US Army Corps
of Engineers
Vicksburg District

RED RIVER WATERWAY PROJECT
SHREVEPORT, LA TO DAINGERFIELD. TX REACH
REEVALUATION STUDY

IN-PROGRESS REVIEW DOCUMENTATION

PUBLIC INVOLVEMENT

MAY 1994

Red River Waterway Project
Shreveport, LA, to Daingerfield, TX, Reach
Reevaluation Study In-Progress Review

PUBLIC INVOLVEMENT

PREFACE

1. In October 1988 (Fiscal Year 1989), the U.S. Army Corps of Engineers, Vicksburg District, was directed by Congress to initiate a reevaluation of the feasibility of the Shreveport, LA, to Daingerfield, TX, reach of the Red River Waterway Project. Subsequent funding was provided by Congress in Fiscal Years 1990-1993.

2. In December 1992, an in-progress review of the feasibility of extending navigation on the Shreveport to Daingerfield reach was completed. The review was a preliminary assessment of project costs, benefits, and environmental impacts. The review revealed that construction of this reach of the project was not economically feasible. The project was also found to result in significant environmental impacts for which mitigation was not considered to be practicable. The reevaluation studies were terminated as a result of the in-progress review.

3. Various documents are available so that the public can better understand the results of the reevaluation study. The documents are:

a. In-Progress Review Documentation prepared in December 1992 for headquarters review.

b. Environmental Summary.

c. Regional Economic Development.

d. Public Involvement.

e. Recreation.

f. Mussel Survey.

g. Historic Watercraft Survey.

h. Geotechnical Investigations.

i. Geomorphic Investigations.

Copies of all these documents have been placed in the local depositories listed in the Public Involvement documentation. Copies can be obtained from the Vicksburg District for the cost of reproduction.

4. The public involvement plan for the reevaluation study was developed by a private consulting firm in coordination with the Vicksburg District. The public involvement documentation discusses the evolution of the plan and the status of the activities at the time of the in-progress review. Due to the early termination of the study, all aspects of the plan were not implemented.

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INTRODUCTION

The purpose of this document is to describe the public involvement program that was conducted in connection with the Red River Waterway, Shreveport, Louisiana to Daingerfield, Texas Navigation Study. Since the study is ongoing, this is an interim report covering the activities of the first two and a half years.

The public involvement program was conducted by the Vicksburg District Corps of Engineers with the assistance of a contractor. Given the nature of public involvement, this required a very close working relationship between the contractor and the Corps.

The contractor had primary responsibilities with respect to many of the major features of the program. In some cases, responsibilities were largely limited to advice and participation. In addition, the Corps conducted many activities in which the contractor was not a participant, including contacts and meetings with local interest groups, public officials, local project sponsors, state and Federal agencies, and the media.

As a consequence, this document does not attempt to describe all aspects of the public involvement program, but rather those aspects to which the contractor made a contribution.

PROGRAM INITIATION

The Shreveport to Daingerfield Study is a reevaluation study of a project that was authorized in 1968. The authorized project is the Red River Waterway Project, a series of locks and dams and channel modifications that is nearing completion up to Shreveport. The Shreveport to Daingertield portion would extend navigation up to Daingerfield, Texas.

Since the overall project had been authorized in 1968, work had been proceeding over a couple of decades, and public consciousness of the Daingerfield reach portion of the project was understandably diminished. There had, in fact, been only one significant mention of the Daingerfield reach in Corps reports during the intervening years, and that mention was made within the context of a comprehensive study primarily concerned with water supply.

Interest in the construction at the project due to the reevaluation study has resulted in the formation of the Shreveport to Daingerfield Waterway Association by interested parties in the project area.

The Waterway Association established a write-in campaign to show public support for study funding and, from the beginning, consistently pressed for a reduced timeframe for the study. In addition, the Waterway Association began to hold press'conferences and to give presentations before organizations. It also conducted a survey of potential shippers.

In the meantime, concerns about the project began to be expressed by the Greater Caddo Lake Association (GCLA), which has a distinguished history with respect to the protection of the lake and had previously demonstrated its capacity to mobilize public support for its positions. This organization actually has two components reflecting the bifurcation of the lake by the state boundary. The Texas side has traditionally been the most active, publishing an effective newsletter. GCLA was joined in the expression of concern about the project by the board of the Lake 0' the Pines Civic Association.

Previous reports and field visits had made it clear that the Daingerfield reach study would be confronted by significant environmental issues. It was also understood that the intensity of these issues would be increased because of the passage of significant environmental legislation since the original project authorization in 1968. On the other hand, these same reports and visits, as well as the initial activities of the Waterway Association, made it clear that there would be a high level of support for the project because of the depressed economic conditions in East Texas.

PROGRAM PLANNING

The contractor was instructed to devise a public involvement program for the Shreveport to Daingertield Study. This design was to be based on: (1) an estimation of the major social, economic, and environmental issues that would likely arise during the course of the study; (2) an identification of the various interest groups and individuals that must be included in the public involvement process; and (3) an understanding of the desires of the public with respect to the level of public involvement activity.

The program was devised through three procedures: literature review,. observation, and conversation. The first step was to assemble and review all of the available documents, including previous correspondence, news articles, project documents, studies concerning other projects in the

area, and related meeting transcripts. In addition, the general political, social, and natural history of the area was reviewed through library holdings.

The next step was to travel through the area by automobile to get a feel for the general social and economic conditions and to obtain first-hand knowledge of the geography, landscape, and primary environmental features. This step, which is often overlooked in public involvement activities, is essential for the conduct of productive interviews and also for demonstrating to people a personal concern for the issues they consider important.

The next step was to establish a list of the major types of agencies, individuals, and organizations that needed to be interviewed. Many of these were readily, identifiable through previous documents, particularly news articles and transcripts of public meetings that had been held in conjunction with previous water resources studies in the area. A list of individuals to be interviewed was prepared using the following categorizations: waterway promoters; water resources development groups; mayors; business and industry; transportation; chambers of commerce/economic developers; property owners; recreation, culture, and tourism; environmental; media; academic; and miscellaneous.

Although the initial categorization did not change, there were some name changes, and other individuals were included as a result of recommendations made by interviewees. The interviews were not formal and did not involve a survey instrument, which would have been inappropriate for an initial probe concerning a project that would be defined through the planning process. Interviews were conducted with 45 people, usually at homes or places of business. In addition, every opportunity was taken for informal conversations with persons encountered through chance meetings (e. g . , service station operators).

Information from the readings, observations, and interviews was collected together to devise the public involvement program, which was described in the July 1990 report, ***Development of a Public Involvement Program for the Shrevepon to Daingerfield Waterway Project. In*** addition, an information strategy paper was prepared that was used for discussions with the Corps.

The investigations revealed that there was a high level of interest in the study on the part of people within the immediate project area, that there was intensity of feeling with respect to support for and opposition to the idea of a navigation project, that opponents and proponents respected each other's positions, and that there was little understanding of Corps procedures and' most particularly of the nature of a reevaluation study.

Given these conditions, it was concluded that the Corps should: (1) seize the initiative with respect to public perceptions about control of the planning process; (2) fully inform the public about its statutory responsibilities, decision making criteria, and general approach to planning; (3) keep the public fully informed about study progress and about the reasons particular decisions are made; and (4) involve local decision makers in the planning process.

An open planning process with a high level of public information and participation was recommended, and a wide range of public involvement measures was suggested:

1. Holding public meetings
2. Planning with an advisory panel
3. Establishing a mailing list
4. Developing a brochure
5. Disseminating a newsletter
6. Preparing summaries of technical reports
7. Establishing depositories
8. Implementing a media program
9. Designing special workshops
10. Developing a slide presentation
11. Continuing the leadership interviews

A staged implementation program was recommended for the first two years of the public involvement effort. Of the measures that were recommended, only two were not formally implemented. Rather than establishing a formal advisory panel, it was concluded that this function could be better carried out through a series of technical workshops that would be open to interested individuals rather than restricted to a group of selected individuals.

PROGRAM ELEMENTS

The following pages describe the major public involvement measures in terms of their rationale, approach, and accomplishments. Although the measures are segmented for discussion, many are intimately related to each other, particularly in terms of the development of particular themes. Most of the measures were initiated simultaneously, although the newsletter did not begin to be produced until after the public involvement program was well underway, and the technical

workshops did not begin until after a significant amount of technical information had been developed through the study.

Mailing List

A mailing list is fundamental to any large-scale public involvement program, particularly one involving meetings and newsletters. The objective in the. approach to a mailing list was to design one that was project-specific and that could be used for rapid mailings and for reference.

The first step in developing a mailing list was to secure existing lists. Mailing lists for previous studies and projects in the area were obtained from three Corps offices. Attendance lists for previous meetings related to the navigation project were obtained. News articles and correspondence were scanned for possible additions. An attempt was made to secure mailing lists from area organizations.

These initial lists were compiled under various categories.

The second step was to prepare a solicitation-of-interest brochure (Appendix A). This was a single-page, tri-fold brochure that briefly described the authorized project and the study and asked the respondent whether he would be interested in receiving additional information on the study. A tear-off postage-paid card asked for phone number and organizational affiliation in addition to name and address.

The solicitation-of-interest brochure was sent to all names on the initial mailing list. The Greater Caddo Lake Association and Lake 0' the Pines Civic Association mailed copies to persons on their organizational lists, and the Red River Waterway Association sent copies out along with its newsletter. About 15,000 copes of the brochure were disseminated. Additional copies were prepared that were later used for distribution at various meetings within the study area that might be attended by interested parties.

The initial mailing list was then discarded and replaced by those who had shown interest. Significant additions to the mailing list were obtained through the initial public meetings. Additions and deletions have been made on a weekly basis throughout the duration of the study.

The mailing list is computerized and is sorted alphabetically and by zip code. The alphabetical list is used for reference, since it contains information on telephone numbers and organizational affiliations. The zip code list is used for the production of mailing labels for mailouts outs concerning public meetings, workshops, and the newsletter.

The mailing list (Appendix B) presently contains about 1,000 names. It is a unique list in the sense that it contains only the names of persons and organizations who have expressed an interest in receiving information on the study. The mailing list has proved to be fundamental as a support instrument for disseminating information on the study. It will probably be expanded dramatically should the initial project evaluation prove to be positive and the study proceed toward a final report.

Public Meetings

The initial public meetings for the Shreveport to Daingerfield Study were designed to serve four purposes: (1) inform the public about the study; (2) enable the public to express its concerns; (3) fulfill the statutory responsibilities for scoping meetings; and (4) enable the Corps to assume a leadership role in the eyes of the public in the conduct of the study.

At fust, it was assumed that a single meeting in a central location (the town of Jefferson, Texas) would suffice. However, although there was a large turnout in Jefferson, the weather was bad, so it was decided that additional meetings should be held so that no one would be overlooked in the planning process. Additional meetings were held in Longview, Texas; Hughes Springs, Texas; and Blanchard, Louisiana.

The Blanchard meeting was intended to serve the needs of people in the Shreveport area and in Mooringsport, since the Louisiana Greater Caddo Lake Association had requested a public meeting that would be easily attendable by its older members. Although Blanchard is only a short distance from both Shreveport and Mooringsport, the dual objective was not satisfied, and there were complaints from the Waterway Association and from Shreveport environmental groups about nonresponsiveness to their particular needs. Eventually, a special presentation on the study was given at a Waterway Association meeting, and it was decided that a special set of technical workshops should be held in Shreveport to give Shreveport citizens a greater opportunity to participate in the study.

Meeting sites were chosen for accessibility and for the capacity to meet the special needs imposed by meeting design. Three meetings were held at public schools, and one meeting was held at a civic center. Public schools are usually the only places that provide adequate facilities in rural areas. Although the facilities were excellent at the chosen schools, considerable difficulty was experienced in assimilating Corps and school board regulations.

Meeting notices (Appendix C) were prepared for the Jefferson meeting and for the Hughes Springs, Longview, and Blanchard meetings jointly, since the latter three were held during the same

week. The notices contained a brief description of the study and the content of the meetings, as well as a location map. Meeting notices were sent to all names on the mailing list. In addition, a notification was placed in the *Federal Register*, and a press conference was held before the Jefferson meeting.

All of the meetings were similar in that they were composed of an informational session and a workshop session. The informational session at the Jefferson meeting provided an introductory speech by the District Engineer, a speech on the study process by the study manager, speeches on the authorized project and the public involvement program, a special video presentation, an aerial overview of the study area, and workshop instructions. The format for the three later information sessions was somewhat different, since the introductory remarks were made by the study manager.

The meeting rooms contained numerous wall and table displays (maps and documents). Attendees were greeted at a reception desk, were signed in, and were given a name tag and meeting packet (Appendix D). The packets contained an agenda, a list of study contact persons (with telephone numbers), a workshop location map, an issues identification sheet, a brief description of the elements that would be covered by the study, and maps of the authorized project and possible alternatives.

After the presentations, the attendees broke up into workshop groups on the basis of workshop numbers that had been assigned sequentially by sets (in terms of number of workshop groups anticipated). The purpose of this assignment pattern was to make certain that a wide range of opinions would be expressed in each workshop group.

Each workshop group met in a different room. Brief instructions were given on workshop purposes and procedures, which were designed to identify as many issues as possible within the time allotted and without comment. Workshop participants were arranged in a semicircle. Comments were solicited sequentially and recorded on flip charts until all comments were exhausted.

The results of the workshops were later increased through mail-ins of the issues identification sheets. The issues identified in the workshops and afterwards were compiled in two publications: (1) *Study Issues Identified by the Public at the Meeting in Jefferson, Texas, 28 March 1991;* and *(2) Study Issues Identified by the Public at the Meetings in Longview and Hughes Springs, Texas, and Blanchard, Louisiana, June 1991.* Whenever possible, questions were addressed. Both publications were sent to all meeting attendees, and the identified issues were folded into the planning process.

Public meeting attendance was as follows: Jefferson, 400; Longview, *35;* Hughes Springs, 46; and Blanchard, 64. Many of the attendees at the three later meetings had previously

attended the Jefferson meeting. About one-third of the attendees at the Blanchard meeting were from Shreveport. Although retrospectively it appears that the three later meetings were not needed, they were recognized by the public as an extra effort by the Corps to assure that everyone's opinion was heard, and they established a core of persons vitally interested in the study and willing to attend any meetings in which information on the study was disseminated.

Responses to the public meetings were highly favorable, with the exception of the aforementioned criticism with respect to the need for additional meetings in Shreveport and Mooringsport. The meetings provided a very thorough overview of the study and, through the workshops, an opportunity to influence the study process. Only one major difficulty was experienced--a blackout during the Jefferson workshops. This actually contributed to a relaxed discussion and respect for the Corps in being able to proceed under difficult circumstances.

Depositories

The purpose of the depositories is to make study materials readily available to the public as they are produced and to establish permanent residences for study materials. The study area contains 18 counties in Texas, three in Arkansas, and two parishes in Louisiana. It was decided that depositories should be established in central locations in all of the counties in Texas. The three counties in Arkansas were best served by Texarkana, and the two parishes in Louisiana were best served by Shreveport.

As a consequence, invitations to join the depository system were sent to 20 city and county public libraries. Up-to-date information on the libraries was obtained from regional library associations. The letters of invitation briefly described the study, the purpose of the depository system, study duration, and estimated shelf needs. Copies of the solicitation-of-interest brochure and Jefferson public meeting notice were included. All but three accepted the invitation, and one later joined the depository system because of special requests by patrons.

An university archives and an historical museum joined the depository system at personal request. Two public libraries in major metropolitan centers outside of the study area were included at the request of a major Texas environmental organization. This brought the number of depositories to 22 (Appendix E).

The initial set of depositories was described in the first newsletter. Subsequent inclusions were listed in later issues of the newsletter. The newsletter articles also described the materials

deposited. The first installment included the two reports on issues identified at the public meetings, a map volume of topographic maps and aerial mosaics, and the first issue of the newsletter.

Depositories were sent a binder for the newsletters, which are sent pre-punched. The only other study documents that have been deposited thus far are subsequent issues of the newsletter and a set of geologic maps. In addition to the official study materials, early reports on Caddo Lake obtained from the National Archives are being sent to the depositories because of their intrinsic interest to patrons.

No attempt has been made to formally evaluate the depositories. Informal conversations with some library heads indicate that the materials are lightly used, with the National Archives materials being more heavily used than the study materials. This should not be surprising because most of the depository materials (e.g., newsletters and issues identification documents) have been widely distributed, and there is not yet a great deal of information that can be sent to the depositories. Depositories appear to be very pleased to be able to add to their collections.

Newsletters

The newsletter was envisioned as the primary tool for informing the public about study progress. There was some initial skepticism about the availability of a sufficient amount of information to enable a newsletter to be produced during the early stages of the planning process. This skepticism evaporated when it was found that the public was interested in study methodologies, as long as they could be expressed in simple terms.

Six issues of the newsletter have been produced thus far (Appendix F), approximately every two months, beginning with the September 1991 issue. Each issue is disseminated to all persons on the mailing list and to the depositories. Additional copies are distributed within the Vicksburg District office and the Shreveport regional office to keep study participants within the Corps informed about study progress. Full sets are distributed at meetings and to all new inclusions on the mailing list.

Each newsletter is computer generated and is photocopies-printed on 11" x 17" colored paper that is doubly folded so that the address block appears on the outside. A crisp, three-column format is used, and illustrations are provided whenever possible. Newsletters are addressed by labels printed from the mailing list and are secured by a colored tab. The newsletters are sent to the Vicksburg District for mailing because they are franked.

Each newsletter begins with an article on some historic aspect of the study area, which serves as an enticement to read the more technical articles. The historic articles are drawn from papers that have been prepared on the basis of primary research. It was found early in the study that area residents are intensely interested in the history of the area, about which they know little, partly because many are recent retirees and partly because the area has been only lightly covered by historic studies (with the exception of Jefferson, Texas).

The historic articles thus solicit interest in the newsletter by providing previously unknown information. The historic articles are of two types. The first type covers the development of waterbodies, navigation, and water resources projects in the area. The purpose of these articles is not only to inform, but also to place the people of the area in a better position to evaluate the navigation project. Another set of historic articles is devoted to major archaeological and historical finds during the course of the study.

The rest of the newsletter content is devoted to articles on technical aspects of the study, timeliness, study events, depository submissions, and information on meetings. Each issue has thus far contained articles on three technical subjects. Most of these have been discussions of methodology. It is assumed that the focus will soon shift to results, since they are now becoming available. The methodological articles should have placed everyone in a good position to understand study results.

Some of the technical articles are merely descriptions of what has been done. Others are direct responses to misunderstandings or concerns that have appeared in the media, through local contacts, or during the public meeting workshops. Each technical article is developed on the basis of close monitoring of the technical studies and through conversations with the technical personnel working on the study.

The technical articles are fairly straightforward and attempt to avoid any appearance of support or opposition to the project. Drafts of the technical articles are submitted to the relevant technical personnel and revised. All articles are then submitted to the study manager for comment. A print-ready copy is then prepared that is submitted for final approval.

The newsletter has served, as originally envisioned, as the primary tool for information dissemination on study progress, although this may change with the advent of the technical workshops. Although the newsletter has not been formally evaluated, verbal and written comments and numerous requests for inclusion on the mailing list indicate that it has been immensely popular. Besides providing historic information of interest, it has enabled the public to have a greater

appreciation of the study process and has been taken by the public as a sign that the Corps is operating in the context of openness. Whether the newsletter has been able to change any public conceptions with respect to technical issues remains to be seen.

Media

Apart from the media activities in connection with the initial public meeting, there has been little in the way of direct media activity. The Corps has responded to the media for information that was included in various television, newspaper, radio, and magazine presentations. Nevertheless media coverage has been the least successful element of the public involvement program.

It is obvious that more attention needs to be made to the media in order to generate a more complete and impartial perspective on the project. This problem has been discussed, and corrective actions are now being implemented, beginning with a series of meetings with the media that will occur immediately after the first technical workshop.

Technical Workshops

Although technical workshops were included as part of the public involvement plan, they were not implemented until the end of the second year of the public involvement program. This was reasonable given the fact that a sufficient amount of technical information for holding workshops had not been collected until that time. Although part of the initial plan, implementation was stimulated by requests from the public to achieve a more active role in the study.

The factors leading to the implementation of the technical workshops were described in a position paper (Appendix G) that was discussed with the Corps. The major factors were that the newsletter could not answer questions, a significant amount of provisional information was being produced that could be presented verbally but not on paper, dissatisfaction with public forums that did not lead to open discussion, the aforementioned interest on the part of a number of people to be more heavily involved in the study, and the fact that the upcoming lengthy review process on the provisional findings needed to be supplemented by activities that would continue the high level of public involvement.

As designed, the workshops would be held once a month for the duration of the study and would deal with single technical topics that would offer an opportunity for coherent discussion. Each workshop would be led by the technical people working on that aspect of the study, including Corps and other agency personnel. It was also anticipated that non-study personnel (such as the Coast

Guard) should be brought in to address particular concerns of the public (in this instance, the regulation of barge traffic).

It was hoped that all of the workshops could be held in a single place to facilitate arrangements and to have all interested parties together for discussions. However, because of the criticisms that had arisen from the lack of a public meeting in Shreveport, it was decided that workshops would be held on succeeding nights in Shreveport and at some other place in the study area. Considerable public pressure has been exerted to spread the non-Shreveport meetings over the immediate project area.

The first technical workshop will be held on October 20 and 21 at LSU in Shreveport and at the Kelly Park auditorium in Kellyville. These sites were chosen for their centrality and. accessibility (particularly handicapped access in the case of Kellyville). Meeting notices (Appendix H) were sent to all persons on the mailing list, since these were the people who had already expressed an interest in the study.

The first workshop will be concerned with hydrology. It is anticipated that a number of people will attend the first workshop who are really interested in a public meeting format for the expression of opinion. Afterwards, the workshops should be attended almost entirely by people who are interested in discussing particular technical subjects.

Local Contacts

Throughout the public involvement program, a considerable amount of effort has been expended with respect to maintaining contacts with people in the study area. This activity was an outgrowth of the leadership interviews, which had been important in the design of the public involvement program because informal conversations brought out issues at a personal level in a non-confrontational atmosphere.

Local contacts were an expansion of the leadership interviews in terms of number of persons contacted, with intensification through the development of working relationships with people who took an active interest in the study. Local contacts were of three basic types: face-to-face conversation, telephone contact, and correspondence.

The study area has been visited once or twice a month since the beginning of the public involvement program. Some of these visits were in conjunction with specific activities such as public presentations; but most were simply for the sake of talking with people, telling them about study progress, listening to their concerns and aspirations, and either transferring information back to the

Corps or directing people to the appropriate Corps personnel for response. In this sense, the contractor has acted as a liaison between the Corps and the public and has been in a good position to monitor developments within the study area.

These contacts have resulted in the development of very close working relationships with a small number of people who have shown a high level of interest in the study. These working relationships are fairly evenly divided between persons who consider themselves pro or con with respect to the idea of navigation.

The development of these working relationships has been largely passive in the sense that the contractor has responded to initiatives on the part of individuals in the study area. Contacts are maintained with a large number of individuals, and much of this is based on contractor initiative, but close working relationships have been established with about 20 people, largely because of their expressions of interest.

Although invited to do so, the contractor has not attended the meetings of any local organizations, apart from requests for presentations either by the contractor or the Corps. This was done in order to avoid any suggestion of impropriety or prior judgement of project feasibility.

In addition to conversation, telephone contacts and correspondence have been maintained on a daily basis. Much of the correspondence relates to Corps documents and to historic materials. It has been necessary to establish a document file, from which copies have been made on a request basis. In this sense, the contractor has acted as an information transfer mechanism.

These contacts have been successful in the sense of stimulating interest in the study, providing information so that people can be in a better position to make rational choices, and providing a greater degree of participation than is available through such things as public meetings. This success has been generated by the following factors:

1. The Corps has made clear its position as an objective analyst.

2. The contractor has avoided any expressions of personal opinions with respect to the idea of a navigation project.

3. Tie has been divided equally between project supporters and project detractors.

4. Both sides are well aware of the degree of contact with the other.

PROGRAM CONTENT

The preceding pages have focused on program mechanisms. Although mechanisms are important, this particular public involvement program has been distinguished because of its careful attention to content. This content has been achieved by:

1. The personableness of the approach with respect to local contacts.
2. Close working relationships between the contractor and Corps staff.
3. Historical and archeological research.

Personal visits on a continuous basis are helpful in reducing the tensions that normally exist between an agency and the public. Such visits also enable a full appreciation of the concrete aspects of the study area, which serves to mitigate the problems normally encountered in an arms-length study.

Although a newsletter could be produced without close contacts with the Corps, the particular quality of the newsletter that is produced is directly related to the close working relationship between the contractor and Corps technical staff. In order to write an informative newsletter, it has been necessary for the contractor to know the technical studies from the inside.

In the first leadership interviews, it became obvious that there was a great deal of interest in the history of the study area. As a consequence, a large amount of effort has been devoted to researching that history. Of particular importance along these lines has been the wealth of materials that have been discovered in the National Archives and in court records.

These materials have been used to establish lead articles for the newsletter, to prepare a slide presentation that has thus far been given on seven occasions, to develop themes that will lead to a balanced perspective on the project, and to convey to the public information that will be valuable to them whatever the outcome of the study. These researches have also facilitated the potential discovery of important historic sites.

EVALUATION

Given the particular factors that would be encountered during the study, a completely open planning process was pursued with a high level of public information and participation. The mechanisms that have been implemented and the intensity with which they have been implemented have achieved this objective.

Secondary purposes were to assure respect for the Corps as an objective analyst, to provide satisfaction with the study process no matter what the study outcome, to maintain neighborliness on

the part of people in the area to the degree that could be achieved, and to give the project a fair hearing by placing people in a better position to make rational decisions. The first three purposes have been substantially achieved. Whether the last purpose has been achieved will not be known until next year and will be partly dependent on the outcome of the technical workshops.

Overall, the public involvement program has encountered and overcome two difficulties. The first difficulty was to develop an effective program during the early stages of the planning process when little was available in the way of study conclusions. This difficulty was overcome by an emphasis on study methodology in the information and participation mechanisms.

The second difficulty was in the use of an outside contractor and the local perception of the purpose of the public involvement program. Use of a contractor provided the distancing necessary to convince people that the public involvement activities were not carried out for the sake of project promotion, but it also gave rise to some initial problems concerning the contractor's non-authoritative status. These problems were inherent in such a relationship and proved to be minor.

From the Corps' side, the difficulties inherent in the client-contractor relationship were overcome by the inclusion by the Corps of the contractor as a full study participant. The effectiveness of the working relationship could not have been achieved apart from the study manager's sensitivity to the requirements of a full-scale public involvement program.

The public involvement program appears to be highly successful. Although no formal evaluations have been made, comments and correspondence suggest that the public meetings, newsletter, depositories, and local contact activity have been well received.

RECOMMENDATIONS

Since the program has been successful, there are only three recommendations:

1. Continue the program as is.

2. Give the technical workshops a chance to realize their potential by implementation of the workshops as originally designed, unless the first workshop demonstrates a need for corrective action.

3. Implement a larger media program.

Appendix A

SOLICITATION-OF-INTEREST BROCHURE

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

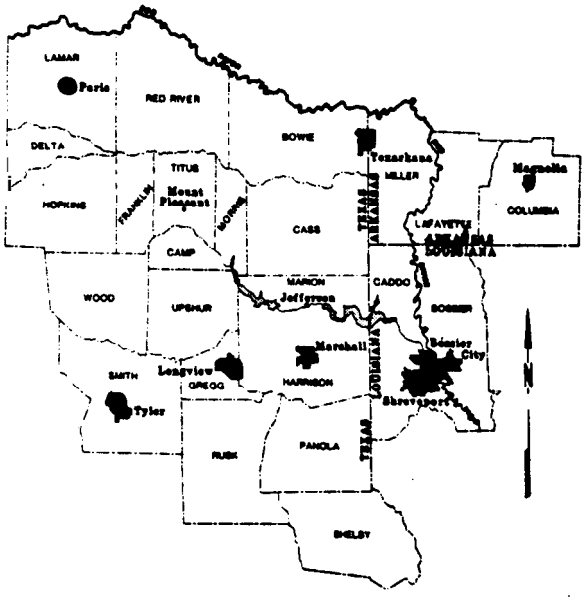
Attention: CELMK-PD-F
DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS.
P.O. BOX 60
VICKSBURG, MISSISSIPPI 3918%0060

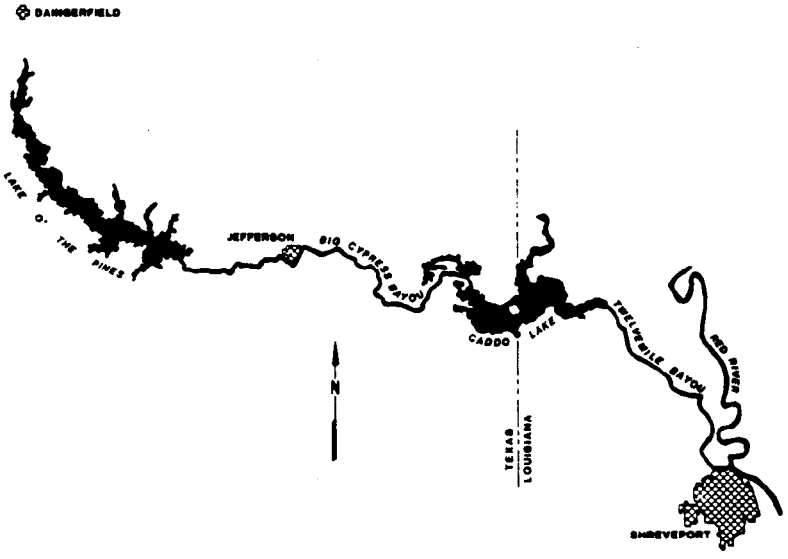
An Invitation to Participate in the

SHREVEPORT, LOUISIANA, TO DAINGERFIELD, TEXAS, NAVIGATION STUDY

The Vicksburg District U.S. Army Corps of Engineers is conducting a study to reevaluate the feasibility of a navigation channel for barge transportation from Shreveport, Louisiana, to the northwestern end of Lake 0' the Pines. The study will give equal weight to developmental and environmental concerns and will cover human resources, environmental resources, waterway transportation; recreation, water supply, irrigation, flood control, and area redevelopment.

If you would like to be kept informed about study progress, please tear off and send in the attatched postage-paid card. For additional copies of this brochure, contact Marty Garton, Study Manager, at (601) 631-5446.





The Shreveport to Daingerfield navigation channel, with accompanying locks, would be an extension of the Red River Waterway Project, Mississippi River to Shreveport, Louisiana, which is under construction. A channel to Daingerfield was authorized by Congress in 1968. As envisioned, it would begin at the Red River and would be routed through Twelvemile Bayou, Caddo Lake, Cypress Bayou, and Lake 0' the Pines. However, the authorized channel is being completely restudied. The restudy will look at various alternatives to the authorized route and its structural features, which will be identified with assistance from the public. This map gives a general view of the geographic areas through which the channel would pass.

Yes, I would like more information (all of which is free) about the Shreveport, Louisiana, to Daingetfield, Texas, Navigation Study. I would like to receive:

- ☐ ***The study newsletter***
- ☐ ***Notification of public meetings***

Name: _____

Street: _____

City: _____

State: _____

Zip: _____

Phone: _____

Organization (if any): _____

Appendix B

MAILING LIST

Mailing List Withheld Because Of Disclosure Restrictions.

Appendix C

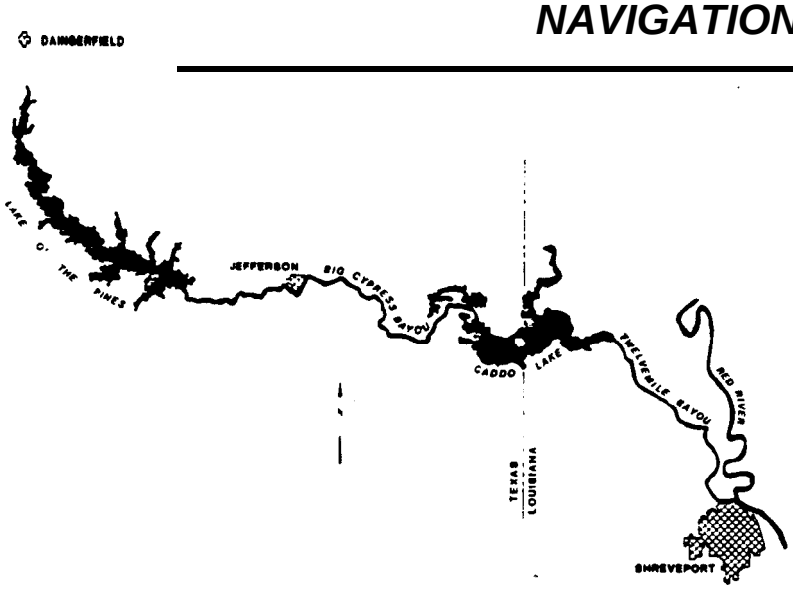
PUBLIC MEETING NOTICES

The Vicksburg District U. S. Army Corps of Engineers
Invires You To A

PUBLIC MEETING/WORKSHOP

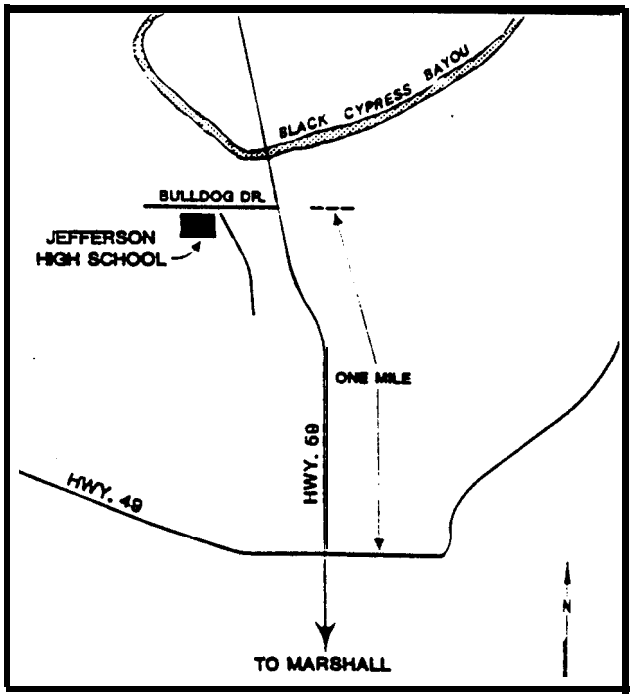
Concerning The

SHREVEPORT, LOUISIANA, TO DAINGERFIELD, TEXAS NAVIGATION STUDY



TIME: ***Thursday, March 28, 1991***
7:00 P.M.

PLACE: ***The Commons Area***
Jefferson High School
Jefferson, Texas



THE STUDY: ***The*** Shreveport, Louisiana, to Daingerfield. Texas, Navigation Study will reevaluate the feasibility of a navigation channel for barge transportation from the Red River at Shreveport to the northwestern end of Lake 0' the Pines. The channel, with its accompanying locks, would be an extension of the Red River Waterway Project. Mississippi River to Shreveport. Louisiana, which is under construction.

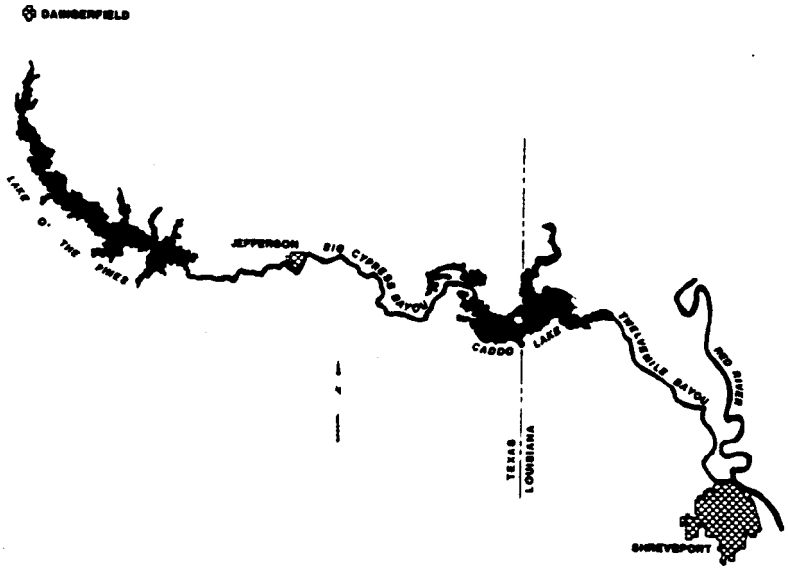
A navigation channel to Daingerfield was authorized by Congress in 1968. As envisioned, the channel would be 9 feet deep by 200 feet wide and would be routed through Twelvemile Bayou, Caddo Lake, Cypress Bayou, and Lake 0' the Pines. However, the authorized channel is being completely restudied in the light of current economic factors and environmental emphasis. The restudy will give equal weight to developmental and environmental concerns and will look at various alternatives to the authorized route and its structural features.

THE MEETING: ***This*** public meeting will be the first in a series of public involvement activities. It will provide an opportunity for the Corps to describe how the study will be conducted and for you to ask questions, make comments, and give guidance to the Corps. Your early participation in the planning process will help to assure a thorough and objective study that addresses all of the issues.

We will be using a new meeting format. The first part of the meeting will be devoted to presentations on how the Corps will approach the study, the authorized project and possible alternative routings, the study elements, how the Corps determines whether a project is feasible. and the public involvement program. Then we will break up into smaller groups (attendance optional) to secure from you identification of opportunities, issues, concerns. and suggestions. These will be recorded and used as a basis for initial study orientation and expanded through subsequent meetings and contacts as the study proceeds. .

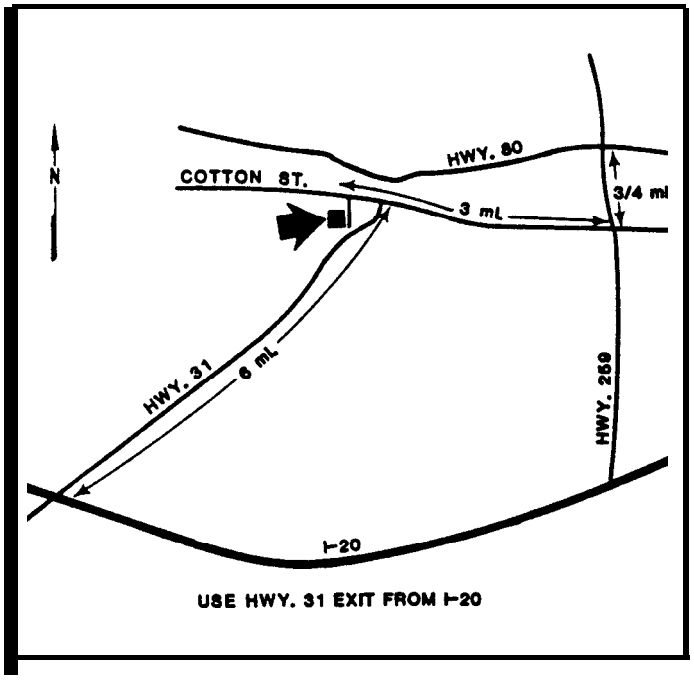
For more information, contact Marty Garton, Study Manager, (601) 631-5446

Shreveport to Daingerfield Navigation Study
PUBLIC INVOLVEMENT WORKSHOPS



LONGVIEW

Time: Monday, June 24, 1991, at 7:00 PM
Place: Maude Cobb Activity Center



THE STUDY:

The Shreveport, Louisiana, to Daingerfield, Texas,; 'Navigation Study will reevaluate the feasibility of a navigation channel for barge transportation from the Red River at Shreveport to the northwestern end of Lake 0' the Pines. The channel, with its accompanying locks, would be an extension of the Red River Waterway Project, Mississippi River to Shreveport, Louisiana, which is under construction.

A navigation channel to Daingerfield was authorized by Congress in 1968. As envisioned, the channel would be 9 feet deep by 200 feet wide and would be routed through Twelvemile Bayou, Caddo Lake, Cypress Bayou, and Lake 0' the Pines. However, the authorized channel is being completely restudied in the light of current economic factors and environmental emphasis. The restudy will give equal weight to developmental and environmental concerns and will look at various alternatives to the authorized route and its structural features.

BACKGROUND:

The first public metting and workshop for the study was held at Jefferson, Texas, on March 28, 1991. Approximately 400 people attended the meeting.

As a part of our continuing public involvement program, additional workshops will be held the last week of June, 1991, at Longview, Texas, Hughes Springs, Texas, and at a place midway between Oil City and Shreveport, Louisiana.

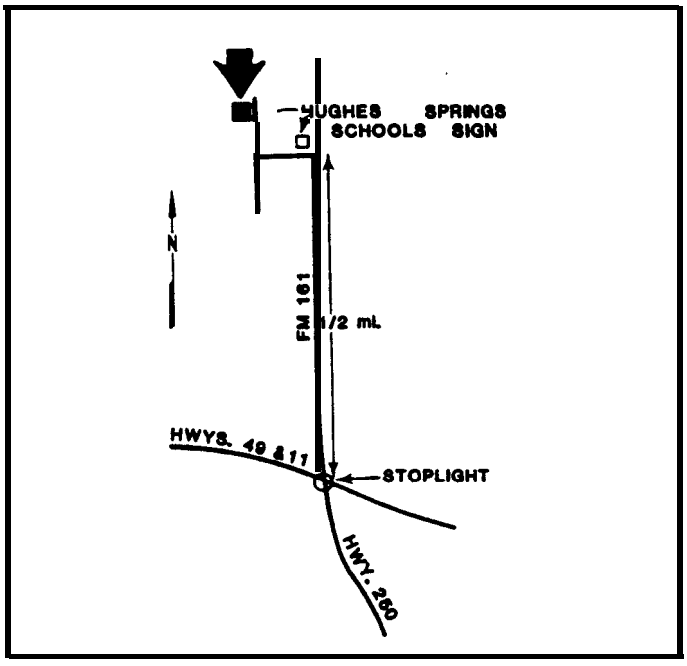
THE WORK-SHOPS:

The workshops will be similar to the one held in Jefferson, Texas. The first part of the workshop will be used to discuss the study process, alternative plans, authorized project, feasibility analysis, and the public involvement program. We will then break up into smaller groups (attendance optional) to secure from you identification of opportunities, issuses, concerns, and suggestions. Your input will be recorded and will be considered as part of the study.

For more information, contact ***Marty Garton, Study Manager with the Vicksburg District, Corps of Engineers at (601) 631-5446.***

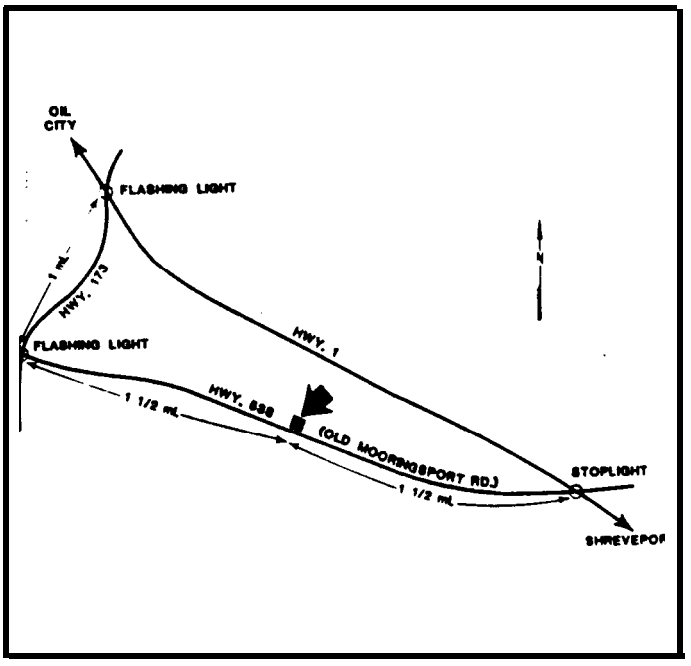
HUGHES SPRINGS

Time: Tuesday, June **25, 1991,** at **7:00** PM
Place: Hughes Springs High School



OIL CITY-SHREVEPORT

Time: Thursday, June 27, 1991, at **7:00** PM
Place: Donnie Bickham Middle School



DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGJNEERS
P.O. BOX SO
VICKSBURQ, **MISSISSIPPI 39181-0060**

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Appendix D

PUBLIC MEETING PACKET

Agenda

PUBLIC MEETING/WORKSHOPS
SHREVEPORT TO DAINGERFIELD NAVIGATION STUDY

Opening Comments
(Colonel Steve Page, District Engineer)

The Study Process
(**Marty** Garton, Study Manager)

The Authorized Project
(Roger Cockrell, Staff Planner)

The Project Area (Video)
(Maryetta Smith, Study Biologist)

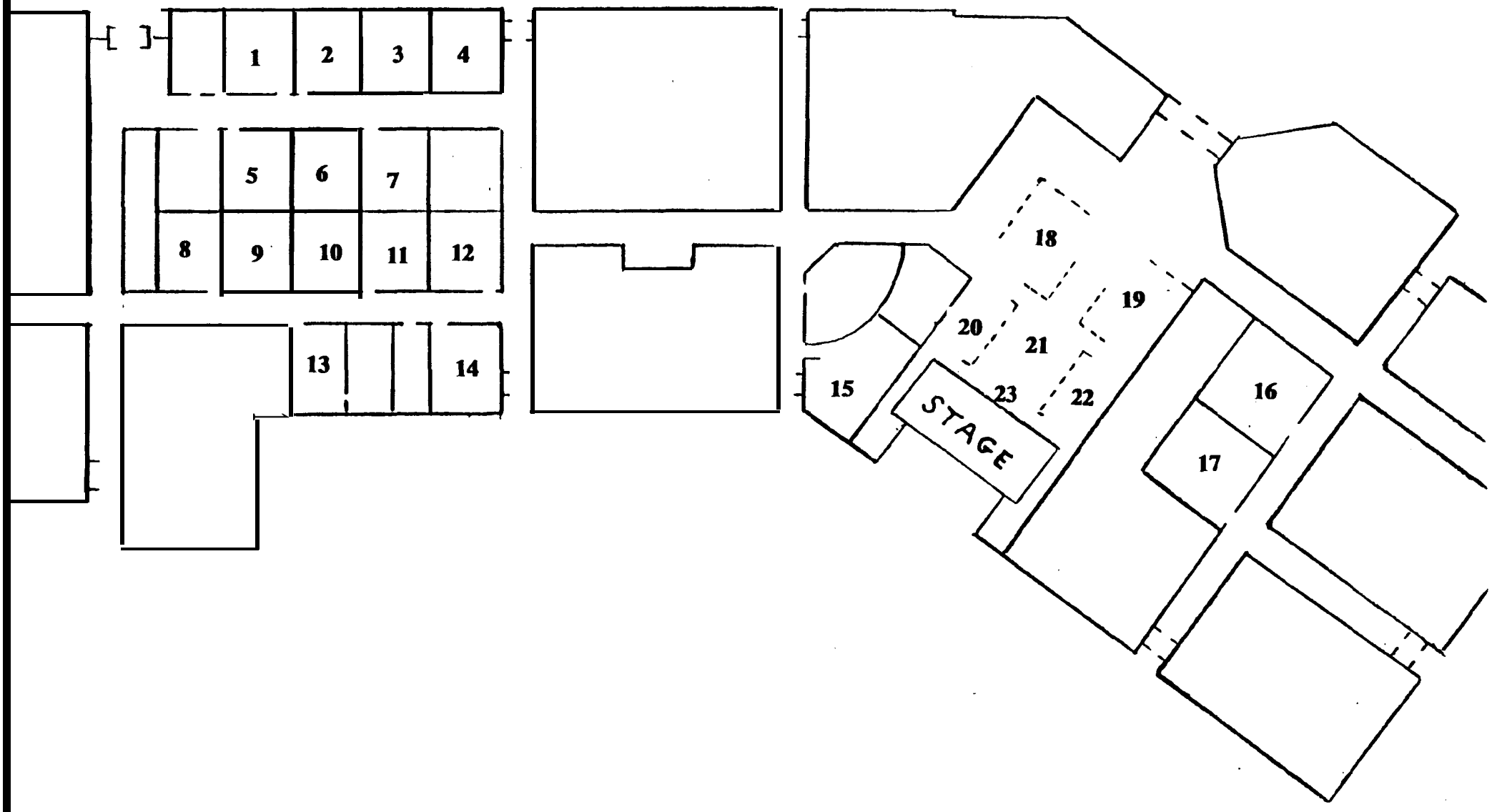
The Public Involvement Program
(Jacques Bagur, Public Involvement Specialist)

Workshop Procedures
(**Marty** Garton, Study Manager)

15-Minute Break

Workshops

WORKSHOP LOCATIONS



ISSUES IDENTIFICATION SHEET

This sheet should be used to record any issues that you think should be addressed in the Shreveport to Daingerfield Study. Express your concerns or any opportunities you think could be realized through the study. Record your comments as statements, questions, or observations. If you will be attending a workshop, use this sheet as a reminder of things you want to say. If you will not be attending a workshop, drop this sheet off at the reception table before you leave.

If you wish to take the sheet home to record additional comments, it may be sent to:

U.S. Army Engineer District,, Vicksburg
A'ITN: CELMK-PD-F
P.O. Box 60
Vicksburg, Mississippi 39 18 l-0060

TOPICS TO BE STUDIED
SHREVEPORT, LOUISIANA TO
DAINGERF'IELD, TEXAS
REEVALUATION STUDY

This is a list of the subjects that will be covered by the Shreveport to Daingerfleld Navigation Study. Think of the issues that you would like to see addressed by the study in connection with these topics as they relate to your community or the geographic area in which you are particularly interested. Use these thoughts to formulate issues on the Issues **Identification Sheet.**

1. **ENVIRONMENT**AL STUDIES. These will include resources such as aquatic (fish, etc.), terrestrial (deer, etc.), and waterfowl (ducks, etc.). Studies will include a supplement to the environmental impact study for the overall Red River Waterway Project. This supplement would apply to the Shreveport, Louisiana, to Daingerfleld, Texas, reach of the overall Red River Waterway Project. These studies will also include investigations into possible enhancements in the environmental quality of the area.

2. WATER QUALITY STUDIES. These studies will involve testing of water samples from the entire reach from the Red River to where U.S. Highway 259 crosses Lake 0' The Pines. As a companion study to the water quality sampling, sediment samples will be taken throughout the reach to determine what contaminants may or may not be in the sediments.

3. CULTURAL RESOURCE **STUDIES. These** studies will investigate the history and cultural resources of the area. This will include recent history, such as the steamboat era, as well as earlier history involving the native Americans who might have lived in the area. Areas of historical significance will be identified and assessed according to National Register standards.

4. RECREATION STUDIES. Studies will be conducted to determine the recreational needs of the area and if there are opportunities to provide additional recreation areas.

5. HYDRAULIC STUDIES. These studies will involve stream and lake water levels for existing conditions as well as for future conditions with any of the alternatives studied in place.

6. HYDROLOGY STUDIES. These studies will involve the actual flow of water in the streams for existing conditions as well as future conditions with any of the alternatives studied in place.

7. ECONOMIC STUDIES. These studies will investigate the economic feasibility of the range of alternatives developed during the study. These studies will examine the benefits of the alternatives versus the costs of the alternatives to determine if any of the alternatives developed are economically feasible. Benefits would include transportation savings, recreation, etc. Costs include actual construction, environmental, etc.

8. DESIGN STUDIES: These studies will involve determining lock sizes needed for the design tows, channel sires, channel bank protection schemes, etc.

9. PUBLIC INVOLVEMENT STUDIES. These studies will be used to assist in formulating a range of alternatives, evaluating the alternatives based on their social acceptability, and eventually selecting one plan that best meets the needs of the area.

10. FOUNDATION INVESTIGATIONS. These studies will involve a thorough investigation of the geology of the area in order to determine the stability of the soils in the study area. These studies will involve a series of soil borings throughout the reach to assist in this analysis.

11. GROUND WATER STUDIES. These studies will investigate the impacts that a potential project might have on the ground water resources of the area.

STUDY CONTACT PERSONS

MARTY GARTON (Study Manager)
ATTN: CELMK-PD-F
U.S. Army Engineer District, Vicksburg
P.O. Box 60
Vicksburg, Mississippi 39 18 l-0060
(601) 631-5446

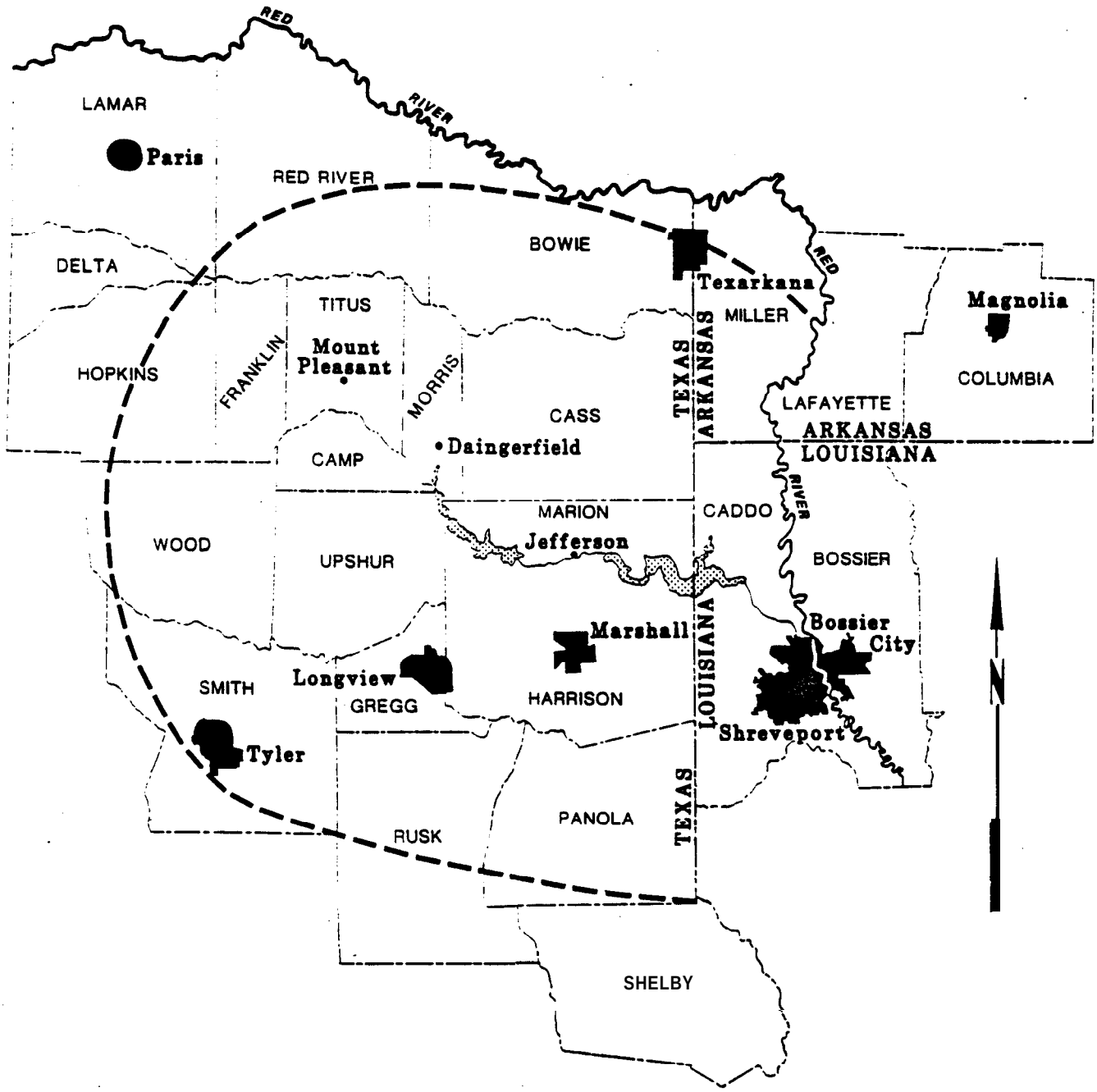
ROGER COCKRELL (Staff Planner)
ATTN: CELMK-PD-F
U.S. Army Engineer District, Vicksburg
P.O. Box 60
Vicksburg, Mississippi 39 18 l-0060
(601) 63 l-5425

MARYETTA SMITH (Study Biologist)
ATTN: CELMK-PD-Q
U.S. Army Engineer District, Vicksburg
P.O. Box 60
Vicksburg, Mississippi 39 18 l-0060
(601) 631-5433

ROBERT (STONEY) BURKE (Study Economist)
ATTN: CELMK-PD-E
U.S. Army Engineer District, Vicksburg
P.O. Box 60
Vicksburg, Mississippi 39 18 l-0060
(601) 631-5462

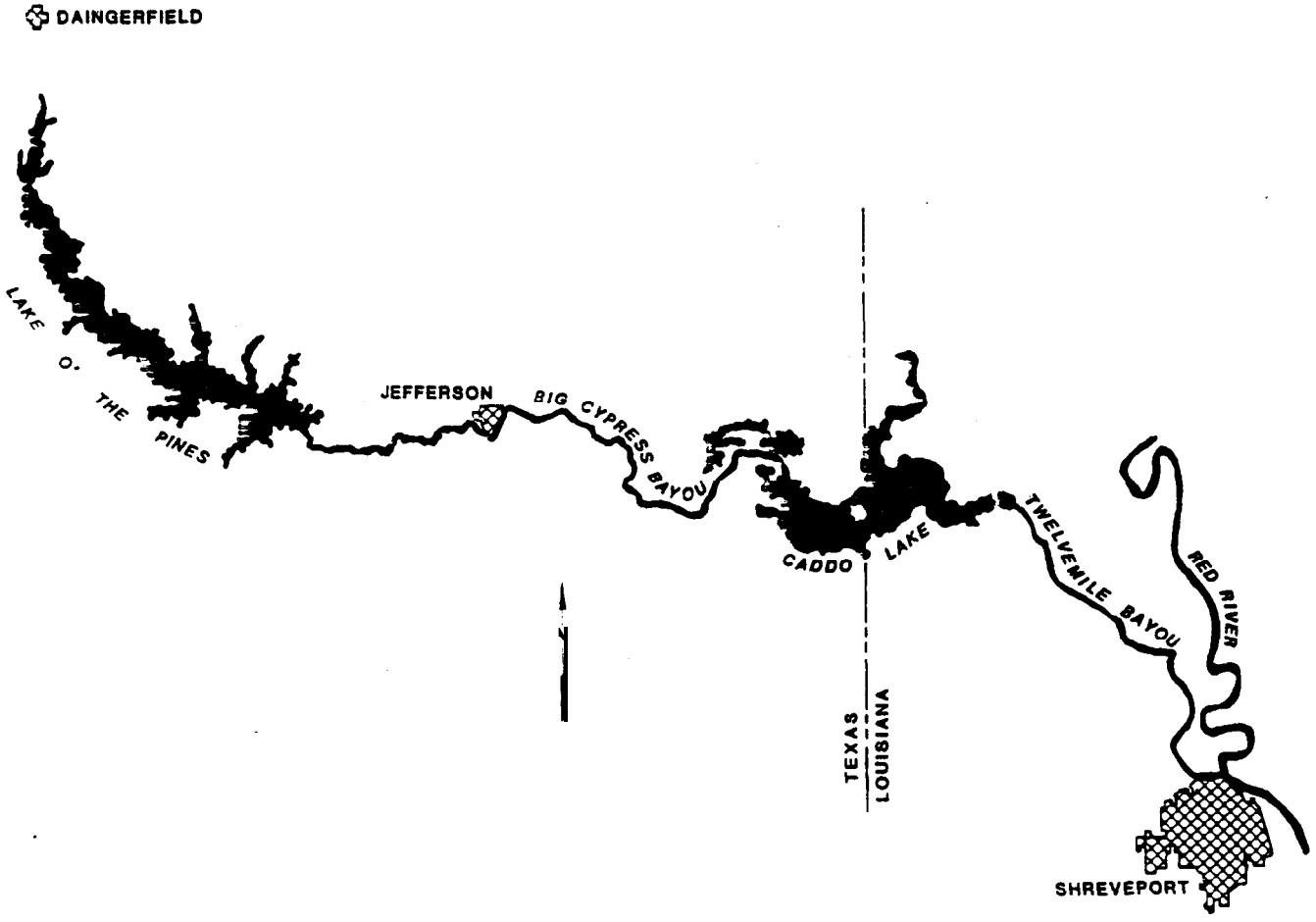
CHRIS **INGRAM (Public Involvement Specialist)**
Geo-Marine, Inc.
612 America Street
Baton Rouge, Louisiana 70802
(504) 338-9065

JACQUES BAGUR (Public Involvement Specialist)
Gulf Engineers & Consultants, Inc.
P.O. Box 2996
Baton Rouge, Louisiana 70821-2996
(504) 343-38 12

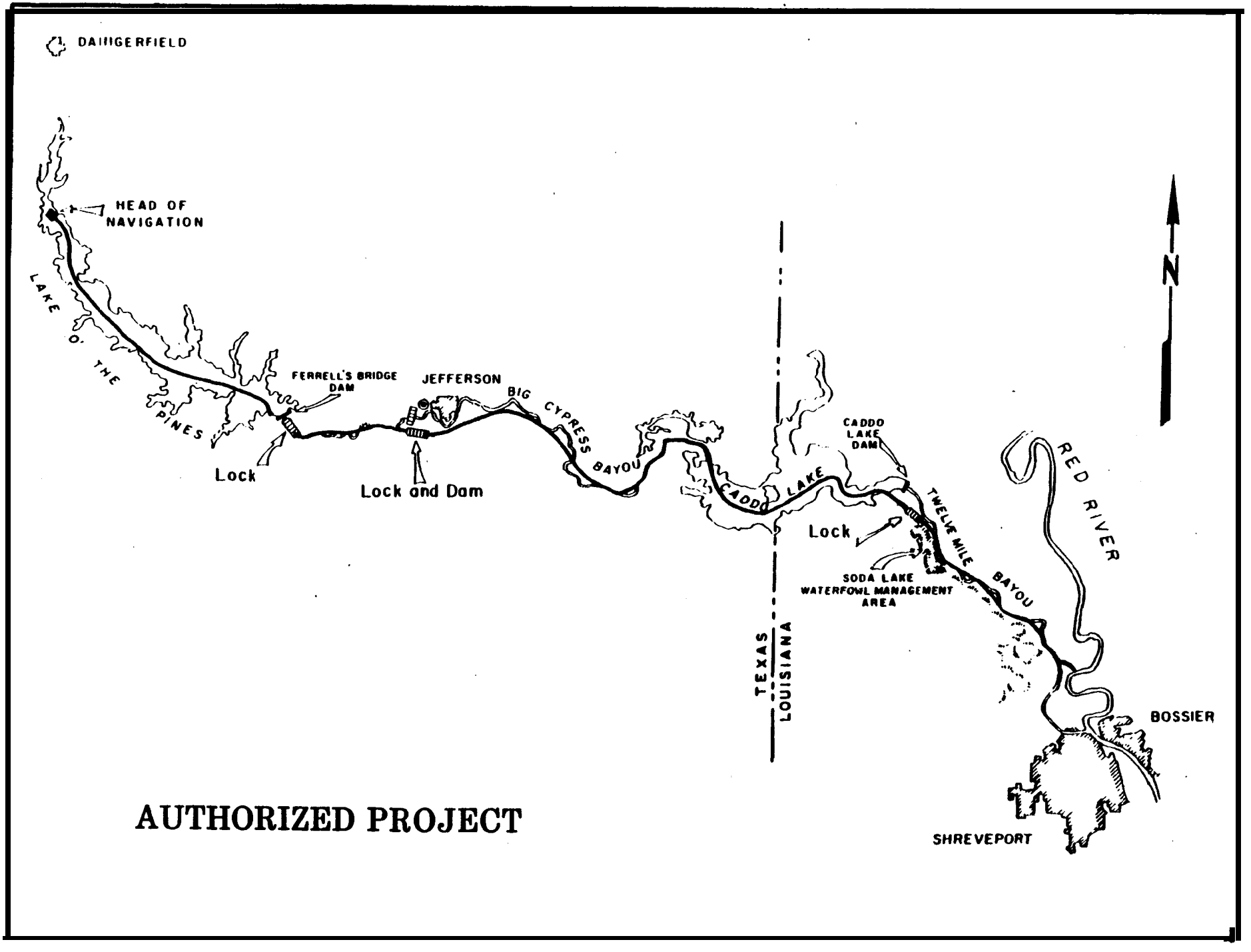


60 Mile Radius From Proposed Waterway

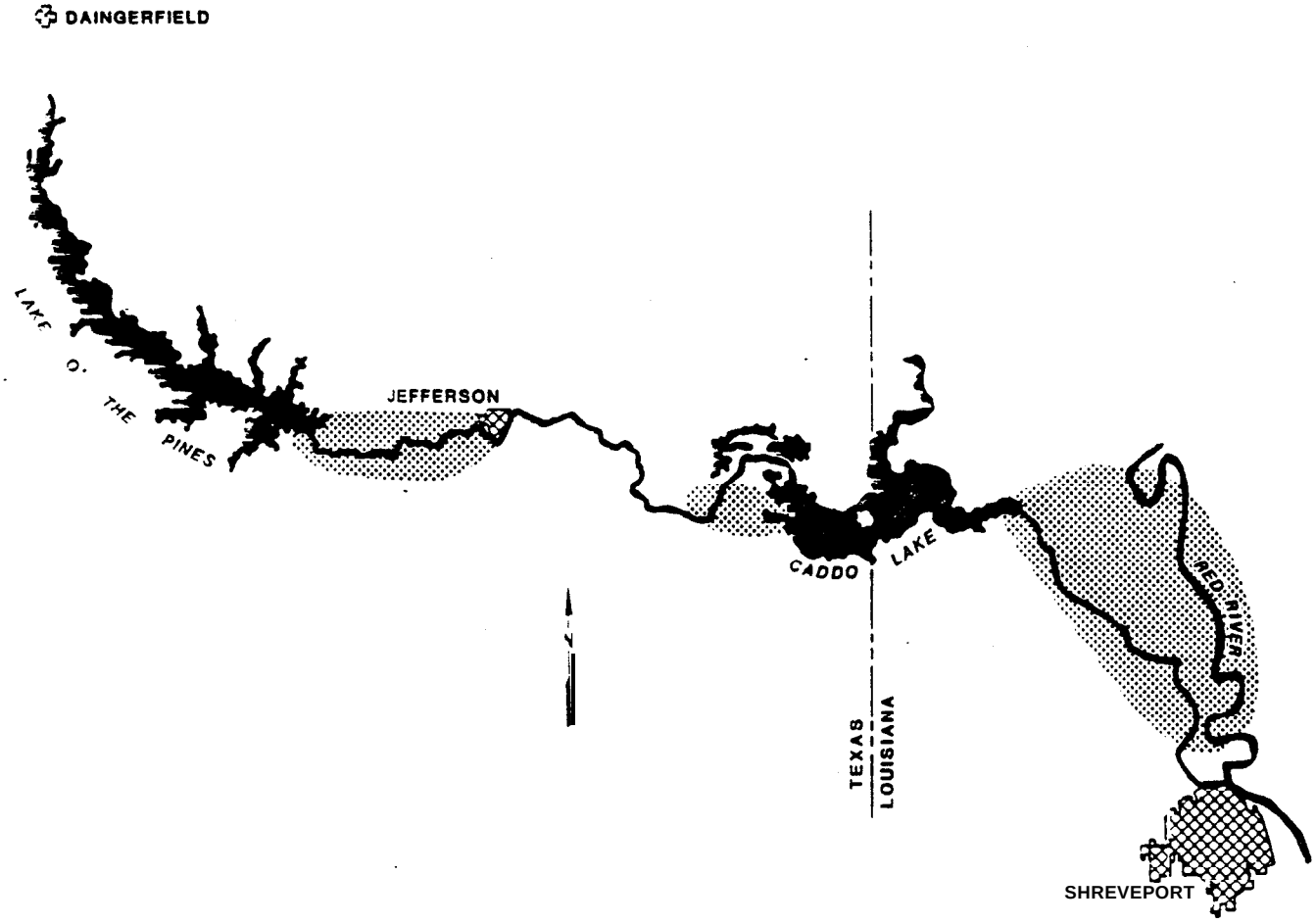
GENERALSTUDYAREA



PROJECT AREA



AUTHORIZED PROJECT



ALTERNATIVES
(GENERAL AREAS)

Appendix E

DEPOSITORY MAILING LIST

Ms. Dianne Page, Librarian
Service League Library
5[illegible] West College
Carthage, Texas 75633-1408

Ms. Joyce Morrison, Librarian
Upshur County Library
702 Tyler Street
Gilmer, Texas 75644-2145

Ms. Judy Qualls, Librarian
Franklin County Library
P.O. Box 622 (Kaufman & Main)
Mt. Vernon, Texas 75457-0622

Ms. Mary Sullivan, Librarian
Quitman Public Library
Box 77 (202 E. Goode)
Quitman, Texas 75783-0077

Ms. Michelle Otstott
Carnegie Public Library
303 W. Lafayette
Jefferson, Texas 75657-2209

Ms. Betsy Tull, Director
Red River County Public Library
Box 508 (307 N. Walnut Street)
Clarksville, Texas 75426-0508

Ms. Mary McGee, Acting Director
Rusk County Memorial Library
106 E. Main Street
Henderson, Texas 75652-5912

Ms. Wilma Taylor, Director
Sulphur Springs Public Library
201 N. Davis
Sulphur Springs, Texaas 75482-2636

Ms. Alice Coleman, Librarian
Texarkana Public Library
ATTN: Sandra Holmes
600 W. 3rd Street
Texarkana. Texas 75501-5054

M[illegible] Coe Haygood
C[illegible]do-Pine Island Oil and
Historical Society
P.O. Box 897
Oil City, Louisiana 71061

Ms. Karen Wheat, Acting Director
Delta County Public Library
520 S. W. 1st Street
Cooper, Texas 75432-2509

Mr. Ron Heezen, Director
Longview Public Library
222 W. Cotton
Longview, Texas 75601-6348

Ms. Beverly Lewis, Director
Paris Public Library
326 S. Main
Paris, Texas 75460-5825

Mr. Chris Albertson, Director
ATTN: Penny Reynolds
Tyler Public Library
201 S. College
Tyler, Texas 75702-738 1

Mr. Stephen Hussman, Archivist
Noel Memorial Library
LSU-Shreveport
One University Place
Shreveport, Louisiana 71115-2399

Ms. Earlene Walton, Librarian
Daingerfield Public Library
207 Jefferson Street
Daingerfield, Texas 75638-1713

Ms. Justine Frank, Acting Director
Marshall Public Library
300 S. Alamo
Marshall, Texas 75670-4273

Ms. Paula Rose, Librarian
Pit&burg/Camp County Library
609 Quitman Street
Pittsburg, Texas 75686-0343

Mr. Carlos Colon
Shreve Memorial Library
424 Texas
Shreveport, Louisiana 71101

Ms. Lee Ann Weathersby
Atlanta Public Library
101 West Hiram
Atlanta, Texas 7555 l-2237

Dallas Public Library
ATTN: Documents Librarian
Government Information Center
1[illegible] Young Street
Dallas, Texas 75201-9987

Ms. Marsha Lutch
Central Reference Unit
Fort Worth Public Library
300 Taylor Street
Fort Worth, Texas 76102-7309

Appendix F

NEWSLETTERS

WATERWISE

No. 1

The Newsletter of the Shreveport to Daingerfield Study

Vicksburg District
Corps of Engineers

THE FIRST MAP OF CADDO LAKE

Caddo Lake first appears on William Darby's 1816 Map of the State of Louisiana. When Caddo Lake was formed in the Spring of 1800, it was part of a larger waterbody called Sodo by the Indians. which included Cross Lake and the now-extinct Clear, Shifttail, and Soda lakes. Caddo Lake is represented on Darbv's map as the western arm of this larger waterbody. with Jeems Bayou shown as a small bump.

Darby, who was born in Pennsylvania in 1775, was the typical Nineteenth Century Renaissance Man--self-taught surveyor, cartographer, planter, historian, geographer, publisher, poliricai commentator, short-story writer, and professor. As a deputy surveyor for the U.S. government, he was the first to map the Atchafalava Basin. He performed topographical reconnaissance work for Andrew Jackson during the Battle of New Orleans. helped survev the boundary between the United States and Canada in 1818. and ended his professional career in the Land Office in Washington. D.C.. where he died in 1854.

Darby's map was published by John Melish in Philadelphia with an accompanying journal titled A ***Geographical Description of the State of Louisiana.*** Melish used Darbv's depiction of Northwest Louisiana and Northeast Texas in a new edition of his own map of the United States. Melish's map was important in the Adams-Onis Treaty of 1819. which established the boundary between the United States and New Spain. Darby felt that his contribution was not sufficiently recognized and petitioned Congress for restitution, which was provided in the sum of $1.500 ten weeks before he died

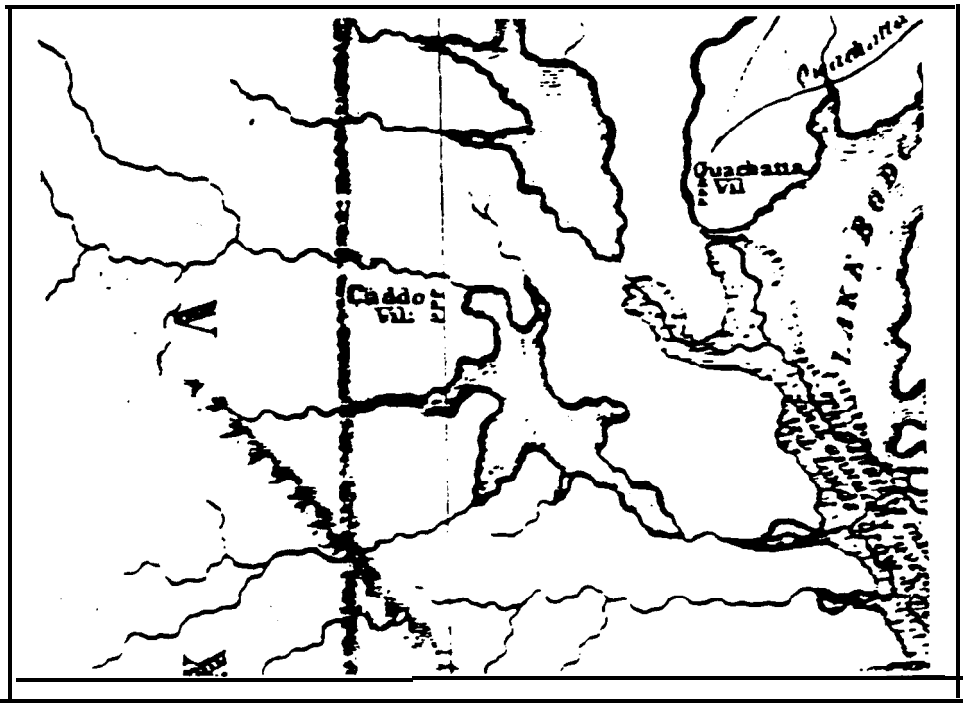
Darby's map of Louisiana was the first to contain information on the northern portion of the state developed through the procedures of scientific cartography. Darby traveled up the Red River to the northwest comer of the state, ranged as far east as Bayou Macon (near the Mississippi), then went up the Sabine and down to the Gulf of Mexico, passing through areas that had only been visited briefly by explorers and traders.

The investigations that gave rise to the depiction of Caddo Lake took place in the latter half of 1811. Caddo Lake and the larger waterbody (Sodo Lake) of which it was a part are not named on Darby's map; but he refers to the larger waterbody as Caddo Lake in his travel journal, apparently because of the proximity of the Caddo Indian village, which is clearly delineated on the map.

The excellence of Darby's depiction of the Sodo Lake complex can be seen by comparison to any later maps produced before the disappearance of Clear, Shifttail. and Soda lakes. The southwest bulge is somewhat exaggerated, and Darby obviously did not travel far to the west, since the stream pattern for Cypress Bayou is vague. It is also apparent that Darby did not travel up Jeems Bayou, which would have been choked with cypress trees at the time.

The club-shaped extension at the northern end of the Sodo Lake complex is Clear Lake, which has since disappeared. The stream entering Clear Lake from the west is apparently a misplacement. Drainage into Clear Lake was from the northeast, and the stream pattern is obviously that of Jeems Bayou. This misplacement occurred because Darby obtained his information on stream patterns in the Sodo Lake area from the half-Indian trader Francois Grappe, who lived on Lake Bistineau. Darby would

continued on *page* 2



MAP

continued from page *1*

have thought that Grappe was describing a stream entering into Clear Lake because he had not traveled up Jeems Bayou and was not aware that it was a large waterbody.

The thin line immediately to the east of the Caddo village is the 94th degree of longitude, which was identified on Darby's map as the 17th degree because international conventions on longitude were not established until the late 1800s. 'The thicker line to the west is the state boundary. It passes through what is now Texas because the boundary between the United States and the Republic of Texas was not established until 1841. Boundary uncertainties before that time made Northwest Louisiana and Northeast Texas a No-Man's Land.

In spite of these minor errors of detail, Darby's depiction of Caddo Lake and the Sodo Lake complex of which it was a part is widely recognized as an extraordinary achievement bv a man working alone at his own cost. without sophisticated surveying equipment, covering most of northern Louisiana during a six-month period, and traveling through unchartered areas occupied only by Indians.

COMMENTS SOLICITED

Do you have any comments on the newsletter or suggestions for topics that you would like to see covered? If so. call Marty Garton at *(601)631-5446* or Roger Cockrell at (601)631-5425 or write to 3515 *I-20* Frontage ***Road. Vicksburg, MS 39180-51 91.***

DEPOSITORIES ESTABLISHED

Depositories have been established in convenient locations throughout the study area to provide ready access to study documents as they are produced. The following libraries are official study depositories:

- Carnegie Public Library
  303 W. Lafayette
  Jefferson, Texas
- Daingerfield Public Library.
  207 Jefferson Street
  Daingerfield, Texas
- Delta County Public Library
  520 S.W. 1st street
  Cooper, Texas
- Franklin County Library
  Kaufman & Main
  Mt. Vernon, Texas
- Longview Public Library
  222 w. Cotton
  Longview, Texas
- Marshall Public Library
  300 S. Alamo
  Marshall, Texas
- Paris Public Library
  326 S. Main
  Paris, Texas
- Pittsburg/Camp County Library
  609 Quitman Street
  Pittsburg, Texas
- Quitman Public Library
  202 E. Goode
  Quitman, Texas
- Red River County Public Library
  307 N. Walnut Street
  Clarksville. Texas
- Rusk County Memorial Library
  106 E. Main Street
  Henderson, Texas
- Service League Library
  522 West College
  Carthage, Texas
- Shreve Memorial Library
  424 Texas
  Shreveport, Louisiana
- Sulphur Springs Public Library
  201 N. Davis
  Sulphur Springs, Texas
- Texarkana Public Library
  600 W. 3rd Street
  Texarkana. Texas
- Tyler Public Library
  201 S. College
  Tyler, Texas
- Upshur County Library
  702 Tyler Street
  Gilmer, Texas

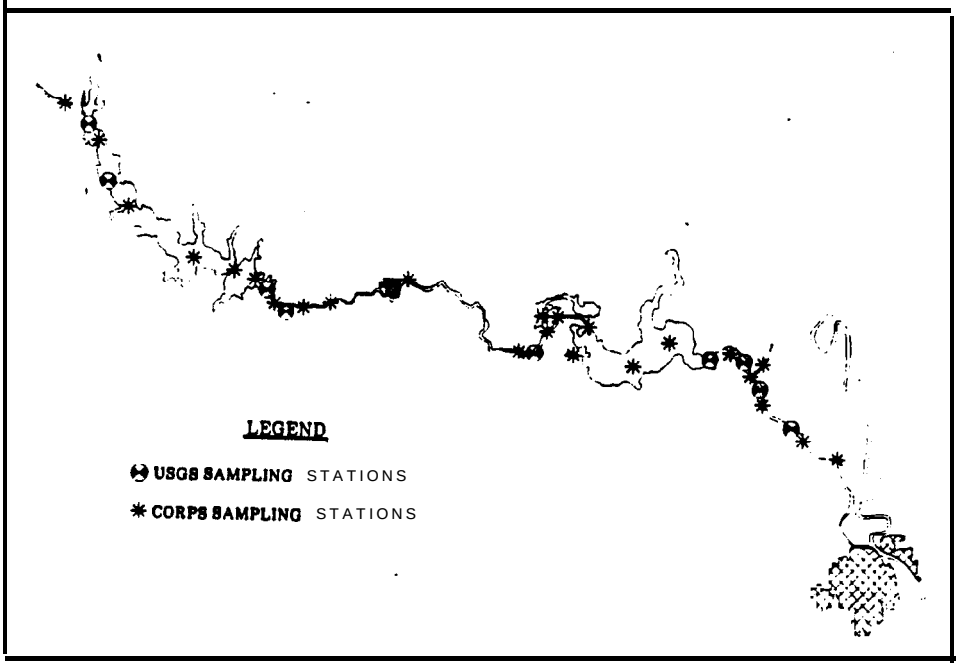
These depositories aiready contain the questions and comments that were provided by the public during the workshops held in Jefferson (Study ***Issues Identijied by the Public at the Meeting in Jefferson, Texas,*** 28 ***March 1991)*** and in Longview, Hughes Springs, and Blanchard (***Study*** Issues ***Identified by the Public at the Meetings in Longview and Hughes Springs, Texas, and Blanchard, Louisiana, in June 1991).***

Also on deposit are copies of the map volume ***Shreveport, LA-Daingerfield, TX: Mosaics and U.S.G.S. Quadrangle Maps. This*** publication contains topographic maps of the project area as well as aerial photographs that have been assembled as mosaics.

A full set of these newsletters is being provided to the depositories. Future issues of the newsletter will inform you about subsequent inclusions in the depositories.

SEDIMENT/WATER QUALITY ANALYSIS

During the issues identification process, many people expressed concerns about the potential effects of dredging and barge traffic on the water quality of the lakes and streams of the project area. These concerns were largely rooted in assumptions about contaminants in the bottom sediments of Lake O' the Pines, Caddo Lake, and Twelve-mile Bayou and about how these suspected contaminants might get into the water column through project-related activities, thereby affecting water supply and the environment. An additional concern was the potential for spills and discharges from barges, which might also affect water quality.



The first step in addressing these concerns is to determine what the existing conditions are with respect to sediments and water quality. Determination of these existing conditions is always done at the beginning of a Corps navigation study, but is particularly relevant in the light of the expressed public concerns.

What is the present quality of project area waters? Do bottom sediments contain toxic substances and, if so, at what levels of concentration? The answers tb these questions are being sought through an extensive Sediment/Water Quality Study. which is under the direction of Dave Johnson. Dave is Chief of the Water Qualitv Section at the Vicksburg District, with a degree in Environmental Engineering and 13 years of experience.

The S/WQ Study is in two parts. The first part is being conducted by the U.S. 'Geological Survey, an agency that collects water quality data throughout the United States. Under a contract with the Corps, the USGS is collecting water samples on a monthlv basis at nine sites throughout the project area (see map). These sites were selected through consultation with the U.S. Fish and Wildlife Service and are key locations for profiling the water quality throughout the area. These samples will be analyzed for turbidity, dissolved oxygen, conductivity, temperature, acidity and alkalinity, nutrients. and solids.

The second part of the S/WQ Study is being conducted by the Corps, which is taking a look at both sediment and water quality through two intensive sampling tnps throughout the project area. Twenty-four samples were taken in late June, and six more will be taken during a low-water period. Because of the immense care that must be exercised to assure that the sampling procedures are scientifically exact, sample taking at each station takes from l-l.5 hours.

The water samples are being taken with a brass bottle and a pump set at the desired depth. Most of the samples are being taken from within one-half meter of the bottom. Samples for volatiles (e.g., oils), however, must be taken from the surface.

The sediment samples are being taken from lake bottoms and from depositional areas in streams. Depositional areas are places where recent sediments are being deposited, such as the inside of bends in streams. All samples are being taken from the top 3-4 inches of sediment. since we are interested in what is in recent sediments. Sediment samples are being taken with one of three sediment samplers, dependine on the sediment types encountered. The first is a ponar sampler that has two jaws that close around the sediment sample. The second is a brass corer, which, as the name implies, takes core samples. The third is a pipe dredge, which is dragged along the bottom to collect the sample.

The water quality and sediment samples collected by the Corps are being sent for analysis to the Waterways Experiment Station Analytical Laboratory in Vicksburg, which is an Environmental Protection Agency-certified laboratory. The samples will be analyzed according to EPA procedures for a wide range of parameters, including pesticides, heaw metals, organics, TNT derivatives, dissolved and suspended solids, and, from the Caddo Lake samples, petroleum products.

Many samples have alreadv been taken, and others will be taken within the month. All of the preliminary samples will be analyzed bv the beginning of October, and we will report on the results in a later issue of the newsletter. Because of the sophisticated collection and analytical techniques that must be employed, the S/WQ Study is very costly (about $5,000 per sample for each of the 24 samples). But, the results will tell us what we need to know about existing water quality and sediment conditions and their causes.

After the base conditions have been established. it will then be time to look at how the project might affect them and how they should be addressed. Determination of appropriate courses of action will, of course, be largely dependent on what is found through the sediment/water quality analysis.

WHAT'S HAPPENING

- The hydrology and hydraulics of the study area are being evaluated in terms of existing conditions.
- Transportation savings are bang reviewed, updated, and verified.
- The economic base of the area is being studied.
- The geologic features of the area have been mapped
- A groundwater monitoring system has been put in place.
- Soil borings that will be used to determine foundational needs for structures are underway.
- Scopes of work for the cultural resources investigations have been developed, and geomorphic studies of the prehistoric environment of the study area are underway.
- The scope of work for the recreation demand and need study is being developed.
- Coordination with the public is continuing.
- Alternatives to the authorized project are being formulated.
- Data for the evaluation of terrestrial habitats is being collected.
- A scope of work for the evaluation of aquatic habitats is being developed

WHAT'S AHEAD

- The hydrology and hydraulics of the authorized project will be evaluated.
- Study of the economic base of the area will continue
- A studv will be conducted to consider the future economics of the study area.
- The U.S. Geological Survey will monitor the levels and basic qualities of the groundwater.
- Soil samples will be tested and classified.
- High-probability areas for historic and prehistoric cultural sites will be investigated.
- Recreation demands and needs will be determined.
- Public coordination and the formulation of alternativeswill continue.
- The evaluation of aquatic habitats will be initiated.
- The structural design of the authorized project will be evaluated.

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WATERWISE

No. 2

The Newsletter of the Shreveport to Daingerfield Study

Vicksburg District
Corps of Engineers

CYPRESS BAYOU PROJECT

Maps of Caddo Lake show "Government Ditch" from Bois d'Arc Pass down toward Uncertain. And on Cypress Bayou below Jefferson, there are unnamed cutoffs known locally as "government ditches." These are the most visible remnants of a large navigation project that was carried out by the U. S. Army Corps of Engineers between 1872 and 1918.

The prolect's official title was "Cypress Bayou and Waterway Between Jefferson. Texas, and Shreveport, Louisiana." It included Cypress Bayou, Caddo Lake, Soda Lake (which no longer exists), and Twelvemile Bayou. Congress began the project through a $10,000 appropriation in the Rivers and Harbors Act of 1872. Twenty-three other appropriations were made by Congress through 1918, bringing the total project cost to nearly $300.000.

The work consisted of dredging, the removal of obstructions such as stumps and logs in the channel. the removal of leaning trees and snags from the banks, the cutting of willows and other brush. the posting of channel markers, and the construction of a dam at the foot of Caddo Lake. The work was conducted by dredges (the first of which was loaned by Jefferson), snagboars. quarterboats, field crews. equipment, and explosives.

The waterway between Jefferson and Shreveport was the subject of discussion nearly every year in Congress. But, the appropriations for work were grouped in clusters. so that the project can be divided into four time periods.

1872 - 1879: The first work during this period consisted of dredging and of removing channel obstructions in the fairly shallow area from the Jefferson wharf to three miles downstream. The dredged material was placed on the slope of the natural bank because the dredge could not cast higher up. Most of the dredged material was moved further back by hand labor.

In the Dougherty's Defeat area a few miles downstream of the old riverport town of Smithland, four overland cuts were made (Little Cypress, Middle Cypress. and the two Sisco Island cuts). Another set of cuts was produced in the Benton Lake area, and between the two sets of cuts there was extensive dredging and removal of obstructions.

At Bois d'Arc Pass at the mouth of Cypress Bayou, 1,000 stumps were removed or cut to low water, and the channel that later came to be known as "Government Ditch" was dredged. The seven cuts produced channels approximately 45 feet wide and 7 feet deep and reduced the navigation distance between Jefferson and Shreveport from 96 to 65 miles.

The entire waterwav was reworked to remove thousands of additional channel stumps and logs and leaning trees on the banks. The navigation route was then posted with channel markers.

1887 - 1890: In 1884, a survey of Cypress Bayou and the lakes was conducted by Capt. Eric Bergland of the Corps of Engineers. whose 1885 map appears below. Bergland found that many of the cuts had filled in, owing to the sandy alluvial soil and the fact that the dredged materials had been deposited on the banks. He recommended redredging and extension of the Bois d'Arc Pass Cut into deeper water.

The cuts were reworked, with the exception of the two Benton cuts, which were still in good condition. The Bois d'Arc Cut was extended 1,000 feet, to produce an 8,000-foot channel. Extensive dredging was also done near Jefferson. An 800-foot-long channel was dredged through the Albany Plats area of Soda Lake, and signboards were posted.

1893 - 1898: A new dredge was purchased, because the old one had worn out. However, low water made it impossible for the dredge to cross the Albany Plats area. As a consequence, work during this period was limited to the activities of two chopping parties. who used tools, tackle. and explosives to remove obstructions in the channel and along the banks from Jefferson to Shreveport.

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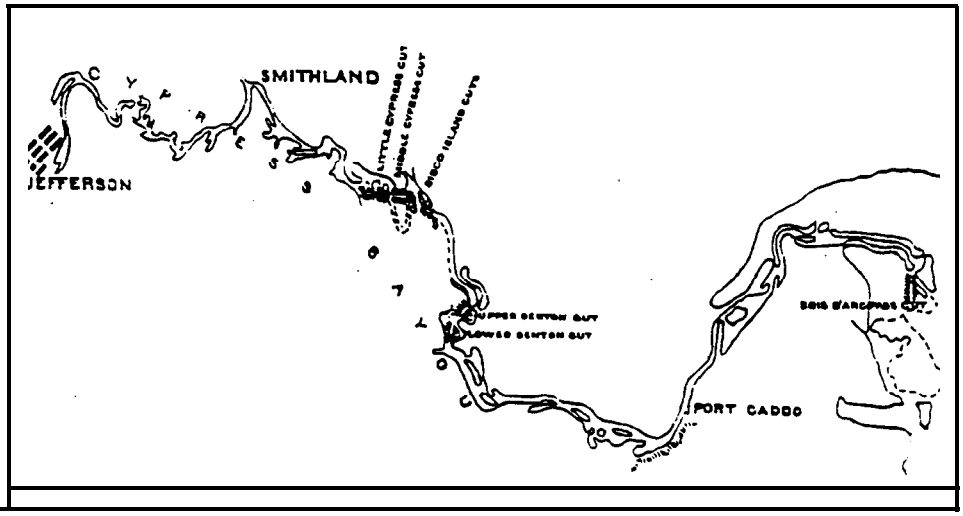

CYPRESS BAYOU

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1906 - 1918: The most significant feature of the fourth period was the building of a dam at the foot of Caddo Lake in 1914, which was the forerunner of the existing dam. Because the purpose of the dam was to maintain navigation between Jefferson and Mooringsport, it was officially part of the "Cypress Bayou and Waterway" project. All channel work, which was restricted during this period to the removal of obstructions. occurred upstream of Mooringsport.

The work was conducted by quarterboats. the second of which was wrecked in March 1918. Hand labor continued until May, after which all additional project appropriations were allocated to the maintenance of Caddo Lake dam, and the waterway project effectively came to an end.

SUMMARY: