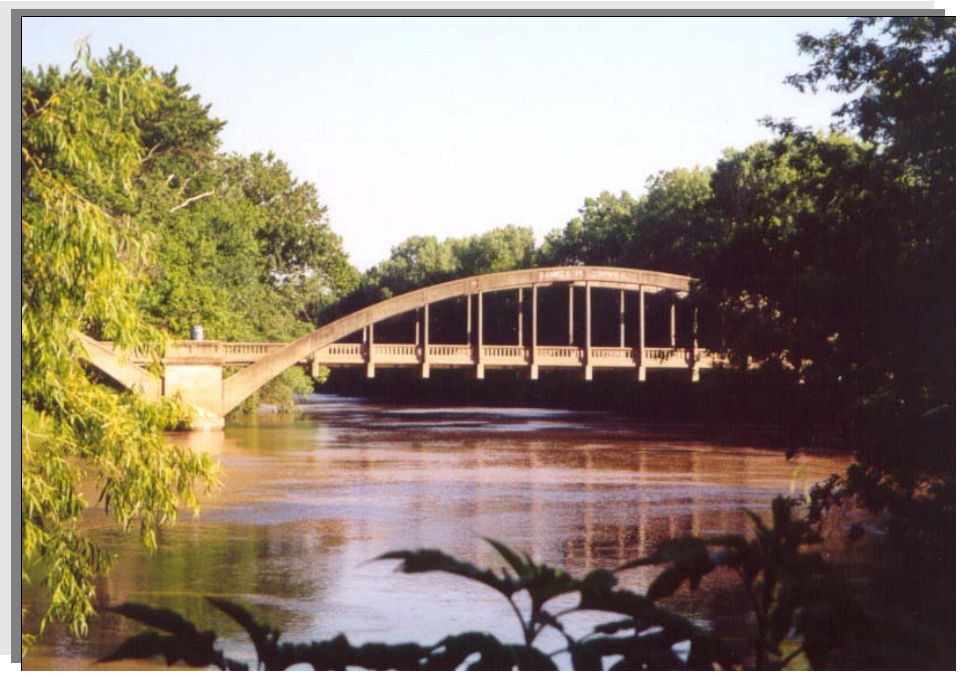
DRAFT

SUPPLEMENT TO THE FINAL ENVIRONMENTAL IMPACT STATEMENT

Prepared for the:

REALLOCATION OF WATER SUPPLY STORAGE PROJECT: JOHN REDMOND LAKE, KANSAS



VOLUME II - APPENDICES

JUNE 2002

United States Army Corps of Engineers; Tulsa District
1645 South 101 East Avenue
Tulsa, Oklahoma 74128-4609

DRAFT

SUPPLEMENT TO THE FINAL ENVIRONMENTAL IMPACT STATEMENT

Prepared For:

Reallocation of Water Supply Storage Project: John Redmond Lake, Kansas

U.S. Army Corps of Engineers; Tulsa District
1645 South 101 East Avenue
Tulsa, Oklahoma 74128-4609

VOLUME II - APPENDICES

JUNE 2002

Prepared By:

engineering-environmental Management, Incorporated
1510 West Canal Court, Suite 2000
Littleton, Colorado 80120

VOLUME II

APPENDICES

APPENDIX A

Public Scoping Comments
Notice of Intent
Distribution Lists

DRAFT

PUBLIC SCOPING PROCESS COMMENTS AND SUMMARY REPORT FROM NOTICE OF INTENT AND SCOPING MEETINGS JOHN REDMOND LAKE, KANSAS

July 2001

United States Army Corps of Engineers; Tulsa District
1645 South 101 East Avenue
Tulsa, Oklahoma 74128-4609

DRAFT

PUBLIC SCOPING PROCESS COMMENTS AND SUMMARY REPORT FROM NOTICE OF INTENT AND SCOPING MEETINGS JOHN REDMOND RESERVOIR LAKE

Prepared For.

Reallocation of Water Supply Storage Project:
John Redmond Lake, Kansas

U.S. Army Corps of Engineers; Tulsa District
1645 South 101 East Avenue
Tulsa, Oklahoma 74128-4609

July 2001

Prepared By:

engineering-environmental Management, Incorporated
1510 West Canal Court, Suite 2000
Littleton, Colorado 80120

EXECUTIVE SUMMARY

Under Contract Number DACA56-00-D-2013, Task Order 0034 (27 April, 2001), the Department of the Army, Corps of Engineers -Tulsa District, tasked engineering-environmental Management, Inc. to conduct Phase I of the Final Environmental Impact Statement Supplement to the John Redmond Lake EIS. The purpose of the supplement is to identify the environmental, cultural, social, and economic aspects of reallocation of flood control storage to water supply storage at John Redmond Lake, Kansas. Task 6.0 of this project provides the results and analysis of public scoping meetings held in March and April 2001 as a stand-alone report for this task, but the information contained herein will also be presented in appropriate sections of the FEIS.

A Notice of Intent to prepare an EIS for Reallocation of Water Supply Storage for John Redmond Lake, Kansas was published in the *Federal Register* on 7 April 2001. Two public scoping meetings were held in conjunction with the notice, the first in Burlington, Kansas (29 March 2001) and the second in Chetopa, Kansas (5 April 2001). Thirty individuals were present in each meeting and represented citizens, county agencies, state agencies, and federal agencies. A synopsis was prepared summarizing the concerns and issues identified by meeting attendees

The Burlington, Kansas comments focused on remediation of the "logjam" formed in the Neosho River, inclusion of a seasonal pool management plan, federally threatened fish habitat concerns, flooding in the Otter Creek Wildlife Management Area, crop damages and harvesting concerns due to flooding, wildlife displacement due to high water, Neosho River bank erosion concerns, construction of up-drainage detention ponds and the Cedar Point Dam, the state highway bridge (K-130) creates a backwater, and an increase in duration and frequency of down-river flooding. The Chetopa, Kansas comments focused on the only function of the reservoir being that of flood control, dredging the reservoir, Neosho River bank erosion concerns, an increase in duration and frequency of down-river flooding, and a recreation focus (waterfowl hunting) versus flood control.

Seventeen written comment forms, letters, and electronic mail resulted in three supporting the proposed water level raise, nine opposed to a water level raise due to loss of flood control storage, three supporting dredging of sediments, one concerned about dam safety with the water level raise, two supporting wildlife management and habitat improvement as a key project focus and two noting that wildlife habitat would be negatively affected, two stating that recreational opportunities would be improved, one opposed to the proposed project because it was to only benefit recreation, and three supporting "logjam" remediation. In addition, a petition with 101 signatures was presented to the Corps requesting removal of the "logjam" located approximately 0.9 miles east of the Jacob Creek boat ramp. Road and property flooding are reasons cited for its removal.

The lists of agencies, organizations, and individuals consulted during environmental impact statement preparation are incomplete in this report. These lists will be continually updated as contacts are made relative to the resource information needs addressed.

TABLE OF CONTENTS

1.0 CONSULTATION AND COORDINATION

1.1 Introduction

This introduction provides a summary of the scoping process, and a list of agencies, organizations, and persons consulted in the preparation of this DSEIS. Comments, correspondence, and notices are contained in Attachment A. The project mailing list is contained in Attachment B. The mailing list was compiled from interested individuals, agencies, and organizations during the project development process. It is current through June 2001. Individuals on the mailing list may not receive a copy of the DSEIS; however, they will receive a letter announcing availability of the DSEIS, and a notice of availability will also be published in local newspapers

2.0 PUBLIC COORDINATION

As required by CEQ regulations for implementing NEPA (40 CFR 1500-1508), the U S. Army Corps of Engineers, Tulsa District, provided for an early and open scoping process to determine issues to be addressed and those considered significant to concerned citizens and organizations. Public involvement opportunities to date include the EIS notification process, including the NOI and the opportunity to comment on the NOI, and interagency and public scoping meetings Sections 2 1 through 2 3 provide more information on the public coordination process Additionally, public hearings will be held on the DSEIS following the requisite comment period

2.1 Notice of Intent

In conformance with the requirements of NEPA (40 CFR 1501.7), a NOI to prepare an EIS for the John Redmond Lake Reallocation Study, Kansas was published in the *Federal Register* on April 7, 2001 (see Attachment A). Alternatives to be evaluated were identified in the NOI as the no action, and another alternative to raise the lake's conservation pool by two feet to accommodate for sediment buildup. Significant issues to be addressed in the EIS were identified as potential impacts to.

- The Flint Hills National Wildlife Refuge;
- Recreation and recreational facilities,
- Structures of the dam;
- Fish and wildlife resources within, above, and below the lake;
- Downstream flows on the Neosho River; and
- Other impacts identified by the public, agencies, and Corps studies.

The scoping period ended on June 1, 2001

2.2 Scoping Meetings

Two public scoping meetings were held in conjunction with the NOI. The first meeting was held on March 29, 2001, in Burlington, KS, and the second meeting was held on April 5, 2001, in Chetopa, KS The purpose of these meetings was to inform the public of the upcoming water supply reallocation study and to allow citizens an opportunity to comment on the proposed two-foot raise in the conservation pool at John Redmond Lake. An advertisement for the scoping meetings was placed in the *Coffey County Republican* newspaper on March 14, 2001. Press releases were sent to 47 newspapers, and radio and TV stations for publication (see Attachment A). Copies of the presentation and handout materials are included in Attachment C.

Thirty individuals representing the public and state and county agencies attended the meeting in Burlington, Kansas. Only two written comments were received at the meeting, but attendees could obtain comment forms to fill out and return by mail.

Thirty individuals representing farmers, pecan growers, the City of Chetopa, and a representative from Congressman Coburn's office also attended the meeting in Chetopa, KS Most attendees were in opposition to any action that would result in a reduction of flood control storage, no matter how slight. No written comments were received at the meeting, but attendees could obtain comment forms to fill out and return by mail.

In addition to the two public scoping meetings, a meeting was held with the Neosho Basin Advisory Committee on March 16, 2000. At this time, the advisory committee has neither approved nor disapproved of the proposed project.

2.3 Summary of Issues Identified During The Scoping Process

Burlington, Kansas Meeting, March 29, 2001. The following is a synopsis of the concerns expressed by attendees of the Burlington, KS meeting:

- Remove the logjam at Jacob Creek.
- Cut a channel around the logjam.
- Logjam creates a higher pool in the upper reaches of the lake
- Removal of the logjam would permit water to enter the conservation pool
- Include seasonal pool management plan in the reallocation study
- Keep riffles at Hartford clean for Madtom habitat.
- Concern for flooding Neosho Madtom habitat
- Operations Division should clean out log jam, as done in early years.
- Logjam is causing increased flooding off Corps property upstream of John Redmond, around flood pool lands, and upstream to Emporia, KS.
- Determine if the increased conservation pool limit Kansas Department of Wildlife and Park's (KDW&P) seasonal pool manipulation plans
- Raising the conservation pool will adversely impact the KDW&P Otter Creek wildlife management area (1,600 acres) and make it flood more frequently.
- More damage to crops due to increased flooding because of conservation pool raise

- Animals are being forced out of their habitat because of higher water levels (i e , increasing crop damage and increasing car/deer accidents)
- Stream bank caving caused from the way the Corps operates John Redmond losing cushion of extra flood control storage.
- Should build detention ponds above John Redmond to trap sediment as was promised before John Redmond was built.
- Build Cedar Point Lake like the Corps was supposed to.
- Increase in conservation pool will increase the duration and frequency of flooding on easement lands.
- K-130 bridge increases backwater effect.
- High pools isolate non-easement lands preventing farmers from harvesting crops

Written comments received are summarized in Table 1 below.

Chetopa, Kansas Meeting, April 5, 2001 The following is a synopsis of the concerns expressed by attendees of the Chetopa, KS meeting

- There has been an increase in stream bank caving on the Neosho River caused by the way the Corps operates John Redmond for flood control.
- The flood pool is already insufficient
- A loss of flood control in John Redmond will increase the duration and frequency flooding lands downstream on the Neosho River
- The only real solution to sedimentation in the lake is dredging the reservoir.
- John Redmond's only purpose is flood control—all other uses are subservient to flood control or are extraneous.
- The only reason the Corps wants to raise the water level is for the duck hunter.

Written comments received are summarized in Table 1 below.

Written Comments. The Corps received seventeen comment forms, letters, and e-mails during the scoping period in response to the NOI or public meetings The content of the comments are similar to the concerns expressed at the public meetings, and include:

- Three generally for the two-foot raise in water level.
- Nine opposed due to loss of flood control storage.
- Three stated that the lake should be dredged.
- One stated that a raise in the water level would make the dam unsafe.
- Two noted that wildlife management and habitat improvement should be a key part of the project.
- Two others noted that habitat would be negatively impacted.
- Two noted that the project would improve recreational opportunities.
- One was opposed to the project because it was being done strictly to benefit recreation.
- Three stated that the logjam needs to be removed.

Table 1 details the written comments received during scoping.

Table 1. Written Scoping Comments

Letter No.	Agency/Organization/ Individuals	Comment	Where Discussed in the EIS – Section	Where Discussed in the EIS – Page
1	Kevin Wellnitz Neosho Rapids, KS	Raising the conservation pool would lead to more frequent flooding of longer duration, which would lower property values	3 3 3 8 3 3 8 4 4 3	3-3 to 3-16 4-5 to 4-8 3-65 to 3-68 3-68, 69
		Maintenance below the bridge north of Hartford on K-130 is poor Trees are growing under the bridge obstructing water flow causing water on the west side of K-130	3 8 4 4 8 6	3-68, 69 4-25
2	Robert Withrow Chetopa, KS	Opposed to raising the conservation pool that would result in loss of flood storage	3 3 3 8 3 3 8 4	3-3 to 3-16 3-65 to 3-68 3-68, 69
3	Jane Bicker Chetopa, KS	Opposed to raising the conservation pool that would result in loss of flood storage	3 3 3 8 3 3 8 4	3-3 to 3-16 3-65 to 3-68 3-68, 69
4	Jeff Jackson Columbus, KS	Opposed to raising the conservation pool that would result in loss of flood storage	3 3 3 8 3 3 8 4	3-3 to 3-16 3-65 to 3-68 3-68, 69
5	Linda Jackson Chetopa, KS	Opposed to raising the conservation pool that would result in loss of flood storage	3 3 3 8 3 3 8 4	3-3 to 3-16 3-65 to 3-68 3-68, 69
6	Irene & David Elmore Chetopa, KS	Opposed to raising the conservation pool that would result in loss of flood storage	3 3 3 8 2 3 8 3 3 8 4	3-3 to 3-16 3-60 to 3-65 3-65 to 3-68 3-68, 69
7	Delbert Johnson Oswego, KS	It would be cheaper to dredge the lake than the cost of resulting flood damage	4 8 1	4-18
		A higher water level would make the dam unsafe	1 4 3	1-10, 11
8	Henry Bell Chetopa, KS	Release the water from John Redmond when it begins to rain to prevent additional flooding after a flood	3 3 2 3 3 3	3-6 to 3-9 3-10 to 3-16
		Opposed to raising the pool for hunting and boating	3 4 6 3 8 2	3-47 to 3-50 3-61 to 3-65

Letter No.	Agency/Organization/ Individuals	Comment	Where Discussed in the EIS – Section	Page
9	Jack Dalrymple Miami, OK	The flood pool is already insufficient The Corps has had to make releases in excess of channel capacity Reducing flood storage capacity would further exasperate the situation resulting in a negative impact downstream	3 3 2 3 3 3 3 8 2	3-6 to 3-9 3-10 to 3-16 3-61 to 3-65
		Compensating for sedimentation in the conservation pool sets a dangerous precedent The only solution is dredging	2 3 3 3 4 8 1	2-2 3-3 to 3-16 4-18
10	W P Zimmerman Welch, OK	Any raise in the lake level will decrease flood control Dredge the sediment	2 3 3 3 3 8 3 3 8 4 4 8 1	2-2 3-3 to 3-16 3-65 to 3-68 3-68, 69 4-18
11	W K Nielsen Emporia, KS	Encourage raising the level of the conservation pool.	Comment Noted	
12	No name	Neosho madtom habitat will be flooded	3 4 5	3-43, 44
13	Deborah Wistrom Hartford, KS	Raising the lake level will not stop the existing logjam problem	3 3 2 3 3 6	3-10, 20, 21 3-25
	Leonard Jirak Hartford, KS	Include pool management for fish and wildlife Riffles below Hartford need to be periodically flushed to ensure good habitat for madtom	3 3 3 3 3.6 3 4 4	3-10, 20, 21 3-25, 26 3-39, 40
	Bob Culbertson New Strawn, KS	Manage pool levels with drawdowns for wildlife on a regular basis	2 5 3 3 2 3 4.4 3 4 5 5 1	2-3 3-9 3-38 to 3-40 3-43, 44 5-2
14	Larry Bess Emporia, KS	Fishing has deteriorated over the past several years due to reduction of riffle areas and silting Raising the lake level will result in more silt	3 3 3 4 8 3	3-16 to 3-21 4-21, 22
15	Ron Casey Hartford, KS	The logjam is causing the banks to erode and drop more trees, making the logjam bigger	3 3 3 3 3 6 3 4 4	3-10, 30, 21 3-25 3-39, 40
		The current lake level is not deep enough to boat on	3 8 2 3 8 3	3-63 to 3-65 3-67, 68
16	Terry Emmons Hartford, KS	The lake level should be raised 2 to 3 feet	Comment Noted	
		Clear the logjam to allow easier movement of the fish, and for boating access	3 3 3 3 3 6 3 4 4	3-10, 20, 21 3-25, 26 3-39, 40
17	Ben Cuadra Waverly, KS	Supports the raising of the pool to increase boating access	3 8 2 3 8 3	3-63 to 3-65 3-67, 68

The USACE, Tulsa District, has also received (2001, specific date unknown) a petition signed by 101 individuals from Jacob Creek, Burlington, Emporia, Hartford, and Neosho Rapids, KS. The petition requests the removal of a logjam 0.9 miles east of the Jacob Creek (Strawn) boat ramp. The petitioners state that the logjam is causing road and property flooding The petition is included as Attachment D

All of the above concerns have been noted and are addressed in the DSEIS.

3.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS CONSULTED

3.1 Federal Agencies

Department of Agriculture
- Natural Resources Conservation Service

Department of Energy
- Wolf Creek Nuclear Generating Station

Department of the Interior
- U S Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Geological Survey

3.2 State Agencies

Emporia State University
Kansas Biological Survey
Kansas Department of Health and Environment
Kansas Department of Transportation
Kansas Department of Wildlife & Parks
Kansas State Historic Preservation Office
Kansas State Historical Society
Kansas State University Agricultural Extension
Kansas Water Office

3.3 Local Agencies

City of Burlington, Kansas
City of Chetopa, Kansas
Coffey County, Kansas
Lyon County, Kansas
Neosho River Committee

ATTACHMENTS

A. Comments, Correspondence, and Notices

B. Project Mailing List

C. Scoping Meeting Presentation and Handouts

D Log Jam Petition

ATTACHMENT A: COMMENTS, CORRESPONDENCE, AND NOTICES

[Federal Register: April 7, 2000 (Volume 65, Number 68)]
[Notices]
[Page 18316-18317]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr07ap00-73]

DEPARTMENT OF DEFENSE

Department of the Army, Corps of Engineers

Notice of Intent To Prepare an Environmental Impact Statement (EIS) for the John Redmond Lake Reallocation Study, Kansas

AGENCY: U.S. Army Corps of Engineers, Department of Defense.

ACTION: Notice of intent.

SUMMARY: The purpose of the EIS is to address alternatives and impacts pertaining to reallocation of water storage at John Redmond Lake, Kansas.

FOR FURTHER INFORMATION CONTACT: Questions or comments concerning the proposed action should be addressed to Mr. David L. Combs, Chief, Environmental Analysis and Compliance Branch, 1645 South 101st East Avenue, Tulsa, Oklahoma 74128-4629, telephone 918-669-7660, e-mail: David L. Combs@usace.army.mil.

[[Page 18317]]

SUPPLEMENTARY INFORMATION: John Redmond Lake was authorized by the Flood Control Act approved May 17, 1950, Public Law 81-516a; Project Document HD 442, 80th Congress, 2d Session. Public Law 85-327, dated February 15, 1958, changed the project name from Strawn Dam to John Redmond Dam and Reservoir. It is located on the Grand (Neosho) River at river mile 343.7, about 3 miles northwest of Burlington in Coffey County, Kansas. Project purposes include flood control, water supply, water quality, and recreation. Closure of the embankment was completed in September 1963 and the project was completed for full flood control operation in September 1964.

In 1975, the state of Kansas and the Federal government entered into a water supply agreement for an estimated 34,900 acre-feet of storage remaining after 50 years of sedimentation. After the agreement was signed, it was determined that sediment was entering the lake unevenly from what had been predicted. Over time, sedimentation in the lake has changed the amount of storage the lake has for flood control, water supply and other purposes. Storage available for water supply purposes in the lake has been depleted by sediment distribution such that the water supply agreement obligations are being infringed upon.

Most of the sediment deposited in the lake pool has been below elevation 1039.0 (top of conservation pool), National Geodetic Vertical Datum (NGVD). Based on the Corps sediment surveys for 1964-1993, it was predicted that adequate storage would be available below elevation 1068.0 feet NGVD (top of flood control pool) at the end of the economic life of the project (Year 2014) to meet all authorized project purposes. However, the top of the conservation pool should ultimately be established at a higher elevation to reapportion equitably the

storage between the conservation and flood control pools.

When a lake is designed, each pool (flood control, conservation, sediment) is designed to capture a proportionate amount of sediment. In the case of John Redmond, the sediment load has been as predicted; however, the sediment is accumulating in the conservation pool while the flood control pool has experienced less than expected sedimentation losses.

The reallocation study and EIS will focus on ways to accommodate for the uneven distribution of sediment within the lake and evaluate a number of alternatives. Alternatives presently identified include the no action plan, which follows the current operational practices and another alternative to raise the lake's conservation pool to accommodate for sediment buildup. This alternative includes a 2-foot pool rise with the intentions of raising the conservation pool to elevation 1040.0 feet NGVD and using a phased pool raise of the remaining one-foot, in one-half foot pool increments.

The EIS will evaluate the effects of alternatives on the authorized project purposes and other identified concerns. Significant issues to be addressed in the EIS include: (1) potential impacts to the Flint Hills National Wildlife Refuge; (2) impacts on recreation and recreation facilities; (3) impacts on structure of the dam; (4) impacts on fish and wildlife resources within and also above and below the lake; (5) impacts on downstream flows on the Neosho River; and (6) other impacts identified by the public, agencies, or Corps studies.

Scoping meetings for the project are planned to be conducted in March and April 2000. News releases informing the public and local, state, and Federal agencies of the proposed action will be published in local newspapers. Comments received as a result of this notice and the news releases will be used to assist the Tulsa District in identifying potential impacts to the quality of the human or natural environment. Affected local, state, or Federal agencies, affected Indian tribes, and other interested private organizations and parties may participate in the scoping process by forwarding written comments to the above noted address or attending scoping meetings.

The draft EIS (DEIS) is expected to be available for public review and comment by September 2001. Any comments and suggestions should be forwarded to the above noted address no later than June 1, 2000, to be considered in the DEIS.

Dated: March 27, 2000.
Leonardo V. Flor,
Colonel, U.S. Army District Engineer.
[FR Doc. **00-8674 Filed** 4-6-**00**; 8:45 am]
BILLING CODE 3710-39-M

US Army Corps of Engineers

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well. Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed You may also take this form with you and return it to the address below

Tulsa COE

I have concerns about your plan to raise Conservation pool at John Redmond Lake.

We own property near Neosho Rapids KS. ①

Raising the conservation pool translates to more Frequent flooding of Longer duration, therefore Lower Land Values.

Also the maintenance below the bridge U. of Hartford on K-130 is Very Poor. Currently, trees are allowed to grow under the bridge restricting Water Flow It is Common to ② experience higher Water levels on the West side of the road K-Dot should be required to maintain an open Waterway!

Optional Information:

Name: Kevin Wellnitz Affiliation:

Address: 2022 Rd 140 City: Neosho Rapids State: KS

Zip: 66864 Phone: 316-342-9431 E-mail:

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Hosomback@swt02.swt.usace.army.mil

US Army Corps of Engineers.

(2)

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well. Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed. You may also take this form with you and return it to the address below.

Addressing the flooding situation in Labette and Cherokee Counties! I am opposed to the raising of the conservation pool at John Redmond, or anything else that would result in loss of flood storage. I am a land owner and pecan grower in Labette and Cherokee Counties.

Optional Information:

Name: Robert H. Nethrow Affiliation:
Address: 3083 K. 3rd City: Chetopa State: KS
Zip: 67336 Phone: 316-236-7559 E-mail:

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Hosomback@swt02.swt.usace.army.mil

US Army Corps of Engineers.

(3)

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed. You may also take this form with you and return it to the address below.

We oppose raising the Conservation pool at John Redmond Dam or anything else that might result in loss of flood storage!

Optional Information:

Name: Dave Becker Affiliation: Elmore-Becker Farms, Inc. Farm #1
Address: P.O. Box 85 City: Chetopa State: KS.
Zip: 67336-0085 Phone: 316-236-7785 E-mail:

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Hosomback@swt02.swt.usace.army.mil

US Army Corps of Engineers.

(4)

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well. Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed. You may also take this form with you and return it to the address below.

I oppose the conservation pool at John Redmond Dam being raised to result in storing up flood waters

Jeff Jackson

Optional Information:

Name: Jeff Jackson Affiliation: FARMER
Address: 6429 SW Lostine Rd City: Columbus State: KS
Zip: 66725 Phone: 316-597-2549 E-mail:

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Hosomback@swt02.swt.usace.army.mil

US Army Corps of Engineers

(6)

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well. Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed. You may also take this form with you and return it to the address below.

I oppose raising the conservation pool at John Redmond Dam as a means of storing up water that results in flooding our farms.

Linda Jackson

Optional Information:

Name: Linda Jackson Affiliation: Own farm along Neosho River
Address: 11510 SW Black Jack Rd City: Chetopa State: KS
Zip: 67336 Phone: 316-597-3651 E-mail:

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Hosomback@swt02.swt.usace.army.mil

US Army Corps of Engineers.

6

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed. You may also take this form with you and return it to the address below.

WE WERE TOLD THE JOHN REDMOND DAM WAS MADE TO HELP FARMERS FROM HAVING THEIR LAND FLOODED. NOW WE HEAR DUCK HUNTERS, AND PLEASURE TIME PEOPLE WANT THE DAM WATER LEVEL WHERE IT DOESN'T HELP THE FARMER.

I OPPOSE RAISING THE CONSERVATION POOL AT JOHN REDMOND OR ANYTHING ELSE THAT MIGHT RESULT IN LOSS OF FLOOD STORAGE OF WATER AT THE DAM !!

Optional Information:

Name: IRENE + DAVID ELMORE Affiliation: landowner
Address: 516 NO 3RD City: CHETOPA, KANSAS State: KS
Zip: 67336 Phone 316-236-7997 E-mail: _____

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Hosomback@swt02.swt.usace.army.mil

(7)

US Army Corps of Engineers

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well. Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed. You may also take this form with you and return it to the address below

I do not understand why certain groups wish to change the intent of the lake for flood control. Is it because there is more money provided by other intrest groups, which influence the outcome? Remember what the lake was designed & built for. As to reduction in storage at the John Redmond, due to sediment, why can't the Corps dredge the sediment. That process would be cheaper (1) than the flood destruction that has occured. Seems to me a higher lake level would make the Dam less safe (2)

Optional Information:

Name: Delbert Johnson Affiliation: Farm owner effected by Neosho

Address: 2002 Walnut Rd City: Oswego State: KS

Zip: 67356 Phone: 316 795-2687 E-mail:

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Hosomback@swt02.swt.usace.army.mil

US Army Corps of Engineers

(8)

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well. Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed You may also take this form with you and return it to the address below

I am Henry Bell and I live and own ground east of Chetopa 4½ miles. I have 672 acres in the bottom. I am flooded many times. our local rain comes and goes in 3 or 4 days - when we have already water over our crops then the John Redmond is opened up we are in trouble I have seen it rise 3 inches a hour below my house wondering when it would get in my house it has come within one foot. please let that water start coming out of J.R. when its raining up there. Flood on Flood is bad. I am not for raising water pool for town people to hunt and (1) (2)

Optional Information:

Name: Henry Bell Affiliation: Farmer

Address: 9532 SW Star Rd City: Chetopa KS State: KS

Zip: 67336 Phone: 316 597 2688 E-mail:

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Hosomback@swt02.swt.usace.army.mil

and boat in. When my Crops are under water this is hard to ~~[illegible]~~ continue farming. The water has been over my ground and crops many time 12 to 14 days - Grand Lake needs to let water out when it begins to rain, not use my ground for a holding pool - my pecans are lost my time by holding water level too high -

My Dad helped raise money to start J R Dam for the purpose of controling floods, not for City folks to hunt and run boats on at my Crops expense. pasture cant be used for 6 wks because its dirty. Hay has dirt in it when I bale. I lose thousands of Dollars about every year on account of poor management of water

Something has 2 be done

Henry Bell
9532 SW Star Rd
Chetopa, Ks 67336

US Army Corps of Engineers.

(9)

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well. Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed. You may also take this form with you and return it to the address below.

I would like to thank you for the opportunity to comment on the John Redmond Reservoir Reallocation issue. I would be opposed to any action that would result in a net reduction of flood control storage, no matter how slight. The flood pool is already insufficient. In the past the Corps has had to make releases in excess of channel capacity. Any degradation of flood storage capacity would further exacerbate that situation and result in negative impact down stream. (1)

The aging lakes in our system are silting rapidly. One fear of mine is that stealing more of the flood pool to compensate for loss due to sedimentation in the conservation pool would set dangerous precedence. The only real solution to lakes filling with siltation is dredging (2)

Optional Information:

Name: Jack Dalrymple Affiliation: _____

Address: 54301 E. 75 RD. City: Miami State: OK

Zip: 74354 Phone: 918-540-1870 E-mail: jackdccg@rectec.net

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Holsomback@swt02.swt.usace.army.mil

10

US Army Corps of Engineers

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

The Corps of Engineers is interested in addressing your concerns and questions regarding this study The Corps encourages suggestions as well. Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed. You may also take this form with you and return it to the address below

Any rise in the lake level will decrease flood control. I suggest dredging out the sediment + increase flood control.

Optional Information:

Name: W. Zimmerman Affiliation: _____

Address: RR2 Box 205 City: Welch State: Okla

Zip: 74369 Phone: 918-788-7213 E-mail: _____

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Hosomback@swt02.swt.usace.army.mil

MAR. 24

(11)

DEAR MRS. HOLSOMBACK

I'M WRITING THIS LETTER AS A RESPONSE TO AN ARTICLE IN THE EMPORIA KS. GAZZETTE, WHICH I HAVE ENCLOSED.

I STRONGLY URGE THE CORPS TO RAISE THE CONSERVATION POOL OF JOHN REDMOND RESERVOIR.

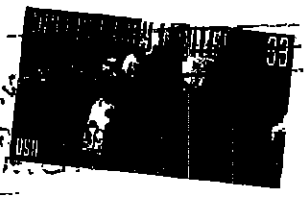
THANK YOU FOR THE OPPORTUNITY TO BE HEARD.

RESPECTFULLY

W. K. NIELSEN

EMPORIA KS.

W.K. NIELSEN
502 WILSON # 29
EMPORIA KS 66801



U.S. ARMY CORPS OF ENGINEERS
ATTN CESWT-EC-H MRS JAN HOLSOMBACK
1645 S. 101 ST AVE, TULSA OKLA.
74128-4629

74128/4623

Redmond study

The U.S. Army Corps of Engineers will hold two public workshops as part of the planning process related to water storage issues at John Redmond Reservoir near Burlington. In the 27 years since the lake was built, sedimentation has reduced the amount of water the lake can hold for flood control. The Corps of Engineers must decide whether to leave things as they are or raise the conservation pool level in the lake.

At 6:30 p.m. March 30, a workshop will be held at the Coffey County Courthouse in Burlington. At 6:30 p.m. April 5, it will be held at Chetopa School in Chetopa.

Comments [illegible] can be sent to the [illegible] of Engineers [illegible], CESWT-EC-H, Attn: Jan Holsombach, 1645 S. 101st Ave., Tulsa, OK 74128-4629. The phone number is (918) 669-7080. [illegible] address is Janet.Holsombach@[illegible].mil.

Items for Region [illegible] The Emporia Gazette, [illegible] Emporia, KS 66801; by e-mail to news2@valu-line.com; or faxed to 342-8108.

US Army Corps of Engineers

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

(12)

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address Feel free to use the back of this form or add pages if needed You may also take this form with you and return it to the address below

What about T+E Species? Neosho mallow habitat will be flooded.

Optional Information:

Name:_____ Affiliation:_____

Address:_____ City:_____ State:____

Zip:_____ Phone: ___-_____ E-mail:_____

Point of Contact

Ms Jan Holsomback,
U.S Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax· 918-669-7546
e-mail. Janet.Hosomback@swt02 swt.usace.army mil

US Army Corps of Engineers

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well. Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed. You may also take this form with you and return it to the address below.

LOG JAM - JACOB CREEK

Cut Channel

Why not get rid of log jam behind take at the end of the lake at Neosho Eagle Creek where water can adequately flow to John Redmond Raising [illegible] [illegible] well at [illegible] [illegible] [illegible]. [illegible] [illegible] (1)

Make sure to include pool management for fish and wildlife. [illegible] below [illegible] will [illegible] [illegible] [illegible] [illegible] [illegible] to insure good [illegible] [illegible] [illegible] (2)

Manage pool level with drawdowns for wildlife on a regular basis. Bob Culbertson (3)

Point of Contact

Questions, comments, and suggestions the John Redmond Reallocation Study can be directed to:

Ms Jan Holsomback,
U.S Army Corps of Engineers, Tulsa District
ATTN. CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone 918-669-7089

Randolph, James C SWT

(14)

From: Combs, David L SWT
Sent: Wednesday, March 22, 2000 9:17 AM
To: Randolph, James C SWT
Subject: FW: John Redmond Resivior

Jim,

Do you make hard copies of these for the file?

David

---Original Message---
From: Holsomback, Janet SWT
Sent: Wednesday, March 22, 2000 7 15 AM
To: Combs, David L SWT, Randolph, James C SWT, Croston, James SWT, Rossman, Edwin J SWT, Padgham, Glen SWT, Fry, James M SWT, Banks, Billy E SWT
Cc: Bell, Ronald W SWT, Sanders, Donald J SWT
Subject: FW John Redmond Resivior

Comment from an interested party to be taken into consideration Jan

---Original Message---
From: LARRY BESS [SMTP drdak1@hotmail com]
Sent: Tuesday, March 21, 2000 9 28 PM
To: Holsomback, Janet
Subject: John Redmond Resivior

My name is Larry Bess. I grew up in Hartford KS My family moved there in 1965, just around the time that John Redmond Resivior was opened. I have many fond memories of the Neosho River and the lake itself. A very large majority of my life and learning experience came from the river and the Flint Hills Wildlife area. My rather large family shared these experiences with me.

Growing up, I remember the river and its many riffles and rocky areas Access to the river in the Hartford area was very easy as the banks of the river sloped gently and the silt was not a problem However, since you folks have begun raising the level of the lake over the past several years, there are now very few riffle areas left The fishing has deteriorated to the point where catching any thing is a surprise I practice catch and release every time. There are few fish to release. My children have not had the opportunities that I was given as there is so much mud and the river banks are very steep. The only access to the river now is by boat. And that has become a very dangerous proposition. Please consider these facts before you raise the level of the lake again. It will only serve to raise the level of the silt more. There must be some solution to this problem other than raising the lake levels.
Thank you,

Larry Bess
730 Whildin
Empona KS, 66801

US Army Corps of Engineers

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

15

The Corps of Engineers is interested in addressing your concerns and questions regarding this study The Corps encourages suggestions as well. Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed. You may also take this form with you and return it to the address below.

My CONCERNS is The log JAM IS holding TO MUCH WATER behind IT CAUSING WATER TO LEAVE the BANKS TO EARLY AND TO GO PLACES IT SHOULDNT GO. IT ALSO CAUSES THE BANKS TO WASH AWAY AND DROP MORE TREES INTO THE WATER MAKING THE JAM bigger. THE LAKE ISNT Deep ENOUGH TO BOAT ON AT LAKE HOWELL

Optional Information:

Name: RON CASEY Affiliation:

Address: 111 2ND CIR City: HARTFORD State: KS

Zip: 66854 Phone: 316-364-2031 E-mail:

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Hosomback@swt02.swt.usace.army.mil

US Army Corps of Engineers.

John Redmond Lake Reallocation Study

Question, Comments, or Suggestions

16

The Corps of Engineers is interested in addressing your concerns and questions regarding this study. The Corps encourages suggestions as well. Your input is an important part of the Corps study process. Please write your question, comment, or suggestion on the space provided below. If you would like to be kept informed about this study please provide your name and address. Feel free to use the back of this form or add pages if needed. You may also take this form with you and return it to the address below.

I feel the lake level should be raised 2-3 feet to compensate for the silting in. (1)

I would also like to see the log jam cleared in the upper end of the lake to allow water to flow freely and allow fish to move in and out from the river. This would also open up the lake to river access. (2)

Optional Information:

Name: Terry Emmons Affiliation: citizen
Address: 465 2nd St J-Creek City: Hartford State: KS
Zip: 66854 Phone: ___-_____ E-mail: _____

Point of Contact

Ms Jan Holsomback,
U.S. Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-HM
1645 S. 101st East Ave.
Tulsa, OK 74128-4629
Phone: 918-669-7089 Fax: 918-669-7546
e-mail: Janet.Hosomback@swt02.swt.usace.army.mil

CESWT-PE-E

17 April 2000

17

TELEPHONE MEMORANDUM

SUBJECT. John Redmond Reallocation Pool Raise

As part of the public comment process, Mr Ben Cuadra of Waverly, Kansas called me on 17 April 2000 to provide comment on the proposed pool raise to augment water supply of the lake. Mr Cuadra stated that he was a fisherman who was interested in access to the river at the upper portion of John Redman reservoir. At the present time the river is typically not accessible because of shallow water Mr Cuadra wanted to express his support for the pool raise and the project

Mr Cuadra's address is as follows.

Ben Cuadra
Waverly, Kansas 66817
(785) 733-8254

David L. Combs
Ch, Environmental Analysis and Compliance Br

Randolph, James C SWT

From: Steve Adams [stevea@wp.state.ks us]
Sent: Wednesday, March 22, 2000 11:27 AM
To: Randolph, James C SWT
Cc: Combs, David L SWT
Subject: Re: John Redmond Lake Reallocation Study

Jim;

Thanks for the reply I will distribute the notice to our staff and try to make sure we have someone in attendance Please let me know if you need any information or assistance from us.

Steve

----- Original Message -----
From: "Randolph, James C SWT" <James C.Randolph@swt02.swt.usace army mil>
To: <stevea@wp.state ks us>
Cc: "Combs, David L SWT" <David L Combs@swt02 swt usace army mil>
Sent: Wednesday, March 22, 2000 11 13 AM
Subject: John Redmond Lake Reallocation Study

> Steve
>
> Dave Combs asked me to respond to your request
>
> We are just initiating the study and have not been working with anyone at
> Widlife and Parks that I am aware of.
>
> We have been working with Dewey Caster of the USFWS office in Manhattan to
> determine thier needs for impact evaluation on fish and wildlife resources
> and Fish and Wildlife Coordination Act funding He may have contacted
> someone in your office, but I am not sure
>
> Please let me know your POC so that we can furnish them planning data as it
> becomes available We look forward to seeing you or your representative at
> the public meetings. If you need to speak with me please feel free to call
> at 918-669-4396.
>
> JIM RANDOLPH

STATE OF KANSAS

Bill Graves, Governor

KANSAS WATER OFFICE
Al LeDoux
Director

901 S. Kansas Ave.
Topeka, Kansas 66612-1249

785-296-3185
FAX 785-296-0878
TTY 785-296-6604

October 10, 2000

Colonel Leonardo Flor
District Engineer
U.S. Corps of Engineers
Post Office Box 61
Tulsa, OK 74121-0061

Dear Colonel Flor.

Attached is the revised proposed lake level management plan for John Redmond Lake. As you may recall, I forwarded similar plans for other lakes in your district with a letter dated July 26, 2000. At that time, I withheld submittal of the proposed John Redmond plan until such time some additional issues could be resolved.

Over the past 10 years there has been a great deal of discussion among state and federal agencies, as well as local individuals and groups, about the best way to implement such a plan. The Kansas Water Office serves a dual role in these issues in coordinating the State position and protecting water supplies dedicated to users under contract with the State of Kansas. My office has always been concerned with all aspects of water supply, flood control and wildlife habitat associated with John Redmond Lake. I believe that this proposal represents the best alternative to meeting all of these needs.

At the end of July, my staff met with members of the Kansas Department of Wildlife and Parks, the U.S. Fish and Wildlife Service and Corps of Engineers staff from both the project and the Tulsa office. After much discussion all parties agreed upon the attached plan. As of the date of this letter, the Kansas Department of Wildlife and Parks is also holding a public meeting on this matter. The Kansas Water Office is also participating in this meeting. Any significant comments will be forwarded to your office as soon as possible.

I ask that you implement this plan as quickly as possible, if we receive any precipitation, so that the fall waterfowl benefits derived from this plan may be achieved. If you have any questions, please feel free to give Earl Lewis, a member of my staff, a call at (785) 296-3185.

Thank you in advance for your consideration of this proposed plan.

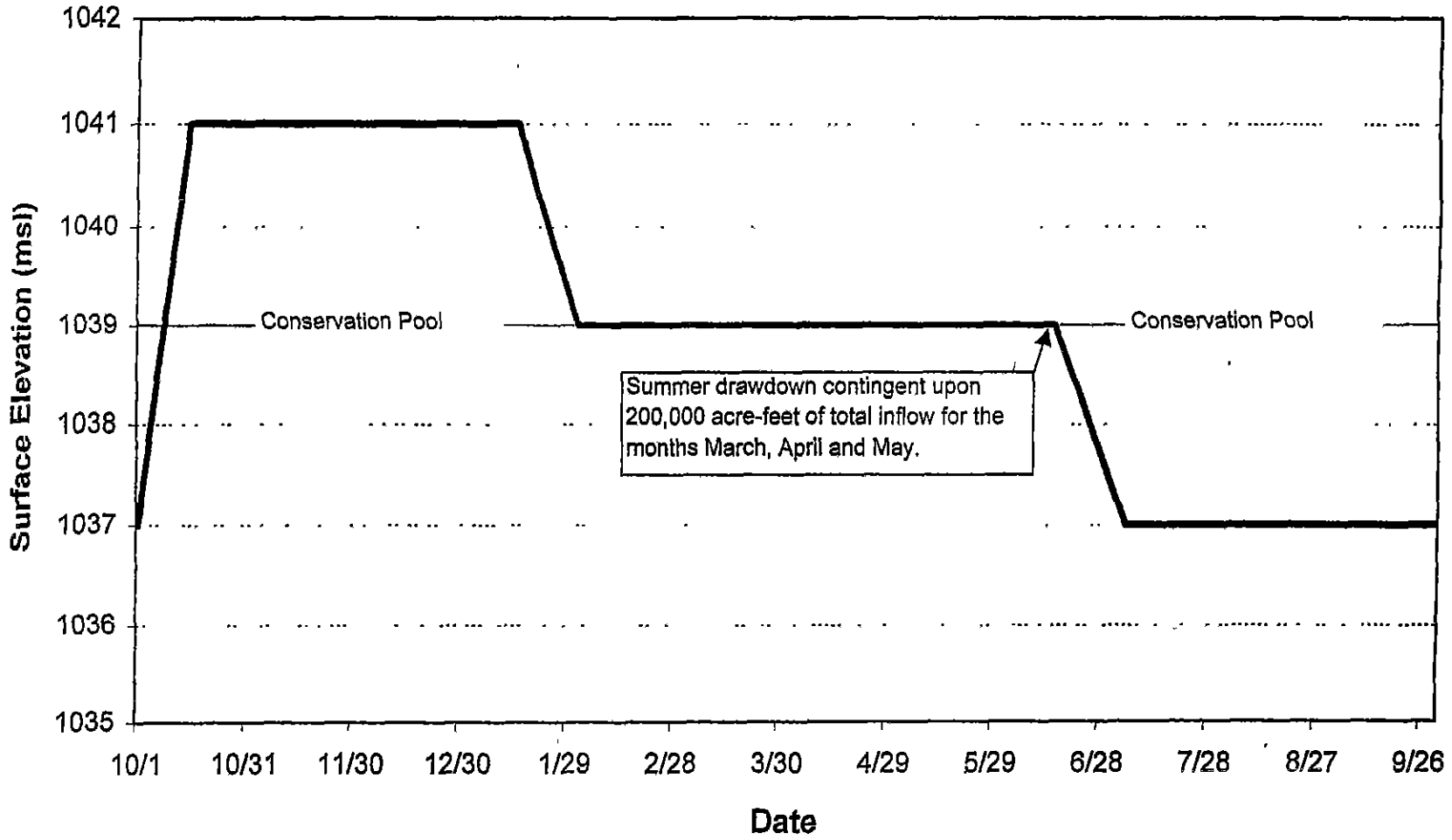
Respectfully,

Al LeDoux
Director

Enclosures

c/enclosures: Richard Oldham, Corps of Engineers, Kansas City
Ronald W. Bell, Corps of Engineers, Tulsa
Dan Mulhern, U.S. Fish and Wildlife Service, Manhattan
Jerre Gamble, U.S. Fish and Wildlife Service, Hartford
Marvin Swanda, Bureau of Reclamation, McCook
Robert Barbee, Kansas Department of Wildlife and Parks, Pratt
John Bond, Kansas Department of Wildlife and Parks, Topeka
Steve Adams, Kansas Department of Wildlife and Parks, Topeka
Leonard Jirak, Kansas Department of Wildlife and Parks, Hartford
Terry Duvall, Kansas Water Office
Clark Duffy, Kansas Water Office

John Redmond Reservoir
Proposed Water Level Management Plan
October 1, 2000 thru September 30, 2005



John Redmond Reservoir
Proposed Water Level Management Plan
October 1, 2000 thru September 30, 2005

Recommendations: (as inflows allow)

1. October 1 to October 15 – Allow lake level to rise to elevation 1041.0 by October 15 if inflows are available. This will provided flooded vegetation for migrating waterfowl and to support waterfowl hunting.

2. October 15 to January 15 – Hold lake level at elevation 1041.0 unless excessive ice conditions persist that threaten structures.

3. January 15 to February 1 – Reduce lake level to normal pool of 1039.0 to reduce ice damage to existing vegetation and operational structures.

4. February 1 to June 15 – Hold lake level at elevation 1039.0

5. June 1 to June 15 – Kansas Water Office will determine if there has been a total of 200,000 acre-feet of inflow into John Redmond Reservoir.

6. June 15 to July 5 – If inflow target has been met, reduce lake level to elevation 1037.0 to allow growth of native vegetation and expose mudflats. The vegetation will provide habitat for the shorebirds throughout the summer, reduce shoreline erosion, improve water clarity/quality, and create habitat for fall migrating waterfowl.

7. July 5 to September 30 – If inflow target has been met, hold lake level at elevation 1037.

US Army Corps of Engineers ®
Tulsa District

DRAFT NEWS RELEASE

For Immediate Release

To Editors, News Directors, and Assignment Editors

Synopsis: John Redmond Lake Reallocation Study will be presented at public workshops in Burlington and Chetopa, Kansas.

News Release No 2000-4
March 15, 2000

Corps to Host Workshops On John Redmond Reservoir Reallocation Study

TULSA, Okla. – The U S Army Corps of Engineers will host two public workshops as part of the planning process related to water storage issues at John Redmond Reservoir, Kansas The workshops are to inform the public and solicit comments regarding alternatives for the reallocation of water storage at John Redmond Reservoir

John Redmond is located in Coffey County, Kansas, on the Neosho River Since 1963, when the lake began storing water, sedimentation has reduced the amount of water the lake can hold for flood control, water supply, and other purposes. The Reallocation Study will focus on ways to accommodate the change Alternatives include:

- No action
- Raising the lake's conservation pool to accommodate for sediment buildup

The Corps study will include consideration of environmental impacts that may occur as a result of each alternative The environmental impact evaluation is done in compliance with the National Environmental Policy Act.

