTAL</u>
Mourning Doves	89	16	4	64	173

The doves were taken in twenty walk-in traps baited with a 50:50 mixture of millet and cracked corn. Banding costs were \$1.66 per bird excluding thirty-three hours of donated time.

E. WOOD DUCK NEST BOX INVESTIGATION

1. LOUISA DIVISION

This spring, before the nesting season, nineteen additional wood duck nest boxes were erected. Twelve of these were metal boxes made at Mingo Job Corps Civilian Conservation Center and are fastened to trees with a bracket. The other seven were boxes made from aluminum machine gun storage cylinders and these were mounted on metal posts and set out around the edges of the pools. Nine wooden boxes and four metal boxes were already present, making a total of thirty-two boxes available for the nesting season.

None of the boxes were used. The most plausible reason for this is a low breeding population which is not yet oriented toward using boxes. Another factor may be that nearly all of the wooden boxes which are mounted on trees were used by fox squirrels.

Since wooden boxes are initially the most acceptable to the ducks, we now plan to remove the wooden boxes from the trees and put them on posts over water. This should eliminate squirrel use and raccoon predation and may be what is needed to get nesting started.

2. KEITHSBURG DIVISION

Before the nesting season, all metal boxes were checked and five more of the Mingo type were erected. The wooden boxes were not checked this year. Only six remain and these are in bad repair. Since the wood ducks are now using metal boxes, the wooden ones will be allowed to deteriorate.

Of the twenty-eight metal boxes available this year, seven were used and all but one of these appeared to be successful. None of the boxes erected this spring were used.

The number of successful nests has remained nearly constant for the last four years as the following table shows.

TABLE II.
MARK TWAIN NATIONAL WILDLIFE REFUGE
WOOD DUCK NESTING SUCCESS - KEITHSBURG DIVISION

<u>YEAR</u>	<u>BOXES AVAILABLE</u>	<u>SUCCESSFUL</u>
1963	13	0
1964	16	2
1965	36	7
1966	36	6
1967	30	6
1968	28	6

3. BIG TIMBER DIVISION

The 100 boxes made from aluminum cylinders and erected in 1965 have two types of roofs. Half of the boxes have conical-shaped roofs, and the other half have flat roofs. In checking the boxes before the nesting season, it was noted that squirrels used almost all of the flat-topped boxes but used very few of the ones with conical roofs. Therefore, we decided to check and maintain only boxes of the latter type.

Accordingly, after the nesting season forty-eight of the conical-roofed aluminum boxes and nine sheet metal boxes were checked. No evidence of wood duck nesting was found. This has been the case for the past three years.

The probable reason for the lack of use is that the birds simply are not yet oriented toward nesting in boxes. It was formerly thought that the nine-inch diameter of the aluminum boxes was too small, but this same type of box has been used successfully at Chautauqua National Wildlife Refuge.

In order to get nesting started, it may be necessary to provide some wooden boxes placed over water on posts, but the fluctuating water level of the Mississippi River makes this an uncertain proposition, at best.

VI. PUBLIC RELATIONS

A. RECREATIONAL USES

Recreational use skyrocketed this year on the Louisa and Keithsburg Divisions. In 1967, total visits numbered 7,274. This year, visits increased to 47,981. Some of the increase may have been due to the fact that recreational use estimates for each year were made by different refuge managers. Even so, it is beyond question that a large increase actually did occur.

As usual, sport fishing accounted for most of the recreational use. Driving for pleasure (Wildlife Scenic Vehicle Routes) was an important activity at the Louisa Division and accounted for about a third of the visits.

The biggest event in the recreation program was the inauguration of self-guided auto tours at Louisa. These were held each Sunday afternoon during October and November. A one-way, circular route, six miles long was established and points of interest along the way were marked with numbered stakes. A leaflet was prepared which explained the things to be seen at each stop and also provided basic information about the refuge and its objectives. Refuge personnel met each car at the entrance to give instructions and hand out the leaflets.

The tours were very well received and 6,750 people participated. Some came from as far away as Des Moines, Cedar Rapids and Clinton. One letter requesting information about the tours was from a resident of Columbia, Missouri.

The main reason people came, of course, was to see the ducks and geese. For the first three Sundays, waterfowl were somewhat scarce because of the delayed migration this year. After that, though, nearly everybody was able to see birds at close range during at least some portion of their tour. On the whole, the visitors were appreciative and we received many compliments.

The tours were not without problems, however. At the start, waterfowl hunters complained because they thought the crowds of people would run the birds south. This, of course, did not prove to be true and the griping gradually subsided as the weeks passed.

The biggest problem was that on two Sundays the crowds were much too large for our road system. The roads were simply not capable of smoothly handling more than about 350 cars in one afternoon.

The worst day was the second Sunday in October, when the refuge was swamped with 600 cars. The crowd resulted from: (1) good publicity from newspapers and radios, (2) good weather, temperatures in the 80's, and (3) tree foliage at the peak of fall coloration. Many people out for a Sunday drive decided to come by the refuge and see what it was like.

"What it was like" that day was hot, dusty and crowded with few waterfowl to be seen. In mid-afternoon, a haze of dust from the cars hung over the whole Louisa bottomland and the only waterfowl in evidence were fifty Canada geese in Fox Pond.

The geese were best observed from the narrow dike road at the south end of the pool and there nearly everybody slowed down or stopped. Traffic backed up for a quarter-mile. Some horn honking occurred as people became impatient with the slow moving line. Two cars ran off the road, got stuck and had to be pulled out. Conditions improved toward evening as the crowd thinned out and waterfowl began their evening feeding flights, but in all, it was a hectic day for the two refuge personnel on duty.

The following Sunday was also crowded (483 cars) but after that there were fewer cars and more waterfowl and the remaining tours were thoroughly enjoyed by all attending.

In summary, the tours gave us a lot of favorable publicity this fall and greatly improved the refuge image. Before next fall, we plan to make several improvements, such as more parking space, and the tours then should be even better.

The overlook parking area on the bluff at Louisa headquarters began receiving heavy use as soon as it was built. During the period from early September (when construction was completed) until the end of the year, an estimated 2,829 visits were made. Much of the use was from goose hunters who were watching to see which way the geese were flying.

On one Saturday morning (September 12) during the two-hour period from 10:00 am until 12:00 noon a total of five cars carrying thirteen people visited the overlook area. Average length of stay was about ten minutes. Interestingly, each group had binoculars and each time the people got out of their cars and went to stand on the bluff to look.

This overlook area is an ideal starting place for a nature trail extending down along the bluff, and we hope to establish one early next year.

B. REFUGE VISITORS

<u>DATE</u>	<u>NAME</u>	<u>AFFILIATION</u>	<u>PURPOSE</u>
3/6	Bob Jack	Iowa Conservation Com.	Discuss Big Timber access.
4/30	C. Rollings	BSF&W - Refuges	S & M inspection.
5/2	R. Wright	BSF&W - Engineering	Louisa Division contracts.
5/28	V. Weismuller	Corps of Engineers	Timber inspection.
6/7	V. Weismuller	Corps of Engineers	Timber inspection.
7/8	Phil Morgan	BSF&W - Refuges	Refuge inspection.
7/10	A. Trandahl	BSF&W	Orientation tour.
8/9	R. Wright	BSF&W - Engineering	Louisa pump contract.
8/29	R. Wright	BSF&W - Engineering	Louisa pump contract.
9/2	Wes Newcomb	BSF&W - GMA	Courtesy call.
9/2	Cleve Vaughn	BSF&W - GMA	Courtesy call.
9/2	Rex Emerson	Iowa Conservation Com.	Trapping violation.
9/10	Bob Jack	Iowa Conservation Com.	Discuss Big Timber access.
10/1	Dr. & Mrs. Leigh Frederickson	Gaylord Memorial Wildlife Laboratory, Puxico, Mo.	Courtesy call and refuge tour.
10/2	Wes Newcomb	BSF&W - GMA	Courtesy call.
10/2	Cleve Vaughn	BSF&W - GMA	Courtesy call.
10/23	R. Wright	BSF&W - Engineering	Louisa pump contract.
10/23	Bill Miller	BSF&W - Engineering	Louisa pump contract.
11/18	Jack Toll	Mingo NW Refuge	Courtesy call.

The following people were frequent visitors this year.

Iowa Conservation Commission personnel: Bill Beebe, Game Warden; Bill Aspelmeier, District Game Manager; David Vollink, Area Game Manager; Jim Ripple, Area Game Manager.

Bureau of Sport Fisheries and Wildlife personnel from Minneapolis: Earl Eliason, Engineering; Joe Richie, Engineering;

Contractors for construction work: Adrian Stephens and Fred Brannon.

Farming permittees: John Wallace, Marion Schafer, Bob Walker, Bill Walker, Leroy Pentecost and Dillon Schantz.

At the end of 1967 the refuge office was moved from its location on the main street of Wapello, Iowa to the headquarters building on the bluff above Lake Odessa. Local people stop by less frequently now, but we do get a lot of visits from vacationers, duck hunters and sightseers.

C. REFUGE PARTICIPATION

Refuge Manager Wayne Weier participated in the following activities:

Feb. 21	Attended Isaac Walton League fish fry.
Mar. 12	Wrote Wildlife Week press release. Distributed Wildlife Week posters and bulletins to public schools.
Mar. 13	Attended Isaac Walton League fish fry.
Mar. 26	With Manager Gillett attended Corps of Engineers meeting in Rock Island, Illinois concerning the proposed 12-foot channel.
Apr. 3	Attended Technical Action Panel meeting.
Apr. 3	Attended Isaac Walton League fish fry.
Apr. 19	Conducted tour of Louisa Division for Life Science Class from Columbus Community High School, Columbus Junction, Iowa.
June 5	Attended Technical Action Panel meeting.
June 12	With Manager Gillett met with Muscatine Island Drainage District concerning Big Timber Access.
June 14	Met with Girl Scout leaders to plan the nature program for a "day-camp".
June 25, 26 and 27	Conducted nature classes for 50 Girl Scouts at a "day-camp" in Wapello, Iowa. Summer student Wilharm helped with this.
July 12	Presented slide talk to 50 high school students at a "Youth Conservation Workshop" at Western Illinois University in Macomb, Illinois.
July 17	Gave talk to 60 girls and 5 adult leaders at a 4-H "Day-Camp" in Wapello, Iowa.
July 19	Presented slide talk to 50 high school students at a "Youth Conservation Workshop" at Western Illinois University in Macomb, Illinois.
Aug. 7	Attended a reorganization meeting for the Wapello Boy Scout Troop.
Sept. 16-20	Attended training course on "Group Supervision and Leadership" given by the Internal Revenue Service in Des Moines, Iowa.
Oct. 2	Attended Isaac Walton League meeting with GMA's Newcomb and Vaughn. Explained Louisa Division auto tours to the group.
Oct. 7	Conducted tour of Louisa Division for 7 Cub Scouts and two adult leaders from Letts, Iowa.
Oct. 11	Conducted tour of Louisa Division for 36 first graders and seven teachers from Winfield, Iowa public schools.
Oct. 16	Presented check from Refuge Revenue Sharing Act to Lawrence D. Greer, County Auditor, Mercer County, Illinois.
Oct. 18	Presented check from Refuge Revenue Sharing Act to Florence Swanson, County Treasurer, Louisa County, Iowa.

Oct. 18-19 Assisted with the Gardner Division bow hunt, Quincy, Illinois.
Nov. 6 Attended Technical Action Panel meeting in Wapello, Iowa and distributed copies of the new Mark Twain Concept Plan to members.
Nov. 15 Attended the National Safety Council's Defensive Driving Course at Necedah National Wildlife Refuge.
Dec. 9-11 Attended Midwest Wildlife Conference in Columbus, Ohio.

Maintenanceman McNeil attended most of the Isaac Walton League fish fries held this year and attended the National Safety Council's Defensive Driving Course held at Chautauqua National Wildlife Refuge.

Refuge personnel Weier, Gillett and McNeil conducted the auto tours held at the Louisa Division during October and November.

D. HUNTING

Even though the Canada goose flock at Louisa was the largest ever (2,000) hunting success was poor. Because of the abundant food on the refuge the birds seldom left the area. Blue and snow geese behaved the same way, consequently the hunting kill was only an estimated fifty geese - forty Canadas and ten blues and snows. Last year, the total goose kill was estimated at 82.

Duck hunting in this area can be quickly summarized as being the poorest ever known. On opening day, October 26, the hunters at Lake Odessa had difficulty getting even one mallard. Wood ducks were more numerous than mallards (about 2:1) in the opening day bag, but few hunters had their limit of two woodies. Last year, hunters at Lake Odessa killed an estimated 2,000 ducks on opening weekend. This year, the total season kill was about 2,000.

Reasons for the low duck kill were thought to be fourfold: (1) low flyway populations, (2) a delayed migration of mallards through this area, (3) a shortage of natural foods in Lake Odessa and in the backwaters of the Mississippi River because of high summer water levels and (4) abundant food on the Louisa Division. Low hunting pressure was not a factor, because it was as heavy as always during the first week or two of the season. It dropped off later as a result of poor success.

Of the four reasons given for the low kill, the low fall duck population was probably most important. However, the general shortage of natural foods in this area may have also been highly influential. For example, the pin oak mast crop which is especially important at Lake Odessa was a failure. Much of this area is covered with pin oak timber which is flooded during the fall and is normally very attractive to the ducks. This year, the birds scarcely used these flooded timber areas.

The total waterfowl kill on the refuge's public hunting areas, Big Timber and Turkey Island, was guessed at 500 ducks, 2 geese, 10 coots, and 2 mergansers.

Hunting pressure on squirrels at the Big Timber Division was heavy. However, at the Keithsburg Division, which was opened to squirrel hunting for the first time this fall, hunting pressure was almost nonexistent. Squirrel hunter visits during the month long season were estimated at 55, but this is probably a maximum figure.

E. VIOLATIONS

Refuge Manager Gillett apprehended two waterfowl hunters on the Louisa Division. They appeared before the U. S. Commissioner in Burlington, Iowa, pleaded guilty to a charge of refuge trespass and were fined \$25.00 each.

F. SAFETY

The staff read all safety bulletins and participated in the monthly safety meetings held at refuge headquarters in Quincy, Illinois. Informal safety discussions were held throughout the year as the need arose.

Guards were placed over the open drive shafts on both of the new 20,000 GPM pumps. The pump at Keithsburg was enclosed with an 8-foot high chain link fence to prevent injury to the public.

Manager Weier and Maintenance man McNeil both attended the National Safety Council's Defensive Driving Course.

VII. OTHER ITEMS

A. ITEMS OF INTEREST

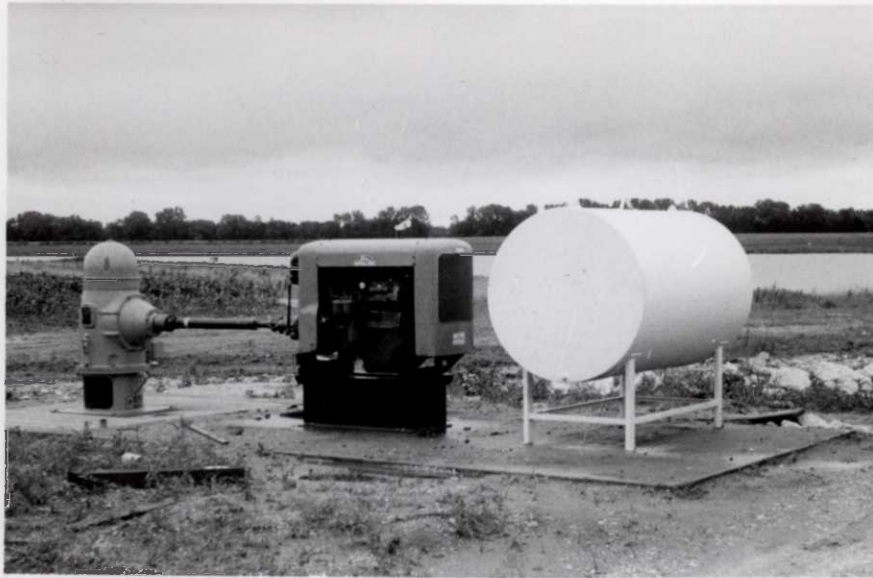
R. Wayne Weier left the job as assistant manager at Mingo Refuge and became a member of the Mark Twain staff on February 11. He has since found the managerial duties of the Louisa-Keithsburg Divisions to be quite a challenge - especially at narrative report time!

Our student laborer this summer was Marshall Wilharm. Marshall was a senior at Iowa State University and returned for his final quarter of studies in September. Upon receiving his B. S. degree in wildlife management, he enlisted in the U. S. Air Force and is now training to be a pilot. Marshall did a good job for us this summer and said that after he finishes with military service and graduate school, he would like to work for the Bureau.

Lloyd Shaw from Keithsburg, Illinois was placed on an intermittent appointment as a laborer to periodically check the operation of the new 20,000 pump at Keithsburg. Mr. Shaw has had previous experience with pumps of this sort and did his job well. We look forward to his continued good service.

B. PHOTOGRAPHS

Photographs are appended.



The 20,000 GPM pump at the Louisa Division designed to drain Fox Pond (in the background) was finally completed on July 15, at a cost of \$50,800.

R-201, P-5A RWW

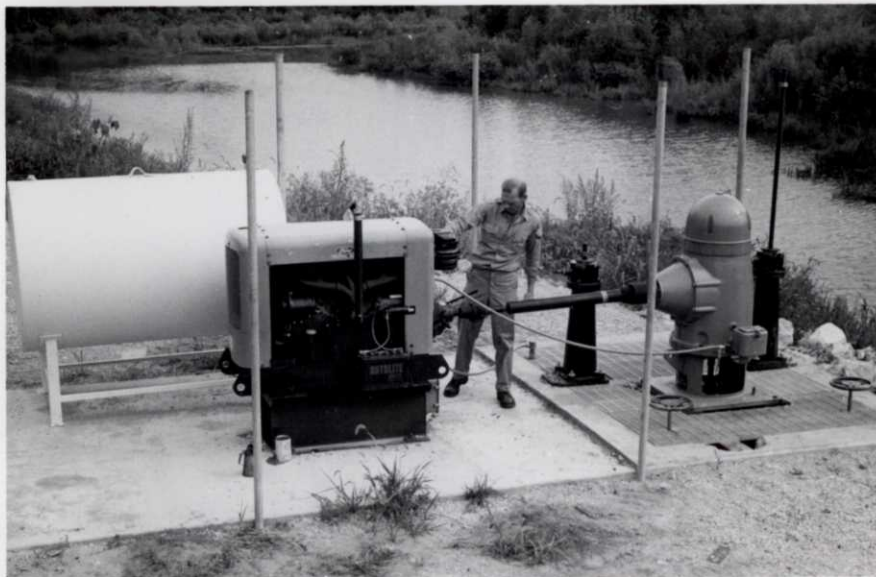
June 1968



After 2 1/2 days of pumping, the concrete sections of the intake pipe came apart. Repairs made the pump inoperable for the rest of the year. Other "good news" was that the inlet ditch (shown extending into Fox Pond) was designed too small and will have to be doubled in width and rip-rapped again. This time by refuge personnel.

R-204, P-114A RWW

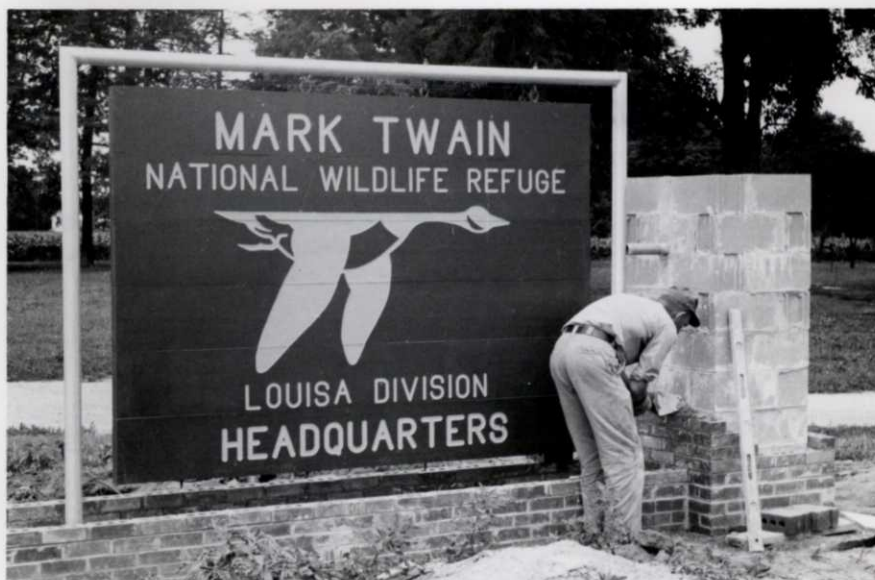
August 1968



The new pump at Keithsburg can be used to pump either in or out of the refuge. Here, maintenanceman McNeil makes adjustments to the diesel engine. An 8-foot chain link fence was later erected around the structure (posts are shown in place) and a guard was installed over the exposed drive shaft.
R-203, P-10A RWW July 1968



McNeil (left) and Manager Weier (right) are shown at work on the foundation for the Louisa headquarters sign. In the background, an aluminum flagpole is held in place by the refuge motor crane until the concrete in the base sets.
R202, P-1 EMW June 1968



McNeil made the pipe fence and laid the blocks and bricks. The total cost of materials and labor was \$700.00 exclusive of the routed redwood sign.

R-202, P-16 RWW

June 1968



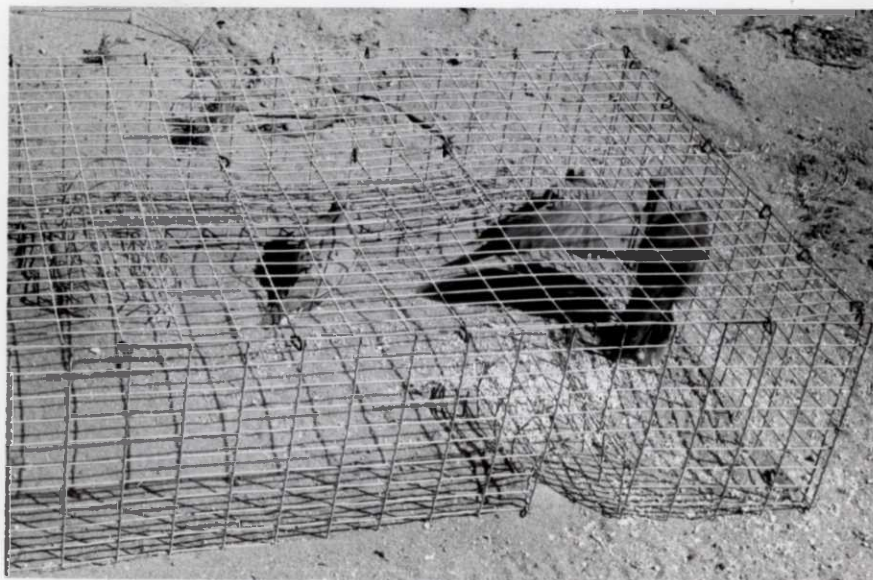
During the summer months, the Louisa headquarters area drew many visitors and sightseers.

R-205, P-20 RWW

August 1968



Our summer student, Marshall Wilharm, was quite successful at trapping mourning doves this year.
 R-201, P-13 RWW June 1968



Most of the doves were taken in traps placed on the bare sand of the Mississippi River levee.
 R-202, P-4 RWW June 1968



Crops were excellent on the Louisa Division this year. This corn, grown by farming cooperator D. D. Schantz, averaged 100 bushels/acre.
R-204, P-21 RWW August 1968



Dead elm trees along the Keithsburg levee fell across the road with every strong wind. This year, a chain saw was standard equipment for a visit to the Keithsburg Division.
R-205, P-14A RWW September 1968