FLINT HILLS NATIONAL WILDLIFE REFUGE Hartford, Kansas

> ANNUAL NARRATIVE REPORT Calendar Year 1980

NATIONAL WILDLIFE REFUGE SYSTEM Fish and Wildlife Service U.S. DEPARTMENT OF THE INTERIOR

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PERSONNEL

1.	Michael	J.	Long
2.	Carlton	R.	Freeburg

- 3. Freida F. Arndt
- 4. Harold E. Shepherd
- 5. Ron E. Thuma
- 6. Gerald K. Laws

Refuge Mgr. GS-11 (PFT) Asst. Refuge Mgr. GS-9 (PFT) (Transferred to Havasu NWR 09-21-80) Refuge Assistant, GS-5(PFT-career seasonal) Eng. Equip. Operator, WG-8(PFT-career seasonal) Maintenance Worker, WG-7 (PFT) Tractor Operator, WG-6 (PT)

REVIEW AND APPROVALS

Area Office Regional Office School S (18) Regional Office 3-12-2/ Date 8) Date Submitted By Flint Hills NWR Date Refuge



A. Introduction

Flint Hills National Wildlife Refuge, established in September 1966, is located 60 miles southwest of Topeka, Kansas in the Neosho River Valley. The name is a misnomer, as the Flint Hills of Kansas are located approximately 40 miles west of the refuge. Overlayed on 18,000 acres of the Corps of Engineers, John Redmond Reservoir Flood Project, the refuge and reservoir are fed by the Neosho River. Flint Hills NWR is one of three Federal refuges in the state.

Refuge habitat is primarily agricultural and grassland with interspersions of native hardwood timber and invading cottonwood-willow on lower elevations.

The primary objective of the refuge is to provide a feeding and resting area for migratory waterfowl.

B. Climatic Conditions

The 1980 year started out dry with approximately 3" of snow during January, and below normal precipitation prevailed throughout the entire year. During July, the temperatures exceeded 100 degrees on 20 different days. Throughout the year extreme heat and winds, along with below normal precipitation severly hurt crop production, vegetation, and drastically cut naturally occurring water supplies.

Weather and reservoir data which affects the refuge are obtained from the U.S. Army Corps of Engineers at John Redmond Reservoir.

TABLE I-Weather conditions and reservoir levels for CY-80

	Inches	Normal	Temper	rature		Lake	Level
Month	Precip.	Precip.	Max.	Min.		Max.	Min.
January	.81	1.24	64	-4		1039.60	1038.88
February	.00	1.33	67	-6		1042.33	1039.00
March	5.11	2.25	70	10	2	1047.58	1038.80
April	.71	3.38	85	31	·***	1055.38	1039.58
May	1.11	4.91	90	35		1039.38	1038.85
June	3.75	4.68	107	55		1039.44	1038.75
July	. 34	3.48	108	61		1039.19	1038.47
August	3.82	2.96	107	59		1038.65	1038.00
September	2.26	4.13	100	45		1038.87	1037.30
October	4.65	2.71	90	23		1037.78	1037.11
November	.53	1.64	82	20		1037.68	1036.90
December	2.70	1.51	68	22		1037.42	1036.80
TOTAL.	25.79	34 22					

C. Land Acquisition

1. Fee Title

All lands managed by the refuge are owned under fee title by the U.S. Army Corps of Engineers (COE).

During 1980, there were meetings with Mr. Lloyd Paxton regarding some lands, less than 5 acres, which were causing boundary problems. These lands had the potential to legally deny public access to Eagle Creek, and were flooding portions of Mr. Paxtons land during certain flood times. Land involved tract 746, Section 36, Township 20S, Range 13E. As of February 26, 1981 the land purchase and transfer to COE ownership seems certain.

2. Easements

A major pipeline company, Panhandle Eastern, has maintained easements through the refuge before refuge existence. It is a substantial line ending in the Great Lakes area. The company maintains the right-of-way by mowing above the pipes, maintaining it clear of trees, and maintaining 2 test sites.

Starting in the fall of 1980, the pipeline company built up an access road to their test site to allow vehicle movement during any season.

D. System Status

1. Objectives

Flint Hills NWR primary objective is a feeding and resting area for migratory birds. Waterfowl objective levels of 30,000 geese (OTU) and 60,000 ducks (OTU) are approximately on target. Weather and waterfowl production are the 2 main factors which influence visiting waterfowl numbers. Flint Hills NWR, because of the large farming program, proximity to a nuclear plant (8 miles) with a large cooling reservoir has great potential to exceed objective levels.

A privately contracted Master Plan was completed in March 1980, which addressed many long range objectives. This plan was 471 pages, and provided a variety of areas to address and directions to follow. Two areas were crucial to giving the plan a trial; 1) changing the farming program; and 2) the road network.

The refuge cooperatively farms approximately 6,000 acres. The plan suggested that approximately 550 acres would suffice. However, to obtain 550 acres it was estimated that 2,500 acres would have to be cooperatively farmed. It also suggested that a bid by share basis be instigated, and a withdrawal of lands could proceed on the bid basis over a period of 20 years. Like all plans, it was 'bought' as a package. Politics from the present cooperators started and Kansas City Area Office staff met with Congressman Whittaker and/or staff. A political decision followed which changed one of the major thrusts of the Master Plan. It was decided that farming would not go on a bid by share basis and present cooperators would be allowed to stay until 'attrition' took place.

Since bidding would not decide refuge share another method was found. A meeting with a committee of farmers, members from the extension service, one member from Denver Regional Office realty staff, a representative from the Kansas City Area Office, and the refuge manager formed a working group. The end result was, rental shares would be 10, 15, and 20 percent, depending on refuge location and effects of reservoir flooding. This changed from the present 16, 20, and 33 percent. The only thing the refuge provides is land. All other costs and services, such as fertilizers, weed control, harvesting of refuge crops, etc are furnished by the cooperator. The decisions made were political in nature. It is expected that non cooperators will question the wisdom of the decisions made, at some time.

By the end of 1980, neither the changes to the Master Plan were documented and signed off on, nor was a farming plan in place. Hopefully by the end of 1981 better documentation will exist.

2. Funding

Flint Hills NWR has a cooperative agreement with the COE, which allows the sale of farm crops, excess to wildlife needs. Surplus farm crop monies are placed in sub-activity 8210, Proceeds from Sales, and can be spent only at Flint Hills NWR.

TABLE II - 5 YEAR STATION FUNDING LEVELS

	Total Budget	Amount of 8210 Funds Collected	Total Salary	% of Total Budget for Salaries	Funds Remaining for Goods &
FY					Services
80 79 78 77 76	\$171,179 148,300 145,300 104,299 58,200	\$62,509.52 88,583.78 10,445.21 35,553.67 57,000.42	\$105,891 95,222 80,038 45,887 37,952	62% 64% 55% 67% 65%	\$65,288 53,078 65,261 21,913 20,248

II. CONSTRUCTION AND MAINTENANCE

A. Construction

The major piece of new construction completed was the maintenance/storage building. Refuge headquarters area has come a long way from a basement office in the Burlington Post Office with maintenance operating out of rented boat stalls in New Strawn. The completed cost of this BLHP funded project, completed by a minority owned construction contractor was \$286,119.83.

A BLHP visitor contact station project is sidetracked. Initially designed as a force account project, but eventually going the bid process after conflicts with the Davis Bacon Act. The present office with attached 2 stall garage was to be extended, to accommodate 2 restrooms, and the garage space converted to a visitor contact station with meeting room.

When the contact station is completed, the station will have all the necessary facilities to support the entire range of station objectives. As a relatively small station the facilities and equipment will be very adequate for needs,

B. Maintenance

A 1.5 cubic yard John Deere front-end loader was received April 22, 1980. Though late in arriving this machine will substantially enhance the equipment capabilities of the refuge. Ordered under the BLHP program, it will support the road rehabilitation needs of the BLHP program and then continue to support a wide array of uses.

With the arrival of the loader, work hastened on re-gravelling portions of the refuge road system. In house capabilities now existed to ditch roadways, load gravel, haul the gravel, and spread gravel.

A wide assortment of tools and equipment, ranging from air compressors to hammers were purchased to equip the new maintenance building Expenditures for equipment were substantial, but the end result is worthwhile.

The inspection function for the new maintenance/storage building was substantial, and Maintenanceman-Thuma was very instrumental in accomplishing the job with a minimum of problems.

The maintenance highlight certainly is the new building. The unsung and continuing efforts of the maintenance staff, as they continue to improve upon all the facilities of the refuge is the major accomplishment. For a 18,000 acre refuge with some 40 odd miles of roads, 50 mile boundary, 90,000 + visitors, the innumerable things they do with minimum direction is the real, and continuing, success story.

C. Wildfire

Native grassland burning has been and is increasing as a tool in grassland and livestock management in this area. It is reasonable to say that local individuals are less safety oriented, in grassland burning, than is the refuge staff. Burning by adjacent neighbors resulted in 191 refuge acres being burned. These situations usually happen during the evenings or on the weekends. When discovered, the fires are out.

To date these fires have not had any detrimental effect on land, structures or property. If resources were available, we would have burned the acres involved.

A fire plan was submitted to the Kansas City Area Office this year, and then re-submitted to the Pierre Area Office after the transition.

Flint Hills NWR hosted a 40-hour Fire Management Workshop from March 17 to 21, 1980. Kansas State Extension Service provided 6 instructors for the workshop. A total of 25 individuals representing 15 field stations, the Denver Regional Office, Forest Service, and Kansas City Area Office attended the workshop.

III. HABITAT MANAGEMENT

A. Croplands

Farming at this station has always been done by cooperators, and has always been in excess of wildlife needs. Presently there are 24 cooperators farming approximately 6,000 acres. The farm program results in various combinations of corn, milo, wheat, and soybeans, with an occasional bit of oats and sunflowers. Crop acreage figures change yearly, as well as within the growing season, due to replanting caused by reservoir flooding. Crop acreage figures are not a major concern. Put another way, a duck never leaves here hungry, just fat.

Agriculture on this scale rapidly becomes a social-political-economic mix, bio-politics in a word. Bio-politics often are involved with dollars, and the following will give a yearly reasonable range to speculate on.

If, for example, the entire refuge farmland was planted to soybeans, then 6,000 acres at 30 bushels/acre at \$7.00 bushel = \$1,260,000.00; or wheat at 6,000 acres at 30 bushels/acre at \$4.00 bushel = \$720,000.00 then the gross economic yearly value would reasonably range between these figures. This station is involved in collecting monies in excess of wildlife feeding needs. The unique part being 'monies' return to this station per cooperative agreement FWS has with the Corps of Engineers.

Last year, 1979, the refuge participated in the Agricultural Stabilization and Conservation Service (ASCS) feed grain and wheat program. The variety of political implications and the differences in program administration, as determined by talking with other refuge managers, led to the decision not to participate in this program until directed to do so.

Farming at this station has definite political constraints, and that is the reality of the situation.

SUMMARY OF 8210 MONIES COLLECTED BY FISCAL YEAR, per crop (Cooperative Farming Began in 1974)

FY	CORN	HAY	MILO	OATS	SOYBEANS	WHEAT	TOTAL
80	\$2417.14	\$3051.11				\$57,041.27	\$62,509.52
79					2743.14	85,840.64	88,583.78
78			1154.67		2226.09	7,064.45	10,445.21
77	739.89		4586.49		6030.44	24,196.85	35,553.67
76				130.00	6610.41	50,260.01	57,000.42
75					80.29	31,541.91	31,622.20
74					900.06		900.06
TOTAL	S\$3157.03	\$3051.11	\$5741.16	\$130.00	\$18,590.43	\$255,945.13	\$286,614.86

B. Grasslands

Controlled burning was attempted on 814 acres of refuge land. Only 615.1 acres or 75.6% was burned by refuge staff, 191 refuge grassland acres were burned as a result of someone else's actions.

Starting on March 18th, a 10 acre field was burned during the fire training workshop. The last day of controlled burning was on April 29, 1980. Approximately 262 man-hours were expended during the 14 day burning period.

Approximately 335 acres of grasslands were mowed. YACC help provided a huge assist in this effort.

Over time more emphasis is being placed on burning rather than mowing for grassland maintenance purposes. Both methods, burning and mowing, reduce woody vegetation invasion. Burning makes the grassland more attractive for haying purposes, and haying must be considered a option for maintenance of grassland in this area. Burning is also considered to be cheaper and does not involve as much fuel usage, as does mowing. Both burning and mowing have their uses, and this station is shifting to burning more each year.

During 1980, 299 acres were seeded to clover and Reeds Canarygrass mixture, 47 acres to Reeds Canarygrass, 5 acres to switchgrass (roadside acres), 20 acres to Big Bluestem/Indiangrass mixture. The majority of this 371 acres were seeded by YACC help. Due to the drought, during the summer of 1980, success rate is unknown.

During the fall of 1980, 82 acres forming a 100 foot buffer strip was planted to a combination of clover, Reeds Canarygrass and Blackwell Switchgrass. This was done by refuge staff.

Drought conditions existed during the summer of 1980. Lyon and Coffey counties were declared agricultural disaster areas. Weeks before the drought was declared a disaster, various inquiries about the possibility of haying refuge grassland started. Considering the political constraints that were placed on the farming program, a bid system was devised for possible use if the area was declared a disaster area. A bidding method allowed participation of many individuals, not only present cooperators. The program also allowed for uncut strips left for cover purposes.

6.

The area was declared a drought disaster area, and the plan was put into effect. After Area Office approval and the proper public notices, a public opening of bids was held on September 29, 1980. Ten units of hay ground were involved. A total of 11 bids were made for 5 units. Bids for 4 units were accepted. A total of \$3,051.11 was received for the 4 units, representing a total of 433.4 acres hayed.

C. Wetlands

Periodic mowing, burning, and selected spraying of wetlands takes place to: 1) control woody vegetation (cottonwood-willow); and 2) selected spraying of Johnsongrass, a noxious weed under state law. With YACC help, 159 acres of wetlands were mowed.

During the 1980 summer drought most wetland areas dried. Water levels were maintained in the John Redmond Reservoir, so migrating waterfowl adjusted by greater use of the larger reservoir areas.

D. Forestlands

Ironically while mowing and burning trees on certain portions, we plant trees in other portions of the refuge. Further, we do not dig up small trees and replant to another location, but purchase them from the extension service. Tree planting in 1980 was for river bank stabilization, trees were purchased because it is cheaper than digging them up.

A total of 400 cottonwood trees, at a purchase price of \$68.00 were planted on the lower portions of the refuge. On higher elevations, 50 pecan and 50 walnut trees were planted, costing \$17.00. The entire tree planting project was completed in 2 days, with YACC help. After planting, the trees were watered during the summer using our fire truck and YACC help.

The area where the cottonwood trees were planted needed to be sprayed for Johnsongrass. This operation was done by refuge staff after covering the seedlings with plastic bags. The chemical used was Roundup.

In 1980, 29 wood collection permits were issued. Collecting is only for flood debris. The reservoir is a wood sump for everything upstream and huge amounts are deposited on refuge and COE land. Wood collecting areas are identified on the permit. No cost is involved and public interest is developing.

E. Other Habitat

Nothing to report.

F. Wilderness and Special Areas

Nothing to report.

G. Easement for Waterfowl Management

Nothing to report.

IV. WILDLIFE

A. Endangered and Threatened Species

The bald eagle is the only endangered species present on refuge administered lands. A peak population of 47 eagles occurred in April of 1980.

B. Migratory Birds

1. Waterfowl

Mallard banding operations entered the second year at this station starting January 3rd and ended on February 14, 1980. During that period, 620 males and 620 female mallards were banded. Other birds banded incidential to mallards included 4 widgeon, 4 pintails, and 1 Black duck. To obtain the goal of a 50/50 sex ratio, 1,762 male mallards were trapped, but released unbanded. A total of 245 recaptures were recorded. Summarizing the recapture data indicates that 26 were not banded by us, 14 were banded by us in 1979, and 205 were recaptures of the 1980 banding program.

Band return information from the 25 recaptures for the 1979 season included birds banded in Kansas 4; Missouri 1; Oklahoma 1; Montana 1; Colorado 3; Idaho 1; South Dakota 1; Minnesota 1; Iowa 5; Alberta 1; Manitoba 2; Saskatchewan 4. Inquires about birds banded by the refuge in 1979 and encountered elsewhere came from North Dakota 1; Missouri 1; Arkansas 1; South Dakota 2; Minnesota 2; Kansas 3; Saskatchewan 5, all totaling 15.

Census data is taken by ground methods. Data for the last half of 1980 is class 'D'. This is a specific area where the absence of the Assistant Manager was felt.

The peak population of mallards was 20,200 on December 23rd; Snow Geese 6,000 on November 19th, and Canada Geese 4,000 on November 19th.

TABLE III - PEAK WATERFOWL POPULATIONS FOR THE PAST 10 YEARS

YEAR	CANADA GEESE	SNOW GEESE	DUCKS
1980	4,000	6,000	35,450
1979	6,000	10,000	60,805
1978	7,500	12,000	61,700
1977	7,500	19,500	68,700
1976	7,000	15,000	66,050
1975	5,000	12,000	37,863
1974	6,000	8,000	42,223
1973	4,000	12,000	97,023
1972	4,200	5,000	69,635
1971	2,800	4,000	135,292

2. Marsh and Water Birds

Nothing to report.

3. Shorebirds, Gulls, Terns and Allied Species

Nothing to report.

4. Raptors

Nothing to report.

5. Other Migratory Birds

Nothing to report.

C. Mammals and Non-Migratory Birds

1. Game Mammals

Any mammal that is legally huntable in the state is huntable on the refuge. Rifled firearms are not permitted on the refuge, for safety reasons involved. Refer to attachments for additional information.

2. Other Mammals

Nothing to report.

3. Resident Birds

Nothing to report.

4. Other Animal Life

Nothing to report.

V. INTERPRETATION AND RECREATION

A. Information and Recreation

1. On Refuge

This station has over 30 entrances from which people can enter. There are 2 trails available to walk, 40 miles of road to drive, 1 area, about 60 acres, used by the local high school as a study site, 2 concrete boat ramp access points, and a variety of river access points for lighter boats. This adds up to a mix of available uses and a difficult to impossible situation to measure using vehicle counters. A contributing problem is the vandalism to the road counters, cutting the hoses is the most popular. Towards the end of the year, public use census methods just broke down. There was not the help to keep it up. A reasonable use figure for all activities would be 90,000 + visits per year.

2. Off Refuge

Off refuge activities were minimal. A few factors involved in this area are: 1) personnel; 2) funding; 3) fuel; and 4) the attitude of not starting anything that you cannot afford to do and or continue.

B. Recreation

1. Wildlife Oriented

The major wildlife oriented recreation in this area is fishing. The public has access to the entire refuge during that time before and after the waterfowl season.

Hunting quality would be judged high considering the light hunting pressure and adequate game present. A very reasonable experience for any visiting hunter is provided.

2. Non-Wildlife Oriented

Within a 30 mile area of this reservoir there are other reservoirs that provide a more attractive environment for the non-wildlife oriented visitor. John Redmond is a very turbid reservoir, very attractive to waterfowl but not to boaters, water skiers, etc. Drive thru traffic probably contributes the highest percentage to visitor usage.

The tourist attraction effect of the nearby nuclear plant and how it will effect refuge numbers, is unknown.

C. Enforcement

The majority of enforcement of hunting/fishing violations is done by 2 local Kansas State Game Protectors. The statistics are not compiled but a reasonable estimate would be that 50 of their cases, for all manner of violations, occurs within the boundaries of the refuge.

Enforcement during the fall of 1980 was token. The reason being the assistant manager position is vacant. During 1980, 5 cases were made.

VI. OTHER ITEMS

A. Field Investigations

Flint Hills BLHP funded Master Plan was completed in 1980, an abstract is attached. The plan was immediately politicized on the farming segment. Costing \$63,966.73 to complete the 471 pages, by the private consulting firm of Oblinger and Smith of Wichita, Kansas, only time will tell how pragmatic it is.

The segment identifying refuge archeological values presents interesting conflicts and opportunities for the station.

B. Cooperative Programs

A six week long CETA program began on June 9, 1980 and ended on July 31, 1980. Five teenage boys from a foster home called "The Farm" worked 30 hours a week during the 8 week program. CETA work projects included; barbed wire removal, interpretive trail maintenance, roadside tree trimming, trash and litter pick-up, painting of buoys and road barricades, and office/shop cleaning.

The entire refuge staff thought these 5 individuals did an excellent summer job. Because they all came from the same household a sense of group unity was already enhancing performance and favorably reflecting on their foster parents.

The YCC program was not continued at this station in 1980. The decision in moving YCC was not made at station level, nor was any input requested from the station concerning this. The YCC removed their equipment and established a residential camp near Quivira NWR.

The YACC program also folded during the year. The last YACC enrollee was terminated on August 15, 1980.

Both YCC and YACC had lots of plus and minus points attached to them. YCC was favored over YACC. The weak link on the YACC was the supervision and chain of command via Regional Office. The tracking of property, reportable and non reportable, also became a problem since much of the property was co-mingled with refuge property. Administration in general increased, not decreased, over time regarding both programs. And since the administration aspect fell upon the refuge staff, almost exclusively, this station will look long and hard before becoming involved in another FWS sponsored youth program.

In an attempt to fill in on some of the work done by various youth programs, contact was made with CETA. This station expects to continue this program if CETA funds remain, and that administration does not become paper bound.

C. Items of Interest

Carlton R. Freeburg, Assistant Refuge Manager, left Flint Hills in September, 1980. Carl transferrred to the Havasu National Wildlife Refuge in California as a maintenance worker.

Manager Long received a \$100.00 Special Achievement Award for setting up the 40-hour Fire Management Workshop held at Flint Hills NWR in March. He promptly spent that on dinner for the staff and their spouses, as the award was the result of a joint effort.

Mike Long, Harold Shepherd, Ron Thuma, Carl Freeburg, and Gerald Laws attended the 40-hour Fire Management Workshop.

Mike Long, Harold Shepherd, and Freida Arndt all received formal Defensive Driving as presented by the Kansas State Department of Transportation. Gerald Laws, tractor operator, attended a Heavy Duty Equipment Maintenance and Operation Training Course at Mingo NWR from May 12-15, 1980

Manager Long and Assistant Manager Freeburg qualified on the pistol range under Kansas State Highway Patrol supervision on May 6, 1980.

Guests/Visitors

Darcio Rossi Jr., an exchange student, from San Paulo, Brazil visited the refuge on February 14, 1980. While visiting the refuge he participated in the duck banding program and took roll after roll of pictures to take back to his homeland. Mr. Rossi attended the Hartford High School while here in the states.

Gordon W. Watson, Anchorage Alaska, Special Assistant to the Director visited and was given a tour of Flint Hills NWR by Carl Freeburg on May 21, 1980.

On August 5, 1980, Fred Mohrman-Congressional Staff Member from Washington, D.C. visited Flint Hills NWR in regards to project, equipment, and accomplishments done through the BLHP Program.

Albert Karvonen, a photographer with the National Audubon Society, Sherwood Park, Alberta, Canada, was given a tour of the Flint Hills NWR on October 2, 1980.

Adi Setia Mohd-Dom, a student from Malaysia, was given a refuge tour on October 9, 1980. Mr. Dom is doing a project on Wildlife Management and Environment while attending the University of Kansas.

Manager Long and Refuge Assistant Arndt jointly wrote, rewrote, and revised the rough draft of the narrative. Manager Long edited the entire report. Refuge Assistant Arndt typed and assembled the entire report.

D. Safety

Regular safety meetings were held during the year. No lost time accidents occurred in 1980. The last lost time accident was in 1976.



Refuge maintenance/storage building, BLHP Project. (Passive Solar Panels to right of emblem) MJL 02/81

John Deere, 1.5 cubic yard, front-end loader was a BLHP funded purchase. MJL 02-81





Field exercises during 40-hour fire training course. CRF 03/80

Typical Controlled Burn-on refuge following Fire School. RET 4/15/80





Refuge headquarters - showing all buildings and all motorized equipment. MJL 02/81

Introduction

In 1978, Tinicum National Environmental Center constitutes 600 acres o federally-controlled land within the urbanized Philadelphia Metropolitan Re gion. The "project area" for the future development of the Center, as of October 1978, is composed of approximately 1154 acres of land within boundaries recommended by Section 2 of Public Law 92-326, as amended.

Tinicum National Environmental Center is administered as a unit of the National Wildlife Refuge System. A Master Plan for developing and administering the Center was prepared during 1977 and 1978 under the direction and supervision of the U.S. Fish and Wildlife Service, Northeast Region Five. This brochure presents a summary of that Master Plan.

Tinicum Marsh occupies the lowlands along the channel of Darby Creek in Delaware and Philadelphia Counties, southeastern Pennsylvania. The modern marsh, as defined for this report, extends from Interstate Highway 1-95, approximately 0.5 mile above the junction of Darby Creek with the Delaware River, upstream approximately 4.7 channel miles (3.4 straight-line miles) to a point opposite 86th Street, near the northern boundary of the lands presently included in the Tinicum National Environmental Center. The project area is bounded on the north and northwest by natural high ground and artificially filled areas. On the south and southwest the boundary is formed by Interstate Highway I-95. The eastern boundary follows the embankment of a former interurban trolley line on the south, and then extends toward the north-northwest generally along the right-of-way of Lindbergh Boulevard.

The history of Tinicum Marsh, the largest remaining tidal wetland in the Commonwealth of Pennsylvania, goes back to the first settlements in the re-gion in 1643 when the early Swedes, Dutch and English diked and drained parts of the marsh for grazing land. At that time the tidal marshes measured over 5700 acres, but with the advent of rapid urbanization since World War I this was reduced to approximately 200 acres located approximately one mile north of Philadelphia International Airport.

A diked, non-tidal area of 145 acres, adjacent to the eastern section of Tinicum Marsh, was acquired and administered by the City of Philadelphia in 1955. This was known as Tinicum Wildlife Preserve. The areas of open water in conjunction with the adjacent heavily vegetated tidal wetlands form an ideal habitat for thousands of migratory waterfowl each year. Visitors to the preserve reached a peak of over 45,000 in 1966.

The remaining area had been threatened in 1969 by plans to route Interstate Highway 1-95 through it and also by sanitary landfill on the tidal wetlands. These activities initiated a long series of injunctions, public hearings and extraordinary effort by private and public groups to secure rerouting of the highway and termination of landfill operations. Under legislation passed by the Congress of the United States during 1972 and signed into law by the President, authorization was given to the Secretary of the Interior to acquire as much as 1200 acres of land in order to create a Tinicum National Environmental Center.

The planning objectives and principles used to prepare the Master Plan are based upon the mandates of Public Law 92-326, as amended. These, in summary, are as follows:

To acquire lands necessary for the purpose of preserving, restoring and developing the natural area known as Tinicum Marsh. Also to construct, administer and maintain a wildlife interpretive center for the purpose of promoting environmental education and to afford visitors an opportunity for the study of wildlife in its natural habitat.

Estimates of public use of Tinicum National Environmental Center were based upon analysis of current utilization of facilities for environmental education in the Philadelphia Metropolitan Region and the observed response to facilities and promotion of programs elsewhere. Nearly five million population resides in this region and a large number of visitors from other parts of the country and abroad visit the major institutions and landmarks which exist.

Tinicim National Environmental Center is accessible by excellent roads and public transit and of particular note is the fact that over five hundred thousand school children are located within one hour travel time from the Center. In addition to heavy utilization by school groups, it is anticipated that classes from colleges and universities will visit the Center and other groups such as birders, church groups and others will contribute to attendance along with numerous individuals and families.

The Master Plan projects that the annual attendance at the Center will be apoximately 245,000. Of the average weekday attendance of 655 visitors, 440 will be members of school groups. The balance will be special groups, residents from the region and tourists. On an average weekend day, 720 visitors are projected of which 160 will be members of special groups and 560 will be either residents of the region or tourists. Attendance will fluctuate. The peak visitor months are expected to be April, May, June, September, October and November. During these peak months the visitor attendance is expected to be double that given above whereas in non-peak months there will be half as many.

Master Plan Elements

Land Acquisition Federal land acquisition for the National Environmental Center will be approximately 1154 acres. Non-federal lands within the project area include approximately 90 acres of submerged lands in the channels of Darby Creek and ts tidewater tributaries, under the jurisdiction of the Commonwealth of Pennsylvania. As of 1978, the Federal Government owns approximately 600 acres at the Center. The U.S. Fish and Wildlife Service will cooperate with overnmental jurisdictions responsible for land uses and activities on areas contiguous to the boundaries of the Center to ensure compatibility of existing and future land uses.

Habitat Management

Much of the land that is recommended for inclusion in the Tinicum National Environmental Center was formerly tidal wetland but it has been altered by diking, dredging or filling. The highly disturbed condition of much of the area presents an unusual opportunity for reclamation and mandates the preservation of existing wetlands and the restoration of former wetlands. The following guidelines were formulated in response to the mandate.

1. The existing 290 acres of tidal wetlands will be managed to maintain their integrity and to enhance their productivity.

2. Areas that formerly were tidal wetlands, but which now are isolated from the tides by embankments, will be reconnected to tidal waters and managed as tidal wetlands wherever this restoration is considered to be the most envi ronmentally-suitable measure. Similarly, most areas that formerly supported intertidal wetlands, but which have been excavated by dredging so that they now are tidal lagoons, will be managed so as to create natural tidal wetlands.

3. Areas of open non-tidal water will be retained or established at appropriate locations to provide habitats for migratory and resident waterfowl and

otodraphs by: Hammer Siler George Associates Wallace McHarg Roberts and Todd Jack McCormick and Associates Consultants for the Master Plan:

United States Fish and Wildlife Service

Wallace McHarg Roberts and Todd

tephenson Airphotos

Vendy McCormick

Delaware County, Pennsylvania Philadelphia and Summary of the Draft Master Plan

Tinicum National Environmental Center







Existing Condition

Impounded Wetland

Tidal Wetland

- Township Boundar

County Boundary

Proposed Habitats

Tidal Wetland

Managed Water

Managed Marsh

Lowland Transitional Fores

Darby Creek

M Phragmites

Upland Forest

Upland Field

Darby Creek

Tidal Lagoon









for fish, and to provide areas for educational wildlife-oriented recreational activities or scientific research.

(b) in other areas vegetation, composed of shrubs or trees indigenous to the

region, will be established to diversify wildlife habitats and to extend the edu-

Approximately 230 acres of new tidal wetland are proposed. These new wet-

lands are located in the northeastern portion of the study area, and east and

west of Wanamaker Avenue. A greater diversity in environments is attained

Approximately two-thirds of the large impoundment in the eastern, federally-

owned portion of the site will be maintained as two impoundments. The re-maining one-third to the north will become tidal wetland.

Immediately west of the existing impoundment and south of Darby Creek, two new impoundments will be created, separated by a cross dike running

north and south. Water control structures will be installed in order to allow

the adjustment of water levels as necessary. Also a series of five or six relative-

ly small upland ponds will be excavated on the large fill area in the center of

the site. The objective is to diversify an area which at present is very homo-

Lowland transitional forest will be introduced or existing stands maintained along the perimeter of both the large existing impoundment to the east, and

Upland field and forest is proposed for the extreme eastern section of the site

and in the center of the site, where common reed is the predominant species.

Approximately 30 acres of common reed will be preserved and divided into 2-

acre plots to be harvested for material used in the biogas generator, a proposed

The tracts to the north of Darby Creek and the tidal wetland and southern

border should be maintained as forest buffers against the urban development

The major public entrance will be at the east end of the Center adjacent to

Lindbergh Boulevard. A secondary entrance will be located at the west end

off Wanamaker Avenue. These locations provide good access by automobile

from major highways in the region and the east entrance is in close proximity

to mass transit facilities to be provided in the future. The primary parking area

for automobiles and buses will also be at the east end. It is recommended that

the only vehicular circulation within the boundaries of the Center be for serv-

ice and emergency uses only. Control of access and circulation will be imple-

mented by having the entire area fenced and by signs which direct visitors to the various sections of the Center. Special facilities will be provided to assist

The largest facility and the primary attraction to the majority of visitors to

the Center will be the Environmental Education Building. This will be located on the eastern edge of the existing impoundment. The building's functions

will be primarily to accommodate environmental education programs on both

an individual and group basis. A lecture theater, classrooms, teaching labora-

tories and exhibit areas will be provided for this purpose. Space for adminis-

trative functions include offices, library, research laboratory and staff lounge.

energy demonstration project at the Environmental Education Building.

cational resources of the Center.

by distributing tidal wetland throughout the site.

the new impoundments immediately west of these.

to the north and Interstate 95 to the south.

handicapped persons visiting the Center.

Environmental Education Building

Restoration of Tidal Wetland

Managed Water

genous.

Upland Field and Forest

4. At appropriate locations, areas will be developed and managed to facilitate scientific research on habitat restoration and/or wildlife management, and to provide educational demonstrations of these and related techniques. Areas that formerly were occupied by tidal wetlands, but which now are covered with dredged materials or fill, will be treated in the following way: (a) where it is most appropriate in regard to the overall goals of the Center the man-placed materials will be removed, and tidal wetlands will be recreat

Floor Plan for the

Environmental Education Build

Refuge Man

Asst. Refuge Manager
Wildlife Manag
Admin. Asst.

Aerial Perspective of the Enviromental Education Bu

(m)



Contract of States

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Wallace McHarg Roberts and Todd This Document prepared by:

Newton Corner, Massachusetts 02158 Northeast Region Five Fish and Wildlife Service Department of the Interior Responsible Federal Agency: Philadelphia, Pennsylvania 19103 1737 Chestnut Street

Photo Credit: Stevenson Air Photos







National Wildlife Refuges

These spaces together with circulation and support areas constitute approximately 21,000 square feet of indoor space. In addition outdoor terraces and exhibit areas will be provided.

The building will be sited on a dike which will be built to separate the man aged impoundment to the south and the managed wetland to the north. The building will be sited and designed so that it fits into the landscape and pro vides flexibility for use of spaces and for additions in the future A significant portion of the building's heating and cooling will be supplied by active solar systems such as solar panels and a solar pond. Also experimental techniques such as a biogas generator, wind generators, water generator or direct plant combustion will serve as informational and research exhibits

The major Environmental Education Themes will be: (1) the ecology of the Tinicum wetlands; (2) the relationship of the Tinicum wetlands to the remainder of the Delaware River Estuary and Middle Atlantic littoral region; (3) the human history of the Tinicum region and the changing system of hu man values in regard to wetlands; (4) the identification and values of environmentally sensitive areas and the basis of environmentally based, land use planning; and (5) the role of the United States Fish and Wildlife Service in the management of the environment of the Nation.

Other Buildings and Structures

A contact station is planned at the west end of the Center with access off Wanamaker Avenue; this will have a small office and public rest rooms. The existing contact station will become a patrol headquarters used primarily by the staff of the Center for communications, and as a first aid station with some basic orientation literature available there also. A maintenance building will be located north of the environmental education building and four residences for personnel employed at the Center are at the extreme north and east end of the project area. A new elevated observation platform is proposed near the middle of the Center overlooking the wetlands, and the existing observation platform at the impoundment will be renovated to provide shelter and seating. Several small observation shelters, blinds, rest areas and a fishing dock are also proposed.

Public Use Facilities

It is probable that virtually everyone who visits the Center will utilize the sys-tem of trails and boardwalks to obtain close views of the vegetation, to watch waterfowl and other birds and to inspect other outdoor features.

The system of trails, boardwalks, shelters, contact stations, observation towers, blinds and rest areas are arranged so that a variety of environmental experiences and routes can be selected by the visitor without overcrowding. The total system of circulation elements, boardwalks, dike trails, service road and access road approximates 15 miles in addition to which canoe trails will give access to Darby Creek and its tidal tributaries.

Administration

Tinicum National Environmental Center will require personnel equipped to provide administration and supervision, interpretation and environmenta education, wildlife management, maintenance and general operations. On the basis of projected number of visitors and from an analysis of personnel required to implement an effective program at the Center the following personnel are recommended: for administration supervision and security, fourteen persons; for interpretation and environmental education, eight persons; for wildlife management, two persons; for maintenance and general operations, five persons.

Phasing and Cost Estimates

The extent and location of each phase of development will be in large part dictated by the acquisition schedule and the total funds available each fiscal year. Two major phases are suggested with the initial developments being in the east end of the Center in the vicinity of the impoundments and the Environmental Education Building.

Cost estimates are based upon 1978 unit costs and without detailed engineering and architectural studies. No estimate is presented for land acquisition. The cost estimate for development of the Tinicum National Environmental Center as presented in the Master Plan document is 8.0 million dollars.



Tinicum National Environmental Center



	S	S	F	W
Wood Thrush			1	
Swainson's Thrush	a			
Gray-cheeked Thrush	C		C	
Eastern Bluebird*	C	С	c	u
Townsend's Solitaire	0			0
Blue-gray Gnatcatcher*	a	a	a	
Golden-crowned Kinglet	c	ŭ	c	с
Ruby-crowned Kinglet	u		C	
Cedar Waxwing	С			u
Loggerhead Shrike*	С	C	С	С
Starling*	а	a	a	а
Bell's Vireo	C	С	C	
Red-eved Vireo	u		c	
Philadelphia Vireo	u			1
Warbling Vireo*	C	C	С	
Black-and-white Warbler	-		u	
Orange-crowned Warbler	a		а	100
Nashville Warbler	a		a	
Parula Warbler.	С			
Yellow Warbler	a		а	
Myrtle Warbler.	a		а	
Black-throated Green Warbler			u	
Blackpoll Warbler	u			
Northern Waterthrush	u			
Louisiana Waterthrush	u			
Mourning Warbler	u			
Yellowthroat*	а	a	С	
American Bedstart	u			
House Sparrow*	а	a	а	a
Bobolink	u			
Eastern Meadowlark*	а	a	а	а
Bed-winged Blackbird *	a	a	a	a
Orchard Oriole*	c	c	C	
Baltimore Oriole*	а	a	a	
Rusty Blackbird	a		u	C
Brown-headed Cowbird*	a	a	a	a
Summer Tanager	u			
Cardinal*	а	а	а	а
Indigo Bunting*	u	a	a	
Dickcissel*	c	c	C	
Purple Finch			u	u
Pine Siskin	-	-		u
Rufous-sided Towhee		2	u	u
Savannah Sparrow			u	
Grasshopper Sparrow*	C	C	C	
Vesper Sparrow	u		u	
Lark Sparrow	u			
Slate-colored Junco	а		а	а
Oregon Junco	u		u	a
Chipping Sparrow	u		a	a
Harris' Sparrow	a	1.77	a	а
	C	1	C	C
Eox Sparrow	u		u	u
Swamp Sparrow			u	
Song Sparrow	С	1	С	С
Lapland Longspur		-		a
GP	0	8 9	4 -	5 3 9

Birds of the Flint Hills National Wildlife Refuge

Flint Hills National Wildlife Refuge, established in 1966, is situated on 18,500 acres of the John Redmond Reservoir on the Neosho River in eastern Kansas. The refuge was set up and is operated through cooperative agreement with the U.S. Army Corps of Engineers. Wildlife habitat is primarily agricultural land interspersed with stands of native hardwood timber, shallow marshes, and flooded sloughs. Grasslands occur only infrequently, along the edges of the refuge.

Managed mainly for waterfowl, the refuge has large concentrations of ducks and geese in fall and winter. Waterfowl populations peak during the fall migration, normally in mid-November. The upper reaches of Redmond Reservoir and refuge marshes attract numerous species of shore- and wading birds. May is excellent for birding, when both shorebird and warbler migrations reach their peak. Most birds common to eastern Kansas can be observed on the refuge.

This folder lists 189 species recorded within the refuge area since 1963, especially by teachers and students from Emporia State College. Abundance by season, and nesting status, are coded as follows:

- a abundant
- S March-May S – June-August
- c common u – uncommon
 - F September-November
- o occasional W – December-February
- r rare
- * nests on refuge



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

Refuge Leaflet 242

May 1970



	S	S	F	W
Fared Grebe	0			2
Pied-billed Grebe	C	0	C	
White Pelican	c	u	C	
Double-crested Cormorant	c	u	c	
Great Blue Heron	a	a	a	u
Green Heron*	a	a	a	
Little Blue Heron	u	u		
Common Egret	u	C	u	
Snowy Egret	C	C	C	
Black-crowned Night Heron		u	u	1.19
Yellow-crowned Night Heron		u		
Muto Supp		0		-
Canada Goose			2	c
White-fronted Goose	a		C	u
Snow Goose	a		a	u
Blue Goose	c	8-1	C	u
Mallard*	a	u	а	a
Black Duck	u		u	u
Gadwall	С	r	С	u
Pintail	а	u	а	u
Green-winged Teal	а	u	а	C
Blue-winged Teal*	a	С	а	u
Shoveler	С	u	C	u
American Widgeon	а	u	а	u
Wood Duck*	C	C	C	r
Rednead	a	u	a	5
Canvashack	a	u	9	
Lesser Scaup	a	u	a	
Common Goldeneve	u	~	u	c
Ruddy Duck	c	u	c	u
Hooded Merganser			u	r
Common Merganser	с		С	a
Turkey Vulture*	а	a	a	
Sharp-shinned Hawk	с		С	с
Cooper's Hawk	С		С	C
Red-tailed Hawk*	а	а	а	а
Rough-legged Hawk			С	C
Ferruginous Hawk			r	-
Golden Eagle	C		C	a
March Hawk*	C	~	0	a
Osprev	a	-	0	C
Sparrow Hawk*	а	c	a	c
Greater Prairie Chicken*	C	C	C	c
Bobwhite*	a	a	a	a
Ring-necked Pheasant			0	
Virginia Rail			u	
Sora	С	с	с	
American Coot	а	с	a	C
Semipalmated Plover	0			
Killdeer*	а	а	а	u
American Golden Plover	u			
Black-bellied Plover	u			51 -
Common Snipe			u	r
Upland Plover*	a	a	C	1011
Spotted Sandpiper	a	u	a	
Greater Vellowless	a	C	a	
Lesser Yellowlegs	a	c	a	

	S	S	F	W
Pectoral Sandpiper	c	u	c	
White-rumped Sandpiper	c	-		
Least Sandpiper	а	с	а	1.1.8
Dunlin	С			
Stilt Sandniper	a	С	а	
Semipalmated Sandpiper	a	c	a	
	u	c	-	
Marblad Godwit	u			
American Avocet	u			
Wilson's Phalarope	C	C	С	1
Herring Gull				r
Bing-billed Gull	C	u	u	c
Franklin's Gull	a	u	a	
Black Tern	a	a	a	
Rock Dove	u	u	u	u
Mourning Dove*	a	a	а	а
Yellow-billed Cuckoo*	а	a	а	
Great Horned Owl*	a	a	а	а
Snowy Owl				r
Barred Owl*	a	a	a	a
Common Nighthawk*	a	a	a	
Buby throated Humminghird	а	a	а	
Belted Kingfisher		u		
Vellow-shafted Elicker*	2	9	9	9
Red-shafted Flicker	a	a	a	u
Red-bellied Woodpecker*	а	a	а	a
Red-headed Woodpecker*	a	а	a	u
Yellow-bellied Sapsucker	u		u	u
Hairy Woodpecker	u	u	u	u
Downy Woodpecker*	а	a	a	а
Eastern Kingbird*	а	a	C	
Vestern Kingbird*	C	C	u	
Great Crested Elycatcher*	a	a	C	
Eastern Phoebe*	c	c	c	
Empidonax spp	a	u	a	
Eastern Wood Pewee*	C	С	С	
Horned Lark*	а	c	a	a
Tree Swallow	u			
Barn Swallow*	а	а	a	
Cliff Swallow	u			
Blue Jay*	a	a	a	a
Black copped Chickedeet	C	C	C	C
Tufted Titmouse*	a	a	a	a
White-breasted Nutbatch*	C	C	0	0
Red-breasted Nuthatch	-	Ĩ	u	u
Brown Creeper			u	u
House Wren*	c	C	с	
Winter Wren				0
Carolina Wren*	с	c	С	C
Long-billed Marsh Wren			C	
Snort-billed Marsh Wren			u	
Cathird*	C	a	C	u
Brown Thrasher*	a	a	a	r
Pohint	-	-	-	-

FLINT HILLS NATIONAL WILDLIFE REFUGE PERMITTED RECREATIONAL ACTIVITIES EFFECTIVE October 1, 1979 To September 30, 1980



Flint Hills National Wildlife Refuge was established on September 1, 1966 on 18,500 acres of land with the flood pool of John Redmond Reservoir.

The refuge is managed primarily for migratory waterfowl. Intensive use by ducks and geese occurs during the spring and fall migration. Farmlands are managed on a share basis with area farmers. The refuge crop share provides food for migrating waterfowl and resident wildlife. Numerous ponds and a system of shallow marshes provide additional waterfowl habitat.

Waterfowl management requires that portions of the refuge be closed to public access during periods of intensive waterfowl use. Public access is restricted during the period beginning one day before the opening of the regular waterfowl season, as determined by state and federal law and continuing through the close of the season.

All public access, use, or recreational activity not expressly permitted is prohibited.

SPORT FISHING

John Redmond Reservoir offers excellent fishing for channel catfish, crappie and white bass. Fishing within the refuge is governed by applicable fishing regulations established by the Kansas Fish & Game Commission.

<u>After waterfowl hunting seasons end</u>, all waters within the refuge are open to fishing. Vehicle access is restricted to existing roads.

During waterfowl migrations, some waters are closed to fishing and public access. Closed areas are designated by signs and water buoys. Access to waters opened to fishing during this period is provided by roads shown on the included map. The Neosho River proper is open to fishing during this time.

All ponds and water impoundments within the refuge may be fished with pole and line only while fisherman is in attendance. The 15-inch minimum length for black bass, as defined by Kansas law, applies to all refuge ponds and impoundments.

HUNTING

General Regulations (Summary)

Detailed regulations are published in the Code of Federal Regulations. Individuals are encouraged to check these regulations or consult with the Refuge Manager.

The refuge is open for public hunting of all species of migratory game birds, upland game birds, and all other animals for which the Kansas Fish & Game Commission has established open season in this area, with the exception that the refuge is closed to FIREARM Deer Hunting.

All state and federal hunting regulations apply. The following special regulations also apply to hunting on refuge lands.

- 1. The use of rifled firearms is not permitted.
- 2. Vehicle traffic is restricted to existing roads.
- 3. Dogs may be used to hunt and retrieve game birds and small game animals only. Dogs may not be used for hunting fur bearing animals and non-game animals, either by sight or trailing by scent.
- 4. Hunting blinds may be constructed by the public but limited to above ground construction of a temporary nature. Constructed blinds become the property of the Government. Daily occupancy of blinds will be determined on a first come first serve basis regardless of ownership.

Regulations following the close of the waterfowl hunting seasons:

The entire refuge, excluding special recreation areas designated on this map is open to public hunting in accordance with general regulations.

Regulations during time of partial refuge closure:

Deer hunting with bow and arrow is permitted on the Hartford, Eagle Creek and Strawn Units (see map).

Hunting is permitted on the Hartford, Eagle Creek and Strawn Units (see map).

The interior boundaries of all Hunting Units are formed by the south bank of the Neosho River. The Neosho River is not open to hunting. As a safety measure the Neosho River is closed to hunting and the possession or transportation of firearms on the river is prohibited.

Special Note: The exterior boundaries of refuge lands open to hunting are posted with signs designating them as open to hunting. The area behind the signs is refuge land. Land in front of the sign is private property. Landowner permission is required to hunt or enter upon these lands. Hunting access, via boat, to the Strawn Hunting Area is available from launching areas below the downstream refuge boundary. During flood conditions boundary signs may be under water; locations of closed hunting areas is the responsibility of the individual.

FLINT HILLS NATIONAL WILDLIFE REFUGE

Flint Hills National Wildlife Refuge was established under the authority of the Fish and Wildlife Coordination Act on a part of the area acquired by the U.S. Army Corps of Engineers for the John Redmond Dam and Reservoir. This flood control project is administered by the District Engineer, Tulsa, Oklahoma.



MISCELLANEOUS ACTIVITIES

Boating and Water Skiing are permitted on all waters open to fishing and shall be in accordance with the Kansas Boating Act. Boating access is available at the Strawn and Hartford Ramps or by entering the Neosho River channel from the reservoir at the down stream boundary of the refuge.

Picnicking and Camping, Sightseeing, Photography, Hiking, and Wild Food Gathering are permitted, except within areas closed to public access during the waterfowl migration season. Areas closed to public access during this period are appropriately marked.

Fires may be built. Individuals constructing fires are responsible and must thoroughly extinguish them before leaving.

Trash barrels are provided at major traffic points.

SAFETY NOTES

Awareness of the following conditions will contribute to your safety during your visit to the Flint Hills Refuge.

- 1. All refuge roads are subject to flooding.
- 2. Shotguns will be in use on refuge lands open to public hunting.
- 3. The flooded channels of the Neosho River and its tributaries are lined with dead and dying timber. Falling limbs are a hazard to boaters particularly during periods of high winds.
- 4. No facilities or lifeguards are provided for swimming. Sunken debris, present in all areas, from past floods make swimming unsafe. Swimming is not permitted.

For more information about activities permitted on the refuge, or for information on the refuge in general, visit the refuge office in Hartford, Kansas or write to the Refuge Manager, Flint Hills National Wildlife Refuge, P.O. Box 128, Hartford, Kansas 66854. Telephone: Area Code (316) 392-5553

SUNRISE AND SUNSET AT TOPEKA, KANSAS CENTRAL STANDARD TIME

DAY	SE	PT.	00	CT.	NC	DV.	DEC.		JAN.		
	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	Rise A.M.	Set P.M.	
1 2 3 4 5	5 51 5 52 5 53 5 54 5 54	6 54 6 52 6 50 6 49 6 47	6 18 6 19 6 20 6 21 6 22	6 06 6 04 6 03 6 01 5 59	6 50 6 51 6 52 6 53 6 54	5 22 5 21 5 20 5 19 5 18	7 22 7 23 7 24 7 25 7 26	5 01 5 00 5 00 5 00 5 00	7 42 7 42 7 42 7 42 7 42 7 42	5 11 5 11 5 12 5 13 5 14	
6 7 8 9 10	5 55 5 56 5 57 5 58 5 59	6 46 6 44 6 43 6 41 6 39	6 23 6 24 6 25 6 26 6 27	5 58 5 56 5 55 5 53 5 52	6 55 6 56 6 57 6 59 7 00	5 17 5 16 5 15 5 14 5 13	7 27 7 28 7 29 7 30 7 31	5 00 5 00 5 00 5 00 5 00	7 42 7 42 7 42 7 42 7 42 7 42	5 15 5 16 5 17 5 18 5 19	ALC: NO DE CONTRACTOR
11 12 13 14 15	6 00 6 01 6 02 6 03 6 03	6 38 6 36 6 35 6 33 6 31	6 28 6 29 6 30 6 31 6 32	5 50 5 49 5 47 5 46 5 44	7 01 7 02 7 03 7 04 7 05	5 12 5 11 5 10 5 09 5 09	7 31 7 32 7 33 7 34 7 34 7 34	5 00 5 00 5 00 5 01 5 01	7 41 7 41 7 41 7 41 7 41 7 40	5 20 5 21 5 22 5 23 5 24	
16 17 18 19 20	6 04 6 05 6 06 6 07 6 08	6 30 6 28 6 27 6 25 6 23	6 33 6 34 6 35 6 36 6 37	5 43 5 42 5 40 5 39 5 37	7 06 7 07 7 09 7 10 7 11	5 08 5 07 5 06 5 06 5 05	7 35 7 36 7 36 7 37 7 37 7 37	5 01 5 02 5 02 5 02 5 03	7 40 7 40 7 39 7 39 7 38	5 25 5 26 5 27 5 28 5 29	
21 22 23 24 25	6 09 6 10 6 11 6 12 6 13	6 22 6 20 6 19 6 17 6 15	6 38 6 39 6 40 6 41 6 42	5 36 5 35 5 33 5 32 5 31	7 12 7 13 7 14 7 15 7 16	5 05 5 04 5 04 5 03 5 03	7 38 7 38 7 39 7 39 7 39 7 40	5 03 5 04 5 04 5 05 5 05	7 38 7 37 7 36 7 36 7 36 7 35	5 31 5 32 5 33 5 34 5 35	
 · 26 27 28 29 30	6 13 6 14 6 15 6 16 6 17	6 14 6 12 6 10 6 09 6 07	6 43 6 44 6 45 6 46 6 47	5 29 5 28 5 27 5 26 5 24	7 17 7 18 7 19 7 20 7 21	5 02 5 02 5 01 5 01 5 01	7 40 7 41 7 41 7 41 7 41 7 41	5 06 5 07 5 07 5 08 5 09	7 34 7 34 7 33 7 32 7 31	5 36 5 37 5 39 5 40 5 41	
31			6 4 9	5 23			7 42	5 10	7 30	5 42	

Add one hour for Daylight Saving Time if and when in use.



UNITED STATES DEPARTMENT OF THE INTERIOR U.S. FISH & WILDLIFE SERVICE



RL-63520-8

September 1979



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KANSAS CITY AREA OFFICE

U.S. Fish and Wildlife Service programs in Iowa, Kansas and Missouri are administered from this office. The office is located in Suite 106, Rockcreek Office Building, 2701 Rockcreek Parkway, North Kansas City, Missouri 64116. Telephone 816-374-6166

Refuge management is directed primarily at meeting the seasonal needs of migrating waterfowl. Unique attractions of the area are the boardwalk nature trail in Mingo National Wildlife Refuge in Missouri and the historical Missouri River Boat display at DeSoto National Wildlife Refuge in Iowa. DeSoto National Wildlife Refuge also has spectacular concentrations of geese each fall, as do Squaw Creek and Swan Lake National Wildlife Refuges in Missouri.

The Area Office has responsibility for two fish hatcheries from which channel catfish, largemouth bass and smallmouth bass, and rainbow trout are produced and distributed.

Safety Suggestions



BOATING

Don't overload your boat.

Boats must not approach closer to the dam than indicated by warning signs or safety buoy lines.

If your boat upsets, stick to it and use it as a life perserver.

Standing in a boat can lead to disaster.

Help a boat in distress. Give help and if you need help, ask for it.

Each boat must have an approved flotation device for each passenger.

SWIMMING

Swim and wade only where you are familiar with the water depths and the bottom.

Don't swim alone. There's safety in numbers. Be sure water is deep enough before diving.

Be careful of overestimating your swimming ability as water distances are deceiving.

Watch children and non-swimmers closely. Swimmers should avoid regular boat channels, launching ramps, and docks.





Coffey County, in which John Redmond Dam and Reservoir is located, shares the memorable past of a State over which the flags of France and Spain once flew; of great pioneer trails, earth-lodge Indian villages, and sod houses; and of turbulent times in our nation's history. Now in her second 100 years, present-day Kansas is a leader in agriculture, livestock, and mineral resources, a land of modern highways and abundant water, and a growing contender in industry and science. Coffey County ranks high among Kansas counties in wheat, corn, and many crops which make a prosperous diversified agriculture. The John Redmond project was authorized as "Strawn Dam." The town of Strawn was relocated six miles eastward on higher ground when the dam was constructed. The old townsite is now under water. In 1958, Congress renamed it John Redmond Dam and Reservoir for the Burlington Daily Republican's publisher, John Redmond, a beloved figure in Kansas newspaperdom who had received his training under the great William Allen White of the Emporia Gazette. One of the first to champion the causes of flood control and water conservation along the Neosho River, Mr. Redmond's work along these lines continued from the early 1920's until his death in 1953 at the age of 79. His dream of controlling floods in the upper Neosho had started to become a reality with the authorization of the four dams in 1950. The fertile Neosho Valley was flooded 57 times in 34 years, with the worst flood coming in 1951, one year after Congress authorized the project. Floodwaters ran 30 feet deep at the damsite and one-third million acres were under water. John Redmond Dam was pressed into flood control operation several weeks before final completion, protecting the Neosho River Valley for the first time from the damaging floods.

FISHING

Keep clear of boat channels, ski and swimming areas. Be careful when casting If trolling, watch water ahead and traffic. Be considerate of others.

SKIING

Always wear an approved personal flotation device. Stay in open water. Watch for swimmers. Have at least two people in the boat, one to run the

boat, and one to watch the skier.

HUNTING

- Know the correct way to carry your gun.
- Treat every gun as if it were loaded. Always point the gun muzzle in a safe direction.
- Be sure of your target.
- Keep the safety on or the chamber unloaded until ready to fire.
 - Never lay a loaded gun on bottom of boat. Never shoot a rifle at the water.

HAZARDS

John Redmond Reservoir has numerous underwater hazards. Be especially watchful for submerged stumps, logs, fences, and other obstructions — particularly in shallow water and along the shoreline.









Visitors Welcome

John Redmond Reservoir lies in a broad flat valley with margins of the gently rolling Flint Hills — a bluestem grass region of natural scenic beauty. The 59mile shoreline around the reservoir provides excellent camping areas and retreats for vacationists who like to get away from the beaten path. Located in the middle of the vast Central Flyway, the reservoir is on an important flight path for migratory ducks and geese. Large flocks of Canvasback Ducks as well as Snow and Blue Geese move through the Neosho River Valley in the spring and fall, and the Flint Hills contain the largest single concentration of greater prairie chickens in the United States.

Food, bait, tackle, boat rentals, etc., are available near the lake. Facilities available at the public use areas are listed on the map side of this pamphlet.

Please keep the area beautiful for other visitors. Avoid damaging trees and plants. Extinguish all fires, and use trash cans to dispose of refuse.

Inquiries regarding the project and its use are welcomed by the Resident Engineer at the Resident Office near the dam. Copies of regulations governing public use of this reservoir and other information may be obtained at the Resident Office. Our mailing address is: Resident Engineer, John Redmond Resident Office, U.S. Army Corps of Engineers, Route 2, P.O. Box 71, Burlington, KS 66839, Telephone: AC (316) 364-2311.



Recreation



FISHING AND HUNTING

John Redmond Reservoir provides excellent opportunities for fishing and hunting. Principal species of fish in the lake include white crappie, walleye, white bass, channel catfish, flathead catfish, and various sunfish species.

The Kansas Forestry, Fish and Game Commission has a license to 1,472 acres of the project lands for wildlife management. The licensed area is known as the Otter Creek Game Management Area, and is managed primarily for bobwhite quail, mourning dove, greater prairie chicken, cottontail rabbit, squirrel, and deer. The U.S. Fish and Wildlife Service has under

cooperative agreement approximately 18,500 acres of project land and water areas for operation of the Flint Hills National Wildlife Refuge. The Refuge is managed as part of the national migratory waterfowl program and is open to public hunting during hunting season with the exception of the area north of the Neosho River which is closed to public access from October 1 through December 31 each year. Detailed hunting information may be obtained from the Refuge Manager located in Burlington, Kansas.

Hunting and fishing activities are regulated by Federal and State laws. Courtesy and safety should be practiced when utilizing public lands to insure a pleasant recreational experience.

Project Data



LOCATION

John Redmond Dam is located on the Neosho River about 3 miles north and 1 mile west of Burlington, Kansas, just off U.S. Highway 75.

CAMPING AND PICNICKING

John Redmond Reservoir has seven recreation parks which provide camping and picnicking facilities. These facilities include individual camping units (table, cooker, lantern stand, and parking pad), potable water, and sanitation facilities. Also provided are group shelters, toilet facilities, swimming beaches, and boat launching ramps.

BOATING

Boating on the lake is in accordance with the Kansas boating laws and Corps of Engineers' regulations. Operate your boat in a controlled, safe manner at all times.





The middle zone or "conservation storage" provides 79,600 acre-feet of storage for water supply, water quality and space to contain sediment. The water supply portion

of the storage will yield 24.5 million gallons a day. The bottom zone or "inactive storage" provides 2,500 acre-feet of space to contain sediment.

Releases of water are made through the low flow pipes, over the spillway, or a combination of both. Releases are generally less than bankfull, however, during large flood periods they may range up to the bankfull flows of 12,000 cubic feet per second. The release rate depends on such factors as the inflow rate, amount of water in storage, river flows downstream, and weather conditions. A warning device is sounded at the dam prior to making a change in releases.

BENEFITS

John Redmond Dam and Reservoir benefits an area of 312,000 acres of agricultural land and urban areas in the Neosho River Basin above Pensacola Lake. The lake has been credited with preventing an estimated \$27,358,-000 in flood damages through June 30, 1975.





SIGHTSEEING

John Redmond Reservoir is located in the broad Neosho River Valley. The rolling hills afford the visitor an opportunity to see many acres of agriculture and grassland. Fields of wheat, corn, and maize are abundant. Large areas of grasses including Big Bluestem, Little Bluestem, Indian Grass, Switch Grass, Brome Grass, and Sideoats Grama can be seen from the rolling hilltops. The lower areas consist of wooded cover of such species as elm, black walnut, hickory, ash, hackberry, cottonwood, and cedar



WATERSHED

Drainage area above the dam, square miles . . . 3,015

LAKE

Elevations, feet above mean sea level Top of flood control pool
Surface area of lake, acres
At top of flood control pool31,700At top of conservation pool9,400At top of inactive pool610
Storage capacities, acre-feet
Flood control pool562,500Conservation pool79,600Inactive pool.2,500Lake total.644,600
Shoreline length, miles
At top of conservation pool

HISTORY AND DEVELOPMENT

Designed and built by the Tulsa District Corps of Engineers at a cost of \$29,264,000, the project was started in 1959 and placed in flood control operation in 1964. The John Redmond project was authorized by Congress under the Flood Control Act of 1950.

OPERATION

John Redmond Reservoir is one of four Corps of Engineers' lakes in Kansas designed primarily for control of floods and low flow regulation in the upper Neosho River Valley. The other projects are Council Grove Lake on the Neosho River, completed in 1964; Marion Lake on the upper Cottonwood River, completed in 1968; and the authorized Cedar Point Lake on Cedar Creek, a tributary of the Cottonwood River. In addition to flood control, John Redmond Reservoir serves the purposes of water supply, recreation, and fish and wildlife.

John Redmond Reservoir, in order to accomplish its function, has three kinds of storage that are separated by zones from the top to the bottom of the lake: flood control, conservation, and inactive storage.

The top zone or "flood control storage" provides 562,500 acre-feet reserved to catch floodwaters and will remain empty except during times of flood control operation. An acre-foot is 325,850 gallons - enough water to cover one acre to a depth of one foot.

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Storage capacities, acre-feet
Flood control pool.562,500Conservation pool.79,600Inactive pool2,500Lake total644,600
Shoreline length, miles
At top of conservation pool
M
Embankment
Length of dam, feet

DA

Spillway

Tainter gates (14), size, width and height, feet 40 by 35

Outlet Works

Low flow pipes (2), diameter in inches 24 Water supply pipe (1), diameter in inches 30



Safety Suggestions



BOATING

Don't overload your boat.

Boats must not approach closer to the dam than indicated by warning signs or safety buoy lines. If your boat upsets, stick to it and use it as a life per-

server. Standing in a boat can lead to disaster. Help a boat in distress. Give help and if you need

help, ask for it. Each boat must have an approved flotation device for

each passenger.

SWIMMING

Swim and wade only where you are familiar with the water depths and the bottom. Don't swim alone. There's safety in numbers.

Be sure water is deep enough before diving. Be careful of overestimating your swimming ability

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Early Day History



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