The workshops will be held at two locations. The workshops will be in open-house format, with no set or formal presentation Interested persons may arrive anytime between 6 30 p m and 9:00 p m , visit the information tables, discuss the study with Corps personnel, and make comments

Burlington, Kansas, Workshop -- Wednesday, March 29
Coffey County Courthouse
110 South 6th Street, Burlington, KS 66839
Phone 316-364-2191

Chetopa, Kansas, Workshop -- Wednesday, April 5
Chetopa School
430 Elm, Chetopa, KS
Phone· 316-236-7244

Comments and questions can be forwarded to
U.S Army Corps of Engineers, Tulsa District
ATTN: CESWT-EC-H, Ms Jan Holsomback
1645 S 101st East Avenue
Tulsa, OK 74128-4629
Phone· 918-669-7089
Email Janet Holsomback@usace army mil

-- 30 --

Editor
Chanute Tribune
P.O. Box 559
Chanute KS 66720

Editor
Erie Record
P.O. Box 159
Erie KS 66733

News Director
KKOY-AM & FM Radio
Box 788
Chanute KS 66720

Assignment Editor
KAKE-TV (CH 10)
P.O. Box 10
Wichita KS 67201

News Director
KFDI-FM Radio
4220 N. Old Lawrence Road
Wichita KS 67219

News Director
KICT-FM Radio
734 N. Maize Road
Wichita KS 67212

Assignment Editor
KPTS-TV (CH 8)
320 West 21st Street
Wichita KS 67203

News Director
KRZZ-FM Radio
2402 East 37th Street N.
Wichita KS 67219

Assignment Editor
KSAS-TV (CH 24)
316 N. West Street
Wichita KS 67203

Assignment Editor
KSNW-TV (CH 3)
P.O. Box 333
Wichita KS 67201

Assignment Editor
KWCH-TV (CH 12)
2815 E 37th St N
Wichita KS 67219

News Director
KZSN-AM & FM Radio
5610 East 29th Street N.
Wichita KS 67220

Bruce Janssen, Editor
Outdoor Kansas
P.O. Box 820
Wichita KS 67201

Editor
The Sunflower
WSU, 1845 N. Fairmount, Box 134
Wichita KS 67208

Editor
Wichita Business Journal
110 S. Main, Suite 200
Wichita KS 67202

Editor
Wichita Eagle
P.O. Box 820
Wichita KS 67201

News Director
KJTY-FM Radio
1005 S.W. 19th Street
Topeka KS 66604-1103

News Director
KMAJ AM & FM Radio
P.O. Box 4407
Topeka KS 66604

Assignment Editor
KSNT-TV (CH 27)
6835 NW Hwy 24
Topeka KS 66618

Assignment Editor
KTKA-TV
P.O. Box 2229
Topeka KS 66601

Editor
Baxter Springs Citizen
P.O. Box 290
Baxter Springs KS 66713-0290

Editor
Columbus Daily Advocate
P.O. Box 231
Columbus KS 66725

Editor
Galena Sentinel-Times
320 Main
Galena KS 66739

Editor
Altamont Journal & Edna Sun
P.O. Box 405
Altamont KS 67330

Editor
Chetopa Advance
P.O. Box 207
Chetopa KS 67336

Editor
Farm Talk
P.O. Box 601
Parsons KS 67357

News Director
KLKC-AM Radio
109-1/2 S. Central
Parsons KS 67357

Editor
Oswego News
P.O. Box 269
Oswego KS 67356

Editor
Parsons News
1930 Clark
Parsons KS 67357

Editor
Parsons Sun
P O. Box 836
Parsons KS 67357

Editor
Emporia Gazette
P.O. Drawer C
Emporia KS 66801

News Director
KFFX-FM Radio
1420 Cote Drive
Emporia KS 66801

News Director
KVOE-AM Radio
P.O. Box 968
Emporia KS 66801

Editor
Caney Chronicle
P.O. Box 186
Caney KS 67333

Editor
Cherryvale Chronicle
115 N. Labette, P.O. Box 156
Cherryvale KS 67335

Editor
Coffeyville Journal
P.O. Box 849
Coffeyville KS 67337

Editor
Independence News
210 W. Main
Independence KS 67301

Editor
Independence Daily Reporter
P.O. Box 869
Independence KS 67301

News Director
KGGF Radio
P.O. Box 1087
Coffeyville KS 67337

News Director
KIND-AM & FM Radio
Drawer A
Independence KS 67301

News Director
KTPK-FM Radio
3003 SW Van Buren Street
Topeka KS 66611-2224

Assignment Editor
KTWU-TV (CH 11 - PBS)
1700 SW College Avenue
Topeka KS 66621

Editor
Topeka Capital Journal
616 Jefferson Street
Topeka KS 66607

News Director
WIBW AM & FM Radio
P.O. Box 119
Topeka KS 66601

Editor
Neodesha Sun-Register
P.O. Box 356
Neodesha KS 66757

Editor
Wilson County Citizen
P.O. Box 330
Fredonia KS 66736

Editor
Yates Center News
P.O. Box 285
Yates Center KS 66783

ATTACHMENT B: PROJECT MAILING LIST

W K Nielsen
502 Wilson #29
Emporia, KS 66801

Mike Reed
209 Leavenworth Street
Ottawa, KS 66839

Larry Bess
730 Whildin
Emporia, KS 66801

Ron Casey
111 2nd J-Creek
Hartford, KS 66854

Kevin Wellnitz
2022 Road 140
Neosho Rapids, KS 66864

Terry Emmons
465 2nd Street J-Creek
Hartford, KS 66854

Robert H Withrow
3083 North Third
Chetopa, KS 67336

Ben Cuadra
Waverly, KS 66817

Jane Becker
P O Box 85
Chetopa, KS 67336-0085

Darrell Baumhf
405 South Tenth
Chetopa, KS 67336

Jeff Jackson
6429 SW Lostine Road
Columbus, KS 66725

James Loncarich
2178 17000 Road
Oswego, KS 67356

Linda Jackson
11510 SW Black Jack Road
Chetopa, KS 67336

Jerry Getman
20062 York Road
Oswego, KS 67356

Irene & David Elmore
516 North Third
Chetopa, KS 67336

Steve Blackledge
3098 North Eighth
Chetopa, KS 67336

Delbert Johnson
20021 Wallace Road
Oswego, KS 67356

Glen Summer
Rt. 2 Box 186
Welch, OK 74369

Henry Bell
9532 SW Star Road
Chetopa, KS 67336

Lloyd McGill
P O Box 121
Chetopa, KS 67336

Jack Dalrymple
54301 E 75 Road
Miami, OK 74354

Bob Earls
8188 SW Star Road
Chetopa, KS 67336

W P Zimmerman
Rt 2 Box 305
Welch, OK 74369

Steve Darnell
P O Box 520
Chetopa, KS 67336

Grace & Roy Fromm
Rt 2, Box 340
Welch, OK 74369

Mr & Mrs Francis Pope
1605 Emmer Road
Hartford, KS 66854

V O Morgan
Rt 2, Box 295
Welch, OK 74369

Richard Casey
230 Main Street
Hartford, KS 66854

Raymond & Bonnie Conrad
6084 SW 120th Street
Chetopa, KS 67336

Emporia State University
1200 Commercial Street
Emporia, KS 66801

Al Newkirk
417 SW
Miami, OK 74354

Kansas State Historical Society
6425 SW 6th Avenue
Topeka, KS 66615-1099

Faye Lester
Rt 2, Box 315
Welch, OK 74369

Art Bond
300 Main Street
Hartford, KS 66854

Ruth Campbell
403 Pecan Street
Chetopa, KS 67336

T N Terrell
140 - 2nd Street
Hartford, KS 66854

William Reid
P O Box 247
10331 SW 95th
Chetopa, KS 67336

Larry Stevens
344 Lakeview
Burlington, KS 66839

Ron Wood
P O Box 395
Chetopa, KS 67336

Margaret Wiston
440 - 17th Road
Hartford, KS 66854

Ralph Johnson
Rt 2 Box 487
Welch, OK 74369

Grover Cleveland
1091 - 19th Rd NW
Burlington, KS 66839

George McGill
P.O Box 704
Chetopa, KS 67336

Carroll E Rohr
831 Oxen Lane
Leroy, KS 66857

Kenny Reed
P.O Box 452
Chetopa, KS 67336

Ken Reznicek
871 - 13th Road
Burlington, KS 66839

Mary Newkirk
P O Box 1023
Miami, OK 74355

George Wellnitz
864 Rd 150
Neosho Rapids, KS 68864

Jerry Morris for
U S Rep Tom A. Coburn
215 State Street, Suite 815
Muskogee, OK 74401

Kathy & Jim Zell
301 Choctaw
New Strawn, KS 66839

John M Epler
8770 SW Messer
Columbus, KS 66725

Robert E Woods
101 Main, J-Creek
Hartford, KS 66854

Ken Foster
1627 – 7000 Road
Edna, KS 67342

Rick & Deborah Wistrom
100 Main, J-Creek
Hartford, KS 66854

Gene Merry
700 Neosho Street
Burlington, KS 66839

Clara Reisbig
702 South 4th Street
Burlington, KS 66839

Larry Wistrom
440 NW
Hartford, KS 66854

Dennis Ruth
662 Quail Lane SE
Leroy, KS 66857

City of Emporia
522 Mechanic Street
Emporia, KS 66801

City of Chanute
101 South Lincoln
Chanute, KS 66720

Roger Reisbig
442 - 10th Road SW
Burlington, KS 66839

Dan Haines
Wolf Creek Nuclear Operations Corp
2640 Reaper Street
Waverly, KS 66871

City of Burlington
301 Neosho Street
P O Box 207
Burlington, KS 66839

Ron Freund
2444 Iris Road
Lebo, KS 66856

Chris Hase
KDW&P
512 SE 25th Avenue
Pratt, KS 67124-8174

Al LeDoux
Kansas Water Office
901 South Kansas Avenue
Topeka, KS 66612-1249

City of Leroy
City Hall
P O Box 356
Leroy, KS 66857

Joe Rohr
818 Oxen Lane
Leroy, KS 66857

USFWS
Flint Hills Nat'l Wildlife Refuge
P.O Box 128
Hartford, KS 66854

Dr Lloyd Fox
KDW&P
P O Box 1525
Emporia, KS 66801-1525

USFWS, Region 6
Regional Director
134 Union Boulevard, Ste. 350
Lakewood, CO 80228

USEPA, Region 8
Regional Director
999-18th Street, Ste 300
Denver, CO 80202-2466

USGS
Biological Resources Division
4512 McMurry Avenue
Fort Collins, CO 80525

USDA-NRCS
313 Crossing Street
Burlington, KS 66839

Burlington – Post Office
1565 Embankment Road SW
Burlington, KS 66839

Coffey County Commissioners
Courthouse
Burlington, KS 66839

USDA – Farm Services Agency
313 Cross Street
Burlington, KS 66839

USDA–Farm Services Agency
2501 West 18th Street
Emporia, KS 66801

Lyon County Commissioners
Emporia, KS 66801

National Park Service
Tallgrass Prairie National Preserve
Route 1 Box 14
Strong City, KS 66869

USDA – NRCS
2501 West 18th Avenue
Emporia, KS 66801

Honorable Sam Brownback
United States Senate
303 Hart Senate Office Building
Washington, DC 20510

Honorable Sam Brownback
United States Senator
612 South Kansas Avenue
Topeka, KS 66603

Honorable Jerry Moran
House of Representatives
1519 Longworth House Bldg
Washington, DC 20515

Honorable Bill Graves
Governor of Kansas
State Capitol Building, 2nd Floor
Topeka, KS 66612

State Representative Peggy Long
P.O. Box 546
Madison, KS 66860

Honorable Pat Roberts
United States Senate
302 Hart Senate Office Bldg
Washington, DC 20510

Honorable Pat Roberts
Frank Carlson Federal Building
444 SE Quincy, Room 392
Topeka, KS 66683

Honorable Jim Ryun
House of Representatives
330 Cannon House Office Building
Washington, DC 20515

Honorable Jim Ryun
Representative in Congress
800 SW Jackson, Suite 100
Topeka, KS 66612

Burlington Chamber of Commerce
P O Box 423
Burlington, KS 66839

Emporia Chamber of Commerce
719 Commercial Street
P O Box 703
Emporia, KS 66801

Hartford City Hall
Mayor Steve Burris
5 Commercial Street
Hartford, KS 66854

City of Iola
P O. Box 308
Iola, KS 66749

Mr. William Banks, Archaeologist
Historic Preservation Office
6425 SW 6th Avenue
Topeka, KS 66615-1099

Citizen Potawatomi Nation
1901 S Gordon Cooper Drive
Shawnee, OK 74801

Seneca-Cayuga Tribe of Oklahoma
P O. Box 1283
Miami, OK 74355

Wichita and Affiliated Tribes of
Oklahoma
P O Box 729
Anadarko, OK 73005

Sac & Fox of the Mississippi
in Iowa
349 Meskwaki Road
Tama, IA 52339

Kaw Nation
Drawer 50
Kaw City, OK 74641

Osage Nation
P O. Box 53
627 Grandview Avenue
Pawhuska, OK 74056

Prairie Band Potawatomi
Nation
14880 K Road
Mayetta, KS 666509

Sheila Bjorlo
National Wildlife Federation
1412 - 16th Street, NW
Washington, DC 20036

Carol Borgstrom, Dept. of Energy
Forrestal Building, Room 4G-085
1000 Independence Avenue, SW
Washington, DC 20585-0001

Eddie R Crouse, Associate Chief
East Branch Project Review
Fed Energy Regulatory Comm
Washington, DC 20426

Scott Faber
Director of Floodplain Programs
801 Pennsylvania Ave, SE, Ste 400
Washington, DC 20003

Richard Sanderson, Director
Office Fed Activities (2252), EPA
401 M Street SW
Washington, DC 20460-0001

Dir Advisory Council Hist Pres
Old Post Office Bldg , #803
1100 Pennsylvania Ave , NW
Washington, DC 2004-2590

Dir Div Environmental Analysis
Office Hydropower Lic., FEC
400 First Street, NW
Washington, DC 20426-0001

Associate General Counsel
Fed Emergency Mgmt Agency
500 C Street, SW, Room 840
Washington, DC 20472-0001

Dir Office of Env. Policy (HEV-1)
FHWA, Nassif Bldg, Room 3222
400 Seventh Street, SW
Washington, DC 20590-0001

Dir, Office Energy & Environmental
Impact
Federal Maritime Commission
1100 L Street, NW
Washington, DC 20573-0001

Asst Sec Natural Resources & Envir
USDA / Admin Bldg , Room 242-W
14th & Independence Ave., SW
Washington, DC 20250-0001

Envir Policy, Special Engineering
Standards Division
USDA Rural Electrification Admin
14th Street and Independence, SW
Washington, DC 20250-0001

Ecology & Conservation Division
Office of Policy & Planning - NOAA
Herbert Hoover Building, #H-6111
14th & Constitution Avenue, NW
Washington, DC 20230-0001

Dir, Office of Environment and Energy
US Dept of Housing & Urban
Development
Room 7154, HUD Building
451 - 7th Street, SW
Washington, DC 20410-0001

Dir, Ofc of Environmental Affairs
U S Dept of the Interior
1849 C Street, NW, Mail #23240
Washington, DC 20240-0001

Dep Dir for Env & Policy Review
U S Dept of Transportation, #10309
Nassif Bldg , 400 - 7th Street, SW
Washington, DC 20590-0001

Commander
Eighth Coast Guard District
Hale Boggs Fed Bldg - 500 Camp St
New Orleans, LA 70130-3313

Ron Klatske
National Audubon Society
210 South Wind Avenue
Manhattan, KS 66502

Glen Cheathum, Waterways Branch
Oklahoma Department of Transportation
P O Box 660
Tulsa, OK 74104-0660

Bob Portiss
Port Director
5330 Cimarron Road
Catoosa, OK 74105-1650

William Gill
U S Fish & Wildlife Service
Kansas State Office
315 Houston, Suite E
Manhattan, KS 66502

Steve Williams
Kansas Department of Wildlife & Parks
900 SW Jackson Street, Ste. 502
Topeka, KS 66612

Dennis Grams
Regional Administrator, USEPA
726 Minnesota Avenue
Kansas City, KS 66101

Dr Ramon Powers
State Historic Preservation Officer
6425 SW 6th Avenue
Topeka, KS 66615-1099

Ron Hammerschmidt, Director
Division of the Environment
Landon State Office Bldg , Rm 901
Topeka, KS 66612-1290

Richard Pankratz, Director
State Historic Preservation Office
6425 SW 6th Avenue
Topeka, KS 66615-1099

James Habiger
USDA NRCS
760 South Broadway
Salina, KS 67401

Office of the Director
Kansas Corporation Commission
1500 SW Arrowhead Road
Topeka, KS 66604-4027

Office of the Director
KDA, Division of Water Resources
901 South Kansas Avenue, 2nd Floor
Topeka, KS 44412-1283

Office of the Director
Kansas Forest Service
2610 Clafin Road
Manhattan, KS 66502-2798

Office of the Director
Kansas Water Office
109 SW 9th, Suite 300
Topeka, KS 66612-1249

Office of the Director
Kansas Biological Survey
2041 Constant Ave , Campus West
Lawrence, KS 66044-2906

Office of the Director
State Conservation Commission
109 SW 9th, Suite 500
Topeka, KS 66615-1099

James R Triplett, Chairperson
Dept of Biology, Pittsburg State Univ
1701 Broadway Street
Pittsburg, KS 66762-5889

Freda Culver
6266 Quakervale
Riverton, KS 66770-9712

Jerry Fultz
1680 - 18000 Road
Parsons, KS 78357-3719

Steve Commons
P.O Box 928
Emporia, KS 66801-0928

Joe Works
870 Hawait Road
Humboldt, KS 66748-9750

Jim Zell
301 Choctaw Street
New Strawn, KS 66839-9801

Pat Sauble
RR1
Cedar Point, KS 66843-9801

Chauncey E Shepard
2824 Massey Road
McCone, KS 66753-6015

Donald E Becker
603 South Jefferson Street
Iola, KS 66749

Dennis Youk
519 Locust Street
Marion, KS 66861-1431

Steve Planner
Basin Planner
109 SW 9th Street, Suite 300
Topeka, KS 66612-1249

John & Cindy Epler
8770 SW Messer Road
Columbus, KS 66725

City of Humboldt
Humboldt, KS 66748

Jack Dalrymple
54301 East 75 Road
Miami, OK 74354

V O Morgan
Rt 2, Box 295
Welch, OK 74369

Larry Bork
3820 SW Roy Road
Topeka, KS 66610

Kansas Dept of Health & Environment
Signature State Office Building
1000 SW Jackson
Topeka, KS 66612

Kansas Dept. of Transportation
915 Harrison, Room 754
Docking State Office Building
Topeka, KS 6612-1568

Jarik & Wilma Mosier
25676 South 608 Road
Grove, OK 74344

De Goodrich
26001 South 605th Road
Grove, OK 74344

Richard Ball
Grove City Council
Box 1268
Grove, OK 74434

Paula Hall-Collins
Executive Director, Grove Chamber
104 B West 3rd Street
Grove, OK 74344

Jan Norman, Executive Director
Grand Lake Association
Route 2, Box 40
Grove, OK 74344

Bruce Poindexter
Delaware County Commissioner
Jay Courthouse
Jay, OK 74346

Larry Gatewood
Chamber of Commerce
9974 South 592nd Road
Miami, OK 74354

James Graves
Ottawa County Commissioner
508 South Francis
Pitcher, OK 74360

Ben Loring
Ottawa District Attorney
102 East Central, Suite 301
Miami, OK 74354

Honorable Louis (Red) Mathia
Mayor of Miami
P.O Box 1288
Miami, OK 74355-1288

Tony Shepard
USDA-ASCS
630 East Steve Owens
Miami, OK 74354

Gary Bogle
Route 1
Strang, OK 74367

Don Brewer
Lakemont Shores Property Owners
RR1, Box 892
Eucha, OK 74342

C.E Holliday
Lake Center West
100 Lakeland Drive
Pryor, OK 74361

Rudy Olson
108 North Georgetown Road
Fort Gibson, OK 74434

Julia Teska, President
South Grand Lake Chamber
P O Box 820
Langley, OK 74350

Lonie Addis
Labette County Commissioner
640 Iowa Street
Oswego, KS 67356

Allen County Commission
1 North Washington
Iola, KS 66749

Gordon Conger
RC&D
Route 3
Iola, KS 66749

Bob Eads
Kansas/Oklahoma Flood Control
P O Box 165
Chetopa, KS 67336

Margaret Fast
Kansas Water Office
109 SW 9th Street, Suite 300
Topeka, KS 66612

Ron Coker
Grand River Dam Authority
P O Box 409
Vinita, OK 74301-0409

Larry Tiemann, Supervisor
Kansas Dept of Wildlife and Parks
1500 West 7th Street, Box 777
Chanute, KS 66720

USGS Biological Resources Division
Columbia Environmental Research Ctr
4200 E New Haven Road
Columbia, MO 65201-9634

Edwin Miller
Kansas Department of Wildlife & Parks
Box 945
Independence, KS 67301

Scott Barlow
Kansas Department of Wildlife & Parks
738 Fegan Road
Toronto, KS 66777

Terry Heatherly
Twin Bridges State Park
14801 South Highway 137
Fairland, OK 74343-9741

Ron Suttles
Department of Wildlife Conservation
P O Box 53465
Oklahoma City, OK 73105

Bert Vanatta
52421 East 65th Road
Miami, OK 74354

Pete and Jim Howser
Harbours View Marina
Route 2, Box 149
Afton, OK 74331

Leonard Jirak
Kansas Department of Wildlife & Parks
540 16th Road NW
Hartford, KS 66854

Jim Smith
Department of Wildlife Conservation
Route 1, Box 75-B
Porter, OK 74454

Gary Voight
KAMO Electric Cooperative
900 South Wilson
Vinita, OK 74301

Gene Merry, Chairman
Coffey County Commissioners Office
Coffey County Courthouse
Burlington, KS 66839

Robert Culbertson
Kansas Department of Wildlife & Parks
207 NW West Cheyenne
New Strawn, KS 66839

Honorable Pat Roberts
United States Senator
4200 Somerset, Suite 152
Prairie Village, KS 66208

City of Council Grove
313 West Main Street
Council Grove, KS 66846

Honorable Todd Tiahrt
House of Representatives
428 Cannon House Office Building
Washington, DC 20515

Honorable Todd Tiahrt
Representative in Congress
155 North Market, Suite 400
Wichita, KS 67202

Honorable Jerry Moran
Representative in Congress
1200 Main Street, Suite 402
Hays, KS 67601

ATTACHMENT C: SCOPING MEETING PRESENTATION AND HANDOUTS

US Army Corps of Engineers®

John Redmond Reallocation Study
Overview
March 2000

Background

In 1975, the State of Kansas and the Federal Government entered into a water supply agreement for an estimated 34,900 acre-feet of storage remaining after 50 years of sedimentation. After the agreement was signed, it was determined that sediment was entering the reservoir unevenly from what had been predicted.

Storage available for water supply purposes in the lake has been depleted by the sediment distribution such that water supply agreement obligations are being infringed upon. Most of the sediment deposited in the lake pool has been below elevation 1039.0 feet (top of conservation pool) National Geodetic Vertical Datum (NGVD). Based on Corps sediment surveys for 1964-1993, it was predicted that adequate storage would be available below elevation1068.0 feet NGVD (top of flood control pool) at the end of the economic life of the project (Year 2014) to meet all authorized project purposes However, the top of the conservation pool should ultimately be established at a higher elevation to equitably reapportion the storage between the conservation and the flood control pools.

When a reservoir is designed, each pool (flood control, conservation, sediment) is designed to capture a proportionate amount of sediment In the case, of John Redmond the sediment load has been as predicted; however, the sediment is accumulating in the conservation pool while the flood control pool has experienced less than expected sedimentation losses.

Alternatives

This study will evaluate a number of alternatives. The alternatives include the no action plan, which follows current operational practices. Other alternatives include a 2-foot rise with the intentions of raising the conservation pool to elevation 1040.0 feet NGVD and using a phased in pool raise of the remaining 1 foot, in one-half foot increments, if needed. Part of the National environmental Policy Act scoping process is to solicit suggestions, comments, and questions about any alternatives for operating the lake. Comments can be directed to the point of contact listed at the end of this document

Effects on Flood Control

Under the alternative of raising the conservation pool, current flood control storage will be reduced to the amount that was originally anticipated to be available at this point in the project life The extra flood control storage that has been of benefit in three occasions since May 1993 will no longer be available.

Under current conditions, the Neosho River has experienced frequent flooding on the reach from John Redmond to Pensacola Dam in Oklahoma. Most of the flooding is in the lower reach of the river due to uncontrolled runoff, however, the perception may be that reduced flood control

storage at John Redmond is to blame should any future floods occur.

In the lake itself, the frequency and duration of higher pool elevations will increase. More frequent closing of roads and public used areas would be expected.

Effects on Water Supply

A recent Kansas Water Office water supply yield analysis indicated that the disproportionate sediment deposition has reduced the water supply capacity at design life by 25 % (approximately 6.5 million gallons per day). The water supply agreement with the Kansas Water Office allows for pool adjustment in one-half foot increments. In order to make an equitable redistribution between the flood control and conservation pools, the top of the conservation pool needs to be raised 1 foot immediately to elevation 1040.0 feet NGVD Sediment deposition predictions have indicated that additional equitable redistribution will need to be made. The Federal Government has a water supply agreement with the Kansas Water Office for all water supply storage in John Redmond. The Kansas Water Office has water supply contracts with the Wolf Creek Nuclear Generating Plant and members of the Neosho Basin Assurance District.

Areas for Consideration

The Corps of Engineers will evaluate the effects of alternatives on flood control and water supply Other areas to be part of the evaluation will include

- Impacts to the Flint Hills National Wildlife Refuge located in the upper reaches of the lake
- Impacts to recreation and recreation facilities
- Impacts to the dam structure
- Impacts to fish and wildlife resource within, below, and above the lake
- Downstream flows on the Neosho River
- Other impacts identified by the public, agencies, or Corps studies

Point of Contact

All environmental considerations will be addressed according to the National Environmental Policy Act. Agencies and the public are encouraged to make comments, ask questions, or make suggestions regarding the John Redmond Reallocation Study. The point of contact is:

Ms Jan Holsomback
U S Army Corps of Engineers, Tulsa District
ATTN CESWT-EC-HM
1645 S. 101st East Ave
Tulsa, OK 74128-4629 Phone: 918-669-7089

WELCOME TO TONIGHT'S WORKSHOP

U. S. Army Corps of Engineers, Tulsa District

John Redmond Lake, Kansas Reallocation Study

Public Information Workshop

Public Involvement

Questions and Comments

- Your Views Are Important
- Comment or Question Forms Available Here, or ..
- Take a Sheet Home and Complete It at Your Convenience
- Postage-paid Envelopes Available at This Table

Mailing List

- List to Keep People Informed; IT WILL NOT be Used For Any Other Purpose
- Sign-in Sheet at Welcome Table will be Used for the Mailing List
- If You Do Not Want to be Included on the Mailing List, Please Indicate Your Preference

More Information?

- The Study Document Will Be Available at Local Public Libraries
- Study Summary Available Here Tonight; Complete Study Available at Cost (Complete Request Form Here)
- Call or Write Anytime! (See Any Representative Here)
- See Web Site. www.swt.usace.army.mil

Scoping Process

- Required by National Environmental Policy Act; Participation With Other Agencies and The Public
- Purpose: Solicit Comments and Questions on Project Alternatives and Impacts
- Official Period Begins March 29, 2000
- Conducted Throughout the Documentation Process (The Workshops Are the First Step)

Public Notices

- Federal, State, Local Agencies and Public Notified of Scoping Period
- Notices made for:
  - Comments on Draft Documents
  - Investigation Findings
  - Record of Decision (if any)

THANK YOU!!!

Your participation is essential!

OVERVIEW

Study Background

- In 1975, the State of Kansas and the Federal Government Entered Into a Water Supply Agreement
  - 34,900 Acre-feet of Storage

Study Background

- Sediment Entered the Reservoir Unevenly
- Storage Available for Water Supply Purposes in the Lake Has Been Depleted by the Sediment

Study Background

- The Sediment Load Has Been As Predicted,
  - However, the Sediment Is Accumulating in the Conservation Pool
  - While the Flood Control Pool Has Experienced Less Than Expected Sedimentation Losses.

Alternatives

- No Action Plan
  - Current Operation
- Raise Conservation Pool
  - Raise Pool 1 foot Initially (1039-1040 0)
  - Raise Pool in 1/2-Foot Increments Thereafter-If Needed (1040 5-1041 0)

Workshop Purpose

- Serves as part of Scoping Process under the National Environmental Policy Act (Identification of Project Impacts)
- Encourages Public Involvement Two-Way Communication
- Overall Purpose
  - Listening and Informing

Alternatives

- Other Alternatives to be Identified During Scoping Process
- Evaluated in Terms of
  - Meeting Water Supply Contracts
  - Environmental Criteria
  - Social Acceptability

Location and Benefits

- Neosho River Basin
  - A Tributary of the Arkansas River River
  - Central Kansas
- Project Benefit/Impact Areas
  - Upstream Recreation and Wildlife Areas
  - Water Supply
  - Downstream Flood Control
  - Water Quality

Water Supply Contract With State of Kansas

- Signed in 1975
- Estimated to Contain 34,900 Acre-feet After Adjustment for Sediment Deposits
- Project Economic Life Ends in 2014
- Contract Amended in 1978 to Allow for an Equitable Redistribution of Sediment Reserve Storage

Reallocated Water Quality Storage Contract with the State of Kansas

- Reallocated Water Quality Storage to Water Supply Storage
- Contract Signed in 1996
- Estimated to Contain 10,000 Acre-feet After Adjustment for Sediment Deposits
- Project Economic Life Ends in 2014

% of Conservation Pool Lost to Sedimentation

Sediment Survey Yr	Conservation Total (Ac-Ft)	Percent Reduction	Cumulative Reduction
1964	82,120	0	0
1974	71 805	13	13
1983	64 210	8	21
1991	60 670	5	26
1993	57,840	4	30
2000	?	?	?

Present Conditions 1993 John Redmond Storage

- Flood Control Storage-1039 0-1068 0 NGVD
  - 565,300 Acre-feet
- Conservation Storage-1020 0-1039 0 NGVD
  - 57,840 Acre-feet Total Conservation Pool
  - 11,760 Acre-feet Water Quality Storage Reallocated to Water Supply
  - 32,300 Acre-feet Authorized Water Supply
  - 13,780 Acre-feet Authorized Remaining Water Quality

Predicted Future Conditions 2014 John Redmond Storage

- Flood Control Storage-1039 0-1068 0 NGVD
  - 565,300 Acre-feet
- Conservation Storage-1020 0-1039 0 NGVD
  - 49,160 Total Acre-feet
  - 10,000 Acre-feet Reallocated Water Quality to Water Supply
  - 27,450 Acre-feet Authorized Water Supply
  - 11,710 Acre-feet Remaining Authorized Water Quality

John Redmond Reservoir Pool Raise Study

- Funds received 1st Quarter Fiscal Year 2000 (October 1999)
- Study will consist:
  - Public Meetings
  - Aerial Mapping
  - Hydrographic Sediment Survey
  - Hydrology and Hydraulics Analysis
  - Flood Control Analysis

John Redmond Reservoir Pool Raise Study - Continued

- Socioeconomic Analysis
- NEPA Documentation
- HTRW Evaluation
- Geotechnical Analysis
- Real Estate Flowage Easements
- Cultural Resources
- Biological Assessment
- U S Fish & Wildlife Coordination

Affected Environment

John Redmond Reservoir Pool Raise Study - Schedule

- Study Schedule
  - Preliminary Work Began November 1999
  - Contracts for Aerial Mapping & Cultural Resources Awarded March 2000
  - U.S Fish & Wildlife Coordination Process Began January 2000
  - Flood Analysis/Hydrology Analysis Begins Fiscal Year 2001

John Redmond Reservoir

- On Neosho River in Coffey County, Kansas
  - 3 Miles Northwest of Burlington
- Earthfill Embankment With a Concrete Spillway
  - 21,790 Feet Long
  - 86 5 Feet Above Streambed
- Full Flood Control Operation in September 1964
- All Construction Completed in December 1965

John Redmond Storage

- Flood Control Storage
  - 1039 0-1068 0 Foot Elevation
  - 565,346 Acre-feet
  - Top of Flood Control Surface Area = 31,700 Acres
- Conservation Storage
  - 1020.0-1039.0 Foot Elevation
  - 34,900 Acre-feet Water Supply (24.5 Million Gallons Per Day)
  - 27,600 Acre-feet Water Quality
  - Top of Conservation Surface Area = 9,400 Acres

Environmental Elements

- Soils, Climate, Water, Air Quality
- Water and Land Resources
- Flora and Fauna (Plants and Animals)
- Threatened and Endangered Species
- Sensitive Lands and Water Resources
- Socioeconomic/Social Resources
- Cultural Resources

Upstream and Downstream Areas

- Reservoirs Lands
  - Otter Creek Game Management Area
  - Flint Hills National Wildlife Refuge
  - Nine Corps of Engineers Recreation Areas
- Downstream Areas
  - Flood Control for 312,000 Acres Farm Land
  - Flood Damages Prevented = $281, 541,000

Environmental Impacts

Potential In-Pool Impacts

- Flint Hills National Wildlife Management Area (Upstream)
- Otter Creek Wildlife Management Area
- Recreation Use on John Redmond
- Cultural/Archeological Sites
- Fish and Wildlife Habitat Losses

Potential Downstream Impacts

- Flood Control Storage
  - Less Flood Protection
- Threatened and Endangered Species
  - Mad Tom Fish Which Lives Below the Dam
- Downstream Flow on the Neosho River
  - Possible Stream Bank Erosion

Potential Impacts

- Others Impacts Found During Scoping Process
  - Environmental Studies
  - Federal, State, and Local Agency Input
  - Input from the Public about Impacts

National Environmental Policy Act Scoping Process

- Identifying Environmental Impacts/Issues
- Includes
  - Participation of Federal, State, Local Agencies, Native American Tribes, Interested Parties
  - Determining The Significant Impacts/Issues
  - Identify Non-significant Issues Or Those Issues Covered By Prior Review

National Environmental Policy Act

- Scoping
- Identify Changes With and Without Project
- Identify Significant Impacts
- Include Public Comment and Response
- Agency Review
- Document Impacts

Hydrology and Hydraulics

Neosho River - Controlled vs. Uncontrolled Drainage Areas

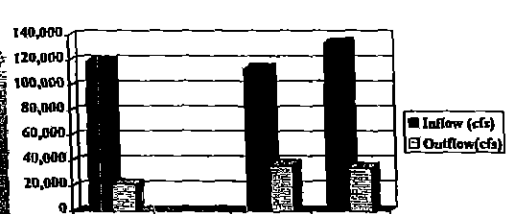
- John Redmond Lake Has a Total of 3,015 Square Miles of Drainage Area, 2,569 Square Miles Are Uncontrolled
- Commerce Gage (Near KS Border) Has an Uncontrolled Drainage Area of 2,861 Square Miles (More Than John Redmond) and a Total Drainage Area of 5,876 Square Miles

JOHN REDMOND STORAGES BEFORE AND AFTER A REALLOCATION

- 2-ft Rise Reduces Flood Storage by 3 5 %
- 1-ft Rise Reduces Flood Storage by 1 7 %
- Present Flood Pool 1039 0-1068 0
- Flood Storage Now 565,300 Acre-ft (3 52")
- Flood Storage 1-ft. 555,600 Acre-ft (3 45")
- Flood Storage 2-ft 545,700 Acre-ft (3.40")

CONTROLLED VS. UNCONTROLLED DRAINAGE AREAS AT KEY POINTS (SQUARE MILES)

Flood of November 1998 Peak Flows



Flood Storage Reductions

Close

- Much of Basin Remains Uncontrolled.
- Reduction in Flood Storage Is Small (1.7 - 3.4 %) With 1-2 Foot Reallocation
- Most Downstream Flooding Is the Result of Uncontrolled Runoff Below John Redmond Due to 84 Hour Travel Time to KS/OK Border From Time of Redmond Release

ATTACHMENT D: LOG JAM PETITION

THIS IS A PETITION REQUESTING THE REMOVAL OF A LOG JAM .9 OF A MILE EAST OF THE STRAWN BOAT RAMP, WHICH IS NOW JACOB'S CREEK BOAT RAMP.

THE LOG JAM IS ENDANGERING AND RUINING PROPERTIES AND FARM LAND. THE LOG JAM IS BACKING WATER FROM THE BOAT RAMP, ALL THE WAY BACK TO EMPORIA. THIS IS CAUSING EXTREMELY HIGH WATER IN THE JACOB'S CREEK COMMUNITY, LOCATED SOUTH OF THE BOAT RAMP (WEST FROM WHERE THE COMMUNITY OF OLD STRAWN WAS LOCATED, WHICH WAS FLOODED OUT TO PUT IN JOHN REDMOND DAM AND RESERVOIR IN ORDER TO KEEP BURLINGTON AND LOWER LEVEL TOWNS FROM FLOODING).

THIS LOG JAM IS CAUSING MANY ROADS, LAND AND HOMES TO FLOOD OUT. IN HARTFORD, THIS HAS CAUSED FARMERS TO LOSE MANY CROPS TO FLOODING AS WELL AS LIMITING THEIR ACCESS TO THEIR LAND TO PLANT OR HARVEST CROPS.

IN NEOSHO RAPIDS SOME HOMES HAD TO BE EVACUATED THAT HAD NEVER BEEN EVACUATED FOR FLOODING BEFORE.

ALSO DUE TO THE WATER BACKUP MANY SCHOOL BUSES ARE HAVING TO REROUTE BECAUSE OF FLOODED ROADS, OFTEN SEVERAL MILES. THIS ALSO CREATES A PROBLEM FOR THE FIRE DEPARTMENT AND FIRST RESPONDERS.

IN 1981 THE LOG JAM WAS APPROXIMATELY 2 ½ TO 3 MILES FROM THE BOAT RAMP THE CORPS OF ENGINEERS CLAIM THEY CANNOT DO ANYTHING ABOUT THIS PROBLEM. THEY LOWER JOHN REDMOND LAKE 6 ', WHICH IS ADJACENT TO THE NEOSHO RIVER WHICH IS SUPPOSE TO GIVE US ACCESS TO THE RESERVOIR . THIS SHOULD GIVE THE CORPS AN OPPORTUNITY TO GET EQUIPMENT IN TO GET RID OF THE LOG JAM, BUT THEY DO NOT WANT TO DEAL WITH THIS LOG JAM AND HAVE TO WORRY WITH LOGS GOING THROUGH THE GATES AT THE DAM

THE CORPS CLAIMS THIS WAS NOT BUILT FOR RECREATION BUT TO PREVENT FLOODING, NOW THE LOG JAM IS CREATING FLOODING BY BACKING THE WATER UP BEFORE IT GETS TO THE DAM.

BY REQUEST OF LEONARD JIRAK (FISH BIOLOGIST) THEY ARE LOWERING THE LAKE 6 TO 12 FEET SO THE UNDERGROWTH CAN GROW TO BENEFIT THE DUCK HUNTERS. THEY HAVE ALSO PUT IN ROUGH ROCK PLACES FOR DUCK HUNTERS TO PUT BOATS IN

WE ARE GETTING AERIAL PICTURES AND COUNTY MAPS TO PIN POINT THESE AREAS AND FACTS.

NAME	ADDRESS
Margaret Wistrom	Jacobs Creek
Gary O. Wistrom	Jacobs Creek
Mark Pumley	JACOBS CREEK
Karen Pumley	JACOBS CREEK
Connie Snyder	Hartford
Gertrude Feaney	Jacobs Creek
Wayne M. Feaney	Jacobs Creek
Barbara Cummings	Jacobs Creek
Carol Harris	Jacobs Creek
Mark Harris	Jacobs Creek
Thomas N Terrell	Jacobs Creek
Juanita Peckels	JACOBS CREEK
Bob Peckels	JACOBS CREEK
Cathy Bowen	Jacobs Creek
Sharon Terrell	Jacob Creek
Dean Edwards	Jacob Creek
Sandra Edwards	Jacobs Creek
Dorothy Lafferty	Jacob Creek
Doris Stuffelbeam	Jacob Creek
Lorraine Engeln	Jacobs Creek
Richard L. Casey	Jacobs Creek
Cristy Casey	Jacobs Creek
James L Conner	Jacobs Creek
Debra Wistrom	Jacobs Creek
Ryan D. Wistrom	Jacobs Creek
Robert Woods	Jacobs Creek

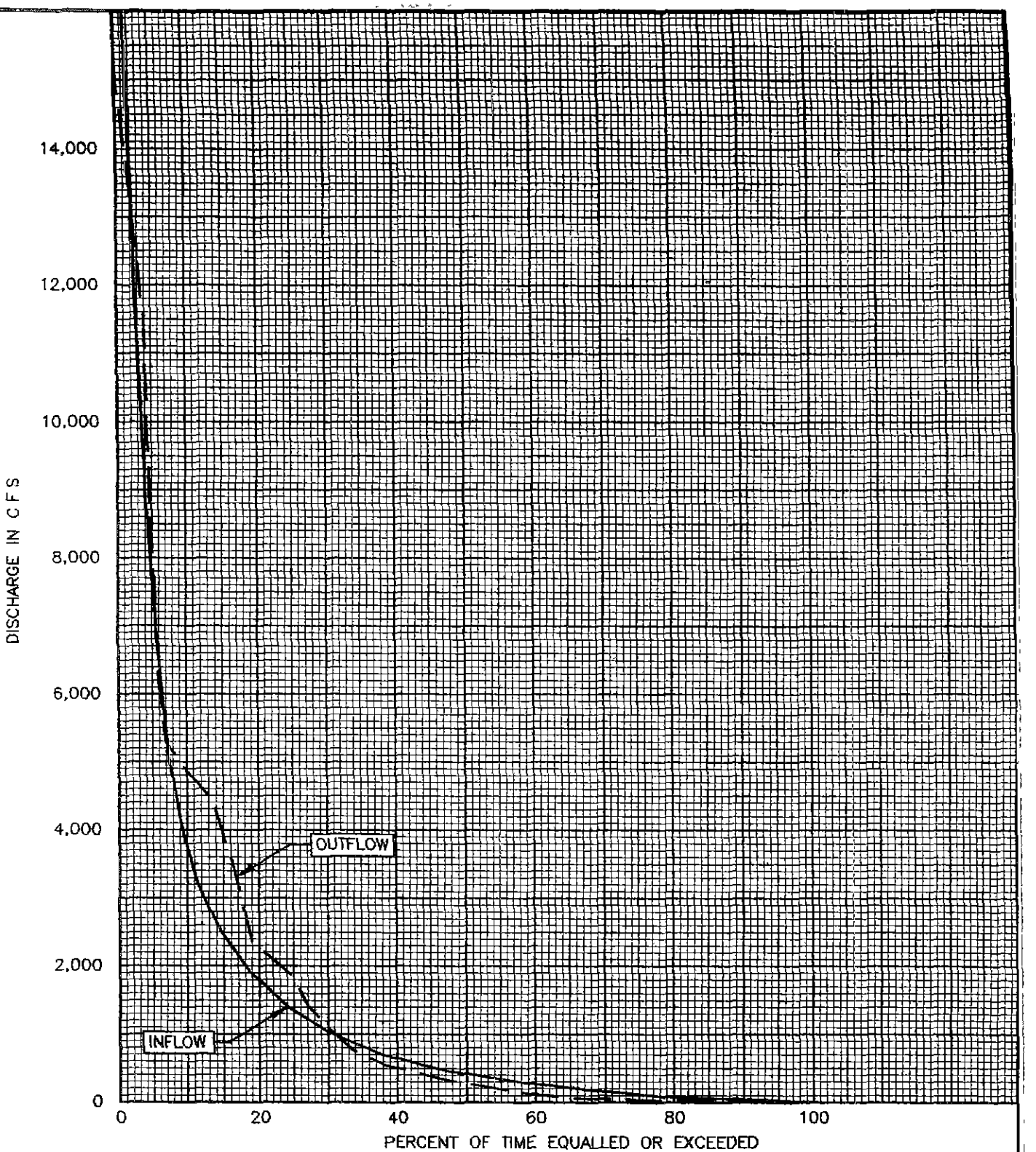
NAME	ADDRESS
Fred Woods	Jacobs Creek
Ruth Woods	Jacobs Creek
Melissa E Leyerham	Jacobs creek
Barbara Leyerham	Jacobs Creek
Harold Hinkle	Jacobs Creek
Betty Hinkle	Jacobs Creek
Margaret Sterling	Jacob Creek
David D. Langley	Jacobs Creek
Maria L. Langley	JACobs CreeK
John Langley	Jacobs Creek
Leroy E. McPherson	Jacobs Creek
Sharon M. Black	Jacobs Creek
Jackie Eddings	Jacobs Creek
[illegible]	Jacobs Creek
Christy Johnson	Jacobs Creek
Angie Smith	Burlington
Ashley Curtis	Jacobs crick
Jarris Alexander	J. Creek
Gloria Lane	J. Creek
Jenny Emmons	J-Creek
[illegible] Emmons	Gridley
Mary Emmons	Jacobs Creek
John M. Mooney	Jacobs Creek
Rachel Denney	Jacobs Creek
Ray Lowry	Emporia Ks
[illegible]	Burlington Ks.

NAME	ADDRESS
Rayma Farmer	B'TON KS. 66839
Florence Jackson	Jacobs Creek
Bill Grosney	Burlington Ks ([redacted])
Paula Grosney	Burlington Ks
Harry L Stephens	Emporia, KS
Rosemary L Cusiatz	Neosho Rapids Ks
William J Cysiatz	NEosho Rapids KS
Nancy L Bellings	Burlington Kansas
Joyce L Singleton	Burlington, Kansas
Carmen L Burris	Hartford Kansas
Susan Burris	Hartford Kansas
Brock Waylor	Hartford KS
Jim Waylor	Hartford KS
Ryan Burgess	Hartford Kansas
Tom Backman	Hartford Ks
Jerry Kam	Emporia, Ks
Robert Sells	Ottawa, KS
Tia Sells	Ottawa Ks
Mike Reed	Ottawa KS
Cheryl Reed	Ottumwa, Kan.
Richard L Lyman Jr	Hartford Ks Jacobs Creek
Jerri L Ryan	Hartford KS Jacobs Creek
Meredith Harris	Jacobs Creek
Mary E Lyman	Jacobs Creek
Robert Farrell	Jacobs Creek

NAME	ADDRESS
Betty J. Tucker	Box 215 Hartford, KS 66854
Robert Tucker	Box 215 Hartford KS 66854
Linda L. Foster	304 W. Maple Hartford, KS 66854
Walter L. Foster	304 W Maple Hartford, KS 66854
Kelva Peterson	208 W Maple, Hartford, Ks
William K. Peterson	208 W Maple Hartford KS
[illegible] E Scott	214 mill ST. Hartford
Carla M. Hagan	105 Merchant Hartford, KS 66854
Colleen Grieder	212 W Exchange Hartford, Ks
Glen Grieder	
David W Bess	2104 Cy Rd 105 Hartford K.S.
Edward L Bess	422 E Maple Hartford Ks 66854
Calvin Yeager	212 Exchange Neosho Rapids 66864 Kans
Debra K Bess	2104 Co. Rd Hartford KS
Vicky J. Bess	422 E Maple Hartford, Ks
[illegible] N. [illegible]	400 Exchange Neosho Rapids Ks
Tom Sullivan	1695 [illegible] Rd NW Hartford KS
Chris Bartel	1461 Rd 20 Madison KS 66860
[illegible] Livingston	1611 [illegible] Rd NW Hartford, Ks 66854
	" " " "
Larry Germann	520 Broad Hartford Ks
Joseph J Wing	291 Rd Y Hartford KS
Kenneth Harm[illegible]	1989 Rd 190 Hartford KS
Esther Johnson	320 Commercial Hartford Ks

APPENDIX B

Hydrology and Water Resources



NOTE
BASED ON PERIOD OF RECORD
JAN. 1940 THRU DEC. 1993 FROM
SUPER RUN A94X03

NOTE
INFLOW CURVE
APPROACHES ZERO AT 65,000 CFS
OUTFLOW CURVE
APPROACHES ZERO AT 17,000 CFS

ARKANSAS RIVER WATERSHED — NEOSHO RIVER, KANSAS

JOHN REDMOND RESERVOIR

Figure B-1

FLOW DURATION CURVE

DEPARTMENT OF THE ARMY, TULSA DISTRICT, CORPS OF ENGINEERS 1994
DRAWN BY: S&G
CHECKED BY S.M.S.

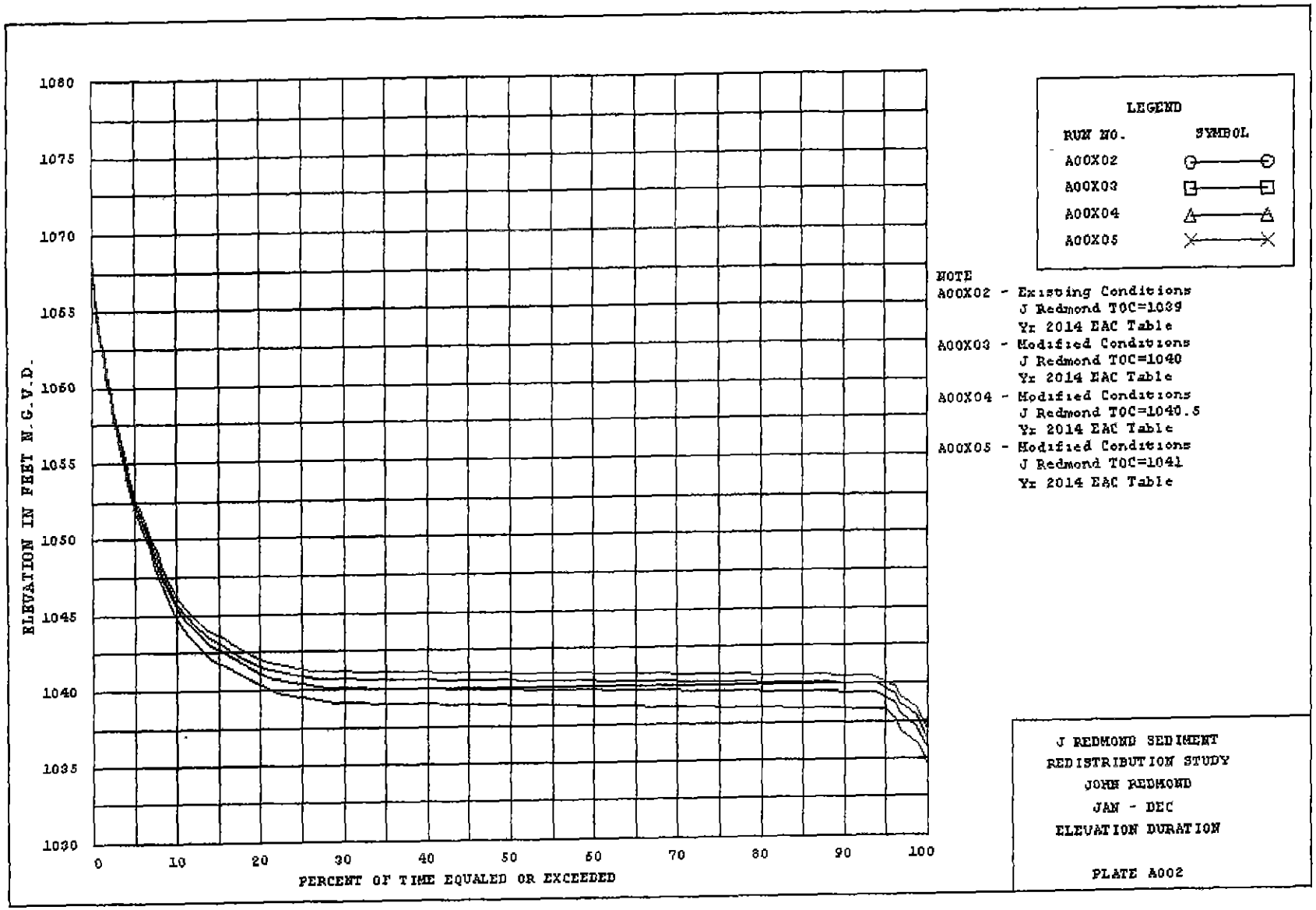


Figure B-2. Elevation Duration – Percent of Time Equaled or Exceeded vs Elevation at JRL for Year 2014
(Source. USACE SUPER 2000, Plate A002)

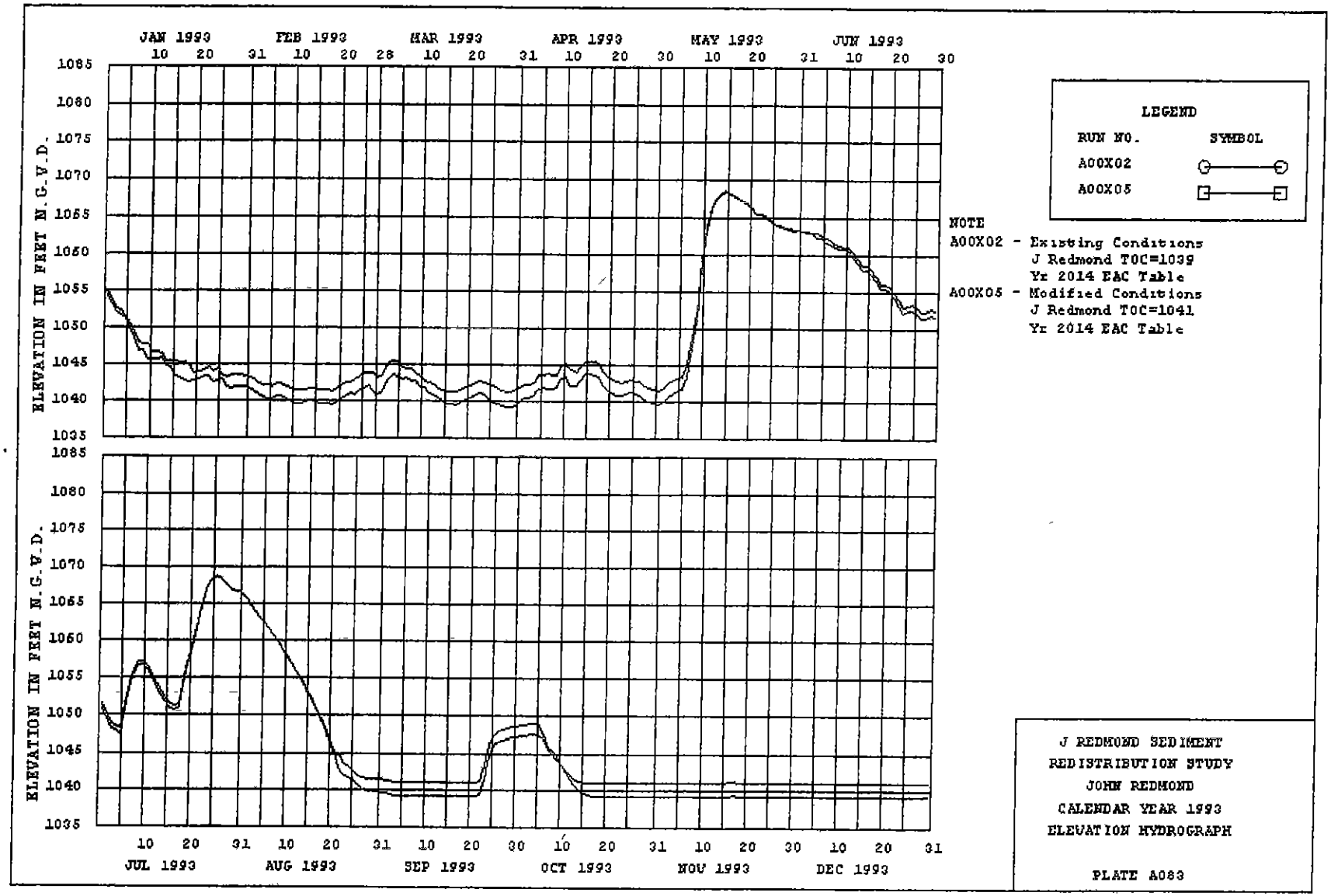


Figure B-3. Time vs. Elevation at John Redmond Lake at Year 2014
(Source USACE SUPER 2000, Plate A083)

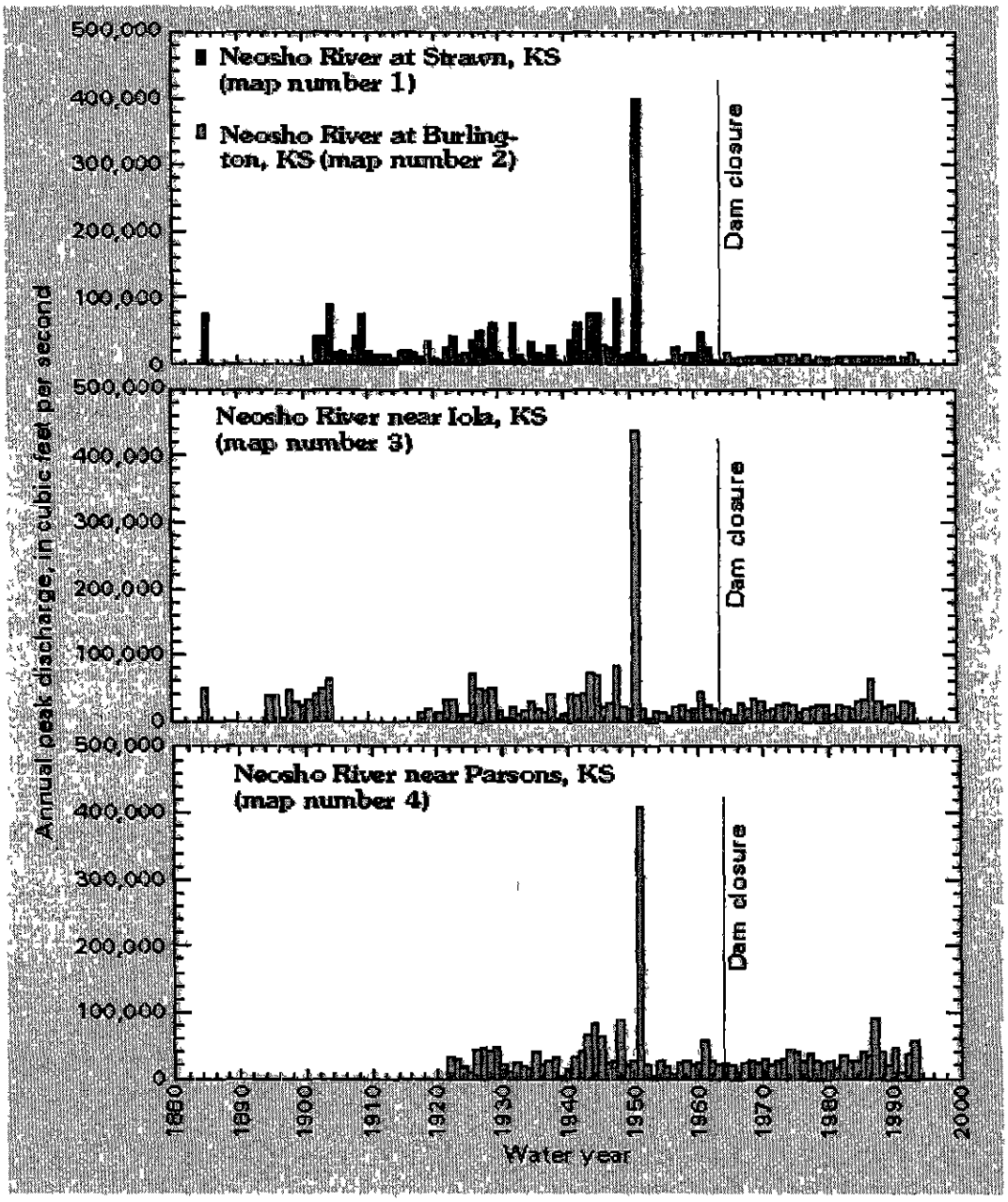


Figure B-4. Annual Peak Discharge for U.S Geological Survey Streamflow-Gaging Station Downstream from John Redmond Dam (Source: USACE SUPER 2000)

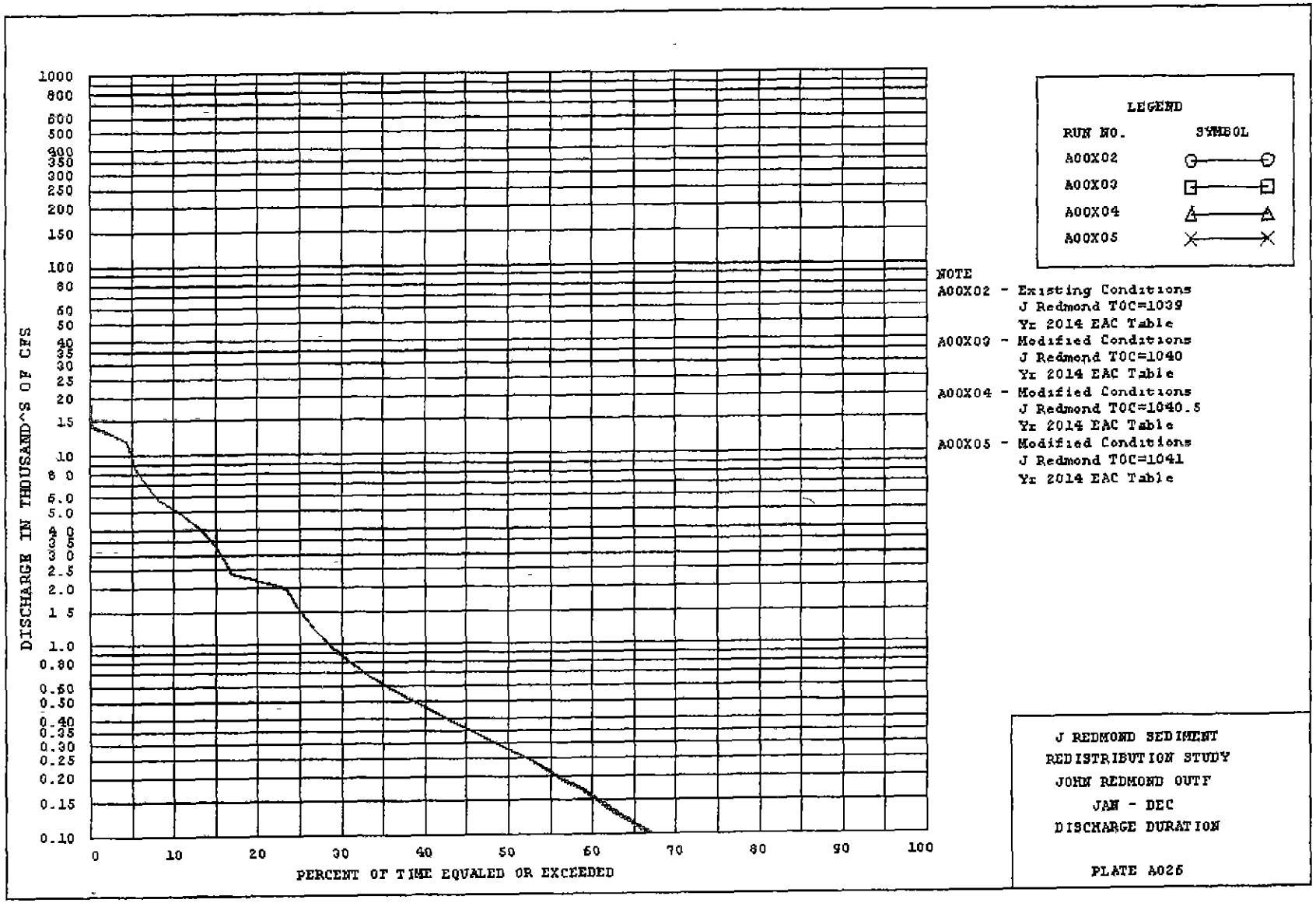


Figure B-5. Discharge Duration – Percent of Time Equaled or Exceeded vs Discharge at John Redmond Outflow for Year 2014
(Source: USACE SUPER 2000, Plate A026)

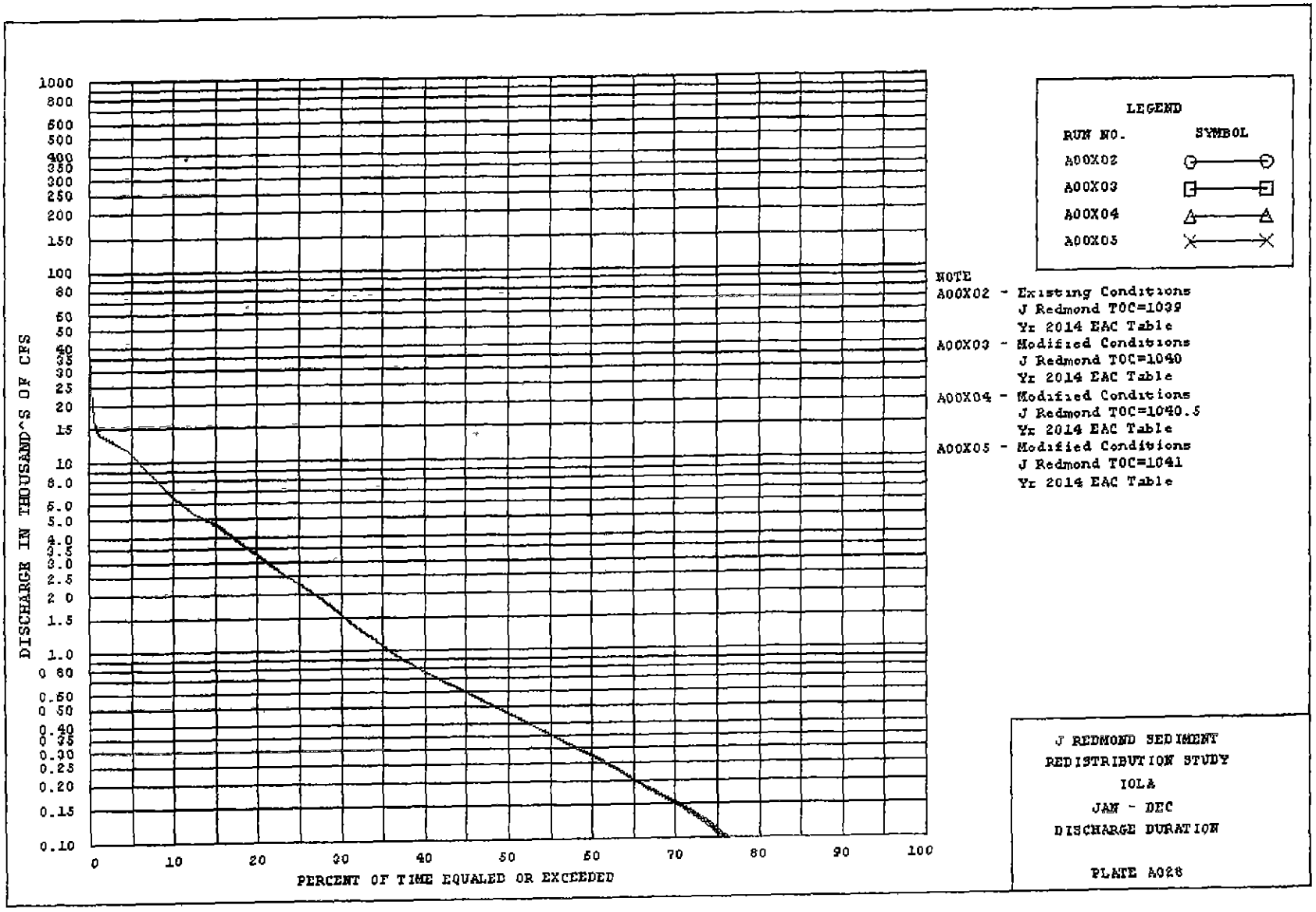


Figure B-6. Discharge Duration – Percent of Time Equaled or Exceeded vs Discharge at Iola Outflow for Year 2014
(Source. USACE SUPER 2000, Plate A028)

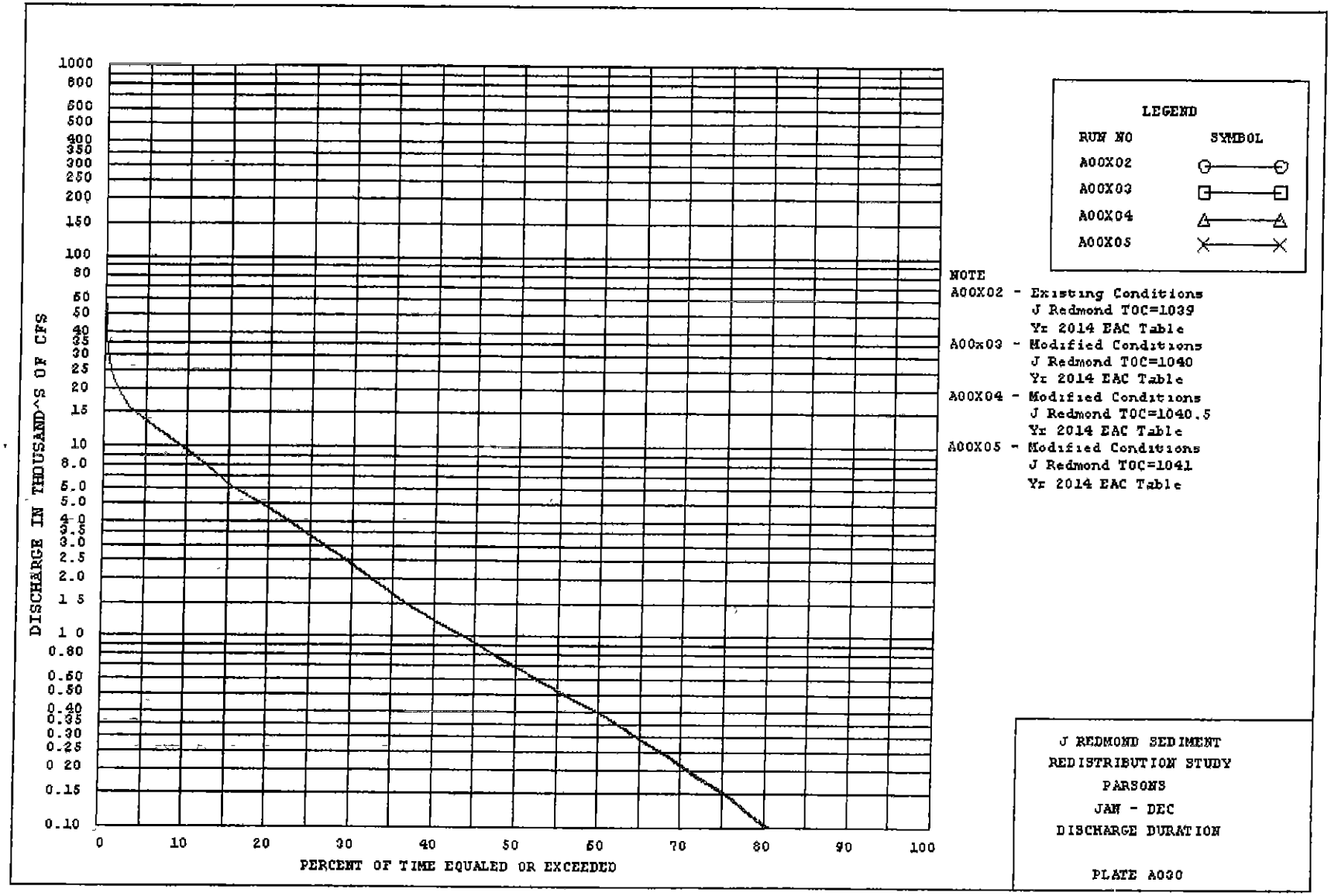


Figure B-7. Discharge Duration – Percent of Time Equaled or Exceeded vs Discharge at Parsons Outflow for Year 2014 (Source USACE SUPER 2000, Plate A030)

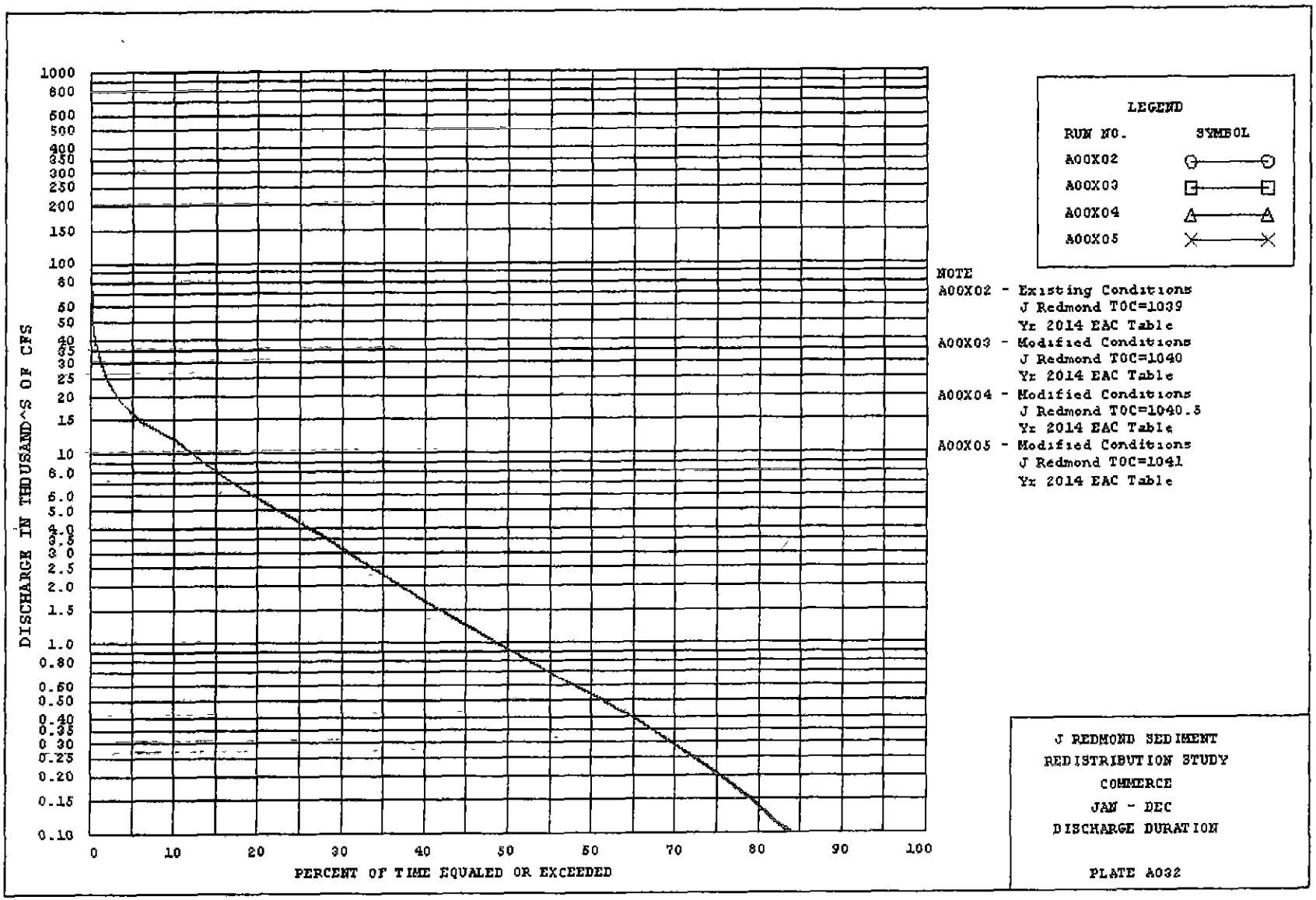


Figure B-8. Discharge Duration – Percent of Time Equaled or Exceeded vs Discharge at Commerce Outflow for Year 2014
(Source: USACE SUPER 2000, Plate A032)

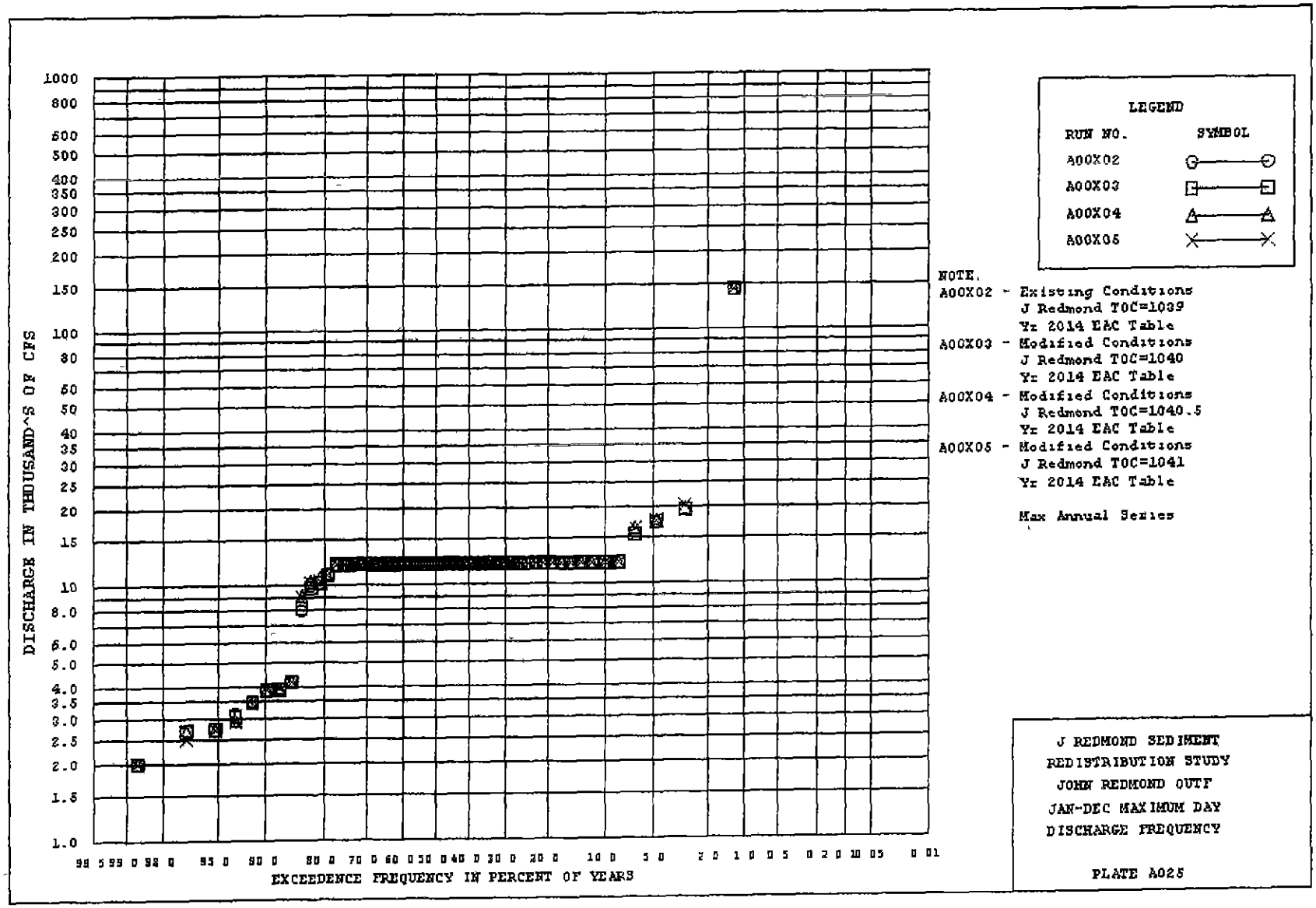


Figure B-9. Maximum Daily Flow Frequency – Exceedance Frequency in Percent of Years vs Discharge at John Redmond Outflow for Year 2014 (Source USACE SUPER 2000, Plate A025)

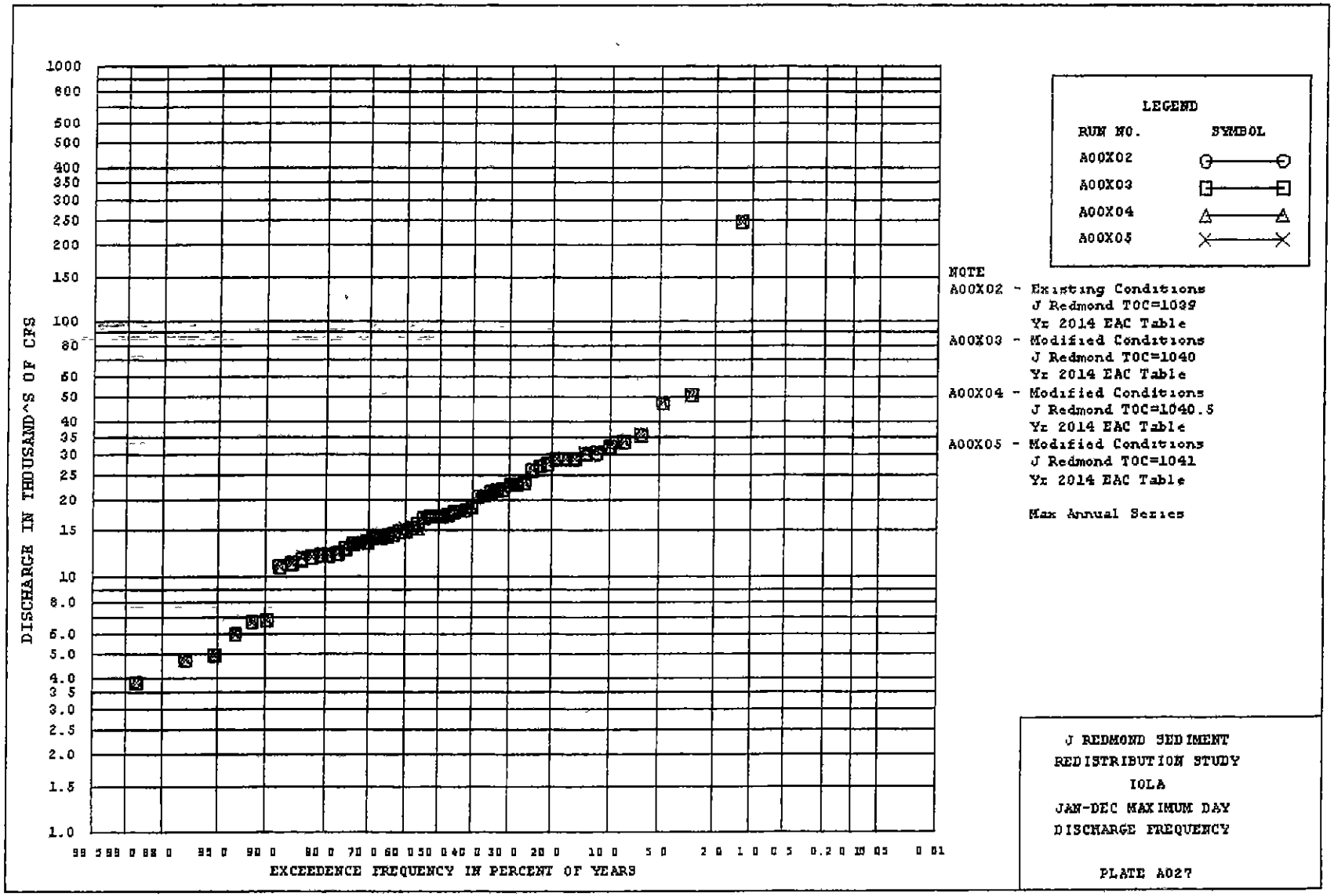


Figure B-10. Maximum Daily Flow Frequency – Exceedance Frequency in Percent of Years vs Discharge at Iola Outflow for Year 2014 (Source: USACE SUPER 2000, Plate A027)

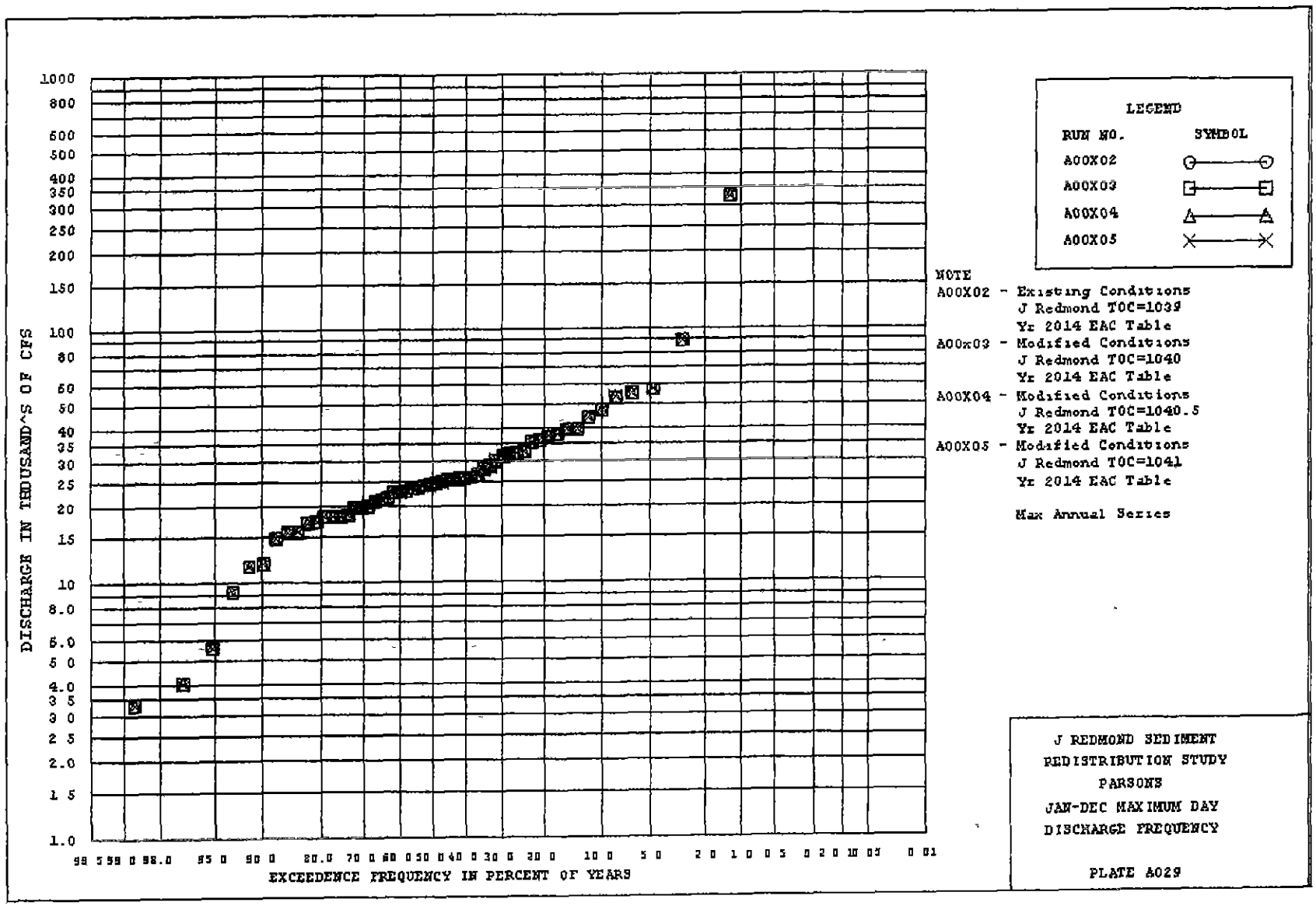


Figure B-11. Maximum Daily Flow Frequency – Exceedance Frequency in Percent of Years vs. Discharge at Parsons Outflow for Year 2014 (Source USACE SUPER 2000, Plate A029)

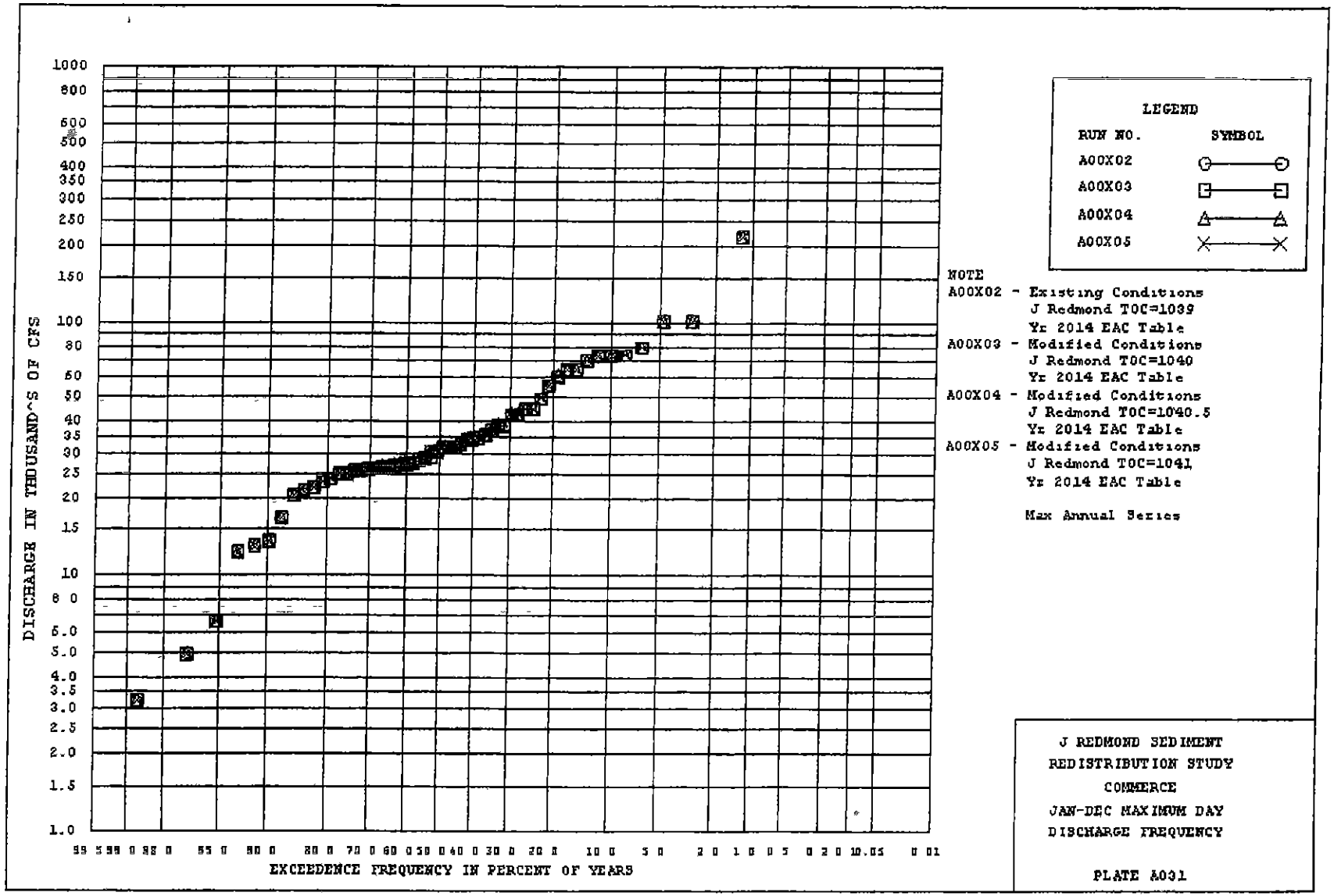


Figure B-12. Maximum Daily Flow Frequency – Exceedance Frequency in Percent of Years vs. Discharge at Commerce Outflow for Year 2014 (Source USACE SUPER 2000, Plate A031)

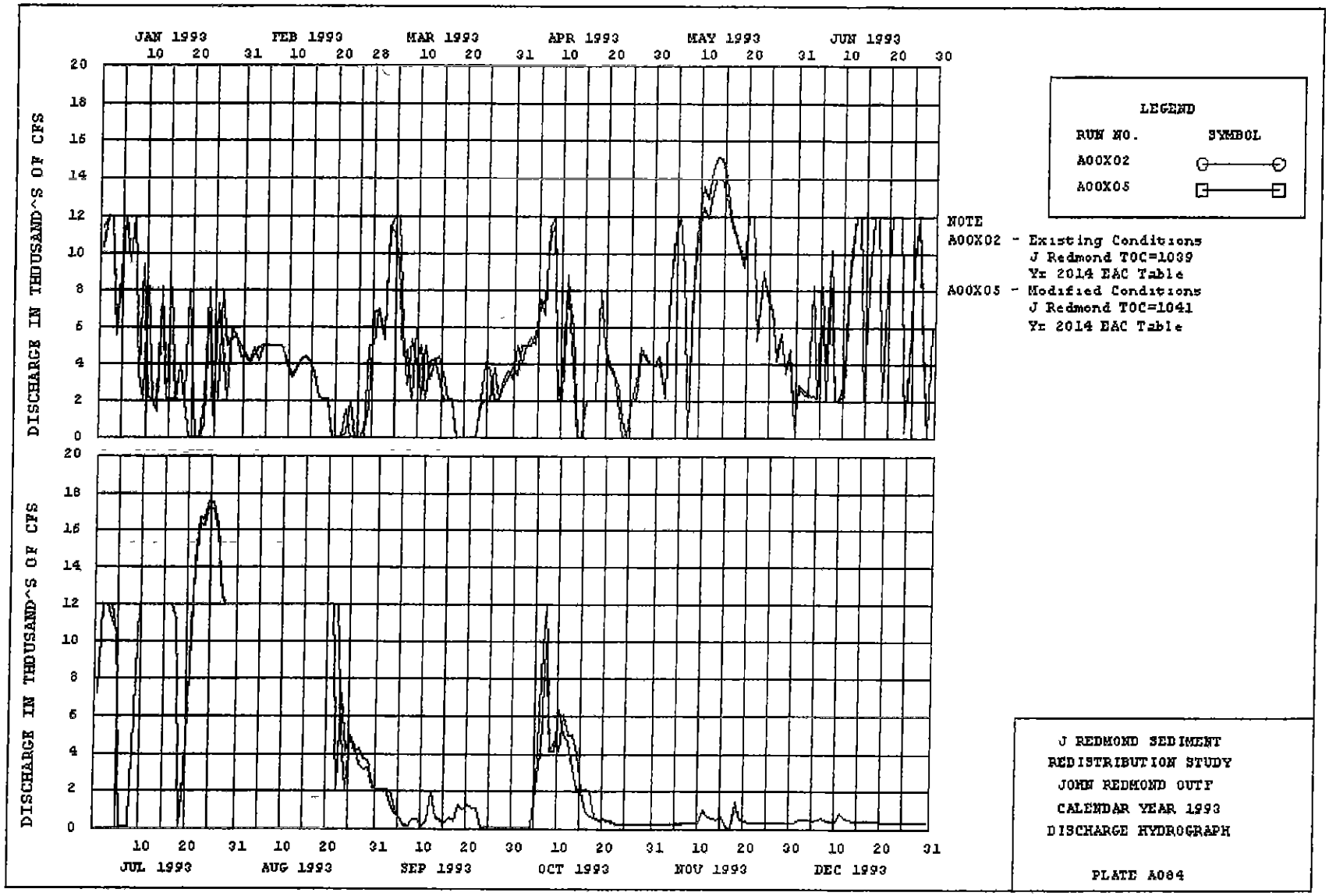


Figure B-13. Discharge Hydrograph of Simulated Flow Year Like 1993 for Year 2014 – Time vs Discharge at John Redmond Outflow (Source USACE SUPER 2000, Plate A084)

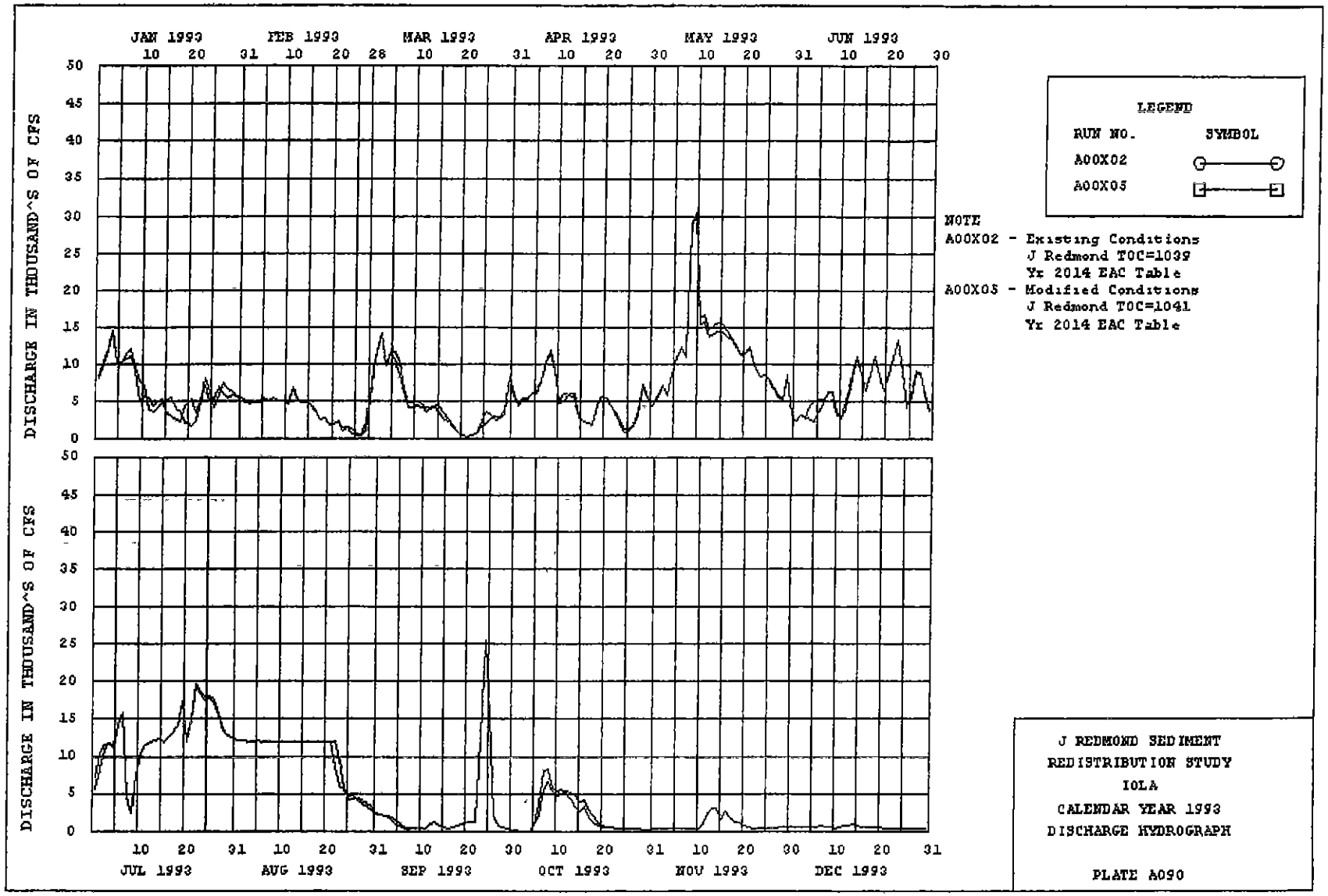


Figure B-14. Discharge Hydrograph of Simulated Flow Year Like 1993 for Year 2014 – Time vs Discharge at Iola Outflow
(Source: USACE SUPER 2000, Plate A090)

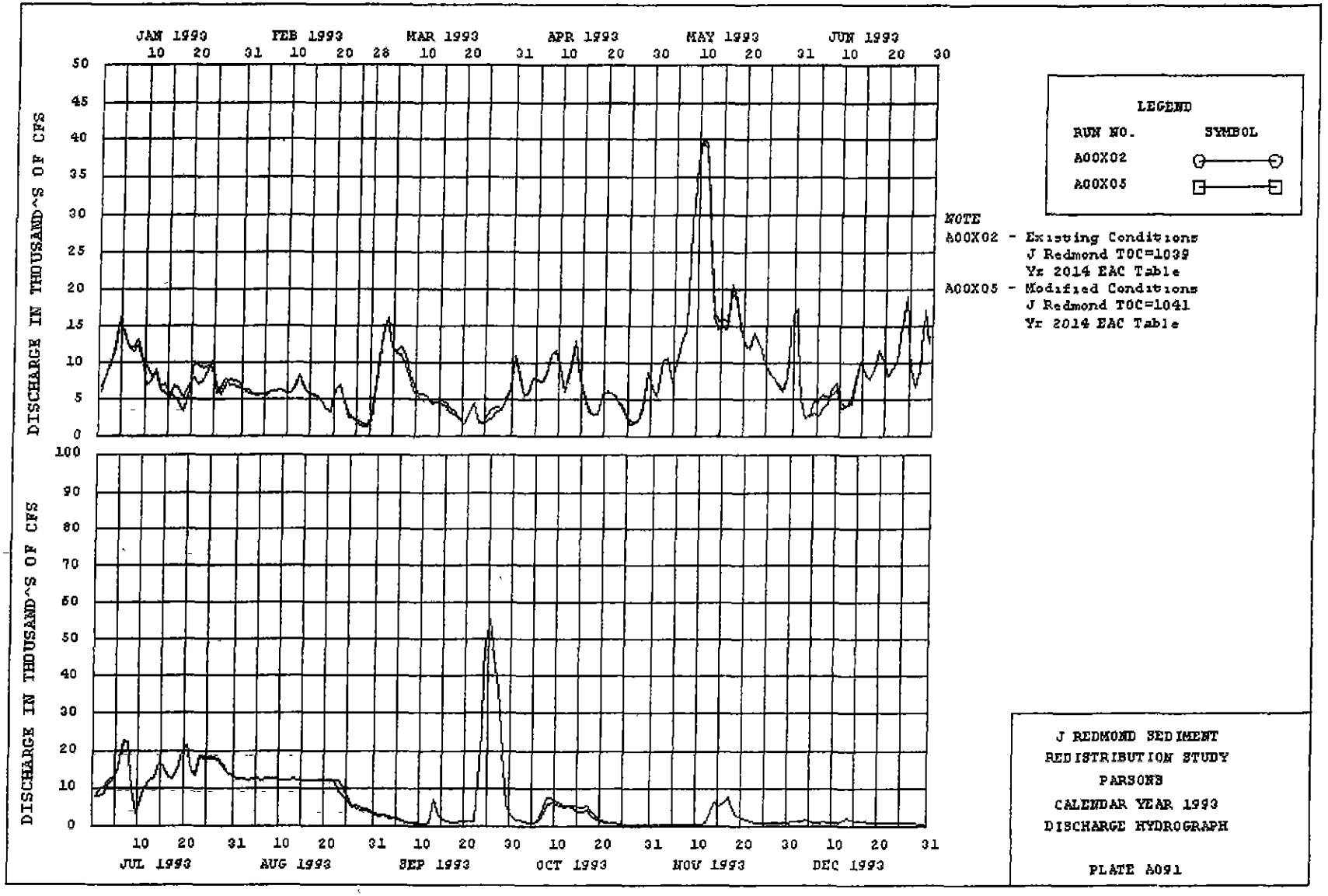


Figure B-15. Discharge Hydrograph of Simulated Flow Year Like 1993 for Year 2014 – Time vs. Discharge at Parsons Outflow (Source: USACE SUPER 2000, Plate A091)

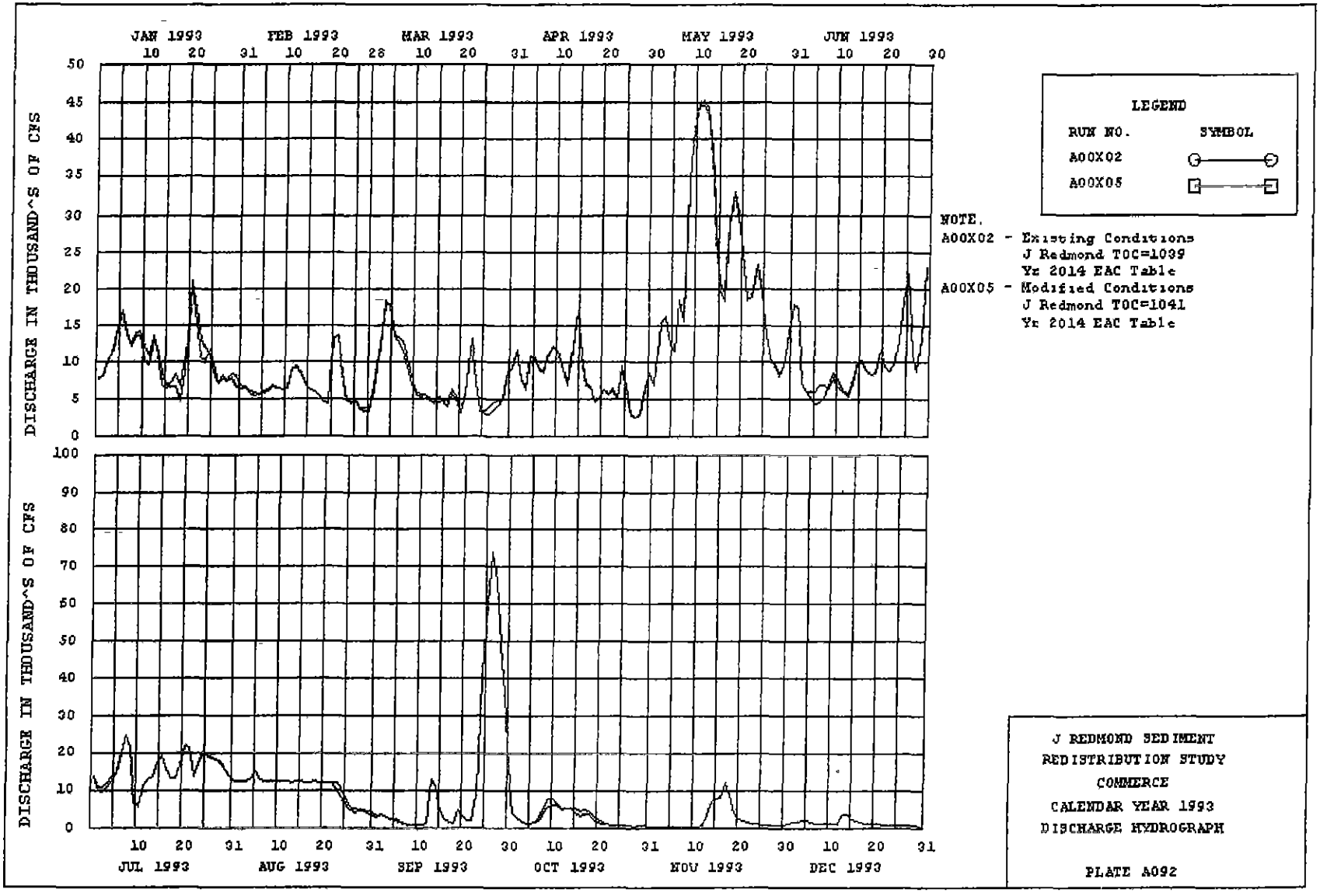


Figure B-16. Discharge Hydrograph of Simulated Flow Year Like 1993 for Year 2014 – Time vs Discharge at Commerce Outflow (Source. USACE SUPER 2000, Plate A092)

Water Quality Samples for Kansas

USGS 07182510 NEOSHO R AT BURLINGTON, KS

Available data for this site Water-Quality Discrete samples GO

Coffey County, Kansas Hydrologic Unit Code 11070204 Latitude 38°11'40", Longitude 95° 44'10" NAD27 Drainage area 3,042.00 square miles Contributing drainage area 3,042 00 square miles Gage datum 983 56 feet above sea level NGVD29	**Output formats** Parameter Group data summary Inventory of available water-quality data Inventory of water-quality data with retrieval Tab-separated ASCII file, serial order Tab-separated ASCII file, wide order Reselect output format

Parameter group summary of available data

Parameter Group	First Date	Last Date	Number of Samples	Number of Values
Total (all data)	1944-05-05	2000-09-21	434	4572
Information	1961-07-25	2000-09-21	333	476
Biological	1992-08-10	1992-08-10	1	2
Nutrients	1961-10-20	1975-07-21	111	255
Major Inorganics	1961-10-20	1975-07-21	111	1312
Minor and Trace Inorganics	1961-10-20	1975-07-21	111	231
Physical Property	1944-05-05	2000-09-21	434	1969
Sediment	1944-05-05	1992-08-10	195	216

Water Resources skip navigation

Data Category: Water Quality | Geographic Area: Kansas | GO

Water Quality Samples for Kansas

USGS 07183000 NEOSHO R NR IOLA, KS

Available data for this site: Water-Quality: Discrete samples | GO

Allen County, Kansas
Hydrologic Unit Code 11070204
Latitude 37°53'27", Longitude 95° 25'50" NAD27
Drainage area 3,818 00 square miles
Contributing drainage area 3,818.00 square miles
Gage datum 914.77 feet above sea level NGVD29

Output formats

- Parameter Group data summary
- Inventory of available water-quality data
- Inventory of water-quality data with retrieval
- Tab-separated ASCII file, serial order
- Tab-separated ASCII file, wide order
- Reselect output format

Parameter group summary of available data

Parameter Group	First Date	Last Date	Number of Samples	Number of Values
Total (all data)	1940-05-20	2000-08-23	211	1151
Information	1940-05-20	2000-08-23	176	304
Physical Property	1940-05-20	2000-08-23	211	723
Sediment	1940-05-20	1961-05-24	51	124

Questions about data gs-w-ks_NWISWeb_Data_Inquiries@usgs.gov
Feedback on this website gs-w-ks_NWISWeb_Maintainer@usgs.gov

Return to top of page

Water Quality Samples for Kansas: Sample Data
http://water.usgs.gov/ks/nwis/qwdata?

Retrieved on 2002-04 23 18:59:09 EDT
Department of the Interior, U.S. Geological Survey
USGS Water Resources of Kansas
Privacy Statement || Disclaimer || Accessibility
1.57 0 98

Water Quality Samples for Kansas

USGS 07183500 NEOSHO R NR PARSONS, KS

Available data for this site: Water-Quality Discrete samples | GO

Labette County, Kansas
Hydrologic Unit Code 11070205
Latitude 37°20'24", Longitude 95° 06'35" NAD27
Drainage area 4,905.00 square miles
Contributing drainage area 4,905 00 square miles
Gage datum 810.25 feet above sea level NGVD29

Output formats

- Parameter Group data summary
- Inventory of available water-quality data
- Inventory of water-quality data with retrieval
- Tab-separated ASCII file, serial order
- Tab-separated ASCII file, wide order
- Reselect output format

Parameter group summary of available data

Parameter Group	First Date	Last Date	Number of Samples	Number of Values
Total (all data)	1958-03-12	2000-08-17	543	14572
Information	1974-10-01	2000-08-17	182	454
Biological	1979-03-28	2000-08-17	118	464
Nutrients	1961-10-20	1994-08-03	288	1512
Organics	1979-03-28	1981-09-22	29	37
Major Inorganics	1961-10-20	1994-08-03	415	4380
Minor and Trace Inorganics	1961-10-20	1994-08-03	246	1706
Physical Property	1958-03-12	2000-08-17	543	5316
Radiochemicals	1981-02-24	1984-12-19	9	9
Sediment	1958-03-12	2000-08-17	155	337

Water Quality Samples for Oklahoma

USGS 07185000 Neosho River near Commerce, OK

Available data for this site: Water-Quality Discrete samples GO

Ottawa County, Oklahoma Hydrologic Unit Code 11070206 Latitude 36°55'43", Longitude 94° 57'26" NAD27 Drainage area 5,876 square miles Contributing drainage area 5,876 square miles Gage datum 748 97 feet above sea level NGVD29	**Output formats** Parameter Group data summary Inventory of available water-quality data Inventory of water-quality data with retrieval Tab-separated ASCII file, serial order Tab-separated ASCII file, wide order Reselect output format

Parameter group summary of available data

Parameter Group	First Date	Last Date	Number of Samples	Number of Values
Total (all data)	1944-06-02	1989-05-24	842	14331
Information	1944-06-02	1989-05-24	173	246
Nutrients	1944-08-27	1980-09-24	575	1255
Organics	1966-01-31	1980-09-24	12	12
Major Inorganics	1944-08-27	1989-05-24	666	5222
Minor and Trace Inorganics	1947-11-01	1989-05-24	146	738
Physical Property	1944-06-02	1989-05-24	786	6239
Sediment	1944-06-02	1989-05-24	116	157

APPENDIX C

Biological Resources

KANSAS BI-MONTHLY WATERFOWL SURVEY
SURVEY TECHNIQUES AND METHODS OF DATA HANDLING

Since the Kansas Department of Wildlife and Parks (formerly the Kansas Forestry, Fish and Game Commission) began conducting waterfowl surveys in 1959, a number of survey schedules have been used Initially, surveys were conducted weekly, usually beginning in August or September and continuing through April or May The weekly counts were reduced to one count every two weeks by administrative order in September, 1974 as a cost saving measure In August, 1978 the number of counts were further reduced, and since then have been conducted twice monthly, September through March (14 counts)

Most surveys were conducted from various vantage points on the ground around water bodies utilized by waterfowl On some larger impoundments such as Tuttle Creek and Milford Reservoirs, aircraft were used during some years to reduce the time required top conduct the survey and improve the coverage of the area involved The number of areas surveyed has varied from a low of 19 in 1976-77 to a high of 39 during recent years

In order to put the data into a form where all years could be presented in a comparable manner on the same table or graph, counts conducted 1970 to present were divided into those made during day 1 through day 15 (1st half of month) and day 16 through end of month (2nd half of month), for months September through March Where more than one count occurred in a one-half month time period, the counts were averaged, and that average represents the count for that area for that time period

Data for years 1970 through 2000 have been entered on computer and are easily accessed

Marvin Kraft
Waterfowl Program Coordinator
Kansas Department of Wildlife and Parks
P O Box 1525
Emporia, KS 66801

Jim
Although the Tables are titled as being for the Flint Hills NWR, the counts do include all of John Redmond Res.
mgk

Kansas Department of Wildlife and Parks

Waterfowl Migration Report (Summary x Year)

Data are included for Flint Hills NWR
Data are included for. Bald Eagle
All periods in the header are included

Year	9/ 1-15	9/ 16-30	10/ 1-15	10/ 16-31	11/ 1-15	11/ 16-30	12/ 1-15	12/ 16-31	1/ 1-15	1/ 16-31	2/ 1-15	2/ 16-28	3/ 1-15	3/ 16-31	Total	% SW*
1970				1	3	3									7	4%
1971									4				1		5	1%
1972							2		14	7	10	20	8		61	10%
1974				1											1	0%
1975					1		3	4	20	1		27			56	8%
1976					1		23	25		25	33				107	17%
1977					1	1	1	12	18	25	14	12	14	41	139	23%
1978								24		9	9	8	17	4	71	14%
1979							7	10	36		1	8	22	1	85	15%
1980								4	26	20			20	2	72	13%
1981						1	5	5	24	14	13	6	19		87	11%
1982						11	9	22	17	26	35	36	5	10	171	31%
1983				2	2	6	6			17	45	25	10	3	116	15%
1984					2	6	6	18	12	28	28	29	10	3	142	18%
1985							9	17		33	22	17	23	1	122	19%
1986					1	13	24	2	28	25	33	30	7		163	24%
1987					1	2	8	4		12	30	104	6		167	22%
1988					6	6	6	20	54	50	3	5	120	10	280	25%
1989					3	1	4	7	12	19	5	16			67	8%
1990					1	2	4	9		22	26	8	8		80	10%
1991					16	15	32	27		50	30	14	2		186	16%
1992				3	4	8	14	13		12	30	10	24	5	123	11%
1993					3	4	4	8	25	28	53				125	12%
1994					2	4	5	12		4	3	2	1		33	3%
1995					1	1	2	3	8	4	3	1		2	25	2%
1996					2	4	2	18	17	9	19	13	1		85	6%
1997					1	3	2	1	10	10	7	2			36	2%
1998							6	3	4	6	4	6	3	4	36	2%
1999				1	2	2	3	11	16	11	12	6			64	4%
2000								4		8	7	29	15	2	65	3%
Grand Total				**8**		**93**		**283**		**475**		**434**		**88**		
					53		**187**		**345**		**475**		**336**		**2,777**	

Usage Notes A 'year' is the period 7/1 to 6/30 The earliest of the calender years is shown * (% SW) % of Statewide is based on species and periods listed

Kansas Department of Wildlife and Parks

Waterfowl Migration Report (Summary x Year)

Data are included for Flint Hills NWR

Data are included for Bald Eagle, Golden Eagle, Osprey, Unknown Eagles

All periods in the header are included

Year	9/ 1-15	9/ 16-30	10/ 1-15	10/ 16-31	11/ 1-15	11/ 16-30	12/ 1-15	12/ 16-31	1/ 1-15	1/ 16-31	2/ 1-15	2/ 16-28	3/ 1-15	3/ 16-31	Total	% SW*
1970				1	3	6		4							14	4%
1971									4				1		5	1%
1972							3		14	7	10	23	8		65	8%
1974				1											1	0%
1975					1		4	6	20	1		27			59	8%
1976					1		23	25		25	33				107	16%
1977					2	1	1	16	18	25	14	12	14	41	144	20%
1978								24		9	9	8	17	4	71	13%
1979							7	10	36		1	8	22	1	85	14%
1980								4	26	20			20	2	72	12%
1981						1	5	5	24	14	13	6	19		87	11%
1982						11	9	22	17	26	35	36	5	10	171	29%
1983				2	2	6	6			17	45	25	10	6	116	14%
1984					2	6	6	18	12	28	28	29	10	3	142	17%
1985							9	17		33	22	17	23	1	122	18%
1986					1	13	24	2	28	25	33	30	7		163	23%
1987					1	2	8	4		12	30	104	9		170	21%
1988					8	6	6	20	56	50	3	5	120	11	285	25%
1989					3	1	4	7	12	19	5	16			67	8%
1990					1	2	4	9		22	26	8	8		80	10%
1991					16	15	32	27		50	30	14	2		186	16%
1992				3	4	8	14	13		12	30	10	24	5	123	11%
1993					3	4	4	8	25	28	53				125	12%
1994					2	4	5	12		4	3	2	1		33	3%
1995					1	1	2	3	8	4	3	1		2	25	1%
1996					2	4	2	18	17	9	19	13	1		85	5%
1997					1	3	2	1	10	10	7	2			36	2%
1998							7	3	4	9	4	6	3	4	40	2%
1999				1	2	2	3	11	16	11	12	6			64	4%
2000								4		8	7	29	15	2	65	3%
Grand Total				**8**		**96**		**293**		**478**		**437**		**89**		
					56		**190**		**347**		**475**		**339**		**2,808**	

Usage Notes A 'year' is the period 7/1 to 6/30 The earliest of the calender years is shown * (% SW) % of Statewide is based on species and periods listed

Kansas Department of Wildlife and Parks

Waterfowl Migration Report (Summary x Year)

Data are included for Flint Hills NWR

Data are included for Blue-winged Teal, Bufflehead, Canvasback, Cinnamon Teal, Common Goldeneye, Fulvous Whistling-Duck, Gadwall, Green-winged Teal, Mallard, Northern Pintail, Northern Shoveler, Redhead, Ring-necked Duck, Ruddy Duck, Scaup (Lesser), Wigeon, Wood Duck

All periods in the header are included

Year	9/ 1-15	9/ 16-30	10/ 1-15	10/ 16-31	11/ 1-15	11/ 16-30	12/ 1-15	12/ 16-31	1/ 1-15	1/ 16-31	2/ 1-15	2/ 16-28	3/ 1-15	3/ 16-31	**Total**	% SW*
1970		8458	10137	17539	10788	58700		19425		19745	3945	22970	22163		**193870**	3%
1971					89075	18400	24200	31800	54000	22303			4005	910	**244893**	2%
1972			375	955	9165	20690	30755	29008	37080	13137	9219	11920	14486	22667	**199457**	2%
1973	65				33528	23250	15045	35750	90	5460	1605	2506	3404	7605	**128308**	2%
1974				3070											**3070**	0%
1975	58	105	375	4312	8250	11250	14250	12003	42500	5000	7025	9050	5089	1130	**110397**	3%
1976	225	400	5900	11200	18901	11050	3400	51000		2050	10000			30800	**144926**	3%
1977	2425	4350	5250	9050	55500	48700	51700	43700	24350	5000	36020	11590	33690	6380	**337705**	7%
1978	500	5650	4800	2050	5800	26600	33400	40200		15300	40750	35350	11875	6620	**228895**	7%
1979	1275	702	2150	1120	16465	17250	15660	42201	20000	20000	20260	8526	662	4900	**171171**	5%
1980	1141	607	2	525	8012	14801	15470	20204	23450	12000	25000		2040	1768	**125020**	4%
1981	76	74	457	4144	5700	3625	7232	15600	22006	28700	35454	12537	10768	6141	**154514**	4%
1982	126	83	379	361	4886	42935	40038	25445	33444	4930	10200	2337	400	1372	**166936**	7%
1983	385	260	1616	6374	19560	40945	57580	7350	17020	21100	18186	4439	1579	13202	**209596**	9%
1984		955	2249	21345	24977	26225	3483	29846	3128	4519	3517	2516	17274	6190	**146224**	7%
1985	52	2186	153	30000	23500	17856	262	587	770	1728	441	7460	1145	2497	**88637**	6%
1986	468	518	5500	13757	44614	11608	1069	20110	11359	1020	3713	728	11607	592	**126663**	5%
1987	870	870	400	550	8799	17050	20475	11364	2257	19388	15807	13864	3197	1266	**116157**	7%
1988	72	115	85	560	20358	3329	16452	6100	17399	3736	520	1249	966	958	**71899**	4%
1989			1878	4159	13225	4965	6740	455	70	2247	4820	9285	3785		**51629**	3%
1990	250	497	200	4198	6900	4570	13705	5340	10	1295	2692	1504	1500	1058	**43719**	3%
1991	75	80	116	1657	28446	21473	2740	8830	2640	2010	3882	2520	1532	2430	**78431**	7%
1992	330	610	2180	6650	14425	38610	19242	24020	275	525	12227	1500	2982	1830	**125406**	5%
1993	670	182	160	1295	7025	4474	1900	1425	251	300	1300				**18982**	1%
1994		170	440	602	7135	10475	33275	44300	4458	1600	6916	12225	1885	10510	**133991**	7%
1995	355	95	190	235	14230	3101	21042	39785	5085	1700	675	3627	5495	880	**96495**	5%
1996	6380	5800	1935	11455	36625	39570	23675	22585	10755	11507	8311	24335	16675	16595	**236203**	8%
1997	480	200	620	6589	7916	27160	7725	14872	23570	5415	5235	11750	5790	4747	**122069**	4%
1998		155	575	2412		47503	65698	5000	492	9898	8376	4303	8421	4570	**157403**	4%
1999	616	685	743	613	2120	6280	4615	8621	7005	14728	12547	8229	3617	2165	**72584**	3%
2000	250	63	102	92	2000	8860	4117	5000	5005	9861	3555	2747	4461	2117	**48230**	2%

Usage Notes A 'year' is the period 7/1 to 6/30 The earliest of the calender years is shown * (% SW) % of Statewide is based on species and periods listed

Kansas Department of Wildlife and Parks

Waterfowl Migration Report (Summary x Year)

Data are included for Flint Hills NWR

Data are included for Blue-winged Teal, Bufflehead, Canvasback, Cinnamon Teal, Common Goldeneye, Fulvous Whistling-Duck, Gadwall, Green-winged Teal, Mallard, Northern Pintail, Northern Shoveler, Redhead, Ring-necked Duck, Ruddy Duck, Scaup (Lesser), Wigeon, Wood Duck

All periods in the header are included

Year	9/ 1-15	9/ 16-30	10/ 1-15	10/ 16-31	11/ 1-15	11/ 16-30	12/ 1-15	12/ 16-31	1/ 1-15	1/ 16-31	2/ 1-15	2/ 16-28	3/ 1-15	3/ 16-31	**Total**	% SW*
Grand Total		**33,870**		**166,869**		**633,305**		**621,926**		**266,402**		**229,067**		**161,900**		
	17,144		**48,967**		**547,925**		**554,945**		**358,469**		**312,198**		**200,493**		**4,153,480**	

Usage Notes. A 'year' is the period 7/1 to 6/30 The earliest of the calender years is shown * (% SW) % of Statewide is based on species and periods listed

Kansas Department of Wildlife and Parks

Waterfowl Migration Report (Summary x Year)

Data are included for Flint Hills NWR

Data are included for Canada Goose, Ross' Goose, Snow Goose (Lesser -white), White-fronted Goose (Greater)

All periods in the header are included

Year	9/ 1-15	9/ 16-30	10/ 1-15	10/ 16-31	11/ 1-15	11/ 16-30	12/ 1-15	12/ 16-31	1/ 1-15	1/ 16-31	2/ 1-15	2/ 16-28	3/ 1-15	3/ 16-31	Total	% SW*
1970		15	41	1542	3062			6482		2869	3100	1350	3275		21736	4%
1971					2960	3925	3425	4104	6000	3660			535	250	24859	3%
1972				800	5570	4550	5075	4900	3000	1900	1070	3320	3300	470	33955	3%
1973	170				5370	6175	1825	895		40	5500	3428	1357	1545	26305	3%
1974				806											806	0%
1975		8	700	9100	12500	15350	18200	17300	7800	5120	5135	5150	2225	300	98888	13%
1976		10	1000	6000	12000	16000	20000	10800		2000	2000			4800	74610	15%
1977		25	2600	6000	22000	23500	23000	28500	16710	5120	16100	14600	21000	5850	185005	23%
1978			800	1550	5600	6900	4110	6753		6800	7800	7200	17400	810	65723	14%
1979			500	2500	12600	9600	17500	7700	8750	8175	7600	6560	150	305	81940	12%
1980				2060	6100	7420	7500	8170	5400	6000	7340		9350	450	59790	13%
1981			150	613	5500	6100		10800	17017	15000	3245	13295	16172	1076	88968	8%
1982			27	713	3380	14023	17833	11513	10090	10340	5100	2368	1550	700	77637	16%
1983				1025	5100	13200	29595	14010	5840	6360	8795	250	515	732	85422	11%
1984			83	1201	13455	13800	17800	13766	3925	833	870	910	1860	2673	71176	9%
1985			30	1400	13000	43917	5213	2689	4012	5190	1262	10080	5683	20	92496	12%
1986	3		25	950	19928	21611	14506	11265	6285	4500	16170	100	4836	125	100304	9%
1987	10	12	18	305	12393	24480	20700	10475	250	6160	4200	7220	815	504	87542	10%
1988	50	35	25	380	6350	19640	17323	20600	6668	2200	250	60	5440	68	79089	7%
1989			40	1200	11300	13275	20850	1280	725	1940	390	2050	7140		60190	7%
1990	40	35	200	1000	13445	28305	29150	950		800	1885	150	3000	87	79047	8%
1991	50	81	80	55	45398	24150	7700	5025	3215	1250	5560	575	438	562	94139	7%
1992	60	75	340	620	15675	27100	21690	47500	14200	100	22160	22150	12050	22	183742	8%
1993	50	20	30	80	2055	11450	4600	3500	2900	500	1500				26685	2%
1994		10		2	1964	21100	13450	4600	102	25	6763	13500	1135	153	62804	4%
1995	45	2			10378	7265	5461	3660	175	880		8945	1950	390	34151	2%
1996	150	200	200	150	7825	20200	135	18100	5300	16970	716	19600	11735	1701	102982	5%
1997	78		66	2915	4355	21455	50350	1440	1847	2175	3225	19550	3850	5835	117141	3%
1998		30	60	811		37100	45985	8080	480	2200	2250	925	810	218	98949	4%
1999		25	20	26	1530	29250	23230	5360	12360	19666	19442	16743	2802	297	130751	8%
2000			30	50	3639	21480	911	547	3550	2205	703	3533	11544	405	48597	2%
Grand Total		**583**		**43,854**		**512,321**		**290,764**		**140,978**		**178,612**		**30,348**		
	706		**7,065**		**284,432**		**447,117**		**146,601**		**160,131**		**151,917**		**2,395,429**	

Usage Notes A 'year' is the period 7/1 to 6/30 The earliest of the calender years is shown * (% SW) % of Statewide is based on species and periods listed

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101ST EAST AVENUE
TULSA, OKLAHOMA 74128-4609

May 8, 2000

Planning, Environmental, and Regulatory Division
Environmental Analysis and Compliance Branch

Mr. William H. Gill
Field Supervisor
U.S. Fish and Wildlife Service
315 Houston Street, Suite E
Manhattan, KS 66502

Dear Mr. Gill:

This is in regards to the ongoing John Redmond Lake Reallocation Study, Kansas. In accordance with Section 7 of the Endangered Species Act of 1973, as amended, the District is requesting an official list of Federally listed threatened or endangered species which might be affected by the proposed action.

Pertinent information and a description of the proposed action were previously furnished to your office during development of our Fiscal Year 2000 funding agreement.

If you have any questions or require additional information, please contact Jim Randolph at 918-669-4396.

Sincerely,

James C. Randolph

for David L. Combs
Chief, Environmental Analysis and
Compliance Branch

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101ST EAST AVENUE
TULSA, OKLAHOMA 74128-4609

May 8, 2000

Planning, Environmental, and Regulatory Division
Environmental Analysis and Compliance Branch

Mr. Steve Williams
Kansas Department of Wildlife and Parks
Box 54-A, Route 2
Pratt, KS 76124-9599

Dear Mr. Williams:

This is to inform you that the Tulsa District is initiating a water supply reallocation study for John Redmond Lake, Kansas. Enclosed is a negotiated scope of work with the U.S. Fish and Wildlife Service which describes the proposed action.

Presently, we are preparing documentation for compliance with the National Environmental Policy Act of 1969 and would appreciate any comments from your agency regarding state listed threatened or endangered species and fish and wildlife.

If you have any questions or require additional information, please contact Jim Randolph at 918-669-4396.

Sincerely,

for David L. Combs
Chief, Environmental Analysis and
Compliance Branch

Enclosure

SCOPE OF WORK
FOR
U.S. FISH AND WILDLIFE SERVICE ACTIVITIES

FISH AND WILFLIFE COORDINATION ACT REPORT AND MITIGATION ANALYSIS
JOHN REDMOND LAKE, REALLOCATION STUDY, KANSAS

Background: In 1975, the state of Kansas and the Federal government entered into a water supply agreement at John Redmond Lake for an estimated 34,900 acre-feet of storage remaining after 50 years of sedimentation. Recent studies have determined that sediment has been deposited unevenly within the reservoir from what had been predicted. The sediment is accumulating in the conservation pool while the flood control pool has experienced less than expected sedimentation.

Storage available for water supply purposes in the lake have been depleted by the uneven distribution of sediment such that the water supply agreement obligations are being infringed upon. Most of the sediment deposition in the John Redmond pool has been below elevation 1039.0 feet (top of conservation pool) National Geodetic Vertical Datum (NGVD). Based on Tulsa District sediment surveys for 1964 and 1993, it was predicted that adequate storage would be available below elevation 1068.0 feet NGVD (top of flood control pool) at the end of the economic project life (2014) to meet all authorized project purposes.

A recent Kansas Water Office (KWO) water supply yield analysis indicated that the disproportionate sediment deposition has reduced the water supply capacity at design life by 25%. The water supply agreement with the KWO allows for pool adjustment in one-half foot increments. In order to make an equitable redistribution between the flood control and conservation pools, the District has been directed to study an equitable redistribution of storage between the flood control and conservation pools. Consequently, the District proposes to raise the conservation pool from elevation 1039 NGVD to elevation 1041 NGVD. The proposed pool level increase would be a phased approach with the first pool increase to elevation 1040 NGVD, the second to 1040.5 NGVD, and finally to elevation 1041, if needed.

Tasks:

1. The U.S. Army Corps of Engineers (USACE) will provide the following to the U.S. Fish and Wildlife Service (USFWS) as it becomes available; 1) digital two-foot contour maps, 2)color IR aerial photography of the lake, 3) pertinent data (including project alternatives and purposes,4)historic and projected changes to flood control operation and downstream releases of flood waters.

2. The USACE will invite the USFWS to participate in all pertinent planning meetings related to the project.

3. The USFWS will participate in field trips to the project site to evaluate proposed project impacts. The USFWS will complete the following tasks: 1) evaluate existing wetland types at the specified elevations for John Redmond and determine changes to habitat types as with the various increased conservation pool alternatives; 2) evaluate boat ramp, access road, and State Park acreages that may be inundated permanently and/or more frequently due to loss of flood storage; 3) evaluate if alternatives will affect timing and release schedules of floodwater evacuation and potential for adverse impacts to the Neosho River downstream of John Redmond; 4) evaluate dike and control structure elevations for managed wetlands on Fling Hills NWR to determine if management of the wetland complex will be compromised; 5) coordinate with Kansas Department of Wildlife and Parks and USFWS refuge personnel to evaluate and determine impacts of proposed pool level impacts on fish and wildlife resources, Flint Hills refuge, existing fishery, and water level management plans.

4. USFWS will prepare and coordinate a draft and final Fish and Wildlife Coordination Act report describing and evaluating existing fish and wildlife resources threatened or endangered species or habitat, and current management activities associated with John Redmond Lake. The report shall also address expected impacts associated with the proposed changes in conservation pool to John Redmond Lake on the noted resources. If impacts are deemed significant mitigation measures shall be recommended.

Estimated costs:

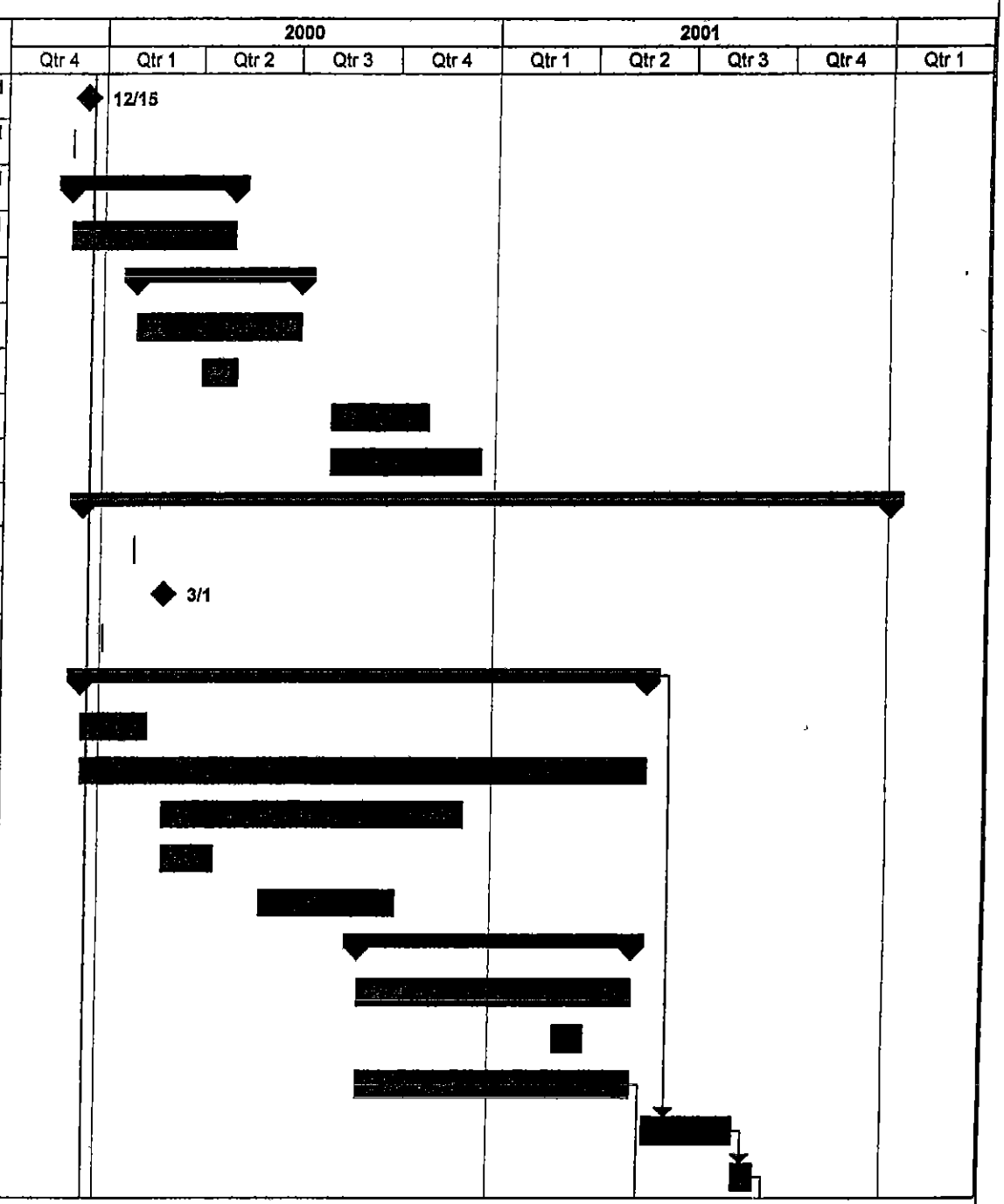
Lit. review, data collection and analysis	20 Md. @ 328/day	6,650
Prep. Of DFWCAR	60 Md. @ 328/day	19,680
Prep of FFWCAR	30 Md. @ 328/day	9,840
Overhead	(38%)	13,745
Total		49,915

Completion Dates:

Draft FWCA report	1 October 2000
Final FWCA report	15 March 2001

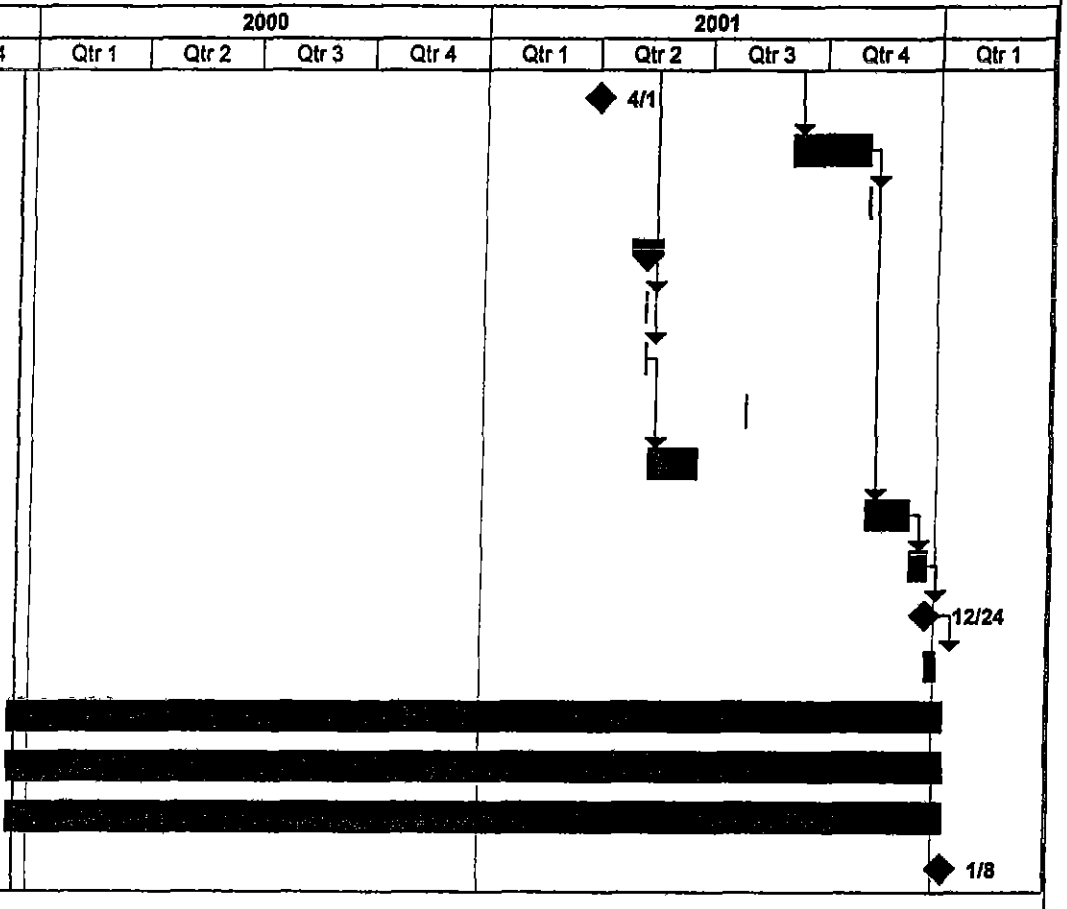
JOHN REDMOND REALLOCATION STUDY

ID	Task Name	Duration
1	RECEIVE FUNDS	0d
2	TEAM MEETING	1d
3	**H&H ANALYSES**	110d
4	FLOOD CONTROL ANALYSIS	110d
5	SOCIOECONOMIC ANALYSIS	110d
6	ECONOMIC ANALYSES	110d
7	SOCIOLOGICAL STUDIES	25d
8	GEOTECHNICAL ANALYSIS	65d
9	REAL ESTATE FLOWAGE EASEMENTS	100d
10	**NEPA DOCUMENTATION [SUPPLEMENT TO FEIS]**	536d
11	PUBLIC MEETING	1d
12	PUBLISH NOTICE OF INTENT	0d
13	SCOPING MEETING	1d
14	**CULTURAL RESOURCES**	375d
15	INVENTORY SHORELINE & VERIFY SITES	45d
16	NRHP EVALUATION OF CULTURAL RESOU	375d
17	GEOMORPHIC STUDY & C.R INVENTORY	200d
18	HTRW EVALUATION	35d
19	BIOLOGICAL ASSESSMENT	90d
20	**USF&WL COORDINATION**	180d
21	Mitigation Analysis	180d
22	TD Participation & Analysis	20d
23	Endangered Species Coordination	180d
24	WRITE DRAFT SFEIS	60d
25	INTERNAL SFEIS REVIEW	14d



JOHN REDMOND REALLOCATION STUDY

ID	Task Name	Duration
26	PUBLIC MEETING	0d
27	AGENCY/PUBLIC REVIEW OF SFEIS	45d
28	INCORPORATE COMMENTS	1d
29	IN-HOUSE REVIEW OF SFEIS	1d
30	FT. WORTH DIST. PERFORMS TECH REVIE	1d
31	T.D REVIEW OF SFEIS	1d
32	PUBLIC MEETING	1d
33	INCORPORATE IN-HOUSE COMMENTS	30d
34	WRITE FINAL SUPPLEMENT TO FEIS	25d
35	REPORT REPRODUCTION	10d
36	PUBLISH SUPPLEMENT TO FEIS	0d
37	PREPARE RECORD OF DECISION	7d
38	PUBLIC COORDINATION	540d
39	GIS SUPPORT	540d
40	PROJECT MANAGEMENT	540d
41	END OF PROJECT	0d



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas Field Office
315 Houston Street, Suite E
Manhattan, Kansas 66502-6172

May 23, 2000

David L. Combs, Chief
Environmental Analysis and Compliance Branch
Tulsa District, Corps of Engineers
1645 South 101st East Avenue
Tulsa, Oklahoma 74128-4609

Dear Mr. Combs:

This is in response to your May 8, 2000 letter requesting threatened and endangered species information relative to a proposal to reallocate water in John Redmond Reservoir, Coffey County, Kansas. The following information is provided for your consideration.

In accordance with section 7(c) of the Endangered Species Act (16 U.S.C 1531 et seq.), we have determined that the following federally-listed species may occur in or around the reservoir, or in the Neosho River upstream or downstream of the reservoir: bald eagle (*Haliaeetus leucocephalus*), Neosho madtom (*Noturus placidus*), and western prairie fringed orchid (*Platanthera praeclara*) If it is determined the project may adversely affect any listed species, the District should initiate formal section 7 consultation with this office. If there will be no effect, or if the Fish and Wildlife Service concurs in writing there will be beneficial effects, further consultation is not necessary

Thank you for this opportunity to provide input on your proposed study.

Sincerely,

William H. Gill

William H Gill
Field Supervisor

cc: KDWP, Pratt, KS (Environmental Services)

WHG/dwm

STATE OF KANSAS

DEPARTMENT OF WILDLIFE & PARKS

Operations Office
512 SE 25th Avenue
Pratt, KS 67124-8174
316/672-5911 FAX 316/672-6020

June 16, 2000

Mr. David Combs
Department of the Army
Corps of Engineers, Tulsa District
Environmental Analysis and Compliance Branch
1645 South 101st East Avenue
Tulsa, OK 74128-4609

Ref: D4 0201
Coffey, Lyon
Trak 20000423

Dear Mr Combs

This responds to your request for preliminary state-listed threatened and endangered species and general sensitive resource information for your water supply reallocation study for John Redmond Lake, which includes a 2 foot incremental increase in the conservation pool elevation for the reservoir, located in Coffey and Lyon Counties, Kansas We have included information on any crucial wildlife habitats, current state-listed threatened and endangered species, species in need of conservation, designated critical habitats, and state public recreation areas for which this agency has some administrative authority

The Neosho River immediately upstream of John Redmond Reservoir is designated critical habitat for the state-listed threatened ouachita kidneyshell mussel (*Ptychobranchus occidentalis*) and Neosho madtom (*Noturus placidus*) The Cottonwood River immediately upstream of the reservoir is also designated critical habitat for the above listed species and the state-listed endangered Neosho mucket mussel (*Lampsilis rafinesqueana*) The Neosho River immediately downstream of the John Redmond dam is designated critical habitat for the state-listed endangered rabbitsfoot mussel (*Quadrula cylindrica cylindrica*) and the state-listed threatened ouachita kidneyshell mussel (*Ptychobranchus occidentalis*) and Neosho madtom (*Noturus placidus*) There are also several mussel species that are known to be present in the Neosho River around John Redmond Reservoir that are designated as species in need of conservation by our agency. All of the above species prefer gravel substrates with flowing water. Increased areas of inundation in the rivers above the reservoir from increasing the elevation of the conservation pool would impact those designated critical habitats and associated species There could also be temporary impacts to downstream critical habitat and species from reduced releases during conservation pool expansion Our agency also considers riparian woodlands to be crucial wildlife habitat for many game and nongame wildlife species. Increasing the area of inundation would temporarily impact and possibly permanently decrease the quantity of riparian woodlands. Additionally, our agency manages the recreational fishery of the reservoir and would be interested in coordinating the timing of the incremental increases and development of mitigation measures to enhance those recreational resources. We would like to see all of the above listed resources and potential impacts dealt with in any environmental assessment and fish and wildlife coordination report developed for the project.

Thank you for the opportunity to provides these comments and recommendations If you have any questions or need additional information, please free to contact me at the phone number or address listed above

Sincerely,

John R Phillips, Aquatic Ecologist
Environmental Services Section

xc KDWP Reg 5 FW Sup , Tiemann
KDWP, Nygren
FWS, Gill

May 24, 2001

Mr. Chris Hase
Kansas Department of Wildlife & Parks
Operations Office
512 SE 25th Avenue
Pratt, KS 67124-8174

Dear Mr Hase·

I am sending this letter to update your files concerning the water supply reallocation study for John Redmond Lake and our May 8, 2000 request for comments regarding state listed threatened or endangered species and fish and wildlife. Per our May 21 and May 23, 2001 conversations, I understand that the information in the letter response dated June 16, 2000 (Trak: 20000423) from your agency remains valid and that you requested this letter of update

Presently, we are preparing project documentation for compliance with the National Environmental Policy Act of 1969 If you have any questions or require additional information please contact Jim Randolph, USACE Fish and Wildlife Biologist, at 918-669-4396. Thank you for your assistance with this update request.

Sincerely,

James D. Von Loh
Senior Biologist
engineering-environmental Management, Inc.

Enclosures· 1) Letter of Request (May 8, 2000), 2) Letter of Response (June 16, 2000), 3) Scope of Work (May 8, 2000).

Cc: Jim Randolph, USACE, Tulsa District: Planning, Environmental, and Regulatory Division; Environmental Analysis and Compliance Branch

APPENDIX D

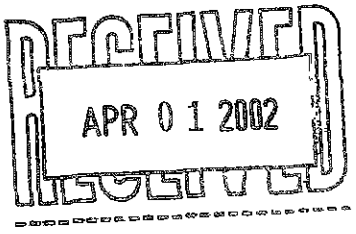
Biological Assessment
U.S. Fish and Wildlife Service Response to Biological Assessment

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas Field Office
315 Houston Street, Suite E
Manhattan, Kansas 66502-6172

March 15, 2002

David L. Combs, Chief
Environmental Analysis and Compliance Branch
U.S. Army Corps of Engineers
Tulsa District
P O. Box 61
Tulsa, Oklahoma 74121-0061



Dear Mr Combs.

This is in response to your Biological Assessment for the John Redmond Pool Raise, Proposed Two Foot Increase in Conservation Pool, Coffey County, Kansas, which we received December 28, 2001 The biological assessment evaluated various sources of impact to the federally-listed bald eagle (*Haliaeetus leucocephalus*), western prairie fringed orchid (*Platanthera praeclara*), and Neosho madtom (*Noturus placidus*), as well as three state-listed mussels. The assessment concluded there would be no effect to the western prairie fringed orchid, due to lack of this species being present in the impact area The assessment further concluded there would be minor effects, many of these temporary, to the bald eagle and Neosho madtom, with a resulting overall net beneficial effect for both species. We readily concur with the determination of no effect for the orchid, and offer the following comments regarding the other two species.

As indicated in our Final Fish and Wildlife Coordination Act Report (FWCA), we anticipate inundation of 195 acres of woodlands from this action, rather than the 158 acres discussed in the biological assessment In either case, this represents a significant impact to the woodland habitat of the area Your assessment identified this as a temporary beneficial effect for the bald eagle, because of the increased number of dead snags which would be available for perches. However, this seems to imply that only dead trees are suitable for use by bald eagles, which is inaccurate It is true that eagles prefer perch trees which afford them a wide view of their surroundings, but live trees can also provide this habitat, for a much longer period of years than dead trees can be sustained. Additionally, during the winter when most eagles utilize the area, live trees are in a dormant state which makes them structurally equivalent to dead trees. And, although there are no currently active bald eagle nests at John Redmond, use of live nest trees is known from elsewhere in the state

It can be expected that trees flooded by this action will decrease in number and suitability as decay, waves, and ice work to destroy them It is unlikely that natural tree regeneration along the fringe of the new pool elevation will be sufficient to replace the total loss through time,

especially considering the adverse effects of frequent flood storage Therefore, we do not concur with the biological assessment's statement of overall beneficial effects from the drowning of this many trees However, it is true there could be a temporary increase in foraging habitat resulting from an increased number of trees being located within or very near the pool. We also concur that fish populations should be enhanced for a period of several years following the pool raise, potentially providing an increased prey base for visiting eagles Given these ameliorating factors, it appears that long-term adverse impacts to bald eagles should be minimized, as long as the tree mitigation measures recommended in the FWCA are implemented

Regarding the Neosho madtom, we concur with the biological assessment that this action will not permanently inundate the upstream gravel bars which currently provide habitat By raising the conservation pool elevation, the likelihood of inundation of these bars by flood storage will increase by about 2%, according to our interpretation of the Corps' data. The long-term impact of this will remain to be seen, but hopefully will not be significant. Downstream, there will be a change in the hydrograph, resulting in a slight increase in the depth and longevity of flood storage releases. In the assessment you conclude that this change will not constitute a significant impact on the Neosho madtom or other aquatic organisms Yet the scientific literature cited in your assessment implicates the presence of John Redmond dam and its operation in decreased madtom populations immediately downstream of the dam, with these negative effects evidenced as far downstream as Iola So it may be questionable to assume that a slight change for the worse in a situation which is already believed poor for a listed species should not be determined to have an adverse effect on that species In fact, the Tulsa District should consider whether it should initiate section 7 consultation on current ongoing operations of the John Redmond dam.

At the same time this assumption of no impact is questioned, however, we concur with the assessment that a benefit may be realized for this and other species by having additional water storage from which to make drought releases Although we believe that sustained high flow releases during flood periods may adversely affect habitat, it is certainly true that little or no release during droughts could significantly adversely affect individuals and populations Therefore, as indicated in the FWCA, the overall net effect may be relatively neutral I would strongly urge the Corps to consider as natural a hydrograph as possible during flood conditions This would necessitate evacuating more water during a shorter period of time, rather than nearly bank full flows sustained for many days or even weeks on end

As you can see, my staff and I do not agree completely with statements of beneficial effect to listed species from this action. However, when all these factors are considered, I concur with the biological assessment's determination that this action is not likely to significantly adversely affect the three federally-listed species over and above the current existing condition. Therefore, there is no need for further section 7 consultation on this pool raise action. The three mussel species evaluated have no federal status at this time, but our comments regarding the Neosho madtom pertain to them as well. The Kansas Department of Wildlife and Parks maintains authority for these state-listed species, as well as for the three federally-listed species.

An idea is presented in the biological assessment with which we do not agree; the notion that small impoundments in the upper portions of tributaries in the basin will have a net beneficial effect to fish and wildlife resources There is ample scientific evidence of the adverse biological effects of small tributary dams, both on the tributaries themselves and on the larger receiving stream The federally-listed endangered Topeka shiner (*Notropis topeka*), which occurs in several tributary watersheds within the basin, has been shown to be intolerant of such dam development. It is hoped that the organized watershed districts within the Cottonwood and Neosho basins do not take your comments as an endorsement for increased development.

Thank you for providing such a thorough biological assessment, and for the opportunity to review and provide our comments. If there are any questions regarding any of these comments, they should be directed to Dan Mulhern of this office, 785-539-3474, ext. 109.

Sincerely,

For: William H Gill
Field Supervisor

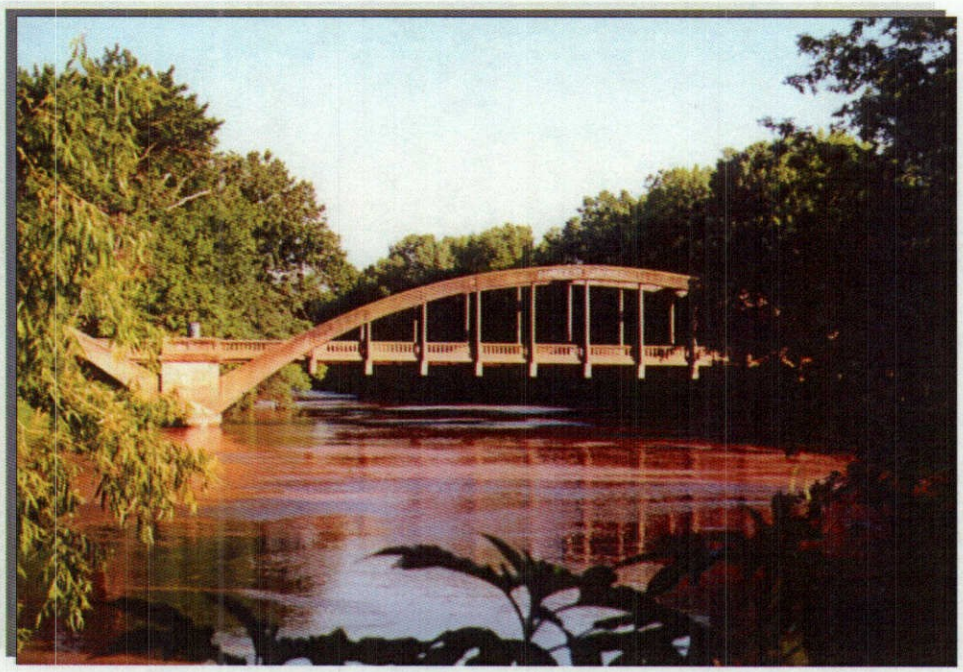
cc FWS, Hartford, KS (Flint Hills NWR)
KDWP, Pratt, KS (Environmental Services)

WHG/dwm

BIOLOGICAL ASSESSMENT

Prepared for the:

REALLOCATION OF WATER SUPPLY STORAGE PROJECT: JOHN REDMOND LAKE, KANSAS



November 2001

United States Army Corps of Engineers; Tulsa District
1645 South 101 East Avenue
Tulsa, Oklahoma 74128-4609

BIOLOGICAL ASSESSMENT

Prepared For

Reallocation of Water Supply Storage Project: John Redmond Lake, Kansas

U.S Army Corps of Engineers, Tulsa District
1645 South101East Avenue
Tulsa, Oklahoma 74128-4609

November 2001

Prepared By

engineering-environmental Management, Incorporated
1510 West Canal Court, Suite 2000
Littleton, Colorado 80120

EXECUTIVE SUMMARY

This biological assessment addresses threatened, endangered, and candidate species listed by the U.S. Fish and Wildlife Service and the Kansas Department of Wildlife & Parks, relative to alternative actions determined for the Reallocation of Water Supply Storage Project: John Redmond Lake, Kansas, proposed by the Tulsa District, U.S. Army Corps of Engineers. The John Redmond Dam was constructed in the Neosho River Basin of Coffey County during the late 1950s and early 1960s, to provide flood control, water supply, water quality, and recreation.

Reservoir water levels fluctuate widely and somewhat unpredictably (up to 30 vertical feet) behind the dam structure. These fluctuations are due to flood flows received from the approximately 3,015-square mile drainage basin upriver from the dam. Approximately 2,569-square miles are uncontrolled below Marion and Council Grove Dams. As a result of pool fluctuations, it has been difficult to farm agricultural land located within the flood pool limits—these fields produce crops only about two of every five years. Each flood event results in a loss of some vegetation, including mature trees, due to inundation and subsequent drowning. Downriver from the dam, releases into the Neosho River are controlled to limit flooding and provide water to the Wolf Creek Generating Station and the Cottonwood and Neosho River Basins Water Assurance District No 3. Flows downriver from the John Redmond Dam to the Oklahoma border encounter an additional 12 low-head dams from 3–15 feet in height The small dams, constructed from the 1930s through the 1950s, are used for diverting flows for municipal and agricultural use.

An assessment is being conducted of four water storage alternatives: two for raising the elevation of the conservation pool by two feet (1,039 ft.–1,041 ft. NGVD), dredging sediments to achieve the desired capacity, and the no-action alternative. Six species identified for the biological assessment are the:

- bald eagle (*Haliaeetus leucocephalus*) – threatened;
- western prairie fringed orchid (*Platanthera praeclara*) – threatened;
- Neosho madtom (*Notorus placidus*) – threatened;
- Neosho mucket mussel (*Lampsilis rafinesqueana*) – species of concern;
- rabbitsfoot mussel (*Quadrula cylindrica clylindrica*) – species of concern; and
- Ouachita kidneyshell mussel (*Ptychobranchus occidentalis*) – species of concern.

A raise in conservation pool elevation would inundate approximately 33 acres of cropland, 18 acres of grassland, 158 acres of woodland, 166 acres of open water, and 196 acres classified as palustrine wetland, totaling approximately 570 acres

The western prairie fringed orchid does not occur in the predominately introduced grasslands adjacent to the conservation pool and will not receive impacts. The bald eagle is transient through the project area and uses John Redmond Lake primarily as a winter foraging site for fish and waterfowl. An increase of trees and snags used as perches will occur and short-term food-supply benefits to the bald eagle will result from an enhanced fishery and increased waterfowl use due to increased habitat during the first five to eight years following a raise in conservation pool elevation.

Affects to the Neosho madtom are not expected to change from the existing condition, e g., they may periodically lose access to two gravel bars in the vicinity of Hartford, Kansas, during drought periods and flood events, but may migrate to these bars during appropriate flows from more suitable riffle and run habitat upriver near Neosho Rapids, Kansas The Neosho mucket mussel, rabbitsfoot mussel, and Ouachita kidneyshell mussel are potentially extirpated upriver from the reservoir and will not be affected by the reservoir raise. A minor shift in the downriver hydrograph due to an elevated conservation pool will have negligible effects to the Neosho madtom and listed mussel species and a beneficial affect may result from additional releases for water quality flows during periods of drought.

There are minor, potentially beneficial impacts to listed aquatic species downriver of John Redmond Dam as a result of this action; the principle one being release of water quality flows during drought periods. Other than timing of dredge operations and a need for a threatened, endangered, or rare species survey of sediment storage, haul roads, and maintenance areas, only minor impacts related to potential release of sediments and associated contaminants washed in from upriver sources have been identified to listed species for the dredge alternative

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

BA	Biological Assessment
CFS	Cubic Feet Per Second
CY	Calendar Year
DOA	Department of Agriculture
e^2M	engineering-environmental Management, Incorporated
ESA	Endangered Species Act of 1973
FHNWR	Flint Hills National Wildlife Refuge
GIS	Geographic Information System
JRL	John Redmond Lake (Reservoir)
KDH&E	Kansas Department of Health & Environment
KDW&P	Kansas Department of Wildlife & Parks
KNHI	Kansas Natural Heritage Inventory
KS	Kansas
MSL	Mean Sea Level
NGVD	National Geodetic Vertical Datum
NRCS	Natural Resource Conservation Service
OCWA	Otter Creek Wildlife Area
OK	Oklahoma
RM	River Mile
RWSS	Reallocation of Water Supply Storage Project
US	United States (Federal)
USACE	United States Army Corps Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WCGS	Wolf Creek Generating Station
WPFO	Western Prairie Fringed Orchid

1.0 INTRODUCTION

In accordance with Section 7(c) of the Endangered Species Act of 1973 (ESA), as amended (16 U.S C. 1531 *et seq.*), the U S. Fish and Wildlife Service (USFWS) is responsible for providing a species list for a Biological Assessment (BA) concerning the possible effects of proposed federal actions on federally-listed species This BA has been prepared at the request of the U.S. Army Corps of Engineers; Tulsa District (USACE) for the proposed Reallocation of Water Supply Storage Project at John Redmond Lake, KS, and will analyze the potential effects of project alternatives and future operation on federally-listed threatened or endangered species. Species listed as threatened or endangered by the USFWS and the Kansas Department of Wildlife & Parks (KDW&P) are addressed herein (**Table 1-1**) Only federally-listed plant and wildlife species are afforded protection under the Endangered Species Act of 1973 (ESA). State-listed species are considered, but are not afforded protection under the ESA.

Table 1-1. Federally- and Kansas-Listed Species for the John Redmond Lake Project Area (Sources USFWS 2000, KDW&P 2000, and KNHI 2001) (Attachment A)

Species	Status / Rank	Comments
Common Name / *Scientific Name*	**Federal / Kansas**	**Source and Habitat**
Bald Eagle (*Haliaeetus leucocephalus*)	US – Threatened KS – Threatened G4/S1B, SZN	USFWS response letter. Transient use of larger trees in the vicinity of open water
Neosho Madtom (*Noturus placidus*)	US – Threatened KS – Threatened G2/S2	USFWS and KDW&P response letters Use shallow riffles with loose/uncompacted gravel bottoms.
Western Prairie Fringed Orchid (*Platanthera praeclara*)	US – Threatened KS – Threatened G2/S1	USFWS response letter Grows in tallgrass silt loam soils, moist sand prairies, or hay meadows with full sunlight
Neosho Mucket Mussel (*Lampsilis rafinesqueana*)	KS– Endangered G2/S1	KDW&P response letter Requires clean, in-stream gravel beds
Rabbitsfoot Mussel (*Quadrula cylindrica cylindrica*)	KS– Endangered G3/S1	KDW&P response letter. Requires clean, in-stream gravel beds.
Ouachita Kidneyshell Mussel (*Ptychobranchus occidentalis*)	KS – Threatened G3G4/S1	KDW&P response letter Requires clean, in-stream gravel beds.

Rank: G2· Globally imperiled because of rarity, typically 6-20 occurrences, G3 Globally vulnerable because it is very rare and local throughout its range, typically 21-100 occurrences, G4· Globally apparently secure, uncommon but not rare, widespread, typically 100 occurrences or more. S1 State critically imperiled because of extreme rarity, typically five or fewer occurrences, S2 State imperiled because of rarity, typically 6-20 occurrences, SZN Zero occurrences/non-breeding population, occurs during migration (KNHI 2001).

The above-listed species were identified in letters addressed during May and June 2000 (**Attachment A**), and were reviewed by each agency for accuracy and completeness during May

2001 (Mulhern, pers.com. 2001 and Hase, pers com. 2001). Listed species status and rank were obtained from the USFWS, KDW&P, and the KS Natural Heritage Inventory (KNHI).

1.1 Project Description

This section describes the water supply storage reallocation project for John Redmond Lake (JRL) and the proposed alternatives The State of Kansas and the federal government entered into a water supply agreement at JRL to provide water for the Cottonwood and Neosho River Basins Water Assurance District No. 3 and the Wolf Creek Generating Station. The Cottonwood and Neosho River Basins Water Assurance District includes 12 cities and four industrial water users (Lewis, pers. com. 2001). JRL is located three miles northwest of Burlington, in Coffey County, KS (**Figure 1-1**).

An estimated 34,900 acre-feet of storage remaining after 50 years of sedimentation (CY 2014) forms the basis of the 1975 agreement (USACE 1976). Water storage was to occur within the conservation pool (1,039.0-ft elevation), however, studies have determined that sediment has been deposited unevenly within JRL, both for the predicted amount and location of sediment deposition. The sediment is accumulating in the conservation pool while the flood control pool has experienced less than predicted sedimentation (**Figure 1-2**).

The uneven sediment distribution has depleted storage available for water supply purposes and is infringing upon the water supply agreement obligations. A recent Tulsa District Office water supply yield analysis indicated a 25 percent reduction in the water supply capacity at design life (CY 2014) because of the disproportionate sediment deposition. Most of the sediment deposition has been below the top of the current conservation pool (elevation 1,039.0 ft.). The USACE has been directed by congress to study an equitable redistribution (reallocation) of water storage between the flood control and conservation pools. Therefore, the USACE is evaluating the alternative actions described in Section 1 3 to resolve the depleted water storage situation and describe potential impacts to threatened or endangered species.

Construction of John Redmond Dam began in June 1959, and final water storage began during September 1964 (USACE 1996). John Redmond Dam is an integral component of a three-dam and reservoir system that includes Council Grove and Marion Reservoirs The three structures provide flood control and other benefits to the Neosho River Basin. The conservation pool of JRL was filled to its initial elevation of 1,036.0 feet during November 1964, and was raised to the current 1,039.0-ft. elevation during April 1976. The Cottonwood and Neosho River Basins Water Assurance District No. 3 and Western Resources, the operators of Wolf Creek Nuclear Power Plant, have contracted with the State of Kansas for all of the water supply storage in the reservoir (USACE 1996). The power plant pumps water from the Neosho River below the dam structure to store in the Coffey County Fishing Lake, approximately three miles east of the John Redmond Dam.

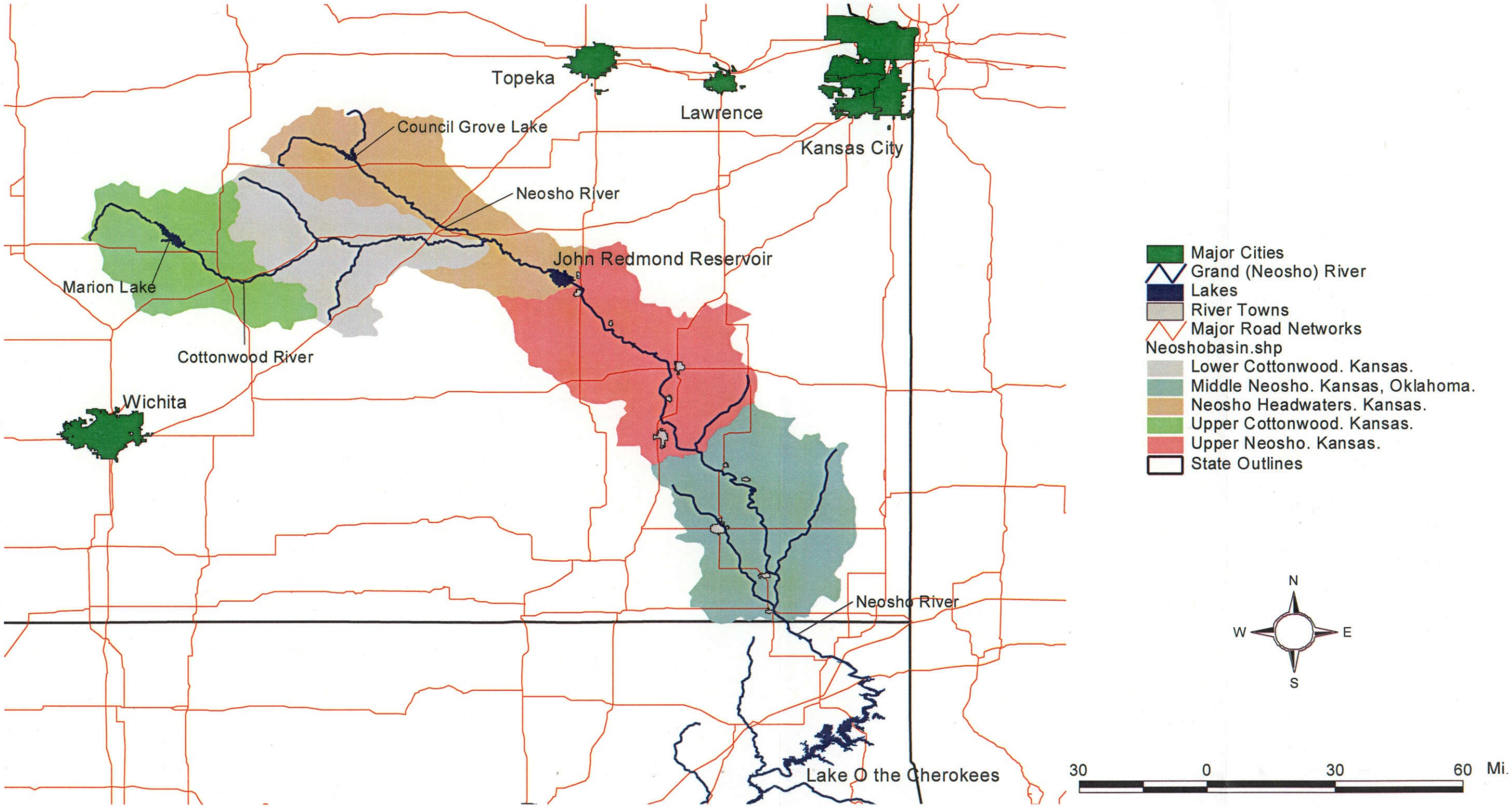


Figure 1-1. Location Map for John Redmond Dam, Lake, and the Neosho River to the Grand (Lake O' the Cherokees) Reservoir

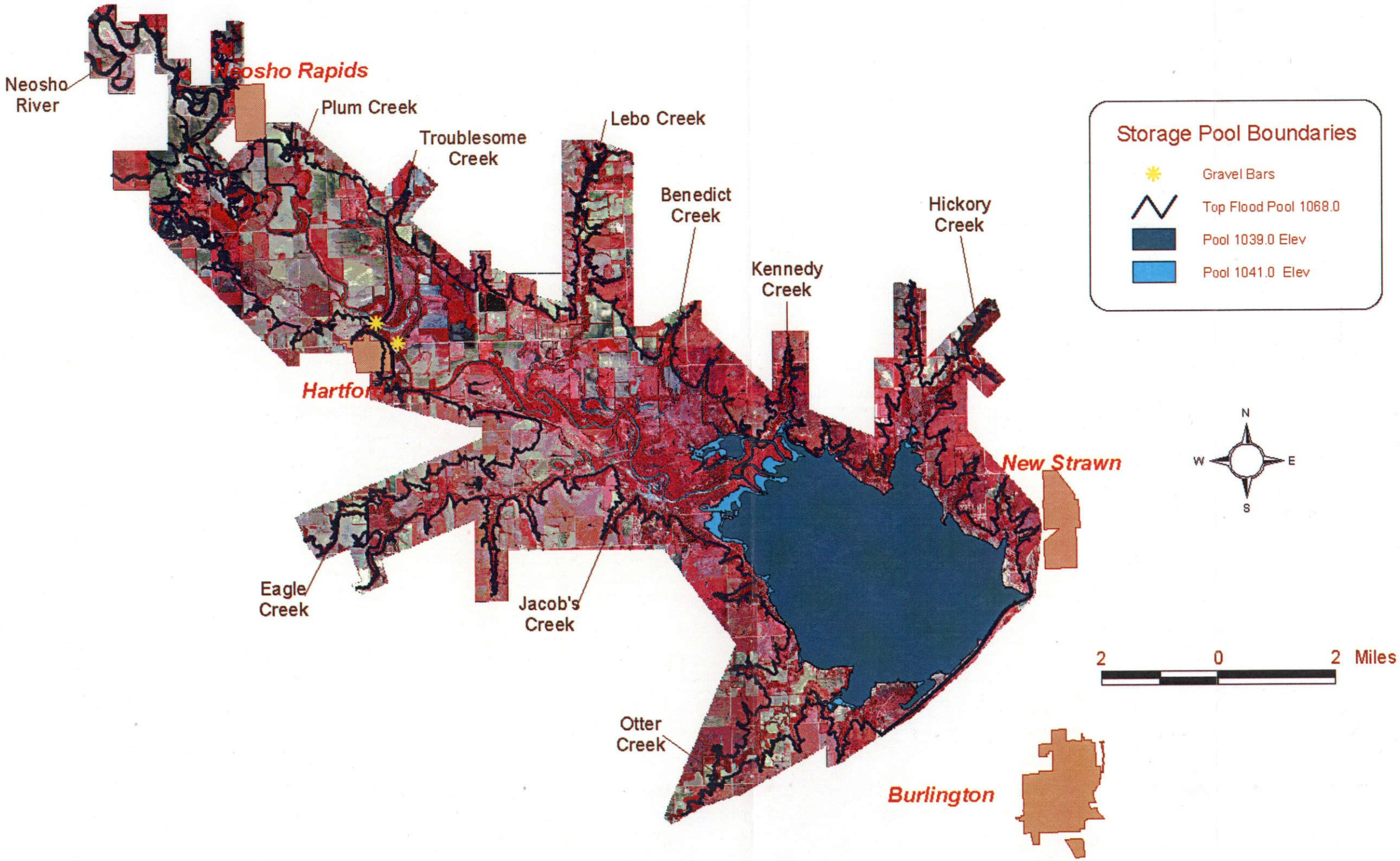


Figure 1-2. John Redmond Lake Site
Conservation and Flood Control Storage Pool Boundaries

1.2 Project Area Location and Management

John Redmond Dam and Lake lie between the towns of Neosho Rapids, Hartford, and Burlington on the Neosho River (RM 343.7) in Coffey and Lyon Counties, KS (**Figure 1-1**) The project area evaluated for the BA includes JRL, associated federal and state leases, and the Neosho River downriver of the dam to the upper limits of Grand Lake (Lake O' the Cherokees), OK (**Figures 1-1 and 1-2**). The USACE (the Arkansas River Control Section of the Hydrology and Hydraulics Branch, Tulsa District) regulates John Redmond Dam and Reservoir according to the water control plan (USACE 1996)

The USACE project manager operates the dam and reservoir under the direction of the Operations Division, Tulsa District. It is a multi-purpose project authorized for flood control, water supply, water quality, recreation, and fish and wildlife. The principal regulation issue identified historically was river bank erosion that occurs during and after periods of high flows in the Neosho River below the dam. To minimize river bank erosion, releases are decreased as slowly as possible to slow the rate of fall in the river stage, since this erosion has been attributed to the fast rate of fall from natural and regulated flows (USACE 1996). However, a recent research project determined that aside from localized channel widening, there was little post-dam construction change in bank-full channel width (Juracek 1999).

In addition to site management by the USACE, leases have been signed with other federal (USFWS) and state (KDW&P) agencies to provide land management for the Flint Hills National Wildlife Refuge (FHNWR) and Otter Creek Wildlife Area (OCWA) (**Figure 1-2**) The USACE maintains six public-use areas, five of which have recreation parks providing camping, picnic areas, drinking water, and sanitary facilities (USACE 1996). Additional recreation facilities present on USACE-managed lands include five boat ramps, an overlook, and a swimming beach.

FHNWR was established in 1966 and consists of approximately18,500 acres located on the upstream portion of JRL (FHNWR 2000). The refuge is managed primarily for migratory waterfowl; its specific management focus includes:

- Intensive use by ducks and geese during spring and fall migration;
- Intensive use by shorebirds during late summer migration,
- Farmlands managed on a share basis with area farmers – the Refuge portion provides food for migrating waterfowl and resident wildlife;
- Numerous constructed ponds and shallow marshes provide additional waterfowl habitat;
- Closures are provided for waterfowl and bald eagle management, and
- Public access restrictions are incorporated during periods of intensive waterfowl use.

OCWA was established in 1966 and consists of approximately 1,472 acres adjacent to FHNWR and the southeast portion of John Redmond Dam. This wildlife area is managed primarily for upland game species: white-tailed deer, wild turkey, mourning dove, bobwhite quail, cottontail rabbit, and squirrel. It's specific management focus includes·

- Farmlands managed on a share basis with area farmers – the wildlife area portion provides food for resident upland game animals and migrating waterfowl;

- Fishing access and management, particularly for channel and flathead catfish;
- Introduction of native ground cover for restoration sites, particularly tallgrass prairie species; and
- Day use recreation.

Permitted activities on the FHNWR include wildlife observation, hiking and sightseeing, photography, boating, picnicking, camping, fishing, hunting, wild food gathering, and fish bait collection. Interpretive trails are present and include the Dove Roost Trail and the Headquarters Trails. OCWA provides wildlife observation, sightseeing, photography, boating, fishing, and hunting opportunities (**Figure 1-3**).

Figure 1-3. Loading at the Boat Ramp and Cat-Fishing, John Redmond Lake—From OCWA.

1.3 Project Alternative Actions

Four potential alternative actions have been identified and proposed for the Reallocation of Water Supply Storage Project at JRL; they are:

I. **No Action**. The current operating plan for the reservoir remains in effect with its existing sedimentation and water storage issues.

II. **Dredge John Redmond Reservoir**. Remove enough sediment from the reservoir to provide the required water supply storage.

III. **Storage Reallocation**. Raise the reservoir conservation pool to elevation 1,041.0 feet (NGDV) to accommodate for sediment buildup. A phased pool raise of one foot to elevation 1,040.0 feet (NGVD), then two 0.5-foot increments, first to 1,040.5 feet and then to 1,041.0 feet elevation.

IV. **Proposed Action: Storage Reallocation**. Raise the reservoir conservation pool to elevation 1,041 0 feet (NGVD) to accommodate for sediment buildup using a single pool raise of two feet.

The following data and **Table 1-2** presents the post-construction JRL baseline Specific physical data describing the dam (USACE 1996), include:

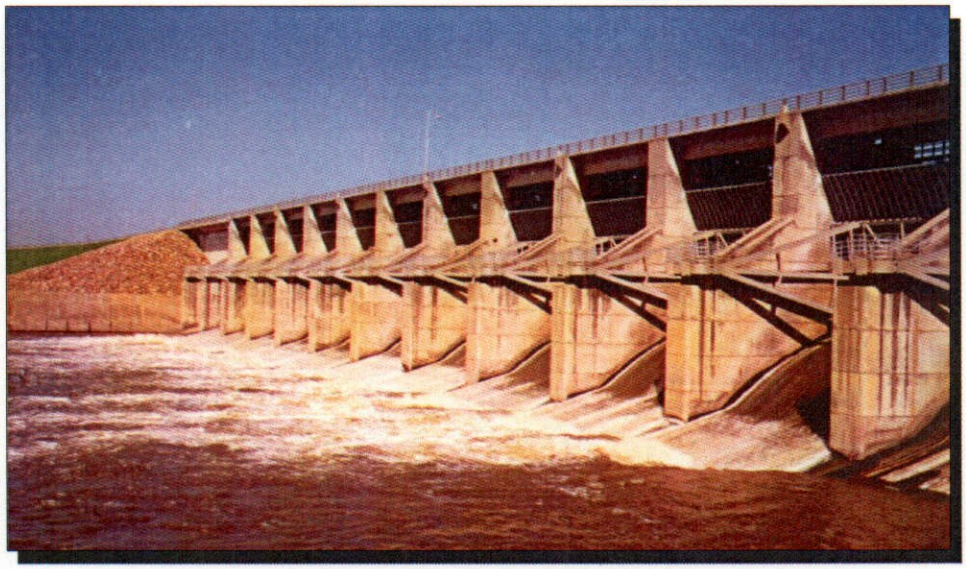
- Earthfill Dam Structure: 20,740 feet long (not including spillway); dam top = 1,081.5 feet NGVD; maximum height = 86 5 feet above the Neosho River bed; crest width = 35 feet 7 inches.
- Spillway· located near left abutment; concrete chute, gated ogee weir; crest elevation = 1,033 0 feet NGVD; length = 560 feet; control = 14 (40 ft. x 35 in.) tainter gates; hoists are individual electric motors.
- Outlet Works: two 24-inch circular pipes for low flow; one 30 inch circular pipe for water supply; invert elevation = 1,015 5 feet NGVD; invert placed through left abutment of spillway; control = motor-operated butterfly valves for low flows and manually-operated gate valves.
- Land Acquisition: taking line is semi-blocked to elevation 1,063.0 feet; easement is elevation 1,073.0 feet or limits of backwater envelope curve.

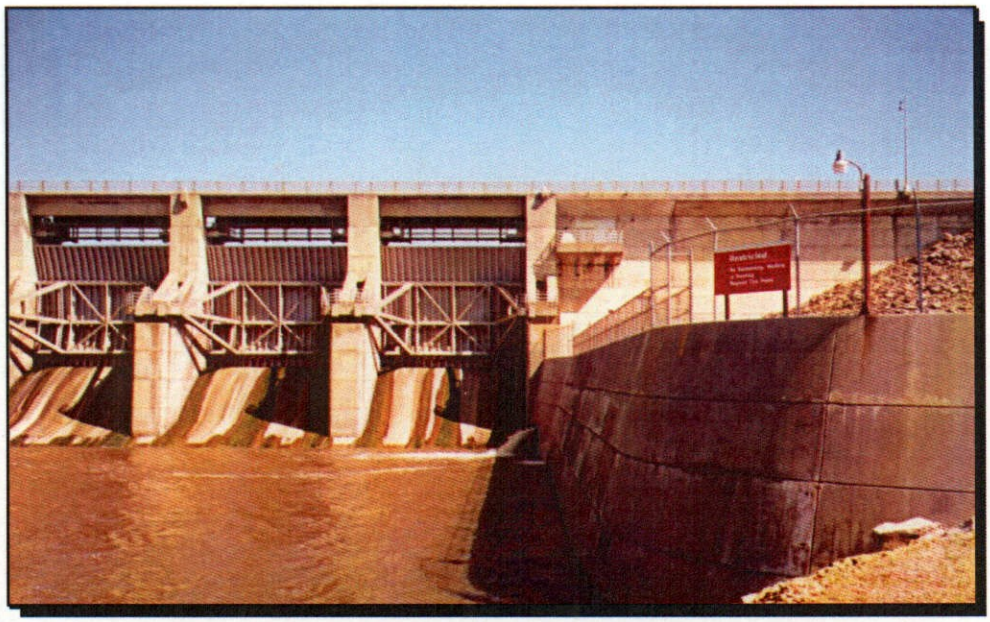
Table 1-2. Project Elevations, Surface Areas, and Storage Volumes (Source USACE 1996)

Project Feature	Elevation in Ft. NGVD	Surface Area in Acres	Storage Volume in Acre-Ft.[1]	Spillway Capacity (cfs)
Top of Dam	1081 5	58,187	1,171,000	732,000
Maximum Pool	1074 5	43,106	807,941	575,000
Surcharge Pool	1073.0	41,111	748,977	542,000
Flood Control Pool	1068.0	34,331	574,918	430,000
Conservation Pool	1039.0	8,084	50,501	25,000
Spillway Crest	1033 0	4,801	9,980	0
Inactive Pool	1020.0	0	0	—
Streambed – Dam	995 0	—	—	—
Flood Control Storage	1039 0 – 1068 0	—	524,417	—
Conservation Storage	1020 0 – 1039.0	—	50,501	—

(1) Based on runoff from uncontrolled drainage area of 2,569 mi^2 (top of dam = 8 55 in and spillway crest = 0 11 in. of precipitation. Resurvey using 2000 data.

Figure 1-4. John Redmond Dam, KS





2.0 METHODS

Three methods were used to gather data for this BA 1) existing literature and data was gathered and reviewed pertinent to the analyses required to describe the project baseline and assess impacts to listed species; 2) researchers/resource professionals knowledgeable of the region, site, and species under consideration were contacted and interviewed; and 3) a site visit was conducted when the water level was at 1,041.5 feet (0.5 ft. higher than the proposed pool raise), to observe the JRL landscape. Listed species recovery plans were of particular importance because they describe the species natural history, distribution and abundance, and delineated actions considered necessary for recovery and/or protection (USFWS 1991 and 1996).

2.1 Existing Data Review

Existing literature and data available for the JRL area were obtained from federal and state resource agencies, and requested from researchers contacted via telephone and electronic mail. Other data sources were accessed from Internet Web sites and reviewed from regional references All data were evaluated for inclusion in this BA. Relevant data for the site hydrology, abiotic and biotic conditions, and species biology, provided the baseline descriptions from which project-related impacts were determined. Of particular importance in impact evaluation to aquatic species was the hydrology modeling performed by the USACE (2001).

Hydrology Model

The JRL and Neosho River hydrology was modeled to determine the impact of reallocating flood control storage to water supply storage to meet contractual water supply requirements through the year 2014, which is the end of the original project economic life (USACE 2001). The USACE SUPER computer model was used to simulate regulation of a multi-purpose reservoir system on a daily basis and to perform an economic analysis of the simulation (Hula 1990).

Four SUPER runs were performed to model:

1. existing conditions for the year 2014 (I. No Action Alternative);
2. raising the top of conservation pool to elevation 1,040 feet (III. Multiple Raise Alternative);
3. raising the top of conservation pool to elevation 1,040 5 feet (III. Multiple Raise Alternative); and
4 raising the top of conservation pool to elevation 1,041 feet (III. Multiple Raise Alternative and IV. Proposed Alternative).

SUPER runs 2, 3, and 4 were analyzed to determine the impacts of these pool raises on upstream (backwater) and downstream (flow) conditions. The computer simulation assumed all reservoirs were in place for the entire period of record and that each reservoir operated based on specific operational criteria. The period of record for the Arkansas River system model used was 56 years (January 1940–December 1995)

The basic SUPER regulation simulation model was run for each alternative operational scenario in the study, except dredging. Two additional modules were also run to develop hypothetical frequency discharges up to the Standard Project Flood for both existing and modified conditions. The additional frequency points were calculated to provide better definition to the upper end of the discharge-frequency curve for extremely rare events Also for this study, hypothetical storms were developed at 67 storm centers within the modeled area at 40 and 50 percent of the Probable Maximum Precipitation.

Reallocation to elevation 1,041 feet accounted for a small amount (3.18%) of the flood pool and resulted in only slight increases in the outflows. For larger flood events there was virtually no difference in pool levels and operations, and only slight differences were observed for smaller flood events. These differences were considered minimal by USACE hydrologists (SUPER 2001).

Listed Species

Recent conservation plan development by the USFWS for FHNWR (2000) and the Geographic Information System (GIS) database development by the Kansas Biological Survey (Egbert et al. 2001) provided current data concerning vegetation and wildlife habitat within JRL. The GIS database was produced using three-date, multi-seasonal Landsat Thematic Mapper imagery and a hybrid classification approach to create an alliance-level cover map for Kansas An assessment of map accuracy was conducted using independent ground verification samples and standard accuracy assessment analysis and reporting procedures. The Kansas GAP vegetation map (Egbert et al. 2001) is considered appropriate for use in large-area resource planning (watershed or county level, or higher). In terms of scale, the map can generally be used for analysis at the 1 100,000 or possibly the 1:50,000 scale, using the GAP land cover map at scales of 1:24,000 or finer is usually inappropriate (Egbert et al. 2001). The minimum mapping unit is approximately five acres. Data analysis and review of the conservation plan allowed preparation of general habitat descriptions, habitat distribution, and also allowed an overlay of elevation data to more accurately describe potential impacts to habitats that may support listed species.

The KDW&P conducts bald eagle surveys along with waterfowl surveys twice monthly, or 14 counts from September through March (Kraft, pers. com. 2001). Most surveys were conducted from various vantage points on the ground around water bodies used by waterfowl. Data were presented for the years 1970–2000 (Kraft 2001) (**Attachment B**)

The Neosho madtom has received increased research emphasis relative to its listed status since the publication of the recovery plan in 1991. Several studies addressing the species distribution, abundance, and behavior were important for potential impact assessment Studies published by Obermeyer et al. (1997), compared quantitative and qualitative sampling methods for species of mussels in the Neosho River and provided results from 99 freshwater mussel assemblages in the study region.

Valuable sources of information for listed species included recovery plans prepared by the USFWS, research studies conducted by federal and state agency personnel, university scientists and graduate students, private organizations, and consultants. This research provided information

on listed species distribution, abundance, reproductive biology, behavior, and habitat parameters such as structure, flow, water velocity, water quality, and additional aspects of listed species biology.

2.2 Contact with Research Professionals

Research professionals with information concerning listed species were identified and contacted via telephone or interviewed in person. Their knowledge of the project area, the listed species, and of published, unpublished, and/or ongoing research was discussed and recorded in contact records These contacts are documented in the reference section of this BA and form one basis for the ensuing discussions and impact assessment.

2.3 Site Visit

A site visit was conducted June 11–12, 2001, to meet with resource managers from the USACE, USFWS, and KS and discuss the biological resources present, including the listed species, and management implications related to operation of JRL. Coincidentally, the reservoir elevation was at the 1,041.5-foot level for a week prior to and during the site visit. This allowed project biologists and other research professionals to observe the reservoir and upriver and downriver conditions at the approximate elevation (0.5 ft. higher) of the proposed action (IV).

THIS PAGE INTENTIONALLY LEFT BLANK

3.0 EXISTING CONDITIONS

The JRL project area is influenced by a continental climate with average annual precipitation of approximately 35 inches (USACE 1996). Precipitation is heaviest from late spring through early summer, with about 75 percent falling during the growing season. Temperatures range from below zero to above 100° F and the winds are predominantly from the south (FHNWR 2000). Evaporation rates range from approximately 73 inches during normal years to approximately 111 inches during drought years (USACE 1996).

3.1 Topography, Geology, and Soils

JRL lies among low, rounded hills. The topography is a result of generally westerly to northwesterly dipping strata that creates resistant bend and irregular cuesta-like ridges The Neosho River Valley is composed of Holocene, Post-Kansan alluvium and is bordered by the Pennsylvanian–Virgilian, Waubansee Group (west end) and Shawnee Group (east end) sedimentary exposures (Merriam 2000; O'Connor 1953). Small exposures of Tertiary Terrace deposits are present at the northwest end of the reservoir (Merriam 2000). The broad, shallow Neosho River Valley is the most prominent topographical feature on the landscape. The maximum relief is about 225 feet, with most of the site ranging from approximately 1,020-foot elevation near the South Recreation Area below the dam to approximately 1,100-foot elevation west of Neosho Rapids, KS within the flood pool boundary.

Soils formed in the region are relatively shallow silty loams and silty clay loams that tend to be fertile, but are low in organic matter and phosphoric acid (FHNWR 2000). Lack of sufficient depth caused by subsoil restrictions such as tight silty clay, shale, limestone, or sandstone, results in saturated soil in wet seasons and droughty soils during dry seasons. The soils are also highly erosive by water and wind.

Several soils within JRL fit the criteria for prime farmland and farmland of statewide importance. The Woodson silt loam, Verdigris silt loam, Summit silty clay loam (1–4% slopes), Kenoma silt loam (1–3% slopes), Eram silt loam (1–3% slopes), and Dennis silt loam (1–4% slopes) are considered prime farmland (NRCS 1993). The Kenoma silty clay loam (1–3% slopes – eroded) and Dennis silty clay loam (2–5% slopes – eroded) soils are considered farmland of statewide importance (NRCS 1993). In addition, Osage silty clay, Osage silty clay loam, and Lanton silty clay loam soils meet the prime farmland designation if they are drained (NRCS 1993).

3.2 Hydrology

John Redmond Dam was constructed to provide flood control, water supply, maintenance of downstream water quality, and recreation opportunities. This project was originally authorized in 1950 under the Flood Control Act, and was known as the Strawn Dam and Reservoir (DOA–TD 1976). Renamed the John Redmond Dam and Reservoir in 1958, construction was initiated during 1959 and completed in1964. The drainage area was calculated at 3,015-square miles in the upper Neosho River Valley As of January 1, 1976, at the design conservation pool elevation 1039 msl, there were 82,100 acre-feet of water storage, 9,400-surface acres of water, and 58

miles of shoreline. At flood pool elevation 1,068 msl, there were 574.918 acre-feet of water storage and a surface area of 34,331 acres. In 1975, the State of Kansas and the federal government entered into a water supply agreement for an estimated 34,900 acre-feet of storage remaining after 50 years of sedimentation (DOA–TD 2001).

Dams are known to affect river systems, generally decreasing the distribution of sediments and altering the hydrologic regime, physical habitat, and water quality downriver (various authors in Wildhaber et al. 2000) A large amount of sediment is delivered to JRL as a result of erosion from riverbanks and farmlands within the watershed Over 25 percent of the original conservation storage has been filled with sediment, although little change has resulted in flood storage (USACE 1996). This results in approximately 25,500 acre-feet of water quality storage available in the reservoir

Juracek (1999) determined that overall channel response to the altered stream flow regime and sediment load introduced by the John Redmond Dam was minor There was some localized channel widening, but little post-dam change in bank-full channel width This is likely attributable to a substantial reduction in the magnitude of the post-dam annual peak flows in combination with the resistance to erosion of bed and bank geologic exposures and vegetated shoreline (Juracek 1999) The channel may also have been over-widened historically by a series of large floods prior to dam construction.

3.3 Water Quality

The water entering JRL is turbid, carrying silt and sediments from tributary drainages and from agricultural land upriver. Water quality concerns have been documented for most of the surface water entering JRL, including contaminants (FHNWR 2000). Consumption advisories are issued most years for the Neosho River due to chlordane compound concentrations in fish During the 1970s several fish kills were related to runoff from confined livestock feedlots. Investigations by the USFWS, Kansas Field Office, identified PCB, atrazine, and heavy metals, including lead, mercury, and arsenic in biota samples, along with lead in sediment samples (FHNWR 2000). Lead, zinc, and cadmium may lower populations of benthic macroinvertebrates used as food sources by the Neosho madtom, therefore reducing its population (Wildhaber et al 1998).

Water quality samples are taken from selected sites at JRL, analyzed on a periodic basis, and published (USACE 1996). The United States Geological Survey (USGS) maintains a national stream-quality accounting network station on the Neosho River near Parsons, KS, where specific conductance, pH, and temperature are recorded bimonthly. Samples are also taken at this site for chemical, biological, and sediment analysis The USGS also collects and analyzes periodic samples for specific conductance, pH, and temperature on the Neosho River at Americus, Burlington, and Iola, KS These data are published in the *Water Resources Data, Kansas* annual report. Neosho River water quality is considered good, requiring only basic treatment for industrial or municipal use (USACE 1996).

Surface water is also sampled monthly below the John Redmond Dam, near the Wolf Creek Generating Station (WCGS) take-up screen house (KDH&E 1999) These samples are taken as controls to compare water quality with that of the Coffey County Lake, discharge cove, and the

spillway. The radiological analyses of samples included gross alpha, gross beta, tritium (H^3), and gamma isotopes.

Thirty sedimentation ranges established upriver from the dam are measured periodically Both endpoints of each range are identified with permanent markers of known vertical and horizontal positions and all are surveyed periodically to compute sediment deposition (USACE 1996). Sedimentation was last measured during the summer of 2000.

The Kansas Department of Health & Environment (KDH&E) classified the Neosho River (downstream from Council Grove Reservoir) and the Cottonwood River as special aquatic life use waters (USFWS 1991). Further defined, these are waters that contain unique habitat types and biota, or species that are listed as threatened or endangered in KS. The general provisions of the KS surface water quality standards (K.A.R. 28-16-28c) state: "... no degradation of water quality by artificial sources shall be allowed that would result in harmful effects on populations of any threatened or endangered species of aquatic life in a critical habitat..." (USFWS 1991) The KDH&E could issue a variance, however, if "important social and economic development" is impaired (USFWS 1991).

The KDW&P (2000) (**Attachment A**) stated. "The Neosho River immediately upstream from John Redmond Reservoir is Kansas-designated critical habitat for the Neosho madtom and Ouachita kidneyshell mussel The Neosho River immediately downstream from the John Redmond Dam is designated critical habitat for the Neosho madtom, Ouachita kidneyshell mussel, and rabbitsfoot mussel. The Cottonwood River immediately upstream of John Redmond Reservoir is designated critical habitat for the Neosho madtom, Ouachita kidneyshell mussel, and the Neosho mucket mussel."

Low flow releases are currently made during dry periods in order to meet minimum flow requirements at Chanute, KS. The minimum flow requirements range from 21 cfs (November-March) to 48 cfs (July-August), or an average of 30 cfs annually (USACE 1996). Major deviations to the water control plan have been approved historically (at the request of the State of Kansas) to manipulate pool levels for the benefit of fish and wildlife habitat.

3.4 Logjam

A drift logjam up to 3/8–mile in length occurs in the Neosho River, near the Jacob's Landing site, above JRL (**Figure 3-1**). The logjam has formed above an island in the Neosho River, which causes the river to fork into two channels. This logjam has attracted local attention in favor of removal, and was a topic of comments obtained during public meetings held in Burlington, KS (USACE 2000). Although the logjam does not contribute to downriver flooding, it is quite large and was considered cost prohibitive to remove (FHNWR 2000)

Figure 3-1. Logjam Area Upriver of John Redmond Lake.

Local citizens attempted removal of the logjam by burning during the summer of 1999, but the wet wood would not carry the fire (FHNWR 2000). The accumulated debris at this site is considered economically unfeasible to remove by demolition or mechanical means. The Neosho River may form a new channel around this location, south of the existing channel (Jirak, pers. com. 2001).

3.5 Fishery

The JRL was recently studied to determine its affect within the Neosho River and on the associated Ictalurid (catfish) populations (Wildhaber et al. 2000). Research conducted to date indicated a positive relationship between the density of Neosho madtoms and the density of other riffle-dwelling benthic fishes. The evidence suggested that interspecific competition was not limiting Neosho madtom populations (Wildhaber et al. 1999). Comparative studies were conducted to determine differences in the Neosho River fishery above the John Redmond Reservoir and below the dam structure (Wildhaber et al. 2000). Generally, more fish were present above JRL than occurred below the dam. The Neosho madtom densities were very low near a Burlington, KS river gauge, but increased to almost the population levels determined above the reservoir near the Iola, KS gauge. The Neosho madtom densities decreased again from Iola, KS, downriver to Parsons, KS.

Table 3-1. Mean Density of Ictalurid Fish Species Captured Above John Redmond Lake and Below John Redmond Dam, Kansas. (Source: Wildhaber et al. 2000.)

Fish Species	Mean Density Above JRL	Mean Density Below Dam
Neosho madtom	19.82/100m^2	5.64/100m^2
Channel catfish	34.31/100m^2	18.73/100m^2
Stonecat	4.61/100m^2	2.83/100m^2
All catfish excluding Neosho madtom	45.40/100m^2	25.66/100m^2

Note: research was conducted at an average water depth - velocity of 0.33m - 0.34m/s above JRL and 0.38m - 0.35m/s below the dam.

Water temperature was cooler by approximately 3°C above the dam (24.74°C) than below (27.58°C) (Wildhaber et al. 2001). Turbidity was higher above the dam (57.0 NTU) than downriver of the dam (27.17 NTU), but the pH was nearly the same (8.37 above vs. 8.47 below). Dissolved oxygen increased downriver of the dam (4.66 mg/l vs. 5.62 mg/l); however, conductivity, alkalinity, and hardness were all higher above the dam structure. It is unknown if these factors limit ictalurid populations (Wildhaber et al. 2000).

The Fredle Index (geometric mean adjusted for distribution of particle sizes) was lower above the dam than downriver from the dam (5.52 vs. 7.82). Although not significantly different, this index indicates that more evenly distributed substrate sizes occur upriver from the reservoir, and a shift to the predominance of larger gravel below the dam may be occurring. This increased coarseness of the substrate is considered a common effect of reservoirs and could be a limiting factor for Neosho madtom populations (Wildhaber et al. 2000).

3.6 Vegetation Resources and Land Cover

A variety of vegetation types that provide wildlife habitat are present within the JRL project area. The highest site elevations support tall- and mid-grasses in a Bluestem Prairie type, also known as Tallgrass Prairies (McGregor et al. 1986). Dry, upper slopes, ridges, and hilltops are dominated by little bluestem, a mid-grass, and lower slopes are dominated by big bluestem, a tall grass. Common associates of the drier upper slopes include side-oats grama, purpletop, and Indian-grass. More mesic lower slopes support broomsedge bluestem, Kentucky bluegrass, silver bluestem, switchgrass, and witchgrass, in addition to big bluestem.

The valley adjacent to the flood plain of the Neosho River and its tributaries, and the reservoir margin, support deciduous woodlands, shrublands, and emergent wetlands. Remnants of farmstead and windbreak plantings are also present, including eastern red cedar, American elm, and Osage orange trees.

Figure 3-2. Representative Upland Woodland at JRL.

Upland woodlands occupy drier sites and may be described as an Oak–Hickory Woodland. This type is dominated by burr oak, northern red oak, pin oak, shagbark hickory, and shell bark hickory. On the driest sites, bitternut hickory, chinquapin oak, Osage orange, redbud, and eastern red cedar are the common tree species. Upland sites typically have good surface and internal drainage. The red oak dominated, north-facing slopes are unique Ozarkian Woodlands as observed in the Eagle Creek drainage (Minnerath, pers. com. 2001).

Figure 3-3. Representative Bottomland Woodland at JRL.

Lowland woodlands occupy relatively mesic sites and may be described as Elm-Ash-Cottonwood Woodland or a Bottomland Hardwood Type. This type is dominated by American elm, green ash, eastern cottonwood, black willow, black walnut, sycamore, silver maple, burr oak, box-elder, and hackberry. Lowland sites typically have heavy soils with poor surface and internal (subsurface) drainage

Figure 3-4. Representative Shrublands at JRL.

Shrublands are present as buttonbush and seedling black willow and eastern cottonwood growing adjacent to the reservoir and river margins. In addition, flood plain shrublands dominated by buckbrush, greenbriar, dogwood, American plum, and the liana, wild grape are present within the project area. Some shrublands are also invading grasslands; these are dominated by species of sumac and seedling trees such as eastern red cedar.

Figure 3-5. Representative Wetlands at JRL.

Wetlands of JRL are typically smartweed beds that grow in shallow coves or in the moist soil units introduced (using levees) to FHNWR. Some emergent wetland species present in moist soil units include spike-rush, bulrush, cattail, and sedge. Some stands of seedling silver maple, eastern cottonwood, and black willow are also present. On the reservoir draw-down zone, weedy annuals such as cocklebur, foxtail grass, and barnyard grass are the common species. Millet is sometimes aerially seeded to draw-down sites to produce waterfowl and fisheries forage.

Croplands within the JRL project area are planted to corn, milo, soybean, winter wheat, sunflower, and alfalfa (**Figure 3-6**). Crops are shared with tenant farmers; a portion is harvested and sold by the farmer, and a portion remains in the field for high-nutrient wildlife forage. Retired agricultural lands and other disturbed lands have been identified as sites for restoration using native grass species (Gamble and Barlow, pers. com. 2001). Several native grass restoration sites on the FHNWR and the OCWA have failed due to flood events during the 1990s.

Figure 3-6. Representative Fallow and Planted Croplands at JRL.

3.7 Wildlife Resources

FHNWR (2001) lists 294 species of birds, including 90 species that are known to nest on the refuge. The refuge provides habitat for a variety of avifauna that use the upland, grassland, agricultural land, hardwood riparian stands, marshes, and flooded sloughs. The peak of migration is April–May for passerine species, July–August for shorebirds, and November–December for waterfowl species. The John Redmond area provides for non-consumptive naturalist activities such as bird watching and for the consumptive use of waterfowl, turkey, northern bobwhite quail, and mourning dove through hunting.

Raptors common to the area include the American kestrel, prairie falcon, northern harrier, red-tailed hawk, great-horned owl, barred owl, and wintering bald eagles. Although not strictly raptors, the turkey vulture and American crow are also common (FHNWR 2001).

Passerine birds common to and nesting within JRL include the American goldfinch, eastern meadowlark, red-winged blackbird, northern cardinal, common yellowthroat, brown thrasher, northern mockingbird, American robin, house wren, black-capped chickadee, barn swallow, horned lark, eastern kingbird, and red-bellied woodpecker among many other species (FHNWR 2001). The introduced European starling and house sparrow are also considered abundant passerine birds for the area.

Shorebirds common to the area include the killdeer, American avocet, herons, plovers, sandpipers, yellowlegs, dowitchers, gulls, and terns (FHNWR 2000). Common waterfowl species present during migration include the mallard, teal (green-winged, cinnamon, and blue-winged), northern shoveler, common merganser, lesser scaup, redhead, wood duck, and

American coot (KDW&P 2001). Commonly observed species of goose include Canada, Ross, snow, and white-fronted.

The numbers of waterfowl present through the season is variable, depending on habitat availability and quality. During the year 2000 migration, approximately 48,600 geese and 48,000 ducks were counted (KDW&P 2001). During the year 1996 migration, approximately 103,000 geese and 236,000 ducks were counted (KDW&P 2001). The primary use of the JRL site by waterfowl is for resting and foraging during migration, little waterfowl nesting activity occurs in the area (Gamble, pers. com. 2001).

A variety of game and non-game mammals are present within the JRL area. The principal game mammals include the eastern cottontail, eastern fox squirrel, and white-tailed deer. Common furbearers present include the muskrat, raccoon, and a few beaver, and the carnivores, coyote, red and gray fox, mink, and species of weasel. The river otter has been reintroduced to the region and a few have been observed using the Neosho River (Gamble, pers. com. 2001).

Fish species common to JRL include the channel and flathead catfish, carp, white bass, and crappie (FHNWR 2000). A variety of amphibians are present, including the plains leopard frog, bullfrog, Woodhouse's toad, and tiger salamander. Common reptiles using JRL aquatic and upland habitats include the snapping turtle, map turtles, softshell turtles, box turtles, the common garter snake, northern water snake, and species of skink.

3.8 Bald Eagle

The bald eagle (**Figure 3-7**) is federally listed as threatened; however, it is under consideration for delisting (*Federal Register* 1999). The species is considered a transient through the FHNWR and the JRL site, and its occurrence is listed as common during the winter months (FNHWR 2000 & 2001). The KDW&P conducts counts of eagles, along with waterfowl species, every other week from the latter half of October through the end of March (Kraft and Culbertson, pers. com. 2001) (**Attachment B**). Bald eagles are first observed in the latter half of October, at the beginning of waterfowl census, and remain through the latter half of March when waterfowl counts are discontinued (KDW&P 2001).

Figure 3-7. Representative Photograph of the Bald Eagle.

Bald eagles use trees around JRL and along the Neosho River and its tributaries as perches for foraging, resting, and as roosts (Gamble, Kraft, and Culbertson, pers. com. 2001). When ice formed on JRL, bald eagles were observed resting directly on the ice where they consumed waterfowl and fish from an open portion of the lake (Culbertson, pers. com. 2001). Bald eagles may take waterfowl directly, in addition to foraging or scavenging for dead and wounded birds.

The total season counts have ranged from as few as one bald eagle in 1974 to as many as 280 in 1988. On average, 10 to 20 individual bald eagles use the JRL area at any one time (Culbertson, pers. com. 2001). Bi-weekly counts over the past 30 years have yielded no bald eagles observed (several periods) and as many as 104 individuals present in the latter half of February 1987 (KDW&P 2001). During the year 2000, 65 bald eagle observations were recorded during the season. four in late December (12/16-31), zero in early January, eight in late January (1/16-31), seven in early February (2/1-15), 29 in late February (2/16-28), 15 in early March (3/1-15), and two in late March (3/16-31) (KDW&P 2001).

Bald eagles were also listed as a nesting species for the FHNWR (FHNWR 2000). In approximately three of the last ten years, a pair (or possibly different pairs) of bald eagles performed nest initiation, but rapidly abandoned the behavior (Gamble, pers. com 2001). It is probable that these were young eagles, as they did not complete nest construction or initiate breeding or egg-laying activities (Gamble, pers. com 2001). The principal site for nest initiation activity at JRL was in the Lebo Creek area (Culbertson, pers. com. 2001). A successful nest site was reported from near the Coffey County Fishing Lake, near the Wolf Creek Power Plant (Culbertson, pers. com 2001).

3.9 Western Prairie Fringed Orchid

The western prairie fringed orchid (WPFO) is federally listed as threatened. Populations of the WPFO in KS, south of the Kansas River, occur in ecoregion 251E (Osage Plains Section of the Prairie Parkland Province) (Bailey et al. 1994). The species may be found within unplowed mesic to wet-mesic prairies and sedge meadows on unglaciated, level to hilly sites, and on Pennsylvanian-age sediments covered with a thin, discontinuous mantle of loess residuum (USFWS 1996). WPFO plants have been observed in the successional communities of borrow pits, old fields, and roadside ditches, and may also have occurred historically on mesic sites in the flood plains of several major rivers in KS (USFWS 1996) The species decline is principally attributed to the conversion of habitat to cropland.

In eastern KS, WPFO habitat was described as mesic to wet-mesic prairies and in northeastern KS it was described as wet-mesic to mesic tallgrass prairie. Freeman (pers. com. 2001) stated that south of the Kansas River the WPFO grows in mesic prairie (dominated by species of sedge, switchgrass, and big bluestem) and moist seeps (the seeps usually are the result of water flowing along a contact between shale and limestone formations). Populations of WPFO in KS are isolated and small and none support more than 50 individual plants (USFWS 1996)

The WPFO has not been documented within the JRL project boundaries Habitat here is considered too dry to support the species (Minnerath, pers. com 2001). There is no mesic tallgrass or wet meadow habitat between the 1,039-foot and the 1,041-foot elevation of the existing and proposed conservation pool (Minnerath, pers. com. 2001). One mesic prairie site of approximately 380 acres has been identified near Neosho Rapids, KS, approximately three miles northwest of the northwestern-most project boundary and within the flood easement boundary This site is dominated by prairie cordgrass and eastern gammagrass and represents potential habitat for the WPFO, although no plants have been observed (Minnerath, pers. com. 2001).

Figure 3-8. Representative Photograph of the Western Prairie Fringed Orchid.

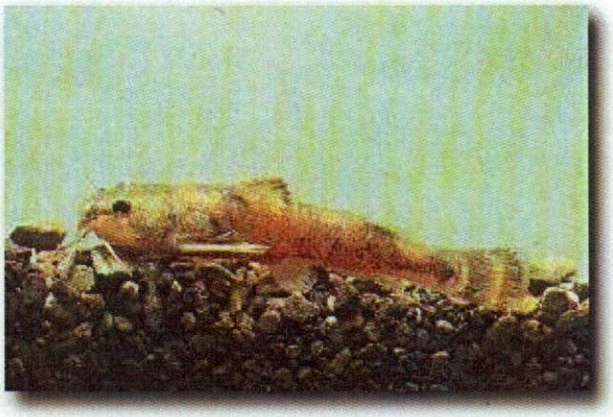
The western prairie fringed orchid is known from Douglas, Franklin, Jackson, Jefferson, Leavenworth, Lyon, Osage, and Shawnee counties in Kansas (USFWS 1996; Freeman, pers. com. 2001). These counties lie mostly north of JRL, which is located predominantly in Coffey and Lyon Counties (although Osage and Franklin counties abut along the north and northeastern Coffey County boundary, respectively). One historical report of the WPFO was documented within the Waverly Prairie of Coffey County during 1969. This prairie was converted to cropland, destroying the former WPFO habitat (Freeman and Brooks 1989). Another population was known in the vicinity of Reading, KS in northeastern Lyon County (Freeman, pers. com. 2001).

3.10 Neosho Madtom

The Neosho madtom (**Figure 3-9**) is federally listed as threatened. It is a small catfish that occupies gravel bars and smaller areas of gravel in rivers of the Neosho Basin (USFWS 1991, Edds, pers. com. 2001). It was federally listed as threatened by the USFWS in May 1990, and a recovery plan was approved the following year (Wildhaber et al. 2000). Historically, it was documented in the Neosho, Cottonwood, Spring, and Illinois Rivers in Kansas, Missouri, and Oklahoma. However, the last collections from the Illinois River were made during the mid–1940s (NSRA 1996). The current distribution for the Neosho madtom includes the Neosho River from Commerce, OK to extreme southeastern Morris County, KS; the Cottonwood River from its Neosho River confluence to central Chase County, KS; and the Spring River from its Neosho River confluence to western Jasper County, MO (USFWS 1991, NSRA 1996) (**Figure 1-1**).

Figure 3-9. Representative Photograph of the Neosho Madtom.

In the vicinity of John Redmond Dam, the Neosho madtom is thought to occupy gravel bars near Hartford, KS and is known near Neosho Rapids, KS, upriver from the reservoir. The site that lies approximately 0.75 miles west of Neosho Rapids, KS was sampled in 1994 and supported the Neosho madtom (27 individuals) (NSRA 1996). This location represents a permanent monitor site and has been sampled every year from 1991–2000 (Tabor, pers. com. 2001 and Wildhaber et al. 2000).



The two gravel bars near Hartford, KS are located west of the SH 130 bridge and east of the Hartford Recreation Area loop road (**Figure 1-2**). Historic sampling, e g , 1950s through 1975, determined that Neosho madtoms were present on the gravel bar west of the SH 130 bridge (two individuals). The gravel bar east of Hartford has yet to be sampled (Shaw, pers. com. 2001).

Further upriver from Neosho Rapids, KS, the Neosho madtom has been collected at the following general locations: 1) Lyon County; 13 km east of Emporia, 11 km east of Emporia, 7 25 km east of Emporia, 5 25 km east of Emporia, 2 5 km east of Emporia, Bridge site at SH 99, Emporia water intake at the Prairie Street Bridge, 4 km west of Americus, 6.5 km north of Americus, and 2) Morris County, 1 km west of Dunlap (NSRA 1996). In addition, eight collection sites have been identified for Lyon County and five for Chase County on the Cottonwood River above its confluence with the Neosho River (NSRA 1996).

Downriver from John Redmond Dam, the Neosho madtom has been found as near as Burlington, KS – City Park (NSRA 1996); however, there is a gradual increase in numbers of individual Neosho madtoms further from the dam to the OK border (Tabor, pers. com. 2001). The Neosho madtom has been collected below the dam at the following general locations: 1) Coffey County; Burlington City Park, 2 km east of Burlington, 2.5 km east of Burlington, and 3 km east of Burlington, 2) Woodson County; at Neosho Falls, and 1.5 km east of Neosho Falls, 3) Allen County; 2 km west of Iola, and downriver of the Humboldt Dam, 4) Neosho County; 3 km east of Chanute, southwest of Erie, 2 km south of Erie, 4 km west of St. Paul, 3 km south of St. Paul, 5 km south of St. Paul, and 19 km northeast of Parsons, 5) Labette County; 13 km east of Parsons, downriver of the Oswego Dam, 2 5 km east of Oswego, and downriver of the Chetopa Dam, 6) Cherokee County; 19 5 km west of Columbus and on Lightning Creek 20 km west of Columbus, and 7) Ottawa County, OK; 10 km west of Commerce, 7.5 km west of Commerce, 7 km west of Miami, and 5 km west of Miami (NSRA 1996).

Neosho madtoms are small, less than three inches (approximately 38–78 mm) in length (Bulger et al. 1998) and occupy riffles or portions of riffles (Wildhaber et al. 2000). Young-of-the-year tended to use areas with slower flow, lower substrate compaction, and shallower depths than did adults (Bulger et al. 1998). These catfish burrow into the substrate during the day and emerge to feed in the late afternoon through evening hours (USFWS 1991). They feed at night on larval insects found among the gravel and pebbles (Cross and Collins 1995 in Wildhaber et al. 2000). Other madtoms that share the gravel bed habitat favored by Neosho madtoms include the slender madtom, stonecat, brindled madtom, and freckled madtom (USFWS 1991). Young-of-the-year channel and flathead catfish have also been found in this riffle habitat, in addition to species of minnows and darters (USFWS 1991).

A few Neosho madtom habitat features were summarized by NSRA (1996) from various studies, and a mean habitat range was determined as follows:

Parameter	Range of Data Means
Water Depth	17-20 cm to 46.3 cm
Water Velocity	10.0 cm/s to 50 cm/s at substrate level 25.8 cm/s to 46 2 cm/s at 0.6m depth
Water Temperature	1°C to 29°C
Dissolved Oxygen	Undetermined (minimum value <6 mg/L)
Turbidity	Undetermined
Substrate Material	8mm to 40mm and 65% to 69% gravel/pebble
Density of Occurrence / *Overall Density*	Winter–Spring· 0.6-2.0/10m^2 / *0 3-1 2/10m^2* Summer–Fall 2.5-6.0/10m^2 / *0.8-2.0/10m^2*

Based on samples collected throughout the year and research conducted by Bulger et al. (1998), the highest numbers of Neosho madtoms occur in riffles during daylight hours in late summer/early fall when young-of-the-year are believed to have recruited to the population (Wildhaber et al. 2000). Research further suggest that Neosho madtoms have a short life cycle (possibly annual) with young-of-the-year appearing with adult collections about the same time the adults began disappearing from collections (Wildhaber et al. 2000). They probably spawn during the period of highest discharge during the summer (USFWS 1991)

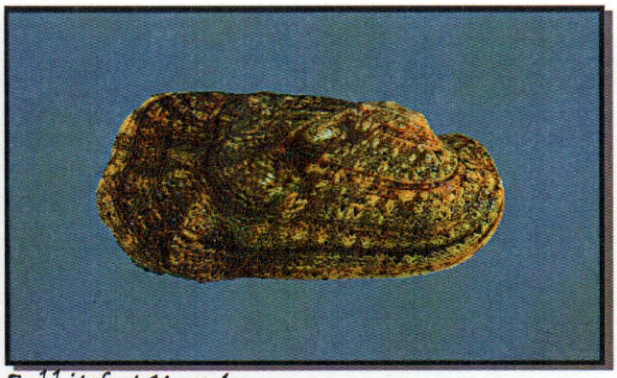
Bulger et al. (1998) reported that most individuals spawned in their second summer (Age I individuals) and very few, if any, survived to spawn at Age II. Also, Bulger et al (1998) observed the development of genital papillae and other external morphological characteristics in breeding adults Courtship behavior was observed and included the carousel and tail curl, similar to behavior observed in other madtom species. Two successful spawning events were studied in the laboratory, and the Neosho madtom females produced 32 and 30 eggs respectively (Bulger et al. 1998). Only two eggs survived, but these hatched in eight days and produced young that were 13 mm and 14 mm in length. In two earlier studies, a Neosho madtom female produced 63 eggs in a flow aquarium at Emporia State University (Pfingsten and Edds 1994) and another produced approximately 60 eggs (Wilkinson and Edds 1997). Bulger et al. (1998) suggested that the small clutch size may be due to time of season (second clutch production) or stress related to the experimental environment.

3.11 Neosho Mucket Mussel, Rabbitsfoot Mussel, and Ouachita Kidneyshell Mussel

Three rare species of unionid mussels recognized as federal species of concern and KS endangered (Neosho mucket mussel and rabbitsfoot mussel) or threatened (Ouachita kidneyshell mussel) may occupy gravel bars of the Neosho River, including some that support the Neosho madtom (USFWS 1991; Obermeyer et al. 1997, Shaw, pers. com. 2001) (**Figure 3-10**). The Neosho mucket mussel is under consideration for listing as a candidate species by the USFWS, an action that may occur during the year 2001 (Mulhern, pers. com 2001).

Figure 3-10. Representative Photographs of Listed Mussel Species.

Ouachita Kidneyshell Mussel



Rabbitsfoot Mussel

The Neosho mucket mussel is endemic to the Arkansas River system, including the Neosho, Spring, Elk, Illinois, and Verdigris River basins of Kansas, Missouri, Oklahoma, and Arkansas. The Ouachita kidneyshell mussel occupies the Arkansas, Black, Red, St. Francis, and White River systems in Arkansas, Kansas, Missouri, and Oklahoma. The rabbitsfoot mussel is more widespread, occupying the Ozarkian and Cumberland faunal regions of 13 states, but is most abundant in the Black River system of Arkansas (Obermeyer et al. 1997).

Nine sites were surveyed in the Neosho River during the summer of 1994 (Obermeyer et al. 1996) to compare quantitative and qualitative sampling methods for evaluating relative abundance, species richness, diversity, size structure, and evidence of recruitment. There was little evidence of recent recruitment detected for mussels observed during this study. Of 21 sites surveyed in the Neosho River from 1993–1995, 32 species of mussel were identified, including 24 live species, four species identified from a literature search, two species identified from recent dead shells, and two species identified from weathered dead shells (Obermeyer et al. 1997).

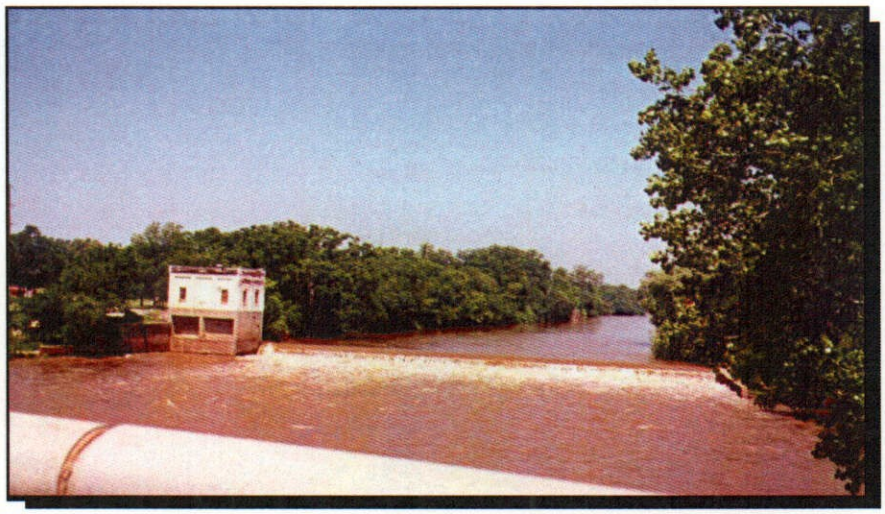
The three mussel species under consideration in this BA were consistently found in shallow riffles and runs (mean depth 25.0-33.7 cm), with stable and moderately compacted substratum, predominantly gravel with a minimum of silt. A chert-gravel derived from Permian and Pennsylvanian limestones is the dominant substratum of shallow riffle habitats. The mussels prefer riffle/run areas with relatively clear, flowing water (Miller, pers. com. 2001). Gravel bar stability is usually the result of some stabilizing force in the river, such as bedrock exposed along the river edge or bedrock on the riverbed (Miller, pers. com. 2001). The stabilizing force slows flows allowing sediments and gravel to collect, versus being swept downstream.

In the Neosho River, the observed habitat used by Neosho mucket mussels (Obermeyer et al. 1997) was: depth = 39.6 cm; current speed = 16.0 cm/s and 27.0 cm/s (100% and 60% depth); substratum character = 41.3% gravel, 35.9% cobble, 14.9% sand, 4.4% boulder, and 3.3% mud; compaction rated 1.1 and siltation rated 1.4. Also in the Neosho River, the observed habitat used by rabbitsfoot mussels was: depth = 12.5 cm; current speed = 27.5 cm/s and 38.0 cm/s (100% and 60% depth); substratum character = 60.0% gravel, 32.5% cobble, 7.0% sand, and 0.5% mud; compaction rated 1.0; and siltation rated 1.0. Living Ouachita kidneyshell mussels were not identified in the Neosho River by Obermeyer et al. (1997), only weathered shells were observed at sampling sites.

All three mussel species of concern have likely become extirpated from the Neosho River above John Redmond Reservoir (Tabor, pers. com. 2001). Research conducted by Obermeyer, et al. (1997) supports this observation because none of the listed species were located on sites sampled upriver of the reservoir. Only weathered shells of the Neosho mucket mussel and rabbitsfoot mussel have been found along the Neosho River above John Redmond Reservoir (Miller, pers. com. 2001). Downstream from the John Redmond Dam, Obermeyer et al. (1997) collected 32 living Neosho mucket mussels and two living rabbitsfoot mussels, in addition to weathered dead shells for these species and the Ouachita kidneyshell mussel. Distribution of mussel species in the Neosho River below John Redmond Dam may also be influenced by 12 overflow dam structures placed to divert water for agricultural and municipal use (Juracek 1999b).

Mr. Shaw (pers. com. 2001) stated that the Neosho River below John Redmond Dam supports a rich mussel population for KS. This observation was supported by Obermeyer et al. (1997), with evidence of 32 species occurring in the Neosho River, using present and historical collection records. Both the Neosho mucket mussel and the rabbitsfoot mussel occur in the Neosho River below John Redmond Dam (Obermeyer et al. 1997). Thirty-two individual Neosho mucket mussels were observed below the John Redmond Dam, occupying 6 of 21 sites surveyed (Obermeyer et al. 1997). These individuals were greater than 20 years old, determined from counts of annular rings. Two individual rabbitsfoot mussels were observed below the dam for the 21 sites sampled on the Neosho River to near the OK border (Obermeyer et al. 1997). A reproducing population of rabbitsfoot mussel is known to occupy gravel bar habitat near Iola, KS (Miller, pers. com. 2001). No Ouachita kidneyshell mussels were identified from the sample sites evaluated below the dam other than some weathered dead shells (Obermeyer et al. 1997).

Figure 3-11. Representative Example of an Overflow Dam on the Neosho River.



In contrast, 1,192 individual Neosho mucket mussels, five rabbitsfoot mussels, and 53 Ouachita kidneyshell mussels were collected from the Spring River, and 77 individual Neosho mucket mussels and 30 individual Ouachita kidneyshell mussels were collected from the Verdigris River (Obermeyer et al. 1997). The Spring River was described as having a faster, cleaner flow while

the Verdigris and Neosho Rivers were considered prairie streams with slower flows and a heavier silt load (Obermeyer et al. 1997).

Both the Neosho mucket and Ouachita kidneyshell mussels are bradytictic breeders, the females attract potential hosts with a mantle lure (Obermeyer et al. 1997) Potential larval hosts for the Neosho mucket mussel include smallmouth and largemouth bass, while for the Ouachita kidneyshell mussel orangethroat, greenside, and rainbow darters have been identified as larval hosts The rabbitsfoot mussel is a tachytictic breeder whose larval hosts may include species of shiner (Obermeyer et al 1997).

THIS PAGE INTENTIONALLY LEFT BLANK

4.0 POTENTIAL EFFECTS

The listed species covered by this report were evaluated for both direct and indirect project-related impacts These impacts may be further categorized as either permanent or temporary, as defined below:

Impact Type	Definition
Direct	Alteration, disturbance, or destruction of biological resources that would result from project-related activities is considered a direct impact Examples include the loss of individual species, covering over habitat by facilities, clearing vegetation, and long-term management as agricultural land, etc
Indirect	Project-related impact that is ancillary to the proposed action or its alternatives Examples include elevated noise levels, dust generation, increased human activity, introduction of exotic species of wildlife and plants, etc.
Permanent	Impacts resulting in the irreversible removal of biological resources. Examples include conversion of habitat to agricultural fields, construction of facilities over cleared land, etc
Temporary	Impacts having effects on biological resources that are reversible. Examples include native grasslands mown annually for hay, fugitive dust generation during construction activities, etc.

The actions assessed in this BA are described in more detail in Section 1.3 and include:

I. No Action
II. Dredge John Redmond Reservoir
III. Storage Reallocation in a Phased Pool Raise
IV. Proposed Action: Storage Reallocation

The impact type and duration are described by listed species in Sections 4.1 through 4 4
In general, the proposed water level raise of the conservation pool to the 1,041-foot elevation using either multiple raise stages or a single raise, would result in an expanded and deeper conservation pool covering approximately 570 additional surface acres. Some major effects related to the higher conservation pool alternatives include.

1. deeper water in the reservoir;
2. backwater up the Neosho River and its tributaries;
3. reduced flow velocity and siltation near the upper end of the reservoir;
4. wave action against higher shorelines;
5. inundation/drowning of shoreline vegetation;
6. debris accumulation;

7. a minor shift in flood release (hydrograph) downstream; and
8. additional water storage during drought seasons and years.

Table 4-1. Summary of Impacts and Types By Listed Species and Proposed Project Alternative

Species	I. No Action	II. Dredge Sediments	III. Phased Raise	IV. Proposed Action
Bald Eagle (Threatened)	existing conditions.	*indirect/temporary.* presence of humans & equipment.	*direct/temporary* increase of perch/roost trees and snags.	*direct/temporary* increase of perch/roost trees and snags
		indirect/temporary: potential release of contaminants in sediments.	*indirect/temporary* increase in forage fish for 5-8 years	*indirect/temporary*: increase in forage fish for 5-8 years
		indirect/temporary fugitive dust release during dredging	*indirect/temporary* increase in waterfowl used as prey for 5-8 years	*indirect/temporary* increase in waterfowl used as prey for 5-8 years
Western Prairie Fringed Orchid (Threatened)	n/a	require assessment of sediment disposal, staging, and haul road sites	no impact	no impact
Neosho Madtom (Threatened)	existing conditions.	*indirect/temporary* release of silt and fine sediments.	*direct/permanent* minor shifting of down-river hydrograph.	*direct/permanent* minor shifting of down-river hydrograph
		indirect/temporary potential release of contaminants in sediments.	*indirect/temporary*: additional water available for low-flow conditions	*indirect/temporary.* additional water available for low-flow conditions.
		indirect/temporary. release of small amounts of hydrocarbons from equipment.		

Species	I. No Action	II. Dredge Sediments	III. Phased Raise	IV. Proposed Action
		indirect/temporary: additional water available for low-flow conditions		
Neosho Mucket Mussel (Species of Concern)	existing conditions.	*indirect/temporary*: potential release of contaminants in sediments *indirect/temporary*: additional water available for low-flow conditions	*indirect/temporary*: additional water available for low-flow conditions.	*indirect/temporary*: additional water available for low-flow conditions.
Rabbitsfoot Mussel (Species of Concern)	existing conditions	*indirect/temporary*: potential release of contaminants in sediments. *indirect/temporary* additional water available for low-flow conditions	*indirect/temporary*: additional water available for low-flow conditions	*indirect/temporary*: additional water available for low-flow conditions
Ouachita Kidneyshell Mussel (Species of Concern)	existing conditions	*indirect/temporary*: potential release of contaminants in sediments *indirect/temporary* additional water available for low-flow conditions	*indirect/temporary* additional water available for low-flow conditions.	*indirect/temporary* additional water available for low-flow conditions.

4.1 Bald Eagle

In a typical year, approximately 10 to 20 bald eagles are present in the JRL vicinity as transients. The potential project effects are summarized for the preferred action and alternatives, as follows:

4.1.1 No Action

Bald eagle use of the JRL area and population size fluctuations will continue as described in Section 3.8. Individual shoreline trees used for perches will occasionally succumb to drowning or toppling by high water and wave action during flood events, as currently occurs (**Figure 4-1**). Note that **Figure 4-1** photographs were taken when the lake level was 1,041.5 feet or 0.5 foot higher than the water raise of the proposed action (1,041.0 feet). Without the project, any enhancement of fish and waterfowl populations, or use of the area, would be performed as part of a predetermined management program or would be secondary to unplanned, natural high water events that occurred in a timely fashion.

The JRL proposed water level management plan prepared for October 1, 2001 through September 30, 2002, currently allows a three-month raise to the 1,041.0-foot elevation from mid-October through mid-January (USACE 2001). This raise benefits migrating waterfowl by providing flooded vegetation and supports waterfowl hunting activities, which indirectly benefits the bald eagle by making more potential prey available. JRL water elevations are then proposed for lowering to the 1,039.0-foot level to reduce ice damage to established vegetation and operational structures (approximately five months from February through June). During July, through September the water elevation is further proposed for lowering to 1,037.0 feet to allow growth of native vegetation (moist soil plant growth on mudflats), provide habitat for migrating shorebirds, reduce shoreline erosion, improve water clarity/quality, and create habitat for fall migrating waterfowl.

The bald eagle would continue to be protected by closures on FHNWR during waterfowl hunting season. Bald eagles would also continue to be counted on a bimonthly basis by the KDW&P, between the months of October and March. Personnel, researchers, and law enforcement staffs of the USACE, USFWS, and KDW&P will provide almost daily observation of wintering bald eagles during the course of their work assignments, and travel to and from the area.

Figure 4-1. Tree drowned during recent flood events and an example of wave action at John Redmond Lake (water elevation = 1,041.5 ft.)

4.1.2 Dredge John Redmond Reservoir

This assessment assumes that existing access is sufficient for dredge equipment to remove sediments and that additional impacts will not result from construction of staging areas, haul roads, and stockpile areas.

- Presence of humans and equipment during bald eagle migration, possibly precluding use of the site during dredging operation: indirect/temporary impact.
- Potential release of contaminants trapped within sediments, particularly agricultural pesticides, during the dredging or excavating operation that could enter the food chain through benthic macroinvertebrates, algae, fish, or waterfowl indirect/temporary impact
- Release of fugitive dust during the dredging or excavating operation, also causing air quality and aesthetic effects and potentially precluding use of the site due to poor visibility for foraging bald eagles· indirect/temporary impact
- Requires assessment of site or sites that would be used to stage and maintain equipment, deliver, and store sediments dredged or excavated from the reservoir.

4.1.3 Storage Reallocation in a Phased Pool Raise

- Woodland area that will be inundated by the proposed raise to the 1,041.0-foot elevation will be approximately 158 acres. There will be an increase in perches and snags on which bald eagles can scan the surroundings for prey, due to inundation: direct/temporary impact
- Increase in fish used as forage by bald eagles for up to five to eight years as a result of better fishery habitat: indirect/temporary impact.
- Increase in waterfowl used as prey by bald eagles because of flooded vegetation: indirect/temporary impact.

4.1.4 Proposed Action: Storage Reallocation

- Woodland area that will be inundated by the proposed raise to the 1,041.0 foot elevation will be approximately 158 acres. There will be an increase in perches and snags on which bald eagles can scan the surroundings for prey, due to inundation: direct/temporary impact.
- Increase in fish used as forage by bald eagles for up to five to eight years as a result of better fishery habitat. indirect/temporary impact.
- Increase in waterfowl used as prey by bald eagles because of flooded vegetation: direct/temporary impact

In summary, the bald eagle is a highly mobile species that will receive minor, direct, and temporary impacts and minor, indirect beneficial effects related to the proposed and alternative actions. The increase of perches and snags from 158 acres of woodland along the proposed 1,041 0-foot elevation shoreline is considered temporary and beneficial based on experience from other Tulsa District reservoirs. This condition will last from 10–15 years, during which time, small trees along the reservoir margin will mature and provide bald eagle perches Under

present reservoir operation, flood events result in drowning a few trees large enough to provide perches (**Figure 4-1**) The bald eagle may also rest on the ice when the reservoir freezes over. A potential positive effect will be an expected five to eight year increase in fish used as prey, and higher waterfowl concentrations due to raising the water level into smartweed, willow, sapling cottonwood and maple, and other vegetation that has become established in some coves, along the existing shoreline, and along tributary drainages. Along with increased waterfowl populations, the number of hunters, and therefore the number of wounded and dead waterfowl available for use as forage for the bald eagle, will likely increase.

4.2 Western Prairie Fringed Orchid

The WPFO has not been documented within the JRL project area, nor does appropriate habitat occur between the 1,039.0-foot and 1,041.0-foot elevation areas. Approximately 18 acres of introduced grassland and weedy forbs will be covered over by the raise to the 1,041.0-foot elevation. These grasslands are mostly planted to the exotics smooth brome and meadow fescue. The WPFO will not receive impacts from the proposed project or the three alternatives assuming that sites selected for storage of dredged sediments and sites supporting ancillary activities related to dredging do not contain WPFO habitat as determined by field review.

4.3 Neosho Madtom

Neosho madtom populations are divided into three distinct regions or subunits, separated by reservoirs, these are: 1) Cottonwood River and the Neosho River above JRL, 2) Neosho River between the JRL Dam and Commerce, OK, and 3) Spring River (USFWS 1991) The USFWS (1991) stated that the numbers of Neosho madtoms seemed to have remained reasonably stable at most sites, but local declines or extirpations have been noted and threats to local populations still exist.

The principal threats determined by the USFWS (1991) were identified:

1. Mainstream impoundments resulting in the loss of about one-third of the potential habitat;
2. Watershed impoundments on tributary streams reducing annual discharges and retaining storm runoff,
3 Drought resulting in riffle areas becoming dry and a projected increase in water demand of 25 percent between 1984 and 2040;
4. Gravel bar removal for construction material resulting in the loss of some populations and habitat of the Neosho madtom;
5. Wolf Creek Nuclear Power Generating Station resulting in a very small chance of possible releases of thermal or radioactive water to the Neosho River and a reduction in releases from JRL;
6. Feedlot pollution resulting in poor water quality,
7. Nonpoint source pollution resulting in urban and agricultural wastewater entering the Neosho River; and
8. Cherokee County, KS Superfund Site resulting in elevated levels of sulfate and trace metals in Spring Creek

The Neosho madtom is present in the Neosho River Basin, both upriver of JRL and downriver from the dam. A slight backwater effect from the reservoir elevation raise of the preferred alternative was examined over gravel bars near Hartford, KS. However, when these gravel bars were visited during the June 11–12, 2001 site visit, the Neosho River was flowing freely over them with no visible sign of pooling. During the time of the site visit, the water level of the reservoir was 0 5 foot higher (1,041.5 ft) than the preferred alternative (1,041 0 ft).

These gravel bars are located approximately four miles upriver of the 1,041-foot reservoir shoreline for the preferred alternative. When an approximately 1 2-ft. per-river-mile elevation increase is used, as reported in the *Water Control Manual* (USACE 1996) and Juracek (1999), the riverbed would lie at approximately the 1,045.8-foot elevation. Additionally, the gravel bars are elevated above the river bed (possibly by 1–3 ft.) and, therefore, should not receive backwater effects from the proposed reservoir raise. Potential effects to the Neosho madtom from the proposed project and alternatives are summarized, as follows:

4.3.1 No Action

The Neosho madtom will continue to experience the habitat quality and habitat effects, as described in Section 3.10 for the Neosho River relative to the current operation of John Redmond Dam and Reservoir. These include.

1. reduced turbidity downriver from the dam;
2. higher water temperature downriver from the dam;
3 marginally higher Fredle Index downriver from the dam;
4 marginally higher water depth downriver from the dam;
5 higher dissolved oxygen concentrations and marginally higher PO_4 concentrations downriver from the dam; and
6. lower alkalinity and NH_3 downriver from the dam

Generally, the effects of the dam on minimum and maximum flows of the Neosho River tended to decrease with increasing distance downstream. Neosho madtom population densities will likely continue to be lower immediately below the dam to near the Iola river gauge than population densities above the reservoir During low flows and drought periods, releases from the dam will continue to be made on a regularly scheduled basis to augment downriver (water quality) flows (USACE 1996).

In addition, the 12 concrete overflow (low-water) dams in place below the John Redmond Dam will continue to influence Neosho River hydrology (Juracek 1999). These dams create an up-river backwater pool, which may result in sediment deposition due to decrease in flow velocity. Down-river of the overflow dams, water velocity and erosive power increase, which may increase channel bed and bank erosion, particularly during high flows.

4.3.2 Dredge John Redmond Reservoir

- Release of silt and sediments downriver during the dredging or excavating operation and potential deposition of this silt and sediment on Neosho madtom gravel bar habitat: indirect/temporary impact.
- Potential release of contaminants trapped within sediments, particularly agricultural pesticides during the dredging or excavating operation: indirect/temporary impact.
- Release of small amounts of hydrocarbons downriver from fuel and lubricants used for maintenance and operation of dredging, excavating, and hauling equipment, potentially causing minor adverse water quality effects: indirect/temporary impact
- Release of fugitive dust during the dredging or excavating operation, causing siltation below the dam in addition to potential adverse air quality and aesthetic effects: indirect/temporary impact.

4.3.3 Storage Reallocation in a Phased Pool Raise

- Minor shifting of hydrograph (flood release) downriver, resulting in slightly deeper water flowing over Neosho madtom habitat for slightly longer periods of time: direct/permanent impact.
- Additional water potentially available for downriver (water quality) releases, enhancing Neosho madtom habitat during periods of low-flow: direct/permanent impact.

4.3.4 Proposed Action: Storage Reallocation

- Minor shifting of hydrograph (flood release) downriver, resulting in slightly deeper and possibly cooler water flowing over Neosho madtom habitat for slightly longer periods of time: direct/permanent impact
- Additional water potentially available for downriver (water quality) release, enhancing Neosho madtom habitat during periods of low-flow: direct/permanent impact.

4.4 Neosho Mucket Mussel, Rabbitsfoot Mussel, and Ouachita Kidneyshell Mussel

Three unionid mussel species of concern were present historically in the Neosho River; however, the Ouachita kidneyshell mussel may have become recently extirpated from the Neosho River (Obermeyer et al. 1995). Another, the Neosho mucket mussel is a federal candidate for listing These mussels are typically found in shallow riffles and runs (mean depths 25.0-33.7cm), with stable and moderately compacted substratum, predominantly gravel, with a minimum of silt (Obermeyer et al. 1997). Living representatives of the three species were not observed in the Neosho River above JRL, although weathered and relic valves of all three species were found upriver from the reservoir (Obermeyer et al. 1997).

Living Neosho mucket and rabbitsfoot mussels were observed in the Neosho River downstream of John Redmond Dam, but the Ouachita kidneyshell was represented only by weathered and relic valves (Obermeyer et al 1997). Little evidence of recent recruitment of mussels was detected during a survey in the Neosho River. Neosho mucket mussels sampled below the dam were all over 20 years in age and rabbitsfoot mussels were in their sixth year of growth (Obermeyer et al. 1997). Unionids produce ovisacs that release glochidia that attach to the gills of host fish, primarily bass and darters (Obermeyer et al 1997; and Umo Gallery 2001). A decrease in host fish populations could affect reproduction among mussel species dependent on them

4.4.1 No Action

The listed mussel species will continue to experience the habitat quality and effects, as described in Section 3 11 for the Neosho River relative to the current operation of John Redmond dam and reservoir. These include:

1. Reduced turbidity downriver from the dam;
2. Higher water temperature downriver from the dam;
3. Marginally higher Fredle Index downriver from the dam,
4. Marginally higher water depth downriver from the dam,
5. Higher dissolved oxygen concentrations and marginally higher PO_4 concentrations downriver from the dam, and
6. Lower alkalinity and NH_3 downriver from the dam.

Generally, the effects of the dam on minimum and maximum flows of the Neosho River tended to decrease with increasing distance downstream. Candidate mussel population densities will continue to be more diverse in terms of species and numbers below the dam because they are potentially extirpated above the reservoir During low flows and periods of drought, releases from the dam will continue to be made on a regularly scheduled basis to augment downstream (water quality) flows (USACE 1996).

4.4.2 Dredge John Redmond Reservoir

- Release of silt and sediments downriver during the dredging or excavating operation and deposition of silt and sediments on gravel bar habitat for mussel species indirect/temporary impact.
- Potential release of contaminants trapped within sediments, particularly agricultural pesticides during the dredging or excavating operation: indirect/temporary impact.
- Release of small amounts of hydrocarbons downriver from fuel and lubricants used for maintenance and operation of dredging, excavating, and hauling equipment, potentially causing minor adverse water quality effects: indirect/temporary impact.
- Release of fugitive dust during the dredging or excavating operation, causing siltation below the dam in addition to potential adverse air quality and aesthetic effects. indirect/temporary impact

4.4.3 Storage Reallocation in a Phased Pool Raise

- Minor shifting of hydrograph (flood release) downriver, resulting in slightly deeper and possibly cooler water flowing over habitat for the two mussel species present, for slightly longer periods of time: direct/permanent impacts
- Additional water potentially available for downriver (water quality) release, enhancing mussel habitat during periods of low-flow direct/permanent impact.

4.4.4 Proposed Action: Storage Reallocation

- Minor shifting of hydrograph (flood release) downriver, resulting in slightly deeper and possibly cooler water flowing over habitat for Neosho mucket and rabbitsfoot mussels for slightly longer periods of time: direct/permanent impact.
- Additional water potentially available for downriver (water quality) release, enhancing mussel habitat during periods of low-flow· direct/permanent impact.

4.5 Design and Implementation Measures to Minimize or Avoid Impacts

Water levels fluctuate widely in the JRL system and are dependant on the timing and intensity of weather events within the drainage basin. As a result, general impact avoidance related to water elevation management while fulfilling the flood control mission of the dam is extremely difficult. The remaining JRL functions of water supply, water quality, and fish and wildlife habitat provide additional complexity to water elevation management that are met by creating annual water level management plans These management plans are followed when the amount of water available is sufficient and controllable, but are unlikely to be met during flooding or extreme drought.

The bald eagle is currently protected with closures established by FHNWR staff during waterfowl hunting seasons. They are monitored regularly by the KDW&P during bimonthly waterfowl census.

Monitoring has been conducted annually by the USFWS for Neosho madtom and associated ictalurid populations; data concerning habitat parameters have also been collected by the USFWS and the USGS, as river conditions permit. Further, research has been conducted to learn more of the species' life history including reproductive behavior. Avoidance of impacts to listed aquatic species can only occur when the reservoir water levels are relatively stable and can be controlled by the reservoir manager. At these times, water quality releases can be made to mitigate low flow conditions, as in drought periods, resulting in more survivable conditions for the Neosho madtom and species of mussel.

4.6 Impact Summary

Most impacts to the listed species are considered indirect and temporary and many are considered beneficial (**Table 4-1**). The only impacts that are considered direct and temporary are the increase of shoreline trees and snags used by bald eagles for perches. Direct and permanent impacts were identified for water level effects. Water level effects include minor shifting of the downriver hydrograph. Beneficial impacts will also result from potentially having more water

stored for water quality release downriver during dry periods, additional perch and roost structures, an improved reservoir fishery, and improved waterfowl habitat.

Potential dredging may result in impacts related to the release of silt (to the water and air), sediment, and potentially environmental toxins (oil, fuel, metals, pesticides, etc.), which could affect downriver water quality, aquatic species, and habitat. In addition, dredged or excavated materials will require hauling and storage or disposal The sites used for these ancillary purposes would require a site visit and clearance to avoid impacts to the species listed in this BA and possibly other rare species in the region

THIS PAGE INTENTIONALLY LEFT BLANK

5.0 CUMULATIVE IMPACTS

5.1 On-going and Reasonably Foreseeable Actions

This section describes planned or continuing actions that along with the proposed action could contribute incrementally to cumulative biological impacts. These actions are not necessarily dependent on the proposed water level raise addressed in this BA nor part of the water storage reallocation project. Other actions in the Neosho Basin that could affect listed species habitat, water quality, and water quantity both above and below John Redmond Dam include the following.

- Installation of small check dams in the upper basin to further hold runoff following storm events. These structures could have a long-term beneficial effect if hydrology to the Neosho River is improved so that water supply is available during dry periods and/or years.
- Gravel mining of bars exposed during dry periods and years has been permitted downriver from the dam Continuation of this activity could result in the loss of habitat and forage for the Neosho madtom and rare mussel species. Historically, mined bars could also represent areas for restoration of aquatic habitat for riffle-dependent species.
- Urban wastewater from sources upriver from JRL may influence water quality, particularly during periods of low flow. Monitoring wastewater quality and quantity entering the Neosho Basin would establish baseline conditions and trends that can be related to future population growth and listed species research.
- Feedlot wastewater was a source of several diminished water quality events related to fish kills in past decades. Legislation has eliminated much of this form of pollution, but a few feedlots draining to the Neosho River still remain and would have a negative influence on water quality.
- Agricultural chemicals used for insect and weed control and soil fertility are released to the Neosho River, in addition to sediments washed from farm fields This is an on-going source for monitoring and potential water management effects.
- There is some research to suggest that a new, lower flood plain may be forming within the confines of the existing Neosho River channel below John Redmond Dam aided by the presence of 12 low-head dams (Juracek 1999). This may eventually result in the narrowing and deepening of the channel.

5.2 Biological Impacts

Cumulative biological impacts related to the water reallocation project alternatives are very minor for predominantly terrestrial species such as the bald eagle and western prairie fringed orchid. The listed aquatic species, which are adapted to riffle and run habitat in the form of gravel bars, are more sensitive to cumulative impacts within the drainage basin.

The first of these impacts would be naturally-occurring drought conditions over an extended period of time. Initially, the Neosho madtom and species of mussel downriver of the dam would

benefit from water quality releases from the reservoir. In a prolonged drought, however, the lack of water and the use of stored water via legal water rights would severely stress the drainage and its biota. Drought may also expose gravel bars to mining, resulting in direct habitat loss for the listed aquatic species, if permits to do so are in place or are authorized

Installation of additional small check dams in the upper Neosho Basin could result in more water being available year-around, through recharge of aquifers. Small structures may also reduce the amount of soil washed into the Neosho River, trapping it higher in the basin, and could reduce storm runoff to the basin.

Feedlot runoff has largely been eliminated as a contaminant to the Neosho River from upriver sources (FNHWR 2000). Agricultural wastewater is a continual source of contaminants, including soil washed from farm fields, and could deliver concentrated chemicals during drought periods. The reservoir would help to dilute this concentration from upriver sources, but it also serves as a sink. Urban wastewater from upriver sources will probably increase in quantity over time as additional residents and industry move into the area. This could also mean additional consumption of water which could affect both water quantity and quality downriver

6.0 CONCLUSIONS

Reallocation of water storage in the conservation pool of JRL, proposed action (IV), will not significantly affect the bald eagle and western prairie fringed orchid. The bald eagle is transient, occurs as a winter migrant, and perches/roosts and forages in adjacent habitats. A few trees adjacent to the shoreline will be inundated because of the proposed conservation pool raise (III and IV), providing the bald eagles with additional perches and roosts. The bald eagle will also continue to rest on the ice when the reservoir freezes. A short-term beneficial impact for bald eagles will be the presence of larger numbers of fish and waterfowl for prey in the five to eight year period following the water level raise; the fishery and waterfowl species will respond positively to improved and expanded habitat amongst the water-covered vegetation. As established during past waterfowl hunting seasons when higher water levels were present, more hunters will use the area, attracted by the larger waterfowl population. As a result, it is probable that more wounded and dead ducks and geese will be available for bald eagle forage Following this five to eight year period of improved and increased habitat, the JRL fishery is expected to return to near its present condition (Jirak, pers. com 2001).

Under the dredging alternative (II), an indirect and temporary impact could occur to bald eagles relative to human presence, noise, and dust generation from dredged or excavated areas. There would be no short-term benefit to bald eagles from improved habitat for fish or waterfowl.

No impacts will occur to the western prairie fringed orchid due to the proposed action (IV) because appropriate habitat does not exist within or adjacent to the conservation pool raise zone Under the dredging alternative (II), storage and disposal areas, haul roads, and staging areas would require a site review process for threatened, endangered, and rare species presence.

The conservation pool raise (IV) will affect the Neosho madtom in a direct and permanent manner from a shift of the downriver hydrograph, which would result in slightly deeper and slightly longer floodwater flows. However, an indirect benefit to the Neosho madtom will result from more water availability as water quality releases during drought periods.

The three listed mussel species were not collected or observed in the Neosho River above JRL and may be extirpated from this reach (Obermeyer et al. 1997). Listed mussel populations downriver of John Redmond Dam are not expected to be affected by a slight change in the hydrograph and these populations would benefit from additional water available as water quality releases during low-flow conditions Dredging or excavating activities (II) within the reservoir area would release silt, sediments, and possible contaminants to the downstream habitat. However, these impacts are considered to be indirect and temporary.

THIS PAGE INTENTIONALLY LEFT BLANK

7.0 REFERENCES

Barlow, S. Kansas Department of Wildlife & Parks, Otter Creek Wildlife Area Manager. 2001. Personal Communication with J. Von Loh, e^2M Biologist June 6, 2001.

Bulger, A., M. Wildhaber, and D. Edds 1998. Population dynamics, reproductive biology and behavior of the Neosho madtom, *Noturus placidus*—a state and federally listed threatened catfish. Final Report to USACE-EASB, Tulsa District. Emporia State University and USGS-BRD Columbia Environmental Research Center. Emporia, KS and Columbia, MO

Culbertson, B. Kansas Department of Wildlife & Parks, Wildlife Biologist 2001. Personal Communication with J. Von Loh, e^2M Biologist. June 20, 2001.

Department of the Army; Tulsa District, Corps of Engineers 1976. Final Environmental Statement. Operation and Maintenance Program John Redmond Dam and Reservoir, Grand (Neosho) River, Kansas, Marion Lake, Cottonwood River, Kansas, and Council Grove Lake, Grand (Neosho) River, Kansas Tulsa, OK.

Edds, D. Emporia State University. Aquatic Ecologist. 2001 Personal Communication with J. Von Loh, e^2M Biologist. July 2, 2001.

_____. 2001. Emporia State University. http://www.emporia.edu/biosci/eddsbiol.htm

Egbert, L.E., D L. Peterson, A.M. Stewart, C.L. Louver, C F. Blodgett, K.P. Price, and E.A. Martinko. 2001. The Kansas GAP Land Cover Map, Final Report. Kansas Biological Survey Report #98. University of Kansas. Lawrence, KS.

Federal Register. 1999. Endangered and Threatened Wildlife and Plants; proposed rule to remove the bald eagle in the lower 48 states from the list of endangered and threatened wildlife. Vol. 64, No. 128, July 6 Washington, DC.

Flint Hills National Wildlife Refuge. 2001. U S. Fish and Wildlife Service, National Wildlife Refuge System. http://www.r6.fws.gov/REFUGES/FLINT/ and http://www.r6.fws.gov/REFUGES/FLINT/nwrmap21.GIF

_____ 2001. Birding Information and Checklist. U.S. Fish and Wildlife Service, National Wildlife Refuge System. http://www.r6.fws.gov/REFUGES/FLINT/flint1.htm

_____. 2000. Comprehensive Conservation Plan. U.S. Fish and Wildlife Service, Region 6 Research Management Consultants, Inc Golden, CO

Freeman, C. Kansas Biological Survey, Botanist. 2001. Personal Communication with J. Von Loh, e^2M Biologist June 4, 2001.

Fry, J. U.S. Army Corps of Engineers, John Redmond Lake Manager. 2001. Personal Communication with J. Von Loh, e^2M Biologist. June 6, 2001.

Gamble, J 2001 Flint Hills National Wildlife Refuge Manager. Personal Communication with J. Von Loh, e^2M Biologist. June 1, 2001.

Hase, C. Kansas Department of Wildlife & Parks, Aquatic Ecologist. 2001. Personal Communication with J. Von Loh, e^2M Biologist. May 30, 2001

Hula, R. L. 1990. Regulated Flow Peak Discharge Frequency Estimates for Large Basins. Hydrology and Hydraulics Workshop, Hydrologic Studies in Support of Project Functions. Angel Fire, NM. Seminar Proceedings No 23. pp. 19-37.

Jirak, L Kansas Department of Wildlife & Parks. 2001. Personal Communication with J Von Loh, e^2M Biologist Site Visit to John Redmond Lake. June 11, 2001

Juracek, K. 1999a. Channel Stability of the Neosho River Downstream from John Redmond Dam, Kansas. U S. Geological Survey, in cooperation with the Kansas Water Office. USGS Fact Sheet 088-99.

_____. 1999b. Geomorphic Effects of Overflow Dams on the Lower Neosho River, Kansas. U.S. Geological Survey, in cooperation with the Kansas Water Office. Water-Resources Investigations Report 99-4147

Kansas Department of Health and Environment. 1999. Wolf Creek Generating Station Environmental Radiation Surveillance Report. Bureau of Air and Radiation, Radiation Control Program. Topeka, KS.

Kansas Department of Wildlife & Parks. 2000. Letter with List of Threatened or Endangered Species for the project area. J. Phillips signatory.

Kansas Natural Heritage Inventory. 2001. Explanation of Ranks and Status Codes. http://www.kbs.ukans.edu/ksnhi/database/ranks.htm.

_____. 2001. Endangered, Threatened, and SINC Species of Kansas. http://www kbs.ukans.edu/ksnhi/database/t&e.htm.

Kraft, M. Kansas Department of Wildlife & Parks, Wildlife Biologist. 2001 Personal Communication with J. Von Loh, e^2M Biologist. June 19, 2001

Lewis, E Kansas Water Office. 2001. Personal Communication with G. Blankenship, Consulting Socioeconomist to e^2M. July 9, 2001.

McGregor, R , T Barkley, R. Brooks, and E. Schofield. 1986. Flora of the Great Plains. University Press of Kansas. Lawrence, KS.

Merriam, D.F. 2000. Geologic Map of Coffey County, Kansas. Kansas Geological Survey, Map M-59 (1:50,000 scale). http://crude2 kgs.ukans.edu/general/geology/county/abc/coffey.html

Miller, E Kansas Department of Wildlife & Parks, Aquatic Ecologist. 2001. Personal Communication with J. Von Loh, e^2M Biologist. June 18, 2001.

Minnerath, J Flint Hills National Wildlife Refuge, Botanist 2001. Personal Communication with J. Von Loh, e^2M Biologist. June 18, 2001

Mulhern, D. U.S. Fish and Wildlife Service, Aquatic Ecologist. 2001. Personal Communication with J Von Loh, e^2M Biologist. May 31, 2001

National Wildlife Federation 2001. Western Prairie Fringed Orchid, Science Facts. Keep the Wild Alive Campaign. http//www nwf.org/wildalive/orchid/sciencefacts.html

Natural Science Research Associates. 1995. Summary of Collections of Neosho Madtoms (*Noturus placidus* Taylor) Hays, KS.

Obermeyer, B.K., D.R. Edds, and C.W. Prophet. 1996 Comparison of Sampling Methods for Assessing Freshwater Mussel Beds in the Neosho River, Kansas. Division of Biological Sciences, Emporia State University. Emporia, KS.

Obermeyer, B K., D.R. Edds, C.W. Prophet, and E J Miller. Freshwater Mussels (Bivalvia Unionidae) in the Verdigris, Neosho, and Spring River basins of Kansas and Missouri, with an emphasis on species of concern. Division of Biological Sciences, Emporia State University. Emporia, KS and KDW&P. Independence, KS.

O'Connor, H.G. 1953 Part 1, Rock Formations of Lyon County in Geology, Mineral Resources, and Groundwater Resources of Lyon County, Kansas. Kansas Geological Survey, Volume 12. http://crude2.kgs.ukans.edu/general/geology/county/klm/lyon.html

Page, L.M and B.M. Burn. 1991 A Field Guide to Freshwater Fishes; North America North of Mexico. Peterson Field Guide Series. Houghton-Mifflin Company. Boston, MA.

Pfingsten, D.G. and D.R. Edds. 1997 Reproductive Traits of the Neosho Madtom, *Notorus placidus* (Pisces: Ictaluridae). Division of Biological Sciences, Emporia State University. Emporia, KS.

Sather, N., C. Freeman, L. Manske, J. Milton, L. Potts, and C Hull Sieg. 1996. Western Prairie Fringed Orchid Recovery Plan. U.S. Fish and Wildlife Service, Region 3. Ft. Snelling, MN.

Tabor, V. U.S. Fish and Wildlife Service Aquatic Ecologist. 2001. Personal Communication with J. Von Loh, e^2M Biologist June 27, 2001

Unio Gallery. 2001. *Ptychobranchus occidentalis* Ouachita kidneyshell http://courses.smsu.edu/mcb095f/gallery/ouachita/kidneyshell.htm

U.S. Army Corps of Engineers. 2001 SUPER Modeling done for the John Redmond Sediment Redistribution Study. Tulsa District. Tulsa, OK

_____. 1996. John Redmond Dam and Reservoir, Neosho River Kansas, Water Control Manual. Tulsa District Tulsa, OK.

U.S. Department of Agriculture. 1993. Kansas Important Farmland Legend Soil Conservation Service (Natural Resources Conservation Service). Salina, KS.

U.S. Fish and Wildlife Service 2000. Letter with List of Threatened or Endangered Species for the project area. W. Gill signatory

U S. Geological Survey. 2001. Zebra Mussel (*Dreissena polymorpha*). http //nas.er.usgs.gov/zebra mussel/docs/sp_account html

_____. 1997. Neosho madtom (*Noturus placidus*) http://ifw2es.fws.gov/oklahoma/madtom.htm

Wenke, T.L., M.E. Eberle. 1991. Neosho Madtom Recovery Plan. Natural Science Research Associates. U.S. Fish and Wildlife Service, Region 6. Denver, CO.

Wildhaber, M. U.S. Geological Survey, Aquatic Ecologist 2001. Personal Communication with J. Von Loh, e^2M Biologist. May 31, 2001.

Wildhaber, M., V. Tabor, J. Whitaker, A. Allert, D. Mulhern, P. Lamberson, and K. Powell 2000a. Ictalurid Populations in Relation to the Presence of a Main-Stem Reservoir in a Midwestern Warmwater Stream with Emphasis on the Threatened Neosho Madtom Transactions of the American Fisheries Society 129: 1264-1280.

Wildhaber, M., A Allert, C. Schmitt, V Tabor, D. Mulhern, K. Powell, and S Sowa. 2000b. Natural and Anthropogenic Influences on the Distribution of the Threatened Neosho Madtom in a Midwestern Warmwater Stream. Transactions of the American Fisheries Society 129: 243-261.

Wildhaber, M., A. Allert, and C. Schmitt 1999. Potential Effects of Interspecific Competition on Neosho Madtom (*Notorus placidus*) Populations Journal of Freshwater Ecology, Volume 14, Number 1.

Wildhaber, M., A. Allert, C. Schmitt, V. Tabor, D. Mulhern, and K Powell. 1998. Both Contaminants and Habitat Limit Neosho Madtom (*Noturus placidus*) Numbers in the Spring River, a Midwestern Warmwater Stream Effected by Runoff from Historic Zinc and Lead Mining. Fish Response to Toxic Environments, C Kennedy and D. Mackinlay, International Congress on the Biology of Fish Baltimore, MD.

Wilkinson, C , D. Edds, J. Dorlac, M. Wildhaber, C. Schmitt, and A Allert. 1996. Neosho Madtom Distribution and Abundance in the Spring River The Southwestern Naturalist, Volume 41, Number 1.

THIS PAGE INTENTIONALLY LEFT BLANK

ATTACHMENTS

Attachment A: Lists of Threatened and Endangered Species Submitted by the U.S. Fish and Wildlife Service (2000) and the Kansas Department of Wildlife & Parks (2000).

- Correspondence: U.S Fish and Wildlife Service
- Correspondence: Kansas Department of Wildlife & Parks
- Correspondence: U.S. Corps of Engineers, Tulsa District
- Correspondence: e^2M
- Scope of Work for U.S. Fish and Wildlife Service Activities
- John Redmond Reallocation Study

Attachment B: Bald Eagle Winter Survey Summaries for John Redmond Reservoir.

- Kansas Bi-Monthly Waterfowl Survey / Survey Techniques and Methods of Data Handling
- Waterfowl Migration Report – Bald Eagle
- Waterfowl Migration Report – Bald Eagle, Golden Eagle, Osprey, Unknown Eagles

ATTACHMENT A

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101ST EAST AVENUE
TULSA, OKLAHOMA 74128-4609

May 8, 2000

Planning, Environmental, and Regulatory Division
Environmental Analysis and Compliance Branch

Mr. William H. Gill
Field Supervisor
U.S. Fish and Wildlife Service
315 Houston Street, Suite E
Manhattan, KS 66502

Dear Mr. Gill:

This is in regards to the ongoing John Redmond Lake Reallocation Study, Kansas In accordance with Section 7 of the Endangered Species Act of 1973, as amended, the District is requesting an official list of Federally listed threatened or endangered species which might be affected by the proposed action

Pertinent information and a description of the proposed action were previously furnished to your office during development of our Fiscal Year 2000 funding agreement.

If you have any questions or require additional information, please contact Jim Randolph at 918-669-4396.

Sincerely,

James C. Randolph

for David L. Combs
Chief, Environmental Analysis and
Compliance Branch

DEPARTMENT OF ARMY
CORPS OF ENGINEERS, TULSA DISTRICT
1645 SOUTH 101ST EAST AVENUE
TULSA, OKLAHOMA 74128-4609

May 8, 2000

Planning, Environmental, and Regulatory Division
Environmental Analysis and Compliance Branch

Mr. Steve Williams
Kansas Department of Wildlife and Parks
Box 54-A, Route 2
Pratt, KS 76124-9599

Dear Mr. Williams.

This is to inform you that the Tulsa District is initiating a water supply reallocation study for John Redmond Lake, Kansas Enclosed is a negotiated scope of work with the U.S. Fish and Wildlife Service which describes the proposed action.

Presently, we are preparing documentation for compliance with the National Environmental Policy Act of 1969 and would appreciate any comments from your agency regarding state listed threatened or endangered species and fish and wildlife

If you have any questions or require additional information, please contact Jim Randolph at 918-669-4396.

Sincerely,

James C. Randolph

for David L. Combs
Chief, Environmental Analysis and
Compliance Branch

Enclosure

SCOPE OF WORK
FOR
U.S. FISH AND WILDLIFE SERVICE ACTIVITIES

FISH AND WILFLIFE COORDINATION ACT REPORT AND MITIGATION ANALYSIS
JOHN REDMOND LAKE, REALLOCATION STUDY, KANSAS

Background: In 1975, the state of Kansas and the Federal government entered into a water supply agreement at John Redmond Lake for an estimated 34,900 acre-feet of storage remaining after 50 years of sedimentation. Recent studies have determined that sediment has been deposited unevenly within the reservoir from what had been predicted. The sediment is accumulating in the conservation pool while the flood control pool has experienced less than expected sedimentation.

Storage available for water supply purposes in the lake have been depleted by the uneven distribution of sediment such that the water supply agreement obligations are being infringed upon. Most of the sediment deposition in the John Redmond pool has been below elevation 1039.0 feet (top of conservation pool) National Geodetic Vertical Datum (NGVD). Based on Tulsa District sediment surveys for 1964 and 1993, it was predicted that adequate storage would be available below elevation 1068.0 feet NGVD (top of flood control pool) at the end of the economic project life (2014) to meet all authorized project purposes.

A recent Kansas Water Office (KWO) water supply yield analysis indicated that the disproportionate sediment deposition has reduced the water supply capacity at design life by 25%. The water supply agreement with the KWO allows for pool adjustment in one-half foot increments. In order to make an equitable redistribution between the flood control and conservation pools, the District has been directed to study an equitable redistribution of storage between the flood control and conservation pools. Consequently, the District proposes to raise the conservation pool from elevation 1039 NGVD to elevation 1041 NGVD. The proposed pool level increase would be a phased approach with the first pool increase to elevation 1040 NGVD, the second to 1040.5 NGVD, and finally to elevation 1041, if needed.

Tasks:

1. The U.S. Army Corps of Engineers (USACE) will provide the following to the U.S. Fish and Wildlife Service (USFWS) as it becomes available; 1) digital two-foot contour maps, 2)color IR aerial photography of the lake, 3) pertinent data (including project alternatives and purposes,4)historic and projected changes to flood control operation and downstream releases of flood waters.

2. The USACE will invite the USFWS to participate in all pertinent planning meetings related to the project.

3. The USFWS will participate in field trips to the project site to evaluate proposed project impacts. The USFWS will complete the following tasks: 1) evaluate existing wetland types at the specified elevations for John Redmond and determine changes to habitat types as with the various increased conservation pool alternatives; 2) evaluate boat ramp, access road, and State Park acreages that may be inundated permanently and/or more frequently due to loss of flood storage, 3) evaluate if alternatives will affect timing and release schedules of floodwater evacuation and potential for adverse impacts to the Neosho River downstream of John Redmond; 4) evaluate dike and control structure elevations for managed wetlands on Fling Hills NWR to determine if management of the wetland complex will be compromised; 5) coordinate with Kansas Department of Wildlife and Parks and USFWS refuge personnel to evaluate and determine impacts of proposed pool level impacts on fish and wildlife resources, Flint Hills refuge, existing fishery, and water level management plans.

4. USFWS will prepare and coordinate a draft and final Fish and Wildlife Coordination Act report describing and evaluating existing fish and wildlife resources threatened or endangered species or habitat, and current management activities associated with John Redmond Lake. The report shall also address expected impacts associated with the proposed changes in conservation pool to John Redmond Lake on the noted resources. If impacts are deemed significant mitigation measures shall be recommended.

Estimated costs:

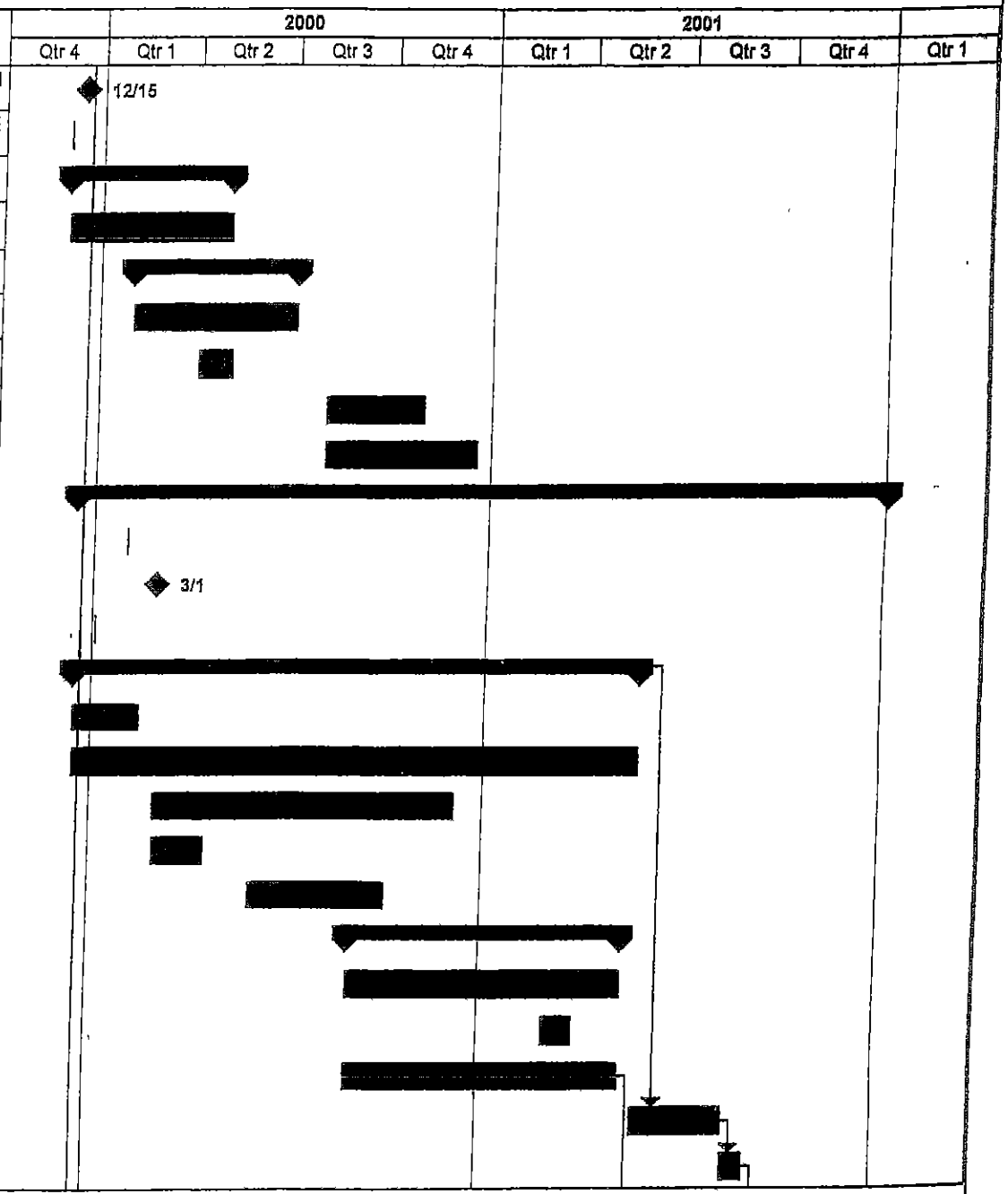
Lit. review, data collection and analysis	20 Md. @ 328/day	6,650
Prep. Of DFWCAR	60 Md. @ 328/day	19,680
Prep of FFWCAR	30 Md. @ 328/day	9,840
Overhead	(38%)	13,745
Total		49,915

Completion Dates:

Draft FWCA report	1 October 2000
Final FWCA report	15 March 2001

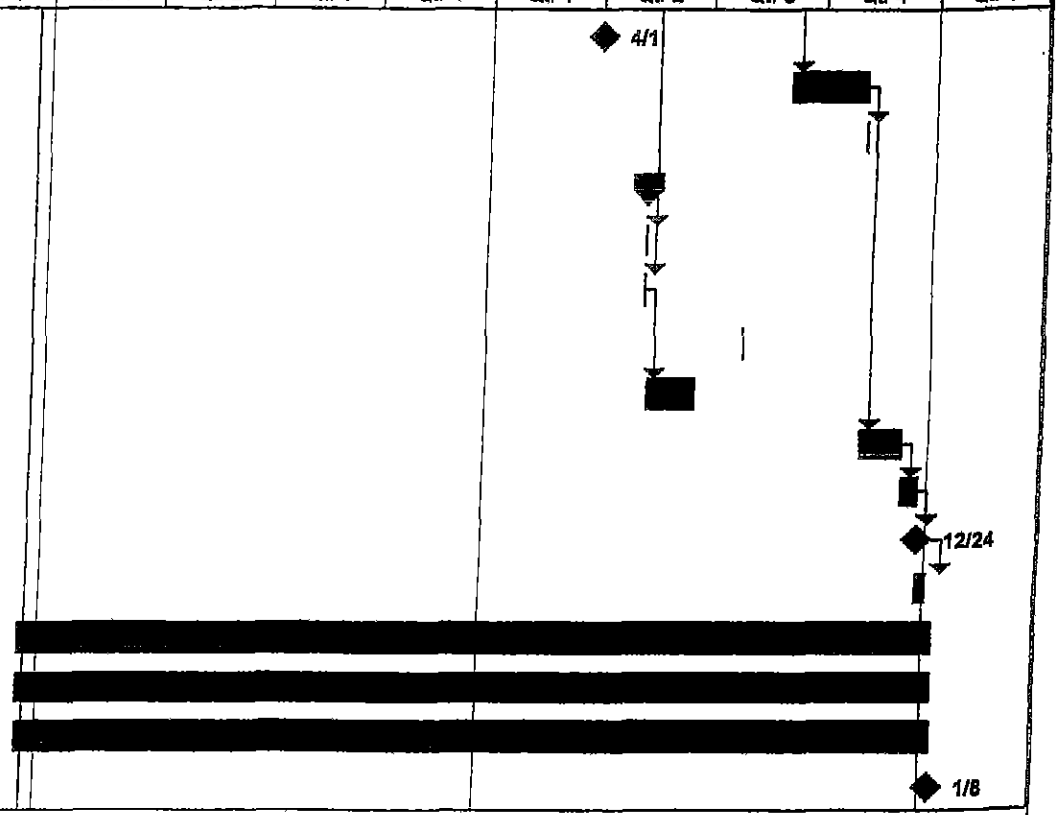
JOHN REDMOND REALLOCATION STUDY

ID	Task Name	Duration
1	RECEIVE FUNDS	0d
2	TEAM MEETING	1d
3	H&H ANALYSES	110d
4	FLOOD CONTROL ANALYSIS	110d
5	SOCIOECONOMIC ANALYSIS	110d
6	ECONOMIC ANALYSES	110d
7	SOCIOLOGICAL STUDIES	25d
8	GEOTECHNICAL ANALYSIS	65d
9	REAL ESTATE FLOWAGE EASEMENTS	100d
10	NEPA DOCUMENTATION [SUPPLEMENT TO FEIS]	536d
11	PUBLIC MEETING	1d
12	PUBLISH NOTICE OF INTENT	0d
13	SCOPING MEETING	1d
14	CULTURAL RESOURCES	376d
15	INVENTORY SHORELINE & VERIFY SITES	45d
16	NRHP EVALUATION OF CULTURAL RESOU	375d
17	GEOMORPHIC STUDY & C.R. INVENTORY	200d
18	HTRW EVALUATION	35d
19	BIOLOGICAL ASSESSMENT	90d
20	USF&WL COORDINATION	180d
21	Mitigation Analysis	180d
22	TD Participation & Analysis	20d
23	Endangered Species Coordination	180d
24	WRITE DRAFT SFEIS	60d
25	INTERNAL SFEIS REVIEW	14d



JOHN REDMOND REALLOCATION STUDY

ID	Task Name	Duration
26	PUBLIC MEETING	0d
27	AGENCY/PUBLIC REVIEW OF SFEIS	45d
28	INCORPORATE COMMENTS	1d
29	IN-HOUSE REVIEW OF SFEIS	1d
30	FT. WORTH DIST. PERFORMS TECH REVIE	1d
31	T D. REVIEW OF SFEIS	1d
32	PUBLIC MEETING	1d
33	INCORPORATE IN-HOUSE COMMENTS	30d
34	WRITE FINAL SUPPLEMENT TO FEIS	25d
35	REPORT REPRODUCTION	10d
36	PUBLISH SUPPLEMENT TO FEIS	0d
37	PREPARE RECORD OF DECISION	7d
38	PUBLIC COORDINATION	540d
39	GIS SUPPORT	540d
40	PROJECT MANAGEMENT	540d
41	END OF PROJECT	0d



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas Field Office
315 Houston Street, Suite E
Manhattan, Kansas 66502-6172

May 23, 2000

David L. Combs, Chief
Environmental Analysis and Compliance Branch
Tulsa District, Corps of Engineers
1645 South 101st East Avenue
Tulsa, Oklahoma 74128-4609

Dear Mr. Combs:

This is in response to your May 8, 2000 letter requesting threatened and endangered species information relative to a proposal to reallocate water in John Redmond Reservoir, Coffey County, Kansas. The following information is provided for your consideration

In accordance with section 7(c) of the Endangered Species Act (16 U.S.C. 1531 et seq.), we have determined that the following federally-listed species may occur in or around the reservoir, or in the Neosho River upstream or downstream of the reservoir: bald eagle (*Haliaeetus leucocephalus*), Neosho madtom (*Noturus placidus*), and western prairie fringed orchid (*Platanthera praeclara*). If it is determined the project may adversely affect any listed species, the District should initiate formal section 7 consultation with this office. If there will be no effect, or if the Fish and Wildlife Service concurs in writing there will be beneficial effects, further consultation is not necessary

Thank you for this opportunity to provide input on your proposed study

Sincerely,

William H. Gill

William H. Gill
Field Supervisor

cc: KDWP, Pratt, KS (Environmental Services)

WHG/dwm

STATE OF KANSAS

DEPARTMENT OF WILDLIFE & PARKS

Operations Office
512 SE 25th Avenue
Pratt, KS 67124-8174
316/672-5911 FAX 316/672-6020

June 16, 2000

Mr David Combs
Department of the Army
Corps of Engineers, Tulsa District
Environmental Analysis and Compliance Branch
1645 South 101st East Avenue
Tulsa, OK 74128-4609

Ref: D4 0201
Coffey, Lyon
Trak 20000423

Dear Mr. Combs

This responds to your request for preliminary state-listed threatened and endangered species and general sensitive resource information for your water supply reallocation study for John Redmond Lake, which includes a 2 foot incremental increase in the conservation pool elevation for the reservoir, located in Coffey and Lyon Counties, Kansas We have included information on any crucial wildlife habitats, current state-listed threatened and endangered species, species in need of conservation, designated critical habitats, and state public recreation areas for which this agency has some administrative authority.

The Neosho River immediately upstream of John Redmond Reservoir is designated critical habitat for the state-listed threatened ouachita kidneyshell mussel (*Ptychobranchus occidentalis*) and Neosho madtom (*Noturus placidus*) The Cottonwood River immediately upstream of the reservoir is also designated critical habitat for the above listed species and the state-listed endangered Neosho mucket mussel (*Lampsilis rafinesqueana*) The Neosho River immediately downstream of the John Redmond dam is designated critical habitat for the state-listed endangered rabbitsfoot mussel (*Quadrula cylindrica cylindrica*) and the state-listed threatened ouachita kidneyshell mussel (*Ptychobranchus occidentalis*) and Neosho madtom (*Noturus placidus*) There are also several mussel species that are known to be present in the Neosho River around John Redmond Reservoir that are designated as species in need of conservation by our agency. All of the above species prefer gravel substrates with flowing water Increased areas of inundation in the rivers above the reservoir from increasing the elevation of the conservation pool would impact those designated critical habitats and associated species. There could also be temporary impacts to downstream critical habitat and species from reduced releases during conservation pool expansion. Our agency also considers riparian woodlands to be crucial wildlife habitat for many game and nongame wildlife species Increasing the area of inundation would temporarily impact and possibly permanently decrease the quantity of riparian woodlands. Additionally, our agency manages the recreational fishery of the reservoir and would be interested in coordinating the timing of the incremental increases and development of mitigation measures to enhance those recreational resources. We would like to see all of the above listed resources and potential impacts dealt with in any environmental assessment and fish and wildlife coordination report developed for the project.

Thank you for the opportunity to provides these comments and recommendations. If you have any questions or need additional information, please free to contact me at the phone number or address listed above.

Sincerely,

John R Phillips, Aquatic Ecologist
Environmental Services Section

xc. KDWP Reg. 5 FW Sup., Tiemann
KDWP, Nygren
FWS, Gill

May 24, 2001

Mr Chris Hase
Kansas Department of Wildlife & Parks
Operations Office
512 SE 25th Avenue
Pratt, KS 67124-8174

Dear Mr Hase.

I am sending this letter to update your files concerning the water supply reallocation study for John Redmond Lake and our May 8, 2000 request for comments regarding state listed threatened or endangered species and fish and wildlife Per our May 21 and May 23, 2001 conversations, I understand that the information in the letter response dated June 16, 2000 (Trak· 20000423) from your agency remains valid and that you requested this letter of update.

Presently, we are preparing project documentation for compliance with the National Environmental Policy Act of 1969 If you have any questions or require additional information please contact Jim Randolph, USACE Fish and Wildlife Biologist, at 918-669-4396. Thank you for your assistance with this update request.

Sincerely,

James D. Von Loh
Senior Biologist
engineering-environmental Management, Inc.

Enclosures: 1) Letter of Request (May 8, 2000), 2) Letter of Response (June 16, 2000), 3) Scope of Work (May 8, 2000)

Cc. Jim Randolph, USACE, Tulsa District: Planning, Environmental, and Regulatory Division; Environmental Analysis and Compliance Branch

ATTACHMENT B

KANSAS BI-MONTHLY WATERFOWL SURVEY
SURVEY TECHNIQUES AND METHODS OF DATA HANDLING

Since the Kansas Department of Wildlife and Parks (formerly the Kansas Forestry, Fish and Game Commission) began conducting waterfowl surveys in 1959, a number of survey schedules have been used Initially, surveys were conducted weekly, usually beginning in August or September and continuing through April or May The weekly counts were reduced to one count every two weeks by administrative order in September, 1974 as a cost saving measure In August, 1978 the number of counts were further reduced, and since then have been conducted twice monthly, September through March (14 counts)

Most surveys were conducted from various vantage points on the ground around water bodies utilized by waterfowl On some larger impoundments such as Tuttle Creek and Milford Reservoirs, aircraft were used during some years to reduce the time required top conduct the survey and improve the coverage of the area involved The number of areas surveyed has varied from a low of 19 in 1976-77 to a high of 39 during recent years

In order to put the data into a form where all years could be presented in a comparable manner on the same table or graph, counts conducted 1970 to present were divided into those made during day 1 through day 15 (1st half of month) and day 16 through end of month (2nd half of month), for months September through March Where more than one count occurred in a one-half month time period, the counts were averaged, and that average represents the count for that area for that time period

Data for years 1970 through 2000 have been entered on computer and are easily accessed

Marvin Kraft
Waterfowl Program Coordinator
Kansas Department of Wildlife and Parks
P O Box 1525
Emporia, KS 66801

Jim
Although the Tables are titled as being for the Flint Hills NWR, the counts do include all of John Redmond Res.
MJK

Kansas Department of Wildlife and Parks

Waterfowl Migration Report (Summary x Year)

Data are included for Flint Hills NWR
Data are included for. Bald Eagle
All periods in the header are included

Year	9/ 1-15	9/ 16-30	10/ 1-15	10/ 16-31	11/ 1-15	11/ 16-30	12/ 1-15	12/ 16-31	1/ 1-15	1/ 16-31	2/ 1-15	2/ 16-28	3/ 1-15	3/ 16-31	Total	% SW*
1970				1	3	3									7	4%
1971									4				1		5	1%
1972							2		14	7	10	20	8		61	10%
1974				1											1	0%
1975					1		3	4	20	1		27			56	8%
1976					1		23	25		25	33				107	17%
1977					1	1	1	12	18	25	14	12	14	41	139	23%
1978								24		9	9	8	17	4	71	14%
1979							7	10	36		1	8	22	1	85	13%
1980								4	26	20			20	2	72	13%
1981						1	5	5	24	14	13	6	19		87	11%
1982						11	9	22	17	26	35	36	5	10	171	31%
1983				2	2	6	6			17	45	25	10	3	116	15%
1984					2	6	6	18	12	28	28	29	10	3	142	18%
1985							9	17		33	22	17	23	1	122	19%
1986					1	13	24	2	28	25	33	30	7		163	24%
1987					1	2	8	4		12	30	104	6		167	22%
1988					6	6	6	20	54	50	3	5	120	10	280	25%
1989					3	1	4	7	12	19	5	16			67	8%
1990					1	2	4	9		22	26	8	8		80	10%
1991					16	15	32	27		50	30	14	2		186	16%
1992				3	4	8	14	13		12	30	10	24	5	123	11%
1993					3	4	4	8	25	28	53				125	12%
1994					2	4	5	12		4	3	2	1		33	3%
1995					1	1	2	3	8	4	3	1		2	25	2%
1996					2	4	2	18	17	9	19	13	1		85	6%
1997					1	3	2	1	10	10	7	2			36	2%
1998							6	3	4	6	4	6	3	4	36	2%
1999				1	2	2	3	11	16	11	12	6			64	4%
2000								4		8	7	29	15	2	65	3%
Grand Total				**8**		**93**		**283**		**475**		**434**		**88**		
					53		**187**		**345**		**475**		**336**		**2,777**	

Usage Notes A 'year' is the period 7/1 to 6/30 The earliest of the calender years is shown * (% SW), % of Statewide is based on species and periods listed

Kansas Department of Wildlife and Parks

Waterfowl Migration Report (Summary x Year)

Data are included for Flint Hills NWR
Data are included for Bald Eagle, Golden Eagle, Osprey, Unknown Eagles
All periods in the header are included

Year	9/ 1-15	9/ 16-30	10/ 1-15	10/ 16-31	11/ 1-15	11/ 16-30	12/ 1-15	12/ 16-31	1/ 1-15	1/ 16-31	2/ 1-15	2/ 16-28	3/ 1-15	3/ 16-31	Total	% SW*
1970				1	3	6		4							14	4%
1971									4				1		5	1%
1972							3		14	7	10	23	8		65	8%
1974				1											1	0%
1975					1		4	6	20	1		27			59	8%
1976					1		23	25		25	33				107	16%
1977					2	1	1	16	18	25	14	12	14	41	144	20%
1978								24		9	9	8	17	4	71	13%
1979							7	10	36		1	8	22	1	85	14%
1980								4	26	20			20	2	72	12%
1981						1	5	5	24	14	13	6	19		87	11%
1982						11	9	22	17	26	35	36	5	10	171	29%
1983				2	2	6	6			17	45	25	10	3	116	14%
1984					2	6	6	18	12	28	28	29	10	3	142	17%
1985							9	17		33	22	17	23	1	122	18%
1986					1	13	24	2	28	25	33	30	7		163	23%
1987					1	2	8	4		12	30	104	9		170	21%
1988					8	6	6	20	56	50	3	5	120	11	285	25%
1989					3	1	4	7	12	19	5	16			67	8%
1990					1	2	4	9		22	26	8	8		80	10%
1991					16	15	32	27		50	30	14	2		186	16%
1992				3	4	8	14	13		12	30	10	24	5	123	11%
1993					3	4	4	8	25	28	53				125	12%
1994					2	4	5	12		4	3	2	1		33	3%
1995					1	1	2	3	8	4	3	1		2	25	1%
1996					2	4	2	18	17	9	19	13	1		85	5%
1997					1	3	2	1	10	10	7	2			36	2%
1998							7	3	4	9	4	6	3	4	40	2%
1999				1	2	2	3	11	16	11	12	6			64	4%
2000								4		8	7	29	15	2	65	3%
Grand Total				**8**		**96**		**293**		**478**		**437**		**89**		
					56		**190**		**347**		**475**		**339**		**2,808**	

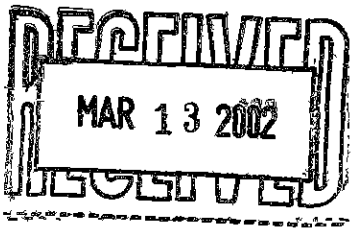
Page Notes A 'year' is the period 7/1 to 6/30 The earliest of the calender years is shown * (% SW) % of Statewide is based on species and periods listed

Tuesday, June 19, 2001

APPENDIX E

Farmland Protection Policy Act Coordination and Correspondence

United States Department of Agriculture
Natural Resources Conservation Service
2917 West Highway 50 Phone 620-343-7276
Emporia, KS 66801-5140 FAX 620-343-7871



March 11, 2002

James D Von Loh, Project Manager
e²M engineering-environmental Management, Inc
1510 West Canal Court, Suite 2000
Littleton, CO 80120

Dear Ms Bowers:

Thank you for the opportunity to review the proposed "Reallocation of Water Supply Storage Project John Redmond Lake, Kansas". This project is located in Lyon and Coffey counties in Kansas.

Since this project involves land already in COE jurisdiction, this project isn't affected by the Farmland Protection Policy Act Also since the area in question is immediately above the conservation pool and below the flood pool the flooding, ponding, and saturation of the soils involved are not properly reflected by the soil survey. Even though ag leases exist on a small portion of the acreage, the probability of successfully harvesting a annual crop is significantly diminished.

Because of the special nature of this request, the project was reviewed with Rod Egbarts, Soil Conservationist , on our state staff for concurrence

If I can be of further assistance please let me know

JEFFREY L. GROSS
Assistant State Conservationist

cc:
Robert K Harkrader, District Conservationist, NRCS, Burlington, KS
Rodney D. Egbarts, Soil Conservationist, NRCS, Salina, KS

December 3, 2001

Mr Richard Schlepp
State Soil Scientist/MO Leader
USDA-NRCS
760 South Broadway
Salina, KS 67401-4642

Dear Mr. Schlepp.

engineering-environmental Management, Inc. is assisting the U S. Army Corps of Engineers, Tulsa District to prepare a Supplement to an Environmental Impact Statement for the "*Reallocation of Water Supply Storage Project John Redmond Lake, Kansas*". Attached for your consideration and evaluation relative to this project are: 1) Form AD-1006, Farmland Conversion Impact Rating, 2) a memorandum summarizing site soils, and 3) a figure to locate soils in relation to John Redmond Lake

Should you require additional information concerning this project and the attached evaluation, please contact me at (303) 721-9219 or·

Mr James Randolph
USACE – Tulsa District
Environmental Analysis & Compliance Branch
1645 South 101 East Avenue
Tulsa, OK 74128-4629

(918) 669-4396

Thank you in advance for your cooperation with this SEIS project and Form AD-1006 evaluation.

Sincerely,

James D Von Loh
e^2M Project Manager

Attachments
File

U S DEPARTMENT OF AGRICULTURE **Form AD-1006**

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	1 Date of Land Evaluation Request November 5, 2001	2 Sheet _1___ of _3___
3 Name of Project: Reallocation of Water Supply Storage Project. John Redmond Lake, Kansas	4 Federal Agency Involved United States Army Corps of Engineers – Tulsa District	
5 Proposed Land Use Flood Control Reservoir with Water Supply Storage	6 County and State Coffey County and Lyon County, Kansas	7 Type of Project Corridor Other XX

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing the NRCS parts of this form
3. Does the site or corridor contain prime, unique, statewide or local important farmland? Yes ☐ No ☐ (If no, the FPPA does not apply - Do not complete additional parts of this form)		4. Acres Irrigated / 5. Average Farm Size
6. Major Crop(s)	7. Farmable Land in Government Jurisdiction Acres: %	8. Amount of Farmland As Defined in FPPA Acres: %
9. Name of Land Evaluation System Used	10. Name of Local Site Assessment System	11. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	**Site B**	**Site C**	**Site D**
A Total Acres To Be Converted Directly	405 acres			
B Total Acres To Be Converted Indirectly, Or To Receive Services	–0–			
C Total Acres In Site	405 acres			
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime and Unique Farmland				
B. Total Acres Statewide and Local Important Farmland				
C. Percentage of Farmland in County or Local Govt. Unit to be Converted				
D. Percentage of Farmland in Govt. Jurisdiction with Same or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland to be Serviced or Converted (Scale of 0 - 100 Points)*				

PART VI *(To be completed by Federal Agency) Corridor or Site Assessment Criteria (These criteria are explained in* 7 CFR 658 5(b & c))	**Max. Points Corridor Other**				
1 Area in Nonurban Use	15				
2 Perimeter in Nonurban Use	10				
3 Percent of Site Being Farmed	0				
4 Protection Provided by State and Local Government	0				
5 Distance from Urban Built-up area	15				
6 Distance to Urban Support Services	10				
7 Size of Present Farm Unit Compared to Average	0				
8 Creation of Non-Farmable Farmland	0				
9 Availability of Farm Support Services	5				
10 On-Farm Investments	0				
11 Effects of Conversion on Farm Support Services	0				
12 Compatibility with Existing Agricultural Use	0				
TOTAL CORRIDOR OR SITE ASSESSMENT POINTS	55				
PART VII *(To be completed by Federal Agency)*					
Relative Value of Farmland (from Part V above)					
Total Corridor or Site Assessment (From Part VI above or a local site assessment)					
TOTAL POINTS *(Total of above 2 lines)*					

PART VIII *(To be completed by Federal Agency after final alternative is chosen)*		
1 Corridor or Site Selected	2 Date of Selection	3 Was A Local Site Assessment Used? Yes ☐ No ☐
4 Reason For Selection		

Signature of person completing the Federal Agency parts of this form	DATE

Wisconsin substitute form AD-1006 6-9-97 Completion instructions http //www wi nrcs usda gov/soil/prime/prinotes.html

MEMORANDUM

TO: USACE and NRCS Staff
FROM: Jim Von Loh, engineering-environmental Management, Inc.
SUBJECT: Farmland Protection Policy Act Compliance using Form AD-1006; Farmland Conversion Impact Rating
DATE: November 5, 2001

Re: Reallocation of Water Supply Storage Project. John Redmond Lake, Kansas Environmental Impact Statement.

This memorandum constitutes a fact sheet for evaluators of farmland within the site boundaries of the above-mentioned U. S. Army Corps of Engineers – Tulsa District project (also see attached figure). Approximately 571 acres within the flood control pool may be permanently inundated for two EIS alternatives for additional water storage at John Redmond Lake. These alternatives would inundate the land by raising the existing conservation pool for water storage from elevation 1,039.0' to 1,041 0'. Of the 571 acres affected, approximately 166 acres are already under water as ponds, river channel, and a portion of the reservoir shoreline, leaving approximately 405 acres of potential farmland Approximately 33 acres of the 405 acres are currently leased for cultivation, however a crop is harvested only about 2 of 5 years because of flooding. It should also be noted that this land is under water several days during flood events and for three months in the fall to provide flooded habitat for migrating waterfowl.

The approximately 405 acres of affected land occupy the following soil types

1) Apperson-Dennis silty clay, 1-4%, 2) Dennis silt loam, 1-4%, 3) Dennis silty clay loam, 2-5%; 4) Eram silt loam, 1-3%; 5) Eram silt loam, 3-7%; 6) Eram-Collinsville complex, 4-15%; 7) Eram-Schidler silty clay loam, 4-15%; 8) Kenoma silt loam, 1-3%; 9) Lanton silty clay loam; 10) Orthents, clayey; 11) Osage silty clay loam; 12) Osage silty clay; 13) Summit silty clay loam, 1-4%; 14) Verdigris silt loam, 15) Woodson silt loam.

A third project alternative under consideration would be to dredge sediments from John Redmond Lake, which would achieve the desired water storage capacity and preclude the above flooding of approximately 405 acres However, haul and disposal of dredged sediments may affect farmland on sites as yet undetermined, and of an unknown acreage.

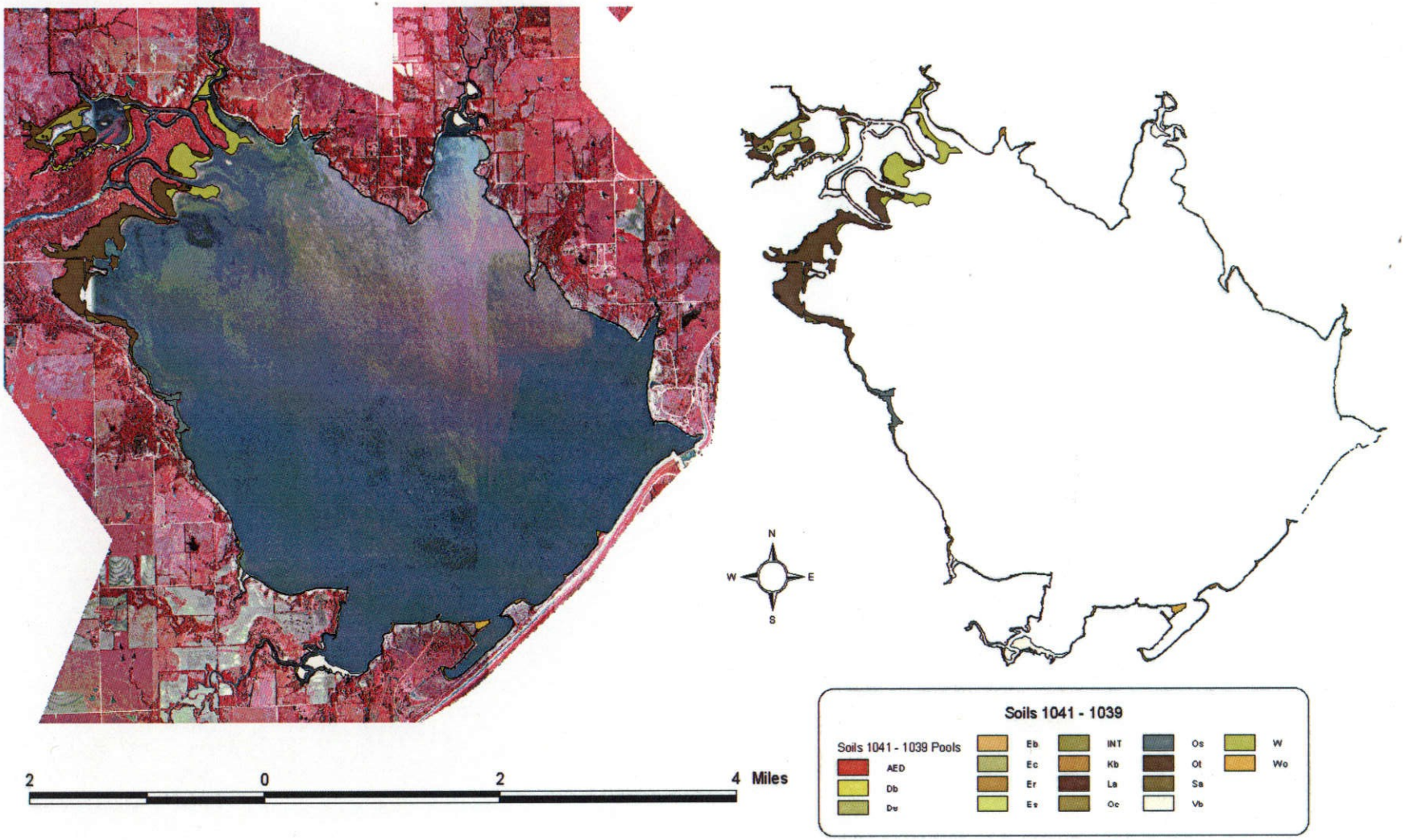


Figure 4-1. Soils Affected by the Pool Raise to 1,041.0 Feet

APPENDIX F

Fish and Wildlife Coordination Act Report
USACE Analysis of Fish and Wildlife Coordination Act Report

TULSA DISTRICT ANALYSIS
U.S FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE COORDINATION ACT REPORT

Purpose In accordance with the provisions of the Fish and Wildlife Coordination Act, the USACE funded the U. S Fish and Wildlife Service (USFWS) to report on the impacts of the proposed pool raise at John Redmond Lake, Kansas A final Coordination Act Report (CAR) dated March 15, 2002 was furnished and constitutes the report of the Secretary of the Interior on the project within the meaning of Section 2 (b) of the Act. A copy of the CAR is furnished in Appendix D. Information from the Kansas Department of Wildlife and Parks (KDWP) was used in preparation of the report and the Service has solicited concurrence from the KDWP. A letter of concurrence from the KDWP has not yet been received.

Summary. With the proposed project a portion of the flood control pool would be reallocated to water supply The proposed two-foot pool raise would inundate a small segment of the Neosho River, 385 acres of the Flint Hills National Wildlife Refuge administered by the USFWS, and 116 acres of the Otter Creek Wildlife Management Area managed by the KDWP. In total, approximately 556 acres of terrestrial wildlife habitat would be permanently inundated as a result of the proposed action

Public recreation facilities and wildlife management units which would be lost to permanent inundation include the Jacob's Creek boat launching ramp and parking lot, the Strawn wetland dike and outlet works, and the Goose Bend #4 wetland dike and outlet works, all of which are located within the Flint Hills National Wildlife Refuge

Cumulative impacts of the proposed action include more frequent and longer duration of inundation by retention of moderate floods within the reallocated flood pool The frequency and duration of flooding would increase by 1 or 2 % for elevations 1042 NGVD to about 1046 NGVD. Gravel bars that serve as habitat for the Neosho madtom would be inundated more frequently and for longer duration than at present. In addition roads and facilities within the Flint Hills NWR and the Otter Creek WMA would be subject to more frequent inundation disrupting management activities, public access, and use.

Recommendations and Comments. The USFWS recommended the following be incorporated into the reallocation study to lessen the impacts on fish and wildlife resources and facilities constructed for wetland creation and management or for public access to reservoir resources

Recommendation No. 1: The Jacob's Creek boat launching ramp and parking area be replaced/relocated above elevation 1041 msl but within the same general area to accommodate angler and hunter access as a cost of the project.

Comment: Concur. Similar facilities of the same type and size would be replaced and/ or relocated to a suitable area, to be jointly determined by the USFWS, USACE, and KDWP

Recommendation No. 2. The Corps of Engineers replace the Strawn Flats and Goose Bend #4 dikes, outlet works and pumping facilities at a site, to be determined by the Service but within the NWR, as a cost of the project

Comment: Concur These facilities would be replaced by recommending construction of mitigation Option #5, by developing 243 acres of wetlands on the Flint Hills NWR at an estimated cost of $437,000.

Recommendation No. 3. The Corps of Engineers initiate an Environmental Management Plan in the Neosho Basin integrating Reservoir Operations and management with conservation of and management of all natural resources within the basin with particular emphasis on providing protection and enhancement for species of concern

Comment Partially Concur. The USACE would be willing to participate in developing a management plan for the Neosho Basin. However, due to the complexity of issues that need to be addressed within the basin, there are many participants including state, other federal agencies, local interest groups, and governments that need to be included in such an effort. We feel it would be more appropriate for such a management effort to be initiated at the state level

Recommendation No. 4. An annual water level management plan be jointly developed by all agencies involved and implemented

Comment. Concur Consideration would be given to developing a water level manipulation plan compatible with the new conservation pool and associated operational guidelines for that pool. However, this plan would need to be originated by the Kansas Water Office and KDWP

Recommendation No. 5 Provisions be made for post-development impact evaluations (follow-up studies) for potential wetland development immediately above elevation 1041 NGVD

Comment: Concur. As a result of the reallocation study a GIS database has been developed for the project. At some point in the future, if required, it could be used to assess changes in wetland development.

List of Mitigation Options

[1]USFWS Mitigation (Alternatives) Options

Option #1 Acquisition: Lands can be acquired, in fee, from willing sellers, at project cost, and then retained in Federal ownership They would be managed under the existing cooperative agreement or lease The estimated land cost is approximately $1,000/acre.

Option #2 Lease of Land: Lands under flowage easement would be leased by the Corps of Engineers from owners for management by the Service or the Department. Wildlife management practices would be required on the land.

Option #3 Conservation Easements: Easements would resemble the Conservation Reserve Program Easements being purchased by the Natural Resources Conservation Service The Service would enforce the easements for tree plantings, wetland creation, and buffers on the Neosho River above and below John Redmond Reservoir.

Option #4 Kansas Army Ammunition Plant: The 13,737 acre Kansas Army Ammunition Plant near Parsons, Kansas is nearing closure The U S. Fish and Wildlife Service proposes to assume management of approximately 1,008 acres of mixed hardwood riparian forest and 515 acres of native bluestem prairie grassland that are being declared excess government property. In addition to the grassland and forest the broad floodplains along Labette Creek and the Neosho River support or could support a variety of wetland vegetation

The Service intends on accepting land from the Plant under Public Law 80-537 at which time it will become Service property administered by the Flint Hills NWR through a no-cost transfer from the U S Army

There are opportunities on the Plant site for increased management of riparian forest, wetland enhancements, or potential for wetland development/creation to benefit wildlife The Service will accomplish these goals over the life of the project (perpetuity) on an incremental basis through our own budget initiatives. There is an opportunity to accelerate management, and enhancements however, through initiation of mitigation measures deemed appropriate for losses incurred at John Redmond Reservoir.

Mitigation could take the form of small wetland enhancement, development or creation of wetlands at appropriate sites, forest stand improvements and assumption of operation and maintenance cost at this satellite facility Operation and maintenance cost are assumed to be approximately $21/acre/year for the 1008 acres of woodland on the site

The advantage to implementation of mitigation at this site are 1.) No initial land cost, 2) Land is relatively free of flooding (not within the John Redmond flood pool), 3.) The site is within the Neosho River basin, 4) Service personnel would manage the resource as part of the Refuge System, 5) Public access would be assured, 6.) Management activities

could commence upon land transfer, 7.) Management of existing woodland is preferable to planting trees in cropland and waiting for them to mature.

Option #5 Wetland Creation on Refuge Lands. The loss of the Strawn Marsh, dike and outlet works and the Goose Bend Marsh, dike and outlet works and fringe palustrine wetlands within the 1039 and 1041 contour will by and large be accomplished by converting cropland within the refuge boundary to wetland. The cost of wetland development is approximately $1,800/acre (U S Army Corps of Engineers) At a bare minimum 243 acres will be needed to be replaced/developed at a cost of approximately $435,000.

[1] Additional land be acquired (does not mean purchase as the only option for the project and be made available to the Service or the department for wildlife management under terms of the existing agreement or license.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Kansas Field Office
315 Houston Street, Suite E
Manhattan, Kansas 66502-6172

March 15, 2002

Mr. David L. Combs
Chief, Environmental Analysis and Compliance Branch
U S. Army Corps of Engineers
Tulsa District
P O. Box 61
Tulsa, Oklahoma 74121-0061

ATTN. Jim Randolph

Dear Mr. Combs:

This Final Fish and Wildlife Coordination Act Report (FWCA) is provided pursuant to the Fiscal Year 2000 Scope-of-Work Agreement for the John Redmond Pool Raise, Proposed Two Foot Increase In Conservation Pool, Neosho River, Coffey County, Kansas between the U.S Fish and Wildlife Service (Service) and the Tulsa District, Corps of Engineers This Final FWCAR was prepared in accordance with provisions of the Fish and Wildlife Coordination Act (16 U S.C. 661 et seq), and constitutes the report of the Secretary of the Interior on the project within the meaning of Section 2 (b) of this Act

Cooperation and information utilized in preparation of this report was obtained from the Kansas Department of Wildlife and Parks, and the Corps. The Service is concurrently soliciting a concurrence letter from the Kansas Department of Wildlife and Parks. The Departments concurrence letter, when received, will be sent to you for inclusion as appendix A

We appreciate the opportunity to discuss impacts to fish and wildlife anticipated by implementation of this project. If you should have any questions concerning the content of our Final FWCAR, please feel free to contact me at 913 539-3474 Ext. 105

Sincerely,

For: William H. Gill
Field Supervisor

Enclosure

WHG/drc

cc ES, Program Supervisor, South, Denver CO
Refuge Manager, Flint Hills NWR, Hartford KS

John Redmond Pool Raise
Proposed Two Foot Increase In Conservation Pool
Neosho River, Coffey County, Kansas

FINAL
Report on Fish and Wildlife Resources
Submitted To
The Tulsa District
U.S. Army Corps of Engineers
Tulsa, Oklahoma

Prepared by
the Kansas Field Office
Ecological Services
Manhattan, Kansas

March 2002

Table of Contents

List of Figures

List of Tables

List of Appendices

EXECUTIVE SUMMARY

The John Redmond Pool Raise Study is an assessment by the Corps of Engineers to increase the water supply capabilities of John Redmond Reservoir A portion of the flood control pool will be reallocated to water supply. A two foot pool raise would inundate a small area of the free-flowing Neosho River, 385 acres of the Flint Hills National Wildlife Refuge administered by the U.S Fish and Wildlife Service (Service), 116 acres of Otter Creek Wildlife Area managed by the Kansas Department of Wildlife and Parks (Department). In total (all project lands) approximately 556 acres of terrestrial wildlife habitat will be permanently inundated if the conservation pool is increased by two feet.

Physical structures, man made improvements, which will be lost to permanent inundation include the Jacob's Creek Boat Launching Ramp and Parking lot, the Strawn wetland dike and outlet works, and the Goose Bend #4 wetland dike and outlet works, all of which are located within the Flint Hills National Wildlife Refuge

Secondary impacts of the pool raise include more frequent and longer duration inundation by retention of moderate floods within the reallocated flood pool The frequency and duration of flooding will increase by 1 or 2% for elevations 10421 NGVD to about 1046 NGVD. Gravel bars that serve as habitat for the Neosho madtom will be inundated more frequently and for longer duration than at present. In addition roads and facilities within the NWR and Wildlife Area will be subject to more frequent inundation disrupting management activities, public access and use

Since the Service and the Department do not own the land within the project area, the Corps does, we are not in a position to oppose reallocation of the flood pool. However, shoreline habitat and permanent facilities inundated by the increased pool elevation should be considered irretrievable during the expected life of the project. Their loss should be mitigated by replacement of physical facilities, above the new conservation level (1041 NGVD) and by acquisition, creation and management of habitat to replace that which is lost.

Recommendation

1 The Jacob's Creek boat launching ramp and parking area be replaced/relocated above elevation 1041 NGVD but within the same general area to accommodate angler and hunter access as a cost of the project.

2 The Corps of Engineers replace the Strawn flats and Goose Bend #4 dikes, outlet works and pumping facilities at a site to be determined by the Service but within the NWR, as a cost of the project.

3 The Corps of Engineers initiate an Environmental Management Plan in the Neosho Basin integrating Reservoir Operations and management with conservation of and management of all natural resources within the basin with particular emphasis on providing protection and enhancement for species of concern.

4 An annual water level management plan be jointly developed by all agencies involved and implemented

5 Provisions be made for post-development impact evaluations (follow-up studies) for potential wetland development immediately above elevation 1041 NGVD.

6 Additional land be acquired (does not mean purchase as the only option) for the project and be made available to the Service or the Department for wildlife management under terms of the existing cooperative agreement or license

INTRODUCTION

This report evaluates the effects on fish and wildlife resources of a proposed 2 foot pool raise above John Redmond Dam, Neosho River, Kansas. The proposed pool raise is due to an uneven distribution of sediment within the lake from what had been predicted at the time the dam was built (1964) Over time, sedimentation has changed the amount of storage the lake has for flood control, water supply and other purposes Storage available for water supply purposes in the lake has been depleted by sediment distribution such that the water supply agreement obligations between the Federal Government and the state of Kansas are being infringed upon.

Work on this project is based on agreements in the FY 2000 Scope of Work identifying a 2 foot raise as the level upon which to perform an assessment. This study was carried out under authority and in accordance with provisions of the U.S Fish and Wildlife Coordination Act of 1958 (16 U S.C. 661 et seq.)

The U.S Fish and Wildlife Service previously provided a planning Aid Report on the Proposed Reallocation of Storage at John Redmond in December of 1995.

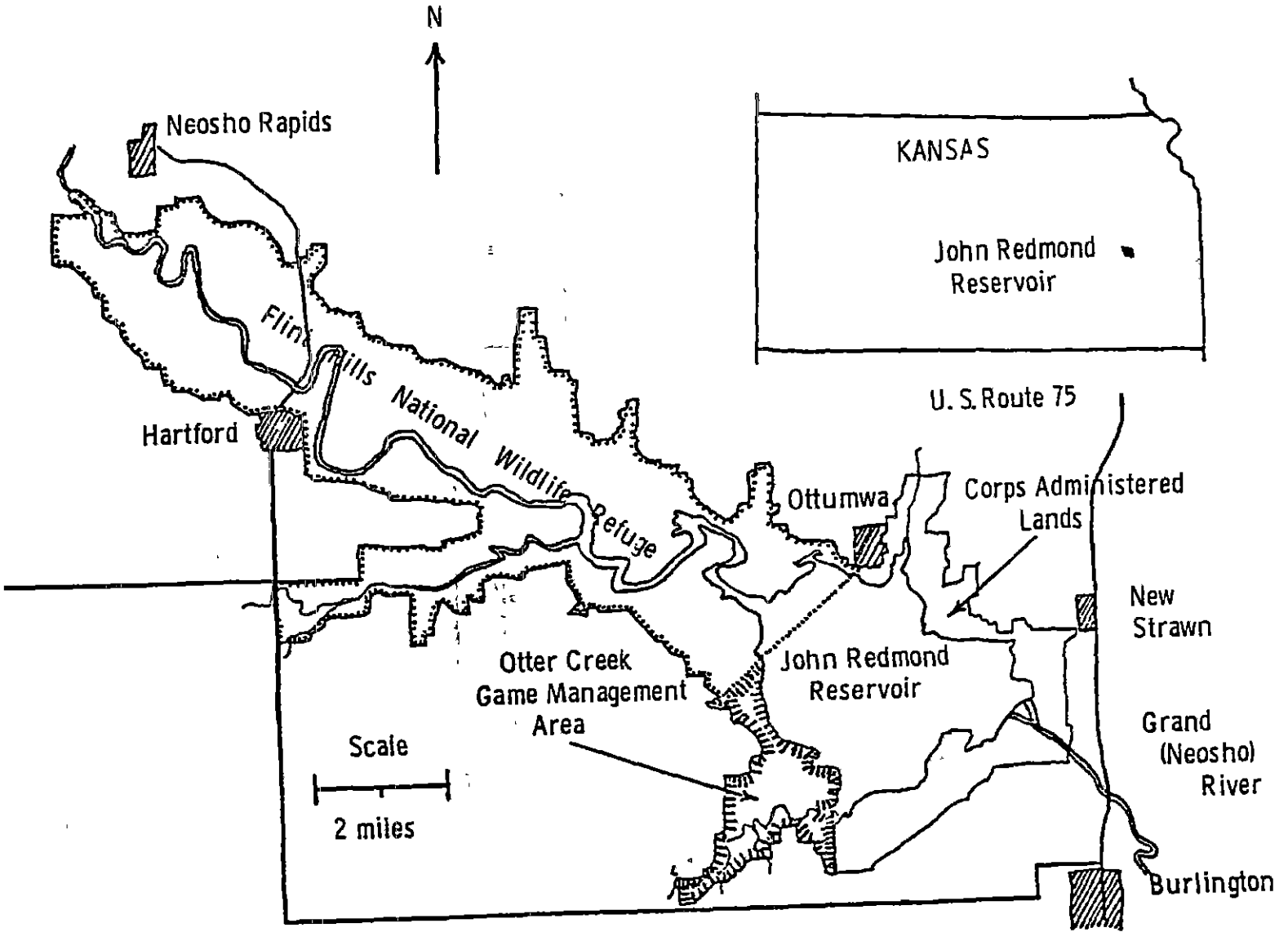
The Kansas Department of Wildlife and Parks have cooperated in the preparation of this report and endorse the contents of this report as indicated in the attached letter dated--------

DESCRIPTION OF THE PROJECT AREA

The proposed project is located above and below river mile 343 7 on the Grand (Neosho) River , about three miles northwest of Burlington in Coffee County, Kansas. John Redmond Lake was authorized by the Flood Control Act approved May 17, 1950, Public Law 81-516a· Project Document HD 442, 80th Congress, 2nd Session Project purposes include flood control, water supply, water quality, and recreation Closure of the embankment was completed in September 1963 and the project was completed for flood control operation in September 1964

John Redmond Dam is the lower unit in a system of three projects (Marion Dam on the Cottonwood River and Council Grove on the Neosho) designed primarily for flood control, water supply and water quality in the upper Neosho River Basin in Kansas At conservation pool, elevation 1039 feet the lake has a surface area of 9,280 acres and a shoreline of 59 miles. At flood pool, elevation 1068 feet the lake has a surface area of 31,660 acres controlling the runoff from a drainage area of 3,015 square miles. The Kansas Department of Wildlife and Parks has license to 1,472 acres of project lands (Otter Creek Game Management Area) for fish and wildlife management The U.S Fish and Wildlife Service has under cooperative agreement about 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 Wildlife Refuge System and much of it is open to public hunting in season. Figure 1.

Figure 1. John Redmond - Wildlife Areas



The Neosho River upstream of John Redmond originates in Morris County and flows southeasterly for more than 300 river miles within Kansas. The Neosho river valley downstream from Council Grove Lake to the inlet to John Redmond Reservoir is about 36 miles long and ranges in width from about 0.3 miles near Council Grove to about 1.6 miles near the confluence with the Cottonwood River The valley downstream from John Redmond Reservoir to the Kansas-Oklahoma state line is approximately 180 miles long and ranges in width from about 0 4 miles near Iola to about 4 5 miles near LeRoy Stream slopes in the vicinity of Council Grove exceed 3 ft/mi but decrease to less than 2 ft/mi in the vicinity of Emporia Downstream from Emporia, the Neosho River channel slope averages about 1 2 ft/mi. The channel slope is controlled primarily by outcropping ledges of limestone and shale, which at low flows create a series of riffles and pools.

Alluvial deposits in the river valley consist mainly of unconsolidated stream-laid gravel, sand, silt, and clay together with occasional cobbles and boulders. The stream valley contains large amounts of chert gravel in the basal part of the alluvium in addition to considerable amounts of sand-size chert grains.

Stream banks vary in height from 15 to 30 feet, and usually support a growth of timber and undergrowth above the water line. Below John Redmond the river meanders in the sense that its location shifts, and its shape adjusts as the channel migrates as a whole down the valley. The meandering process, which is of concern to local interests, consists of eroding banks and deposited material on point bars to form bendways As material is eroded and deposited, the bendways increase in amplitude and gradually move down the valley. Cutoffs occur as the amplitude increases, so the river moves back and forth within certain limits called the meanderbelt

DESCRIPTION OF THE PROJECT PLAN

In 1975, the State of Kansas and the Federal Government entered into a water supply agreement at John Redmond Reservoir for an estimated 34,000 acre-feet of storage remaining after 50 years of sedimentation A recent Kansas Water office water supply and yield analysis indicated that the disproportionate sediment deposition has reduced the water supply capacity at design life to 25%. In order to make an equitable redistribution between the flood control and the conservation pools, the Tulsa District has been directed to study an equitable redistribution of storage between the flood control and conservation pools Consequently the District proposes to raise the conservation pool from elevation 1039 NGVD to elevation 1041 NGVD at John Redmond Reservoir The proposed volume of storage to be reallocated is 17,163 acre feet of storage or 3.18 percent of the flood pool

EVALUATION METHODOLOGY

Resource Category Designation

The U S. Fish and Wildlife Service's Mitigation Policy (Federal Register, Volume 46, No. 15, Pages 7644-7663, January 23, 1981) is used by the Service in the evaluation of impacts to land and water developments and in the subsequent recommendations to mitigate adverse impacts The policy establishes four resource categories, designation criteria, and mitigation planning goals for cover types that the Service anticipates will be impacted by the development of a project. These are the criteria that will be used in any subsequent report by the Fish and Wildlife Service for developing recommendations for mitigation or loss replacement for this project. These are presented below:

Resource Category	Designation Criteria	Mitigation Planning Goal
1	High value for evaluation Species and unique and Irreplaceable.	No loss of existing habitat value
2	High value for evaluation Species and scarce or Becoming scarce.	No net loss of in-kind habitat value.
3	High to medium value for Evaluation species and Abundant	No net loss of habitat value while minimizing Loss of in-kind habitat Value.
4	Medium to low value for Evaluation species	Minimize loss of Habitat value.

In applying the mitigation planning goals, the Mitigation policy directs that the following guidelines be followed:

Resource Category 1

The Service will recommend that all losses of existing habitat be prevented, as these one-of-a-kind areas cannot be replaced. Insignificant changes that do not result in adverse impacts on habitat value may be acceptable provided they will have no significant cumulative impact.

Resource Category 2

The Service will recommend ways to avoid or minimize losses. If losses are likely to occur, then the Service will recommend ways to immediately rectify them or reduce or eliminate them over time If losses remain likely to occur , then the Service will recommend those losses be compensated by replacement of the same kind of habitat value so that the total loss of such in-kind habitat value will be eliminated

Specific ways to achieve this planning goal include (1) physical modification of replacement habitat to convert it to the same type lost, (2) restoration or rehabilitation of previously altered habitat, (3) increased management of similar replacement habitat so that the in-kind value of the lost habitat is replaced, or (4) a combination of these measures By replacing habitat value losses with similar habitat values, populations of species associated with that habitat may remain relatively stable in the area over time. This is generally referred to as in-kind replacement.

Resource Category 3

The Service will recommend ways to avoid or minimize losses. If losses are likely to occur , then the Service will recommend ways to immediately rectify them or reduce or eliminate them over time If losses remain likely to occur, then the Service will recommend that those losses be compensated by replacement of habitat value so that the total loss of the habitat value will be eliminated.

In kind replacement of habitat value is preferable. However, if the Service determines that in-kind replacement is not desirable or possible, then other specific ways to achieve this planning goal include (1) substituting different kinds of habitat, or (2) increasing management of different replacement habitats so that the value of the lost habitat is replaced. By replacing habitat value losses with different habitats or increased management of different habitats, populations of species will be different, depending on the ecological attributes of the replacement habitat. This will result in no net loss of total habitat value but may result in significant differences in fish and wildlife populations This is referred to as out-of-kind replacement

Resource Category 4

The Service will recommend ways to avoid or minimize losses. If losses are likely to occur, then the Service will recommend ways to immediately rectify or reduce them over time If losses remain likely to occur, then the Service may make a recommendation for compensation, depending on the significance of the potential loss.

FISH AND WILDLIFE RESOURCES WITHOUT THE PROJECT

Resource Categories

The major cover types identified in the pool raise area were classified according to Standards for the Development of Habitat Suitability Index Models, 103 Ecological Services Model, U S Fish and Wildlife Service The cover types, along with definitions, are as follows

Cropland - Includes all lands that are used for the growth of agricultural crops that are generally planted and harvested annually. Alfalfa and cool season grasses (hayland) were included in this cover type for this project area.

Palustrine Wetland - Palustrine wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water For purposes of this classification, palustrine wetlands must have one or more of the following three attributes. (1) at least periodically, the land supports predominately hydrophytes; (2) the substrate is predominately undrained hydric soil, and, (3) the substrate is nonsoil and is saturated with water or covered by shallow at some time during the growing season of each year. From Cowardin, L.M., et al 1979 Classification of Wetlands and Deep Water Habitats of the United States U S. Fish and Wildlife Service, FWS/OBS-79/31

Grassland - Areas dominated by nonwoody vegetation, primarily native species which are not regularly mowed for hay.

Woodland - Forestland areas dominated by trees taller than 5 meters and having a canopy cover of at least 25 percent and riparian areas adjacent to creeks, streams, rivers and reservoir shoreline where vegetation is strongly influenced by the presence of water (Riparian areas have one or both of the following characteristics· 1) distinctively different vegetative species than adjacent areas, and 2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms (Riparian areas are usually transitional between wetland and upland)

Lacustrine - Includes all wetlands and deep water habitats situated in a topographic depression or dammed river channel and lacking trees, shrubs, and persistent emergents.

Riverine -Includes all wetlands and deep water habitats except those dominated by trees , shrubs, persistent emergents, emergent mosses, or lichens, which are located in a channel that contains flowing water

Resource categories and designation were determined for these cover types based on the value of the cover type to trust resources and replaceability and scarcity of the habitat on a local, regional and a national basis

The cover types in the John Redmond Pool Raise area were determined to have the resource category designations presented in Table 1.

Table 1. Evaluation of cover types in the John Redmond Pool Raise Project

Cover Types	Species Considered	Reasoning	Resource Category
Cropland	White-tailed deer, killdeer, bobwhite, racoon, mallard	Cropland is of medium value, is not scarce in the project area ; it could be replaced by not harvesting some crops adjacent to the project.	3
Grassland	Pheasant, bobwhite quail, meadowlark, horned lark, meadow voles	Medium value, due to grazing	3
Forest	White-tailed deer, turkey, squirrel, Coopers hawk, red-tailed hawk, warblers	As found on the Neosho River bottoms , it is scarce and difficult to replace , it is mostly destroyed and is in short supply.	2
Palustrine wetland	Red-winged black bird, racoon, muskrat, pheasant, coot, mallard, crappie, blue-winged teal, great blue heron, carp	Important reproduction and nursery area and is scarce in this section of the river It is integrated with riverine habitat and is nearly irreplaceable	2
Riverine	Neosho madtom, White bass, walleye, paddlefish, channel catfish racoon, beaver, waterfowl, gulls, terns	Important to many species of fish. It is in short supply, it is irreplaceable, it contains an important substrate for Neosho madtoms.	2
Lacustrine	Divers, coots, geese, walleye, white bass, drum	It is abundant, low productivity, but of medium value to its associated species	3

The overall wildlife values of terrestrial cover types in the John Redmond project area on a scale of 1-10 (1 lowest to 10 highest) as determined at previously studied Federal projects (Big Hill, Corbin, Douglass, and Upper Little Arkansas River Watershed) are as follows (Table 2):

Table 2 Range of Values

	Big Hill	Corbin	Douglass	Upper Little Ark	Avg
Cropland	3 0	1.5	-	2.7	2 4
Grassland	2.3	5 4	5 9	3.1	4.2
Woodland	6.6	6 4	8.4	4 3	6.4
Wetland	-	-	9 0	-	9 0

Because of their relative abundance, cropland, grassland, and lacustrine cover types were of medium value to species of concern. Grassland and cropland were limited in the project area, but they are abundant outside the project area and/or could be created. Under category 3 designation, the habitat value of these cover types could be replaced with an equivalent value of different cover type, but in-kind replacement would be preferred

Woodlands were determined to be of high value for the species of concern, particularly winter cover for white-tailed deer, and for providing migratory routes for passerine birds. Although woodland can be planted, there is limited area in proximity to the river where trees could be planted to reproduce the type of forest and riparian habitat that exists in the project area Therefore , whether replacement can be accomplished becomes a function of how much habitat is altered. Also, the proximity of free-flowing river with accompanying wetlands and gravel bars makes the woodland immediately adjacent to the waters edge a unique habitat. These two cover types were placed in resource category 2 Any loss of habitat value must be replaced in kind

Palustrine wetlands were determined to be of high value to species of concern, particularly migratory waterfowl (ducks and geese) and shore birds The emergent vegetation on the shore line of the lake is very similar to the isolated wetlands created on Flint Hills National Wildlife Refuge Although some emergent vegetation will be lost, due to an increase in water depth, additional emergents will develop as terrestrial habitat is inundated. Replacement is dependent on how much habitat is altered. Palustrine wetlands are resource category 2, and any loss of habitat value must be replaced in kind.

Since construction of Council Grove, John Redmond and Grand Lake reservoirs free-flowing segments of the Neosho River have become scarce. These segments are important to a number of indigenous fish species, including the Neosho madtom and the paddlefish The gravel bars associated with the free flowing segments are important habitat and spawning areas for indigenous and trust resource species. The free flowing Neosho River is placed in resource category 2 any loss should be replaced in kind.

Aquatic Ecosystem

John Redmond Lake

At multipurpose pool level John Redmond Lake provides a diverse and vital aquatic habitat Sediment encroachment, however, is creating problems for recreation use of the multipurpose pool and has greatly reduced the storage capacity and yield from storage Sediment has been deposited in the upstream portions of the reservoir as expected, but has also been distributed within the multipurpose pool as well and has significantly altered the depth and character of the aquatic habitat Mud flats or shallows occur throughout the middle and upper reaches and tributary streams of the lake These naturally shallow areas have grown in size and extent by the accelerated sedimentation.

The high flow- through of flood waters, sediment load and siltation has made it nearly impossible to maintain a sportfish population requiring two or three years of stable and manageable water conditions to grow individual fish to a harvestable size within John Redmond. With the opening of a quality fishery at Coffee County Lake fishing effort at John Redmond has declined.

Immediately after John Redmond Reservoir was impounded in 1963, the Department initiated a fish stocking program Game fish planted in the lake included crappie and channel catfish in 1963, largemouth bass, walleye, and bluegill in 1964; and striped bass in 1966. Early in this period (exact date unknown), white bass were also planted Stockings of saugeye, wipers and paddlefish continues Non-game species of the free flowing Neosho River fish community underwent rapid expansion following impoundment. They have continued to dominate the lake fishery to this day.

In the late winter and early spring of 1967, severe fish kills occurred over approximately 25 percent of the area of the reservoir's upper basin. Effluent from livestock feedlots located along the Neosho River upstream of the reservoir were identified as the cause of the mortalities Subsequent state legislation provided for more effective control of such wastes, and the problem has been abated

Current angling effort on John Redmond Lake is approximately 21,000 mandays while the stilling basin supports approximately 8,700 mandays of fishing.

Seasonal manipulation of the reservoir pool, both above and below conservation pool, has been an intricate component of fish and wildlife management at John Redmond Reservoir since about 1977. Recent efforts to implement a drastic drawdown, similar to the one implemented in 1978 or 1979 that was a success from a fisheries stand point, has met with resistance at the state level due to concerns of water supply dependability.

Because of the resistance to a major draw down and the opening of other quality sport fisheries within the area, the water level management plan for John Redmond has been modified to provide primary benefits to shore birds and waterfowl with only limited benefit to fisheries

Neosho River

This diverse and seemingly ever changing river environment supports a native and introduced assemblage of aquatic species Several species of fish presently occurring in the river that were introduced by man include the carp, northern pike, white bass, wiper, yellow perch, and walleye

The variety of bottom substraits in the river allows for a good diversity of benthic macroinvertibrates, with 20 to 27 families present. Freshwater mussels from the Neosho River accounted for 58% of the threeridge mussel (Amblema plicata) harvest from the State in 1999 and monkeyface (Quadrula metanevra) from the Neosho accounted for 67% of the state wide total mussel harvest. This diversity of habitat and food base allows a quality fishery to be maintained. The diversity of fish in turn serve as hosts to the glochidia of a diverse number of fresh water mussels The Department has classified the Neosho river as possessing a Value-Class II, high priority fishery resource (Moss and Brunson 1981).

There are over 29,100 angler days per year of angler use on the river between Council Grove and John Redmond, and 63,900 angler days of use between John Redmond and the Kansas-Oklahoma State line. Both reaches are considered to have an excellent sport fishery, especially for catfish The principal fishing areas are limited and generally restricted to adjacent towns, road crossings, low water or overflow dams and reservoir tailwaters.

Principal species of the Neosho river are listed in Tables 3, 4 and 5.

Table 3. Fish species of the Neosho River above John Redmond Reservoir

Spotted bass	Channel catfish
Green sunfish	Longear sunfish
Orange-spotted sunfish	White crappie
Carp	Drum
River carpsucker	Bluntnose minnow
Red shiner	Slenderhead darter
Neosho madtom	Gizzard shad

Table 4 Fish species of the Neosho River below John Redmond Reservoir.

Largemouth bass	White bass
Channel catfish	Flathead catfish
Green sunfish	Bigmouth buffalo
Drum	Smallmouth buffalo
Bluntnose minnow	Brook silverside
Golden shiner	Mosquito fish
Neosho madtom	Red shiner
Slenderhead darter	Slim minnow
Stonecat	Paddle fish
Spotted bass	Walleye
Blue suckers	Wipers
Gizzard shad	Sauger

Table 5 Fresh water mussel species of the Neosho River below John Redmond Reservoir

Pimpleback	Wabash pigtoe
Threeridge	Mapleleaf
Washboard	Threehorn wartyback
Pistolgrip	Monkeyface
Spike	Fragile papershell
Round pigtoe	Butterfly
Bleufer	Plain pocketbook
Wartyback	Neosho mucket
Pink papershell	Fawnsfoot
Yellow sandshell	Flutedshell
Ouachita kidneyshell	Giant floater
Rabbitsfoot	Creeper
Fawnsfoot	Deertoe
White heelsplite	

Species at Risk

The piping plover (Charadrius melodus) is a small shorebird which may be a seasonal spring and fall migrant through portions of Kansas, particularly along the Cimarron, Ninnescah, Arkansas, Kansas, and Missouri Rivers Plovers are associated with unvegetated shorelines, sandbars, and mudflats, utilizing aquatic invertebrates for food. Threatened status

The least tern (Sterna antillarum) utilizes similar unvegetated wetland habitat as do piping plovers, in the same geographic regions of Kansas, feeding primarily on small fish It occurs as a spring and fall migrant through the State, and also nests in central and southwest Kansas Endangered status.

The bald eagle (Haliaeetus leucocephalus) may be expected to occur along any river or at any reservoir in Kansas during winter. Eagles will utilize areas where large trees provide perch sites in proximity to open water, where they feed on fish and waterfowl A first nest was documented in 1989, there were no active nests in 2001. Threatened status.

The Neosho madtom (Noturus placidus) is a small catfish which depends on clean oxygenated gravel bars throughout the mainstem Neosho, Cottonwood, and Spring Rivers in southeastern Kansas, southwestern Missouri, and northeastern Oklahoma Threatened status

The Mead's milkweed (Asclepias meadii), a perennial broad-leaved plant, is associated with unbroken tallgrass prairie, generally occurring as small populations or scattered individuals Kansas counties containing confirmed Mead's milkweed populations include Allen, Anderson, Bourbon, Coffey, Crawford, Douglas, Franklin, Jefferson, Johnson, Leavenworth, Linn, Miami, and Neosho. Threatened status.

The western prairie fringed orchid (Platanthera praeclara) is a perennial plant generally occurring in swales or low edges of slopes in native tallgrass prairie Recent populations have been documented in Douglas, Jefferson, Leavenworth, and Osage counties Threatened status

The Butterfly (Ellipsara lineolata) is a freshwater riverine mussel preferring clean water with good current over gravel substrate. It's historic range included the Neosho, Spring, Fall, and Verdigris rivers Scattered individuals have recently been documented in the Verdigris and Neosho river, but distribution and numbers have been significantly reduced. State, threatened status.

The Flat Floater (Anadonta suborbiculata) is a thin shelled mussel that seems to prefer shallow areas of relatively permanent oxbow lakes having organically rich mud bottoms This preferred habitat is subject to water level changes due to fluctuations in run-off water and flood flows that recharge oxbow lakes Flat floaters appear to be able to repopulate suitable areas when favorable habitat conditions return. The current range of the Flat Floater in Kansas is restricted to the lower reaches of the Neosho and Marais des Cygnes rivers. State, endangered status.

The Neosho mucket (Lampsilis refinesqueana) mussel is an obligate riverine species preferring shallow clean flowing water in fine to medium gravel substrates. Historically found in the Marais des Cygnes, Cottonwood, Spring, Neosho, Verdigris, Fall, and Caney River systems. Currently appears to be extirpated from the Caney River and much reduced in numbers and distribution in the other river systems State, endangered status.

The Redspot Chub (Nocomis asper) is one of our largest native minnows It's range is restricted to streams within the Neosho and Spring River Basins They require streams with a fairly steady flow of clear water , inhabiting deep pools and runs with gravel bottoms They are most common in those streams having aquatic plants along their margins. State, threatened status.

The Rabbitsfoot mussel (Quadrula cylindrica) requires clear streams with gravel substrate and moderate, stable current Historically occurred in the Neosho, Spring and Verdigris rivers. Currently several known populations occur in the Neosho, Spring rivers State, endangered status, Federal Species of concern

The Ouachita kidneyshell (Ptychobranchus occidentalis) is another obligate riverine mussel preferring gravel substrate with clean flowing water Historically it occurred in the mainstem and major tributaries of the Verdigris, Neosho, and Spring rivers. It still occurs in many of these areas, but at mush reduced numbers. State, threatened status, Federal Species of concern.

The Western fanshell (Cyprogenia aberti) is an obligate riverine species found in mud, sand, gravel, and cobble substrate, generally associated with less than three feet of water. Historically found in low densities in the Fall, Verdigris, Neosho, and Spring Rivers Appears to have been extirpated from the Neosho River Scattered individuals have been documented in recent years in the Verdigris, Fall, and Spring rivers and Shoal Creek State, endangered status, Federal Species of concern.

The Blue Sucker (Hybopsis gracilis) prefers large rivers where they occur in swift deep chutes where substrate is rocky and free from silt. It is currently known only from the Missouri River mainstem, the Kansas River downstream of Bowersock Dam at Lawrence, and the Neosho River mainstem downstream from its confluence with the Cottonwood River. Federal Species of concern

The Paddlefish (Polyodon spathula) move out of Lake O' the Cherokees and up the Neosho River from mid-March through mid-May when water temperatures reach 60-65 degrees F These migrations are triggered by water elevations in the river rising a minimum of 3 to 5 feet. Paddlefish reintroduced to John Redmond similarly move into the Neosho above John Redmond and did spawn successfully in the high water year of 1993 It may be possible to utilize Marion and Council Grove reservoirs, and John Redmond reservoir downstream releases during wet years in such a manner that flood evacuation peaks are reduced in magnitude and duration, during periods of potential spawning activity, to increase available spawning habitat for this species. Federal Species of concern.

In addition to the preceding 17 species, the State of Kansas maintains a list of species in need of conservation (Appendix B). The following species may also be found within the basin area and may use riparian and project area lands and therefor should receive special consideration by the Corps in preparation of the environmental assessment

Neosho River Basin

1. Common Map turtle, State, threatened status
2 White-faced Ibis, State, threatened status
3 Snowy Plover, State, threatened status
4 Regal fritillary butterfly, Federal, Species of concern
5 Plains spotted skunk, State threatened status, Federal Species of concern
6 Ferruginous hawk, Federal, Species of concern
7. Cerulean warbler, Federal, Species of concern
8 Earleaf fox glove, Federal, Species of concern
9. Skinner's purple false foxglove, Federal, Species of concern.
10 Cleft sedge, Federal, Species of concern-

Endangered Species

In accordance with Section 7 (c) of the Endangered Species act (16 U S.C. 1531 et seq.), it has been determined that the following federally listed species may occur in the project area: Neosho madtom (*Noturus placidus),* bald eagle (*Haliaeetus leucocepalus),* and western prairie fringed orchid (*Platanthera praeclara).*

Bald eagles generally arrive in the late fall and spend the winter around John Redmond Reservoir and surrounding areas. Eagle use on the Refuge is monitored from October through March and nesting attempts have been documented

In addition, the Neosho madtom is federally listed as threatened and the flat-floater mussel is listed as state endangered and are known to occur within the Neosho river drainage and within the Refuge boundary The Neosho madtom inhabits the gravel bars within the NWR in the vicinity of Hartford and below the Hartford bridge.

Terrestrial Ecosystem

Flint Hills National Wildlife Refuge

The refuge (Figure 2) was established under a cooperative management agreement with the Corps of Engineers to provide habitat for migratory waterfowl in the Central Flyway. The major management objective for Flint Hills NWR focuses on protecting the unique Refuge habitats essential for the survival of the diverse species that utilize the Refuge

Refuge habitats consists of approximately 4,572 acres of wetlands, 1,400 acres of open water, 5,999 acres of riparian wetlands on the Neosho River and associated creeks, 3,917 acres of

cropland, 3,200 acres of grassland, 2,400 acres of woodland, 2,255 acres of brushland, and 120 acres of administrative and recreational areas.

The various habitats present on the Refuge support a variety of species of mammals, birds, reptiles, amphibians and fish Mammals common to the Refuge are white-tailed deer, coyote, beaver, opossum, racoon, bobcat, cottontail rabbit, fox squirrel, and other small mammals River otters have been reported on the Refuge since their reintroduction several years ago on the Cottonwood River upstream of the Neosho River

Bird species commonly seen on the refuge include an abundance of waterfowl such as Canada geese, snow geese, white-fronted geese, mallard, pintail and blue-winged teal Marsh and water birds on the Refuge include American white pelican, great (common) egret, snowy egret, great blue heron, little blue heron, green-backed heron, American bittern, double-crested cormorant, and pied-billed grebe Shorebirds, gulls, and terns seen on the Refuge include greater yellowlegs, dowitchers, ring-billed gull, Franklins gull, and Forester's tern Raptors include red-tailed hawk, northern harrier, Swainson's hawk, Cooper's hawk, great horned owl, and sharp-shinned hawk Other common birds are bobwhite quail, wild turkey, and eastern blue bird.

Fish found on the Refuge include those intrinsic to the Neosho River and those stocked in John Redmond Reservoir. Primary species sought by anglers include channel catfish, white bass, crappie, flathead catfish and carp

Waterfowl management has been the primary focus of many management strategies over the years. While wildlife management perspective has broadened, waterfowl continues to be a major focus and the numbers of waterfowl give an indication of the intrinsic value of the Refuge Table 6 includes the waterfowl counts from 1993 to 1997 and gives an indication of the vast numbers of birds that utilize the Refuge.

Flint Hills National Wildlife Refuge

Coffey and Lyon Counties, Kansas

Legend

- Refuge Boundary
- Parking Area
- Boat Ramp
- Refuge Headquarters

Map # 3 Base Map

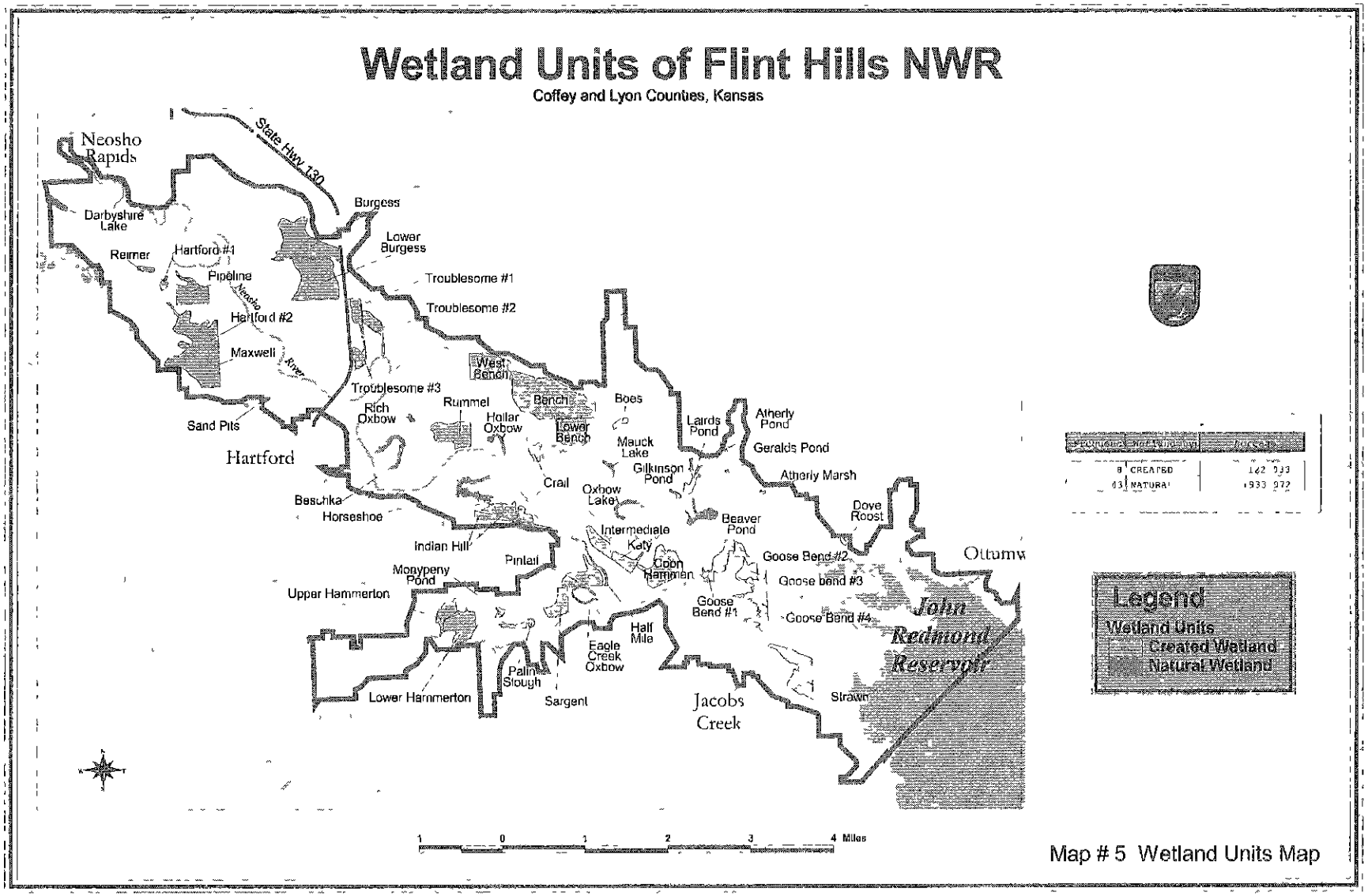
Table 6.

Waterfowl Counts 1993-1997

Year	Canada Geese	Snow Geese	White-fronted Geese	Ducks
1997	1,400	21,305	2,800	33, 535
1996	2,561	20,000	1,215	39,570
1995	3,000	9,100	4,000	48,750
1994	3,100	20,000	1,900	44,550
1993	2,500	31,000	650	16,400

(USFWS, 1997)

Flint Hills Refuge is located within the flood pool of John Redmond Reservoir When the reservoir is at normal conservation pool (1039 NGVD) , very little Refuge land is inundated. During abundant water periods, as much as 95 percent of the Refuge may be inundated by flooding from the rising pool level of John Redmond Reservoir Floods of this severity are not uncommon (1973, 1985, 1986, 1993, 1995, and in 1998) Most precipitation is received in spring and some degree of flooding can be expected, while fall flooding of the Reservoir is less common During drought periods, or other periods of low precipitation, pumping may be necessary to sustain wetlands and maintain wildlife habitat Wetland units depicted in Figure 3



Map # 5 Wetland Units Map

Otter Creek Wildlife Management Area

The 1,472 acre Otter Creek Wildlife Management Area was licensed to the Kansas Department of Wildlife and Parks in 1968, for the conservation and management of resident game as well as other wildlife species. To date, the area has not been developed to the extent planned. Farming is limited for lack of a cooperator willing to risk potential inundation on annual basis and an on-site game manager is not available to administer the area. Hunting pressure is divided about equally between waterfowl and upland game

FISH AND WILDLIFE RESOURCES WITH THE PROJECT

Terrestrial Ecosystem

A two foot pool raise behind John Redmond Dam would impact all of the cover types within the project area There would be losses in category 3 grassland and cropland and an increase in lacustrine habitat. Category 2 woodland and palustrine wetlands would be reduced in size and extent from that presently available To what extent newly inundated terrestrial habitat will convert to wetland is as yet undetermined With a 2 foot pool raise approximately 12.800 feet of the Neosho River and its associated gravel bars will be permanently inundated. Whether and where wetlands and gravel bars will reform over time is not predictable at this time due to uncertainties of potential water withdrawal projects above John Redmond and water withdrawls from the conservation pool.

Land between elevation 1039 and 1041 and their associated cover types are presented in Table 7.

Table 7 Habitat Change with an 2 Foot Increase in Conservation Pool*

FLINT HILLS REFUGE

Crop Land	-10 acres
Forest	-162 acres
Palustrine Wetland	-196 acres
Grassland	-17 acres

OTTER CREEK WILDLIFE AREA

Crop Land	-29
Forest	-22
Palustrine Wetland	-50
Grassland	-15

Corps of Engineers Managed Properties

Cropland	-12 acres
Forest	-11 acres
Palustrine Wetland	-26 acres
Grassland	-8 acres

Total Habitat Loss Entire Project

Cropland	-51 acres
Forest	-195 acres
Palustrine Wetland	-270 acres
Grassland	-40 acres
Total all Habitat Types	-556 acres

*We used the Kansas GAP Analysis Land Cover as our base map to calculate land cover impacts due to the conservation pool raise to 1041 feet NGVD This data base depicts 43 land cover classes for the State of Kansas. The database was generated using a two stage hybrid classification of multitemporal Landsat Thermic Mapper (TM) imagery. The Land cover was overlaid with covers depicting the 1039 foot conservation pool and the proposed 1041 foot conservation pool. ESRI's ArcView geoprocessing extension was used to clip the land cover for each pool level We then clipped the area of the pool raise into three areas based on boundaries depicted on the Flint Hills NWR Public Use Map and Regulations and the Tulsa District COE John Redmond Dam & Reservoir map and brochure. These areas were the Flint Hills NWR, the Otter Creek Wildlife Area, managed by the Kansas Department of Wildlife and Parks, and the rest of the reservoir. Acres of Land use for each area for each pool level were calculated using a script named CalAcres which was provided by the Tulsa District, Corps of Engineers, Hyrology-Hydraulics Branch as a part of the John Redmond GIS project

A terrestrial habitat evaluation utilizing average habitat values, from the 4 referenced reports (Table 2) and acres to be inundated is presented in Table 8

Table 8 Immediate terrestrial habitat value change due to a two foot pool raise behind John Redmond Dam.

Cover Type	AHU/acre	Acres	HU's
Cropland	3 0	-51	-153
Grassland	4 2	-40	-168
Woodland	6.4	-195	-1248
Wetland	9 0	-270	-2430

Environmental changes caused by the pool raise would include. inundating a new portion of the already limited free flowing Neosho River, adjoining lands (including gravel bars and wetland) and by flooding the transition zone where the river and the reservoir currently merge Generally, a two foot rise in pool elevation would inundate an additional 12,800 feet of the Neosho River Inundating an additional portion of the river would, one, displace wildlife species currently inhabiting or seasonally using these areas and second, further reduce the already limited amount of riverine habitat available for fish and wildlife species, requiring those types of habitat a river system has to offer, to complete their life cycle.

In addition to habitat losses the Jacob's Creek Boat launching ramp and parking lot, the Strawn dike and the Goose Bend dikes will be inundated by the increased pool elevation. Finding suitable areas for replacement of these physical features/facilities will be difficult given the finite and shrinking public land base within the flood pool.

Aquatic Ecosystem

A separate quantitative and qualitative habitat analysis for aquatic resources was not conducted . Sport fisheries and rough fish inhabiting the reservoir were expected to gain habitat units with an increase in lacustrine area and the loss of riverine habitat units would be quite small in comparison. However with a pool raise the conversion of riverine to lacustrian habitat can not be replaced

Although it is reasonably certain that a change in the conservation level of the reservoir would significantly alter the condition of lake's fishery, it is difficult to predict precisely what its condition would be after the conservation pool has been reestablished. In general, however, no negative impacts would be expected and a positive impact would be realized initially as established vegetation is inundated providing nursery habitat for juvenile fishes. The species composition of the lake would remain substantially the same. Relative abundance of fishes present would possibly change; total abundance would almost certainly.

The walleye population of John Redmond Lake is currently in only fair condition and there is no reason to expect a change to the worse if the conservation pool is raised Most of the reservoir's walleye currently spawn on the face of the dam. Raising the water level would increase the

amount of riprap that is available for spawning substrate Never-the-less, the fish would continue to actually spawn over riprap that is very near the surface (1 to 4 feet deep usually). Consequently, discharges which result in lowering the water level when eggs and nonmotile fry are present (late March to early May) would have a negative effect on the species

White crappie spawn throughout the shallow portions of the reservoir, usually during April or May The males come to the spawning ground and clean ill-defined nests; the preferred location is in a cove, protected from wave action and having a substrate of fine gravel that is free of silt. This preferred habitat should be readily available after the lakes elevation is increased. The nests are located at depths that range from 1 to 20 feet with most being 10 to 14 feet deep. The eggs which adhere to the nest's substrate, hatch in 2 to 4 days, and the fry remain on the nest for only a short while. The time elapsed between the start of hatching and departure of the fry can be as little as 4 days.

Discharges that result in lowering the lakes water level during the spawning period crappie can strand eggs and fry above the water line This impact would be particularly acute whenever the lake's water level decreases by several feet or more during a period of 2 weeks or less.

The white bass and channel catfish populations of John Redmond Lake are relatively insensitive to moderately fluctuating water levels The wipers do not reproduce in John Redmond and are primarily pelagic like their parent species. Consequently, they are not usually greatly affected by moderate fluctuations of water level

The forage base for the sport fishery is predominately gizzard shad The total, but not the relative number of gizzard shad in John Redmond should change when the pool level is raised. It is not certain what effect short-term moderate water level fluctuations around the higher elevation would have on the species.

The lakes rough fish population (bigmouth buffalo, common carp, smallmouth buffalo, and river carpsucker) would likely increase with the change in surface area, caused by raising the conservation pool level Whether their numbers would change relative to those of the sport fish is unknown These species would not be very much effected by short-term moderate fluctuations in water level after the lake reaches the new conservation pool elevation Temporary drawdowns of long duration and large magnitude would negatively affect the production of rough fish but could potentially enhance sport fish growth Declining water levels would concentrate prey fish and, thereby, allow increased foraging and growth by the lakes sport fish Lush stands of herbaceous vegetation would grow up in the denuded zone and, if then inundated during a subsequent growing season, could serve as substrate for fish food organisms. For such a beneficial effect to occur, it is essential that the vegetation remain inundated throughout most if not all of the growing season. Use of vegetation for food requires sufficient time for it to be colonized by algae, bacteria and invertebrates.

The current water level management plan at John Redmond lake takes advantage of the beneficial effect when regenerated plant materials are inundated. Fluctuation of the pool generally occurs above and below1039 NGVD or conservation pool. The basic plan recently recommended provides for gradual recharge from September through mid-October to 1041 NGVD with levels remaining constant through mid-January A winter drawdown to elevation

1039 NGVD to create storage for anticipated flood waters and to prevent erosion due to ice cover Conservation pool is maintained throughout the spring. A midsummer drawdown to elevation 1037 is accommodated over a four week period (June to 5 July) to release exposed mud-flats to revegetation. Revegetation takes place from 5-July to early September with water levels remaining constant A gradual fall recharge to elevation 1141 NGVD is expected to occur by mid-October but may not materialize due to insufficient fall rains When in effect, the current recommended water level management plan, would fluctuate the pool 2 feet above conservation pool and two feet below.

The beneficial effects of the water level management plan to the lakes fishery, shorebird and to waterfowl populations is well documented There is concern that this important fisheries and wildlife management tool may become increasingly difficult to implement with a permanent increase in the conservation pool Fluctuations above 1041 NGVD could potentially impact gravel bars occupied by the Neosho madtom and could put water on or over access roads, additional dikes and outlet works at constructed waterfowl impoundments Fluctuations could be done but they would have to be below 1041 NGVD

Secondary Impacts

A suite of computer programs collectively called SUPER, were used to model hydrological effects for both the existing and modified reservoir conditions. May through July flow-duration plots, maximum flow and minimum flow frequency plots, and comparative hydro graph plots for John Redmond and down stream control points were provided by the Corps to illustrate the effect of increasing conservation pool We agree, based on the information provided that only slight impacts in outflows from the reservoir can be expected

As a result of the increased conservation pool elevation, flood pool will be reduced by 17,163 acre feet (3 18% of the flood pool) Due to this loss in storage small and moderate flood storage events will inundate lands and facilities above 1041 NGVD on a more frequent basis and for longer duration than at present. Flow duration curves, developed for the 2 foot pool raise, indicate that elevation 1045 NGVD will be subject to inundation 10% of the time if the lake starts storage with the conservation pool at 1039 NGVD. If the lake starts storage at elevation 1041 NGVD, elevation 1045 NGVD is expected to be inundated 11-12% of the time Figure 4.

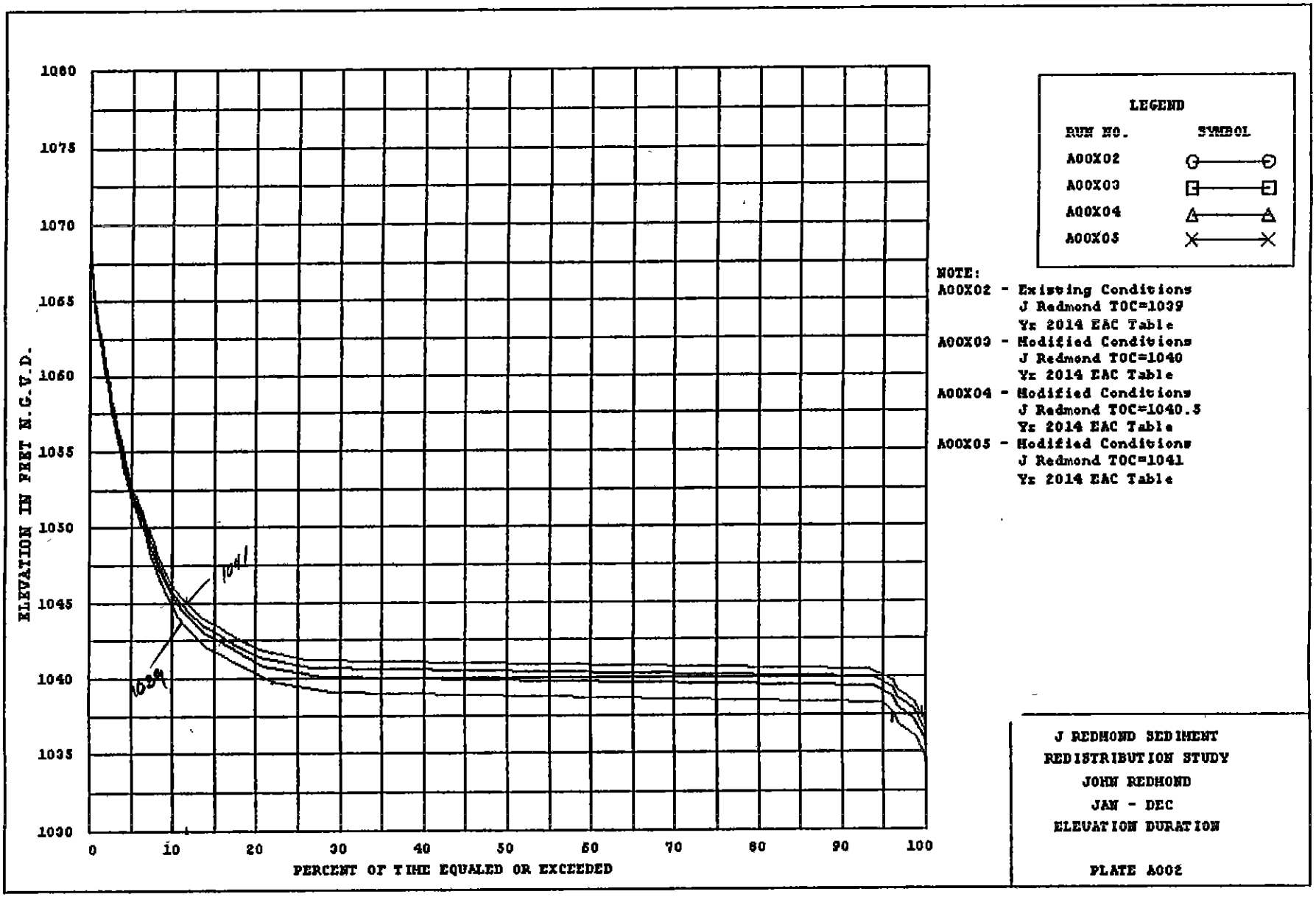


Figure 4 John Redmond Sediment Redistribution, Elevation Duration

From an operational standpoint a one percent change is minimal. From an endangered species perspective the condition of habitat availability is reduced therefore there is an affect to endangered species that require gravel bar habitat for their survival

Discussion

Reservoir operation is based upon the conflicting objectives of maximizing the amount of water available for conservation purposes and maximizing the amount of empty space available for storage of flood waters Conservation purposes at John Redmond include municipal, industrial, recreation, fish, wildlife, and water quality The conservation and flood control pools in John Redmond are fixed by a designated top of conservation (bottom of flood control) 1039 NGVD pool elevation. Planning, design and operating problems associated with flood control are handled separately from those associated with conservation By increasing conservation pool to 1041 NGVD there will be more water available for conservation purposes. Intuitively this should be beneficial to fish and wildlife however, Flint Hills National Wildlife Refuge and Otter Creek Wildlife Area are located on Corps property at the upstream end of this multipurpose reservoir project Increasing the conservation pool will inundate lands that are currently being managed for the benefit of fish and wildlife by the Service , the Department and the Corps The tradeoffs between conservation purposes and flood control are complex and this report is but one aspect of the overall management strategy that must be addressed by the Corps to develop the most beneficial use of storage capacity.

By and large the greatest changes in habitat, as a result of a pool raise, will be the conversion of palustrine wetlands and woodland to open water habitat within areas primarily managed to benefit fish and wildlife The areas potentially impacted by changes at John Redmond are not only important to fish and wildlife species inhabiting them These areas also provide a significant amount of outdoor public recreation such as, but not limited to, fishing, hunting, trapping, wildlife observation and photography, and environmental education and interpretation in an area where the amount of available public land is limited

Recommendations

In summary the Service recommends the following be incorporated in the reallocation plan to lessen the impact of this plan on fish and wildlife resources and a facilities constructed for wetland creation and management or for public access to reservoir resources.

1. The Jacob's Creek boat launching ramp and parking area be replaced/relocated above elevation 1041msl but within the same general area to accommodate angler and hunter access as a cost of the project.

2. The Corps of Engineers replace the Strawn flats and Goose Bend #4 dikes, outlet works and pumping facilities at a site, to be determined by the Service but within the NWR, as a cost of the project.

3. The Corps of Engineers initiate an Environmental Management Plan in the Neosho Basin integrating Reservoir Operations and management with conservation of and management of all natural resources within the basin with particular emphasis on providing protection and enhancement for species of concern.

4. An annual water level management plan be jointly developed by all agencies involved and implemented

5. Provisions be made for post-development impact evaluations (follow-up studies) for potential wetland development immediately above elevation 1041 NGVD

Additional land be acquired (does not mean purchase as the only option[1] for the project and be made available to the Service or the Department for wildlife management under terms of the existing cooperative agreement or license.

[1]Mitigation (Alternatives) Options

Mitigation Lands can be brought under wildlife management by several options, as follows

Option #1 Acquisition: Lands can be acquired, in fee, from willing sellers, at project cost, then retained in Federal ownership They would be managed under the existing cooperative agreement or lease The estimated land cost is approximately $1,000/acre.

Option #2 Lease of land Lands under flowage easement would be leased by the Corps of Engineers from owners for management by the Service or the Department. Wildlife management practices would be required on the land.

Option #3 Conservation Easements. Easements would resemble the Conservation Reserve Program Easements being purchased by the Natural Resources Conservation Service The Service would enforce the easements for tree plantings, wetland creation and buffers on the Neosho River above and below John Redmond Reservoir

Option #4. The 13,737 acre Kansas Army Ammunition Plant near Parsons, Kansas is nearing closure. The U S. Fish and Wildlife Service proposes to assume management of approximately 1,008 acres of mixed hardwood riparian forest and 515 acres of native bluestem prairie grassland that are being declared excess government property In addition to the grassland and forest the broad flood plains along Labette Creek and the Neosho River support or could support a variety of wetland vegetation.

The Service intends on accepting land from the Plant under Public Law 80-537 at which time it will become Service property administered by the Flint Hills NWR through a no-cost transfer from the U.S Army.

There are opportunities on the Plant site for increased management of riparian forest, wetland enhancements, or potential for wetland development/creation to benefit wildlife . The Service will accomplish these goals over the life of the project (perpetuity) on an incremental basis through our own budget initiatives There is an opportunity to accelerate management, and enhancements however, through initiation of mitigation measures deemed appropriate for losses incurred at John Redmond Reservoir.

Mitigation could take the form of small wetland enhancements, development or creation of wetlands at appropriate sites, forest stand improvements and assumption of operation and maintenance cost at this satellite facility. Operation and maintenance cost are assumed to be

approximately $21/acre/year for the 1008 acres of woodland on the site

The advantage to implementation of mitigation at this site are 1) No initial land cost, 2) Land is relatively free of flooding (not within the John Redmond flood pool), 3.) The site is within the Neosho river basin, 4) Service personnel would manage the resource as part of the Refuge System, 5.) Public access would be assured, 6) Management activities could commence upon land transfer, 7) Management of an existing woodland is preferable to planting trees in cropland and waiting for them to mature

Option #5 Wetland Creation on Refuge lands: The loss of the Strawn Marsh, dike and out let works and the Goose Bend Marsh, dike and outlet works and fringe palustrine wetlands within the 1039 and 1041 contour will by and large be accomplished by converting cropland within the refuge boundary to wetland The cost of wetland development is approximately $1,800/acre (U S Army Corps of Engineers 1997) At a bare minimum 243 acres will need to be replaced/ developed at a cost of approximately $435,000

Appendix A

STATE OF KANSAS
DEPARTMENT OF WILDLIFE & PARKS
Operations Office
512 SE 25th Ave
Pratt, KS 67124-8174
Phone (620) 672-5911 FAX (620) 672-6020

10 April 2002

Mr William H Gill, Field Supervisor
U S Fish and Wildlife Service
Kansas Field Office
315 Houston Street, Suite E
Manhattan, KS 66502-6172

Ref. D4.0201
Coffey
Track: 20000423

Dear Mr Gill·

We are responding to your request for our formal letter of concurrence regarding the final copy of the Fish and Wildlife Coordination Act Report for the John Redmond Reservoir water supply reallocation The reallocation consists of raising the conservation pool from 1039 NGVD to 1041 NGVD When carried out, the project will inundate 556 acres including 116 acres of Otter Creek Wildlife Area

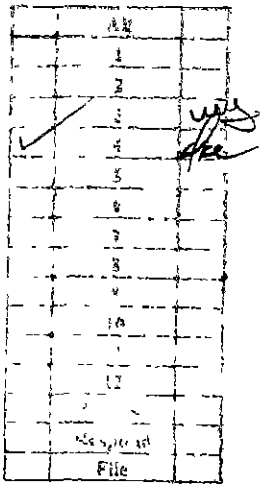
We agree in principle with the recommendations made in the report to be considered in the Corps of Engineers Biological Assessment You addressed the species and habitats that we mentioned in a previous letter to the Tulsa District Corps of Engineers and our previous comments on the draft report We agree that the action likely should not significantly adversely affect those species mentioned in previous reviews beyond existing conditions We concur with your recommendations because you have addressed the species of concern, addressed habitat losses and mitigation recommendations, and have coordinated and included recommendations by Department personnel responsible for managing fish and wildlife resources and public lands in and around the reservoir

If you have any questions, please E-mail Chris Hase with our Environmental Services Section staff at chrish@wp state ks us or call him at extension 198 Thank you for the opportunity to make these comments.

Sincerely,

Keith Sexson

Keith Sexson
Assistant Secretary for Operations



KS ch

xc KDWP, ESS
KDWP Reg. 5 F&W Sup., Tiemann
KDWP Reg 5 Pub. Land Sup , Blex
EPA, Schafer
KDHE, Mueldener

Appendix B

Species In Need of Conservation Known or Likely to Occur in Coffey County, Kansas

Black Tern - *Chlidonias niger* (Linnaeus)

Blue Sucker - *Cycleptus elongatus* (LeSueur)

Bobolink - *Dolichonyx oryzivorus* (Linnaeus)

Cerulean Warbler - *Dendroica cerulea* (Wilson)

Fawnsfoot Mussel - *Truncilla donaciformis* (Lea)

Golden Eagle - *Aquila chrysaetos* (Linnaeus)

Gravel Chub - *Erimystax x-punctatus* (Hubbs and Crowe)

Prairie Mole Cricket - *Gryllotalpa major* (Sauss)

Red-Shouldered Hawk - *Buteo lineatus* (Gmelin)

Short-Eared Owl - *Asio flammeus* (Pontoppidan)

Spike Mussel - *Elliptio dilatata* (Rafinesque)

Wabash Pigtoe Mussel - *Fusconaia flava* (Rafinesque)

Wartyback Mussel - *Quadrula nodulata* (Rafinesque)

Washboard Mussel - *Megalonaias nervosa* (Rafinesque)

Whip-Poor-Will - *Camprimulgus vociferus* (Wilson)

115-15-2. Nongame species; general provisions

(a) The following are nongame species in need of conservation within the boundaries of the State of Kansas.

(1) Invertebrates

Cylindrical papershell mussel, *Anodontoides ferussacianus*
Snuffbox mussel, *Epioblasma triquetra*
Wartyback mussel, *Quadrula nodulata*
Spike (lady-finger) mussel, *Ellipitio dilatata*
Wabash pigtoe mussel, *Fusconaia flava*
Fat mucket mussel, *Lampsilis radiata conspicua*
Yellow sandshell mussel, *Lampsilis teres*
Washboard mussel, *Megalonaias nervosa*
Round pigtoe mussel, *Pleurobema coccineum*
Squawfoot mussel, *Strophitus undulatus*
Fawnsfoot mussel, *Truncilla donaciformis*
Deertoe mussel, *Truncilla truncata*
Ozark emerald dragonfly, *Somatochlora ozarkensis*
Gray petaltail dragonfly, *Tachopteryx thoreyi*
Prairie mole cricket, *Gryllotalpa major*

(2) Fish

Banded darter, *Etheostoma zonale*
Banded sculpin, *Cottus carolinae*
Black redhorse, *Moxostoma duquesnei*
Blue sucker, *Cycleptus elongatus*
Blacknose dace, *Rhinichtys atratulus*
Bluntnose darter, *Etheostoma chlorosomum*
Brassy minnow, *Hybognathus hankinsoni*
Gravel Chub, *Erimystax x-punctata*
Greenside darter, *Etheostoma blennioides*
Highfin carpsucker, *Carpiodes velifer*
Northern hog sucker, *Hypentelium nigricans*
Ozark minnow, *Notropis nubilus*
Plains minnow, *Hybognathus placitus*
River darter, *Percina shumardi*
River redhorse, *Moxostoma gracile*
River shiner, *Notropis blennius*
Slough darter, *Etheostoma gracile*
Speckled darter, *Etheostoma stigmaeum*
Spotfin shiner, *Cyprinella spiloptera*
Spotted sucker, *Minytrema melanops*
Stippled darter, *Etheostoma punctulatum*
Tadpole madtom, *Noturus gyrinus*

(3) Amphibians

Red-spotted toad, *Bufo punctatus*
Northern crawfish frog, *Rana areolata circulosa*

(4) Reptiles

Alligator snapping turtle, *Macroclemys temminckii*
Rough earth snake, *Virginia striatula*
Western hognose snake, *Heterodon nasicus*
Eastern hognose snake, *Heterodon platirhinos*
Timber rattlesnake, *Crotalus horridus*
Glossy snake, *Arizona elegans elegans*

(5) Birds

Bobolink, *Dolichonyx oryzivorus*
Cerulean warbler, *Dendroica cerulea*
Curve-billed thrasher, *Toxostoma curvirostre*
Ferruginous hawk, *Buteo regalis*
Golden eagle, *Aquila chrysaetos*
Short- eared owl, *Asio flammeus*
Henslow's sparrow, *Ammodramus henslowii*
Ladder-backed woodpecker, *Picoides scalaris*
Long-billed curlew, *Numenius americanus*
Mountain plover, *Charadrius montanus*
Chihuahuan raven, *Corvus cryptoleucus*
Black tern, *Chlidonias niger*
Black rail, *Laterallus jamaicensis*
Red-shouldered hawk, *Buteo lineatus*
Whip-poor-will, *Caprimulgus vociferus*
Yellow-Throated warbler, *Dendroica dominica*

(6) Mammals

Eastern chipmunk, *Tamias striatus*
Franklin's ground squirrel, *Spermophilus franklinii*
Pallid bat, *Antrozous pallidus bunkeri*
Southern bog lemming, *Synaptomys cooperi*
Southern flying squirrel, *Glaucomys volans volans*
Texas mouse, *Peromyscus attwateri*
Townsend's big-eared bat, *Plecotus townsendii pallescens*

APPENDIX G

Cultural Resources

Neosho 500-Meter Inventory Chart

The database includes 145 reported or documented sites and surveys within 500 meters of the Neosho River channel, from the John Redmond Reservoir in Kansas (Redmond Dam USGS Quad) to the Neosho entry at Grand Lake in Oklahoma (Miami SE USGS Quad). It includes those mitigated or reported as destroyed It also includes all General Land Office (GLO) sites that were indicated on the source maps.

Sites are organized by county, then quad map, then site number for ease of reference. Chart abbreviations are as follows:

SITE # Special abbreviations are:

> **RSS Survey** = Schmits, Larry J , (1973) *An Assessment of the Prehistoric Cultural Resources of the Neosho (Grand) River Valley and an Evaluation of the Impact of the Proposed Riverbank Stabilization Project* DACW56-73-C-0240. University of Kansas Museum of Anthropology, Lawrence.
> **OHHS-OT10** = Oklahoma Historical Society (1958) "Oklahoma Historic Sites Survey," *Chronicles of Oklahoma* 36:282-314 (OT10 refers to Ottawa County listing no. 19)

ELEV/ft Elevation of the site as indicated on the USGS quad map

EAC/ft Estimated elevation or vertical distance of the site above the Neosho channel

ASI? Is the site area subject to inundation?

DIST to NEOSHO/m Distance of the site in meters from the Neosho channel

INVEST FH? Was the site investigated first hand? Most citations refer to individual site or survey reports included in the Appendix Exceptions are

> **King (1993)** = King, Joseph E. (1993) *Spans of Time Oklahoma Historic Highway Bridges* Center for Historic Preservation & Technology, Texas Tech University
> **OHHS** = see citation above

RISK? Risk assessment takes into account all locational factors that may affect site preservation

PRIORITY Where preservation risk potential exists, sites are assigned "high" or "low" priority values, which also takes into account the known physical integrity and apparent significance of a site, or recommendations by principle investigators for further action

Site and Survey Reports

Site reports are organized numerically according to county:

AN = Allen County
CF = Coffey County
CG = Craig County
CH = Cherokee Countu
LT = Labette County
NO = Neosho County
OT = Ottawa County
WO = Woodson County

Survey reports follow the site reports and are organized numerically.
Specific site locations are not referenced in this inventory chart and may be found in the Confidential Appendix submitted with this report.

COUNTY	QUAD	SITE #	ELEV/ft	EAG/ft	AS1?	DIST to NEOSHO/m	INVEST FH? *	EVIDENCE	DATE	RISK? **	PRIORITY
Coffey	Burlington	14CF12/RSS Survey	990	0-10	Yes	0	1973 (Schmits)	Occupation level in bank projectile point side scraper animal bone	Archaic	Yes	High
Coffey	Burlington	14CF13/RSS Survey	990	0-10	Yes	0	1973 (Schmits)	Occupation level in bank point base, burned earth charcoal	Archaic?	Yes **	High
Coffey	Burlington	14CF401	1010	20	No	120 50 from tributary	1983 (Rainbolt)	Flint chips, corner notch projectile, burned stone	E Ceramic	No	
Coffey	Burlington	14CF402	1016	26	No	450	1983 (Rainbolt)	3 projectile points, cores flint chips	Archaic M Ceramic	No	
Coffey	Burlington	14CF404	1016	26	No	250	1983 (Rainbolt)	2 projectile points chips burned stone	E & M Ceramic	No	
Coffey	Burlington	14CF1323/Survey B1305	1010	20	No	300	1981 Phase 3 in 1982 (Brogan)	Flakes, projectile points (one McKean), mano, burned stone	Archaic	No- mitigated & destroyed	
Coffey	Burlington	Survey B1311	1010	20	No	0-200	1986 Phase 2 (Lees)	None		No mitigated	
Coffey	Burlington	1878 GLO	1005	15	No	300	No	Structure, Denahy	Historic	No	
Coffey	Le Roy	14CF 8/RSS Survey	970	0 10	Yes	0	1973 (Schmits), collecting activity	2 stone-lined hearths in bank manos cores Langtry-type points	Late Archaic	Yes **	High
Coffey	Le Roy	14CF9/RSS Survey	970	0-10	Yes	0	1973 (Schmits)	Flakes and burned stone in bank	Unassigned	Yes	High
Coffey	Neosho Falls	14CF10/RSS Survey	960	0-10	Yes	0	1973 (Schmits)	Corner notched projectile/scraper drill bifaces, burned stone in bank	Unassigned	Yes	High
Coffey	Le Roy	14CF11/RSS Survey	970	0-10	Yes	0	1973 (Schmits)	Burned mussel shells and charcoal in bank	Unaesigned	Yes- action recommended **	High
Woodson	Neosho Falls	14WO3/RSS Survey	960	10	Yes	0	1973 (Schmits)	Stemmed projectile point- fallen from top of bank?	Unassigned	Yes but no action recommended	
Allen	Iola	14AN6/RSS Survey	950	0-10	Yes	0	1973 (Schmits) collecting activity	3 occupation levels in bank much animal bone, points in collection	Unassigned	Yes **	High
Allen	Iola	14AN12	960	20	No	350	1984 (Rogers)	Bifaces scraper cores manos flakes	Archaic	No	
Allen	Iola	14AN308	940	10	No	300 50 from tributary	1971 (Reynolds)	Scrapers knives flakes glass, china, stoneware	Unassigned Historic	No	
Allen	Iola	14AN309/Survey B1399	945	15	No	400 75 from tributary	1971 Phase 2 1982 Phase 3 (Thies)	Pottery cores flakes grass impressed daub	M Ceramic/Pomona	No	
Allen	Iola	14AN329	940	20	No	20	No reported in 1972	Stemmed dart points and ground stone tools in private collection	Archaic?	Possibly	Low
Allen	Iola	14AN335/Survey B1389	950	15	No	200	1982 Phase 3 (Thies)	Endscrapers, point flint chips, biface, burned bone	M Ceramic/Pomona	No- deemed destroyed by plowing	
Allen	Iola	14AN339/Survey B01829	950	15	No	50	1994 Phase 2 (Thies)	Bone awl flakes cores projectile point	L Archaic or Woodland	No- mitigated & destroyed	
Allen	Iola	14AN340	945	15	No	400	1994 Phase 3 (Thies)	Daub mass exposed in borrow pit surface pottery and lithics	M Ceramic/Pomona	No	
Allen	Iola	Survey B01870	945-50	15-20	No	0-1600	1995 Phase 2 (Brechtel)	Line traversed AN 339 (destroyed) and AN 303 (N/A)	No other	No	
Allen	Iola	Survey B01917	945	5-10	No	0 200	1996 Phase 2 (Thies)	None		Mitigated	
Allen	Humboldt	14AN8/RSS Survey	910	0-10	Yes	0	1973 (Schmits)	Charcoal and burned earth lens in bank no artifacts	Unassigned	Yes but no action recommended	
Allen	Humboldt	14AN9/RSS Survey	920	0-10	Yes	0	1973 (Schmits), revised 1999 (Williams)	2 occupation levels charcoal and mussels shells since eroded	Unassigned	Yes, but site reported gone	
Allen	Humboldt	14AN304	930	10	No	300 20 from tributary	1971 (Reynolds)	Knife arrowpoint, flint chips, cores, scraper, pottery burned stone	M Ceramic	No	
Allen	Humboldt	14AN305	930	10	No	100	1971 (Reynolds)	Scrapers blades, flakes	Unassigned	Possibly	Low
Allen	Humboldt	14AN306	940	20	No	150	1971 (Reynolds)	Cores knive arrowpoint flakes animal bone, ground stone	Unassigned	No	
Allen	Humboldt	14AN307	930	10	No	200 50 from tributary	1971 (Reynolds)	Scraper flakes	Unassigned	No	
Allen	Humboldt	14AN341	940	20	No	200	1996 (Thies)	Flakes and burned stone	Unassigned	No	
Allen	Humboldt	14AN342	940	20	No	300	1996 (Thies)	Farmstead debris 1854-1900 birthplace of Walter Johnson!	Historic	No	
Allen	Humboldt	Findspot 1/Survey B1400	920	10	No	275, 20 from tributary	1986 Phase 2 (Logan)	Debris of white ware glass metal	Historic	No, and significance refuted	
Allen	Humboldt	Findspot 2/Survey B1400	920	10	No	200	1986 Phase 2 (Logan)	Debitage scatter	Unassigned	No, and significance refuted	
Allen	Humboldt	Findspot 3/Survey B1400	920	10	No	20	1986 Phase 2 (Logan)	Debitage scatter	Unassigned	Possibly but significance refuted	
Neosho	Chanute	14NO3	920	20	No	230	1965 (Chism)	Projectile points, knives mano, axe scrapers chopper blades	Archaic or E Woodland	No	
Neosho	Chanute	14NO10/RSS Survey	890	0-10	Yes	0	1973 (Schmits)	Three stratified occupation levels in bank mussel shells, charcoal	Unassigned	Yes	Low

COUNTY	QUAD	SITE #	ELEV/ft	EAC/m	ASI?	DIST to NEOSHO/m	INVEST FH? *	EVIDENCE	DATE	RISK? **	PRIORITY
Neosho	Chanute	14NO11/RSS Survey	900	10	No	0	1973 (Schmits) informant reports 19c farm	Surface scatter on top of bank flakes, nails glass china	Unassigned PH and Historic farm	Possibly **	High
Neosho	Chanute	14NO14	900	10	No	450 on waterway	1981(Rogers)	Notched flake core flint chips	Unassigned	Doubtful	
Neosho	Chanute	14NO15	905	15	No	300	1981(Rogers)	Points scrapers, flakes	Archaic	No	
Neosho	Chanute	14NO16	905	15	No	200	1981(Rogers)	Projectile points, graver, drill, flint chips	Archaic	No	
Neosho	Chanute	14NO17/Survey B01823	910	20	No	300	1981 (Rogers), Phase 2 1994 (Thies)	Projectile points, scrapers core, flint chips	Archaic	No, and not relocated Phase 2	
Neosho	Chanute	14NO18/Survey B01823	905-10	15	No	130	1981, 1994 Phase 2 (Thies) revisited 1999	1981 missing 1994 recovered nil 1999 1 point	Unassigned	No, and not relocated Phase 2	
Neosho	Chanute	14NO19	905	15	No	200	1984 (Rogers) revisited 1994 (Thies)	One biface flint chips and burned stone	Unassigned	No	
Neosho	Chanute	14NO20	910	20	No	200	1984 (Rogers)	Flint chips	Unassigned	No	
Neosho	Chanute	14NO21	900	10	No	100	1984 (Rogers)	Core retouched flake biface flint chips	Unassigned	Possibly	Low
Neosho	Chanute	14NO22	905	15	No	150	1984 (Rogers)	Flint chips burned rock	Unassigned	No	
Neosho	Chanute	14NO23	900	10	No	100	1984 (Rogers)	Flint chips burned rock	Unassigned	Possibly	Low
Neosho	Chanute	14NO24	900	10	No	100	1984 (Rogers)	Flint chips burned rock	Unassigned	Possibly	Low
Neosho	Chanute	14NO25	905	15	No	300	1984 (Rogers)	1 biface burned cobbles	Unassigned	Possibly	Low
Neosho	Chanute	14NO26	905	15	No	300	1984 (Rogers)	Projectile points, gravers, cores bifaces, flint chips	Archaic	No	
Neosho	Chanute	14NO27	900	10	No	120	1984 (Rogers)	Core scraper flint chips	Unassigned	Possibly	Low
Neosho	Chanute	14NO28	925	25	No	100	1984 (Rogers)	Projectile points, scrapers drills cores, manos, flint chips	Archaic E & M Ceramic	No	
Neosho	Chanute	14NO305	900	10	No	300 on waterway	No- reported in 1971	Private collection of projectile points and scrapers	Unassigned	Doubtful	
Neosho	Chanute	14NO308	930	40	No	150	No reported 1971	Expanding-stem dart point from private collection	Unassigned	No	
Neosho	Chanute	14NO310	905	15	No	450 on tributary	Reported 1971 visited 1972 (Reynolds)	Projectile points reported 1971 only flakes observed 1972	Unassigned	No	
Neosho	Chanute	14NO311/Survey B01823	900	10	No	100	Reported 1971, Phase 2 1994 (Thies)	Good assemblage of dart points and lithics in private collection	Archaic or Woodland	Possibly, follow-up recommended	High
Neosho	Chanute	14NO312	900	10	No	200 on tributary	Reported 1971, visited 1972 (Reynolds)	Scrapers cores, drill flakes burned rock	Unassigned	Doubtful	
Neosho	Chanute	14NO313	905	15	No	75	Reported 1971 visited 1972 (Reynolds)	Private collection has arrowpoints scrapers, drill, nil in 1972	Unassigned	No	
Neosho	Chanute	14NO314	900	10	No	450 on waterway	No- reported 1971	Dart points, scrapers, blades, drills in private collection	Unassigned	Doubtful	
Neosho	Chanute	14NO317	905	15	No	150	Reported 1971 visited 1972 (Reynolds)	Projectile points, blades drill in private collection, nil in 1972	Unassigned	No	
Neosho	Chanute	14NO318	900	10	No	250	No- reported 1971	Private collection has ground sandstone pieces	Unassigned	Possibly	Low
Neosho	Chanute	14NO320	900	10	No	50	No reported 1971	Private collection has notched dart points, celt, drill, blade	Unassigned	Possibly	Low
Neosho	Chanute	14NO321	900	20	No	50	No- reported 1971	Dart points, scrapers, axes, blades in private collection	Unassigned	No	
Neosho	Chanute	14NO322	900	20	No	30	No- reported 1971	Projectile points arrowpoint oval scrapers in private collection	Unassigned	No	
Neosho	Chanute	14NO327	900	20	No	200	No- reported 1971	Private collection, not described	Unassigned	No	
Neosho	Chanute	14NO328	900	20	No	150	No- reported 1971	Private collection, not described	Unassigned	No	
Neosho	Chanute	14NO375	910	10	No	50 on tributary	Reported 1971 visited 1974 (Reynolds)	Shell-tempered potsherd flint chips, private collection (unknown)	Unassigned/Neosho focus?	Possibly	Low
Neosho	Chanute	14NO406/Survey B01823	915	25	No	300	1974, Phase 2 1994 (Thies)	Projectile points blades, drills, scraper flint chips	Archaic or Woodland	No, and not relocated Phase 2	
Neosho	Shaw	14NO330	885	15	No	150	No- reported in 1971	Unknown, private collection	Unassigned	No	
Neosho	Shaw	14NO376	890	0-10	Yes	0	1976 (Reynolds)	2 hearths, bison bone lithics in channel cut		Yes	High
Neosho	Shaw	14NO396	900-10	20	No	450	1992 (Lees) area collected since 1930 s	1844 70 Canville Trading Post outstanding private collection	Historic	No	
Neosho	Shaw	14NO397- MISSING	890	10	No	100		FILE REQUESTED 8-10-01		Doubtful	
Neosho	Shaw	1878 GLO 1	885	5-10	No	150	None	Structure	Historic	Possibly	Low
Neosho	Erie	14NO6/RSS Survey	870	0-10	Yes	0	1973 (Schmits)	2 occupation levels in bank one with hearths one with points	Archaic?	Yes **	High

COUNTY	QUAD	SITE #	ELEV/m	EAC/m	ASI?	DIST to NEOSHO/m	INVEST FH?	EVIDENCE	DATE	RISK? **	PRIORITY
Neosho	Ene	14NO7/RSS Survey	870	0-10	Yes	0	1973 (Schmits)	6 occupation levels in bank cord roughened sherds, bone	Woodland? Other?	Yes **	High
Neosho	Ene	14NO8/RSS Survey	860	0-10	Yes	0	1973 (Schmits)	Occupation level in bank, animal bone, burned earth and charcoal	Unassigned	Yes	High
Neosho	Ene	14NO9/RSS Survey	860	0-10	Yes	0	1973 (Schmits)	Stone-lined hearth in bank	Unassigned	Yes **	Low
Neosho	Ene	14NO373	870	10	No	450, 50 from tributary	No- reported in 1971	Pottery, points, scrapers manos musket bone bead (collection)	Central Plains Phase, Historic	No	
Neosho	Ene	14NO374	870	10	No	200	No- reported in 1971	Same specs as 373 above (private collection)	Central Plains Phase Historic	Doubtful	
Neosho	Ene	Survey B306	880-70	0-10	Yes	0-150	1990 Phase 2 (Wulfkuhle)	None		No mitigated	
Neosho	South Mound	14NO334	890	50	No	300	No- reported 1971	Points, scrapers knives, celts, gun flint from private collection	Archaic and Historic	No	
Neosho	South Mound	14NO384	855	15	Yes	50 part in borrow pit	1980 (Witty)	Hearths and midden exposed with lithics and bone	E Ceramic/Cuesta Phase	Yes- borrow pit next to pond dam	High
Neosho	South Mound	14NO398	840	0-10	Yes	0	1994 partially excavated in bank (Thies)	Secondary burials with human bone 1 biface waste flakes	Archaic or Woodland	Yes, bank erosion will destroy	High
Labette	McCune	14LT1	850	20	No	150	1963 1982 (Thies)	Debitage, cores hammerstones, burned stone, leveled mound?	Unassigned	No, and deemed destroyed	
Labette	McCune	14LT11/RSS Survey	820	0-10	Yes	0	1973 (Schmits)	Charcoal burned earth, hearth in stream bank	Unassigned	Yes **	Low
Labette	McCune	14LT12/RSS Survey	820	0-10	Yes	0	1973 (Schmits)	Charcoal and mussel shell in stream bank	Unassigned	Yes **	Low
Labette	McCune	14LT330	825	10	No	125	1977 (Stein)	Flakes (and pottery in private collection?)	E Ceramic	Doubtful	Low
Labette	McCune	14LT600	830	0-10	yes	0	No- reported in 1982	2 glass beads in private collection	Historic	Yes	
Labette	McCune	Survey B03	820	0-10	Yes	0-200	1987 Phase 2 (Avery)	None		Mitigated	
Labette	McCune	Survey B1134	820-40	0-20	Yes	0-200	1982 Phase 2 (Thies)	None		Mitigated	
Labette	McCune	1878 GLO	850	30	No	475	None	Structure	Historic	No	
Labette	Oswego	14LT8/RSS Survey	810	0-10	Yes	0	1973 (Schmits)	Occupation level in bank scrapers, grinding slabs, diagnostic points	Archaic	Yes **	High
Labette	Oswego	14LT10/RSS Survey	810	0-10	Yes	0	1973 (Schmits)	2 occupation levels in bank w/ charcoal flakes and point on surface	Unassigned	Yes **	Low
Labette	Oswego	14LT346	810	20	No	200	1981(Downum)	Projectile points, scrapers, manos, pottery daub human teeth	M Ceramic/Pomona	No	
Labette	Oswego	14LT348	820-30	20-30	No	250	1981, 1984 (Rowlison)	Projectile points, scrapers, drills, pottery w/rouletting	Pomona or Historic Osage	No	
Labette	Oswego	14LT349	820	20	No	100	1981(Downum)	2 projectile points, flakes bifaces	Unassigned	No and site destroyed	
Labette	Oswego	14LT355	800	0-10	Yes	0	1991 Phase 2 (Weston)	Hearth at water level projectile point, scraper	L Archaic (C-14 3480±70 BP)	Yes testing recommended **	High
Labette	Oswego	14LT380	820	10	Yes	0	1998 Phase 2 (Thies) with pit excavation	Pottery daub Scallom like projectile point, burned stone	M Ceramic/Pomona	Mitigated & destroyed	
Labette	Oswego	Survey B1132	810	10	No	0-300	1982 Phase 2 (Brogan)	None		Mitigated	
Labette	Chetopa	1878 GLO	810	20	No	400	None	Structure	Historic	No	
Cherokee	Oswego	14CH60/RSS Survey	790	0-10	Yes	0	1973 (Schmits)	Occupation level in bank charcoal flakes 2 diagnostic points	Archaic	Yes **	High
Cherokee	Oswego	14CH61/RSS Survey	790	0 10	Yes	0	1973 (Schmits)	Occupation level in bank 2 scrapers, burned stone	Archaic?	Yes **	Low
Cherokee	Oswego	14CH62/RSS Survey	790	0-10	Yes	0	1973 (Schmits)	Thin occupation level in bank	Unassigned	Yes	Low
Cherokee	Oswego	14CH380	810	20	No	330, 25 from tributary	1981 (Downum) and collectors in 1970's	Projectile points debitage, scrapers, drills, burned stone	Archaic to Pomona?	No, but good potential for excavation	
Cherokee	Oswego	14CH386 Survey B451	800	10	No	450 near marsh	1990 Phase 2 (Wulfkuhle)	Debitage, some heat altered, burned rock (no diagnostics)	Unassigned	Doubtful	
Cherokee	Chetopa	14CH63/RSS Survey	790	0 10	Yes	0	1973 (Schmits)	Stone lined hearth in bank	Unassigned	Yes, but no action recommended	
Cherokee	Chetopa	14CH366	790	10	No	30	1980 (Stein), human teeth reported 1937	Fresno point mano scraper hematite, shell	M Ceramic/Pomona	Possibly	High
Cherokee	Chetopa	14CH367	830	40	No	300	1980 (Stein)	Flint chips	Unassigned	No	
Cherokee	Chetopa	1878 GLO	800	10	No	50	None	Structure	Historic	Possibly, but road there now	
Cherokee	Chetopa	1878 GLO 2	780	10	No	30	None	Structure	Historic	Possibly	Low
Craig	Welch N	34CG21	780	10	No	500	No- reported in 1983	2 human skulls and projectile points- plowed mound?	Unassigned prehistoric	No	
Craig	Welch N	1898 GLO	820	50	No	250	No	Structure	Historic	No	
Craig	Welch N	1898 GLO	810	40	No	350	No	Structure	Historic	No	
Craig	Welch N	1898 GLO	790	20	No	250	No	Structure	Historic	No	

COUNTY	QUAD	SITE #	ELEV/ft	EAC/ft	ASH	DIST to NEOSHO/m	INVEST-FH?	EVIDENCE	DATE	RISK? **	PRIORITY
Craig	Welch N	1898 GLO 3	770	0-10	Yes	0	No	Sawmill	Historic	Yes **	High
Craig	Welch N	1898 GLO 4	775	5-10	No	30	No	Structure	Historic	Possibly	Low
Craig	Miami NW	1898 GLO 5	760	0-10	Possibly	<20	No	Structure	Historic	Yes	High
Craig	Miami NW	1898 GLO 6	770	10	No	40	No	Structure	Historic	Possibly	Low
Craig	Miami NW	1898 GLO	760	0-10	Possibly	500, in lowland marsh	No	Structure	Historic	Doubtful	
Ottawa	Miami NW	34OT74	760	0-10	No	350 near oxbow lake	1993 (Meck)	Debitage ground stone	Unassigned prehistoric	Doubtful	
Ottawa	Miami NW	34OT75	765	15	No	500	1993 (Meck)	Debitage	Unassigned prehistoric	No	
Ottawa	Miami NW	ODT58E0082N4510004	765	15	No	0	1993 (King) 2001 (SHPO)	Pratt through type bridge 1901 NR eligible	Historic	Doubtful, assessment needed	High
Ottawa	Miami SW	Survey 141805	740-70	0-30	No	0-2200	1989 (Hartley)	None		Mitigated	
Ottawa	Miami SE	ODT58N4590E0160005	761	21	Yes	0	1993 (King) 2001 (SHPO)	Mixed truss-type bridge, 1916, NR eligible	Historic	Possibly assessment needed	High
Ottawa	Miami SE	34OT11	780	40	No	150	No but thoroughly reported in 1989	Cores, knives, scrapers lanceolate projectile (donated)	Unassigned prehistoric	No	
Ottawa	Miami SE	34OT38	830	90	No	100	1977 (Saunders and Burkhalter)	Corner-notch projectile point and flake debris	Probably Archaic	No	
Ottawa	Miami SE	34OT92	830	90	No	300	1999 (Ricker)	Cores flakes biface Gary-type projectile point preform	Probably Archaic	No	
Ottawa	Miami SE	1898 GLO 7	750-60	10-20	Yes	150 20 from tributary	No	Structure	Historic	Possibly	High
Ottawa	Miami SE	1898 GLO 8	760	20	Near	450, 75 from tributary	No	Structure	Historic	Possibly	Low
Ottawa	Miami SE	1898 GLO 9	760	20	Near	200	No	Structure	Historic	Possibly	Low
Ottawa	Miami SE	1898 GLO 10	760	20	Near	300 50 from tributary	No	Structure	Historic	Possibly	Low
Ottawa	Miami SE	1898 GLO	760	40	No	500	1958 (OK Historic Sites Survey)	Moses Pooler Trading Post and Post Office, 1862	Historic	No	
Ottawa	Miami SE	OHHS-OT10	740	0	Yes	0	1958 (OK Historic Sites Survey)	Pooler Ferry 1870 Old Military Trail crossing	Historic	Yes	High
Ottawa	Miami SE	1898 GLO	810	70	No	450	No	Structure J Parker	Historic	No	
Ottawa	Miami SE	1898 GLO	770	30	No	400, 150 from oxbow lake	No	Structure	Historic	No	
Ottawa	Miami SE	1898 GLO 11	760	20	Near	50	No	Structure	Historic	Possibly	Low
Ottawa	Miami SE	1898 GLO	770	30	No	50	No	Structure, J Garret	Historic	No	
Ottawa	Miami SE	1898 GLO	790	50	No	375	No	Structure, F M Connor	Historic	No	
Ottawa	Miami SE	1898 GLO 12	740	0	Yes	20	No	Berry Ferry	Historic	Yes	High
Ottawa	Miami SE	1898 GLO 13	750	10	Yes	350	No	Structure	Historic	Yes	High
Ottawa	Miami SE	1898 GLO 14	740	0	Yes	0	No	Structure	Historic	Yes	High
Ottawa	Miami SE	1898 GLO 15	740	0	Yes	0	No	Structure (100 m NE of above)	Historic	Yes	High
Ottawa	Miami SE	1898 GLO 16	750	10	Yes	200	No	Structure	Historic	Yes	High

*Notes. Survey reports are cited where appropriate, **Starred sites located in cutbank area*

Nominated JRL Sites

The nomination of JRL sites 14CF101, 14CF102, 14CF103, 14CF105, and 14CF311/313 to the NRHP will be based on evaluation guidelines Criteria A and B (36 CFR 60.4). Criterion A applies to properties associated with events that have made significant contributions to the broad patterns of history. Criterion B applies to properties that have yielded or are likely to yield information important to history or prehistory. The properties include undocumented archaeological deposits that may, in addition, support eligibility under Criterion C, properties that embody the distinctive characteristics of a type, period, or method of construction (Little et al. 2000:19)

Historic archaeology in Kansas generally, and in Coffey County specifically, has not received the attention or commitment of resources commensurate with prehistoric research. This assessment can only be amplified in the case of one historic adaptation type—rural settlement. Very few farmsteads in Kansas have been documented through excavation, the result being a lack of suitable comparanda for research in any given locality (Lees 1996:140-47) For this reason alone, further investigation of JRL sites might be warranted.

Research conducted in concert with the field evaluation suggests that the JRL farmstead sites have potential to yield information relevant to national, state, and local contexts. For example, while on campaign, Susan B. Anthony and her associates were, in 1867 and 1868, hosted in Ottumwa, the small town (no longer in existence) immediately north of the sites that served the rural community (Lane 1985.78; *Burlington Daily Republican*: July 4, 1868). Five local women have been identified as the first women to vote in the United States, some 45 years before the franchise nationwide (Atherly 1982.308). A local resident also received Exodusters, part of a planned black migration from the South, into his care during the Reconstruction (*Burlington Weekly Patriot*. May 15, 1979). More generally, the sites may contain important information concerning the expansion of white settlement into what was then known as Indian Territory.

At the state and local levels, at least one of these farmsteads (14CF102) represents the first permanent dwelling of one of the earliest settlers in the Otter Creek community, then in the timbered Neosho Valley. Unlike the sod-house frontier of western Kansas, the lifeways of these first residents, their homes, customs, and agricultural practices, have scarcely been documented. Extensive informant interviews, including direct descendants of properties under evaluation, have made it possible to produce detailed histories of the people who lived in these farms. Thomas Arnold, for instance, built 14CF102 for his residence and cooper trade, which initially supplied barrels for a nearby still. This activity in turn bears some relevance to the contentious history of prohibition in the state (Shortridge 1995:198). The interest and research generated by local historians, museums, and descendants of the JRL settlers underscores the importance of these resources to the present community.

These sites are part of what may be considered a historic archaeological district, in being part of a rural village, being united historically by physical development, and being a collection of habitation and limited activity sites (Little et al. 2000:43-44). With the exception of 14CF311/313, all the sites are believed to have been farmsteads in their initial phases. The sites represent different phases of community development. Limited excavations at 14CF101 and 14CF102 have been able to document structural change, and possibly function, of these sites over time. In total, the district represented by these individual sites provides an opportunity to trace, not only the history of the community, but the evolution of a cultural landscape and identity of place in this region of east-central Kansas (Veregge 1995:118).

References

Atherly, M.L. DeLong. 1988. *Angie Lives· Historical Sketches of Families from the Strawn, Kansas Area*. Published by Mary Lou DeLong Atherly.

Lane, E.B. 1985. "Pioneer Days in Strawn and Ottumwa." In *Early Day History of Coffey County*. Coffey County Geneological Society, Burlington, KS.

Lees, W B. 1996. "Historical Archaeology in the Central Plains." In *Archeology and Paleoecology of the Central Great Plains*, Jack L. Hofman (ed), pp. 140-149. Arkansas Archaeological Survey Research Series No 48 Fayetteville, AR.

Little, B., et al. 2000. *Guidelines for Evaluating and Registering Archaeological Properties* National Register Bulletin. U S Department of the Interior, Washington, DC.

Shortridge, J.R. 1995 *Peopling the Plains Who Settled Where in Frontier Kansas* Lawrence University of Kansas Press.

Veregge, N. 1995. "Sense of Place in the Prairie Environment: Settlement and Ecology in Rural Geary County, Kansas." *Great Plains Quarterly* 15:117-32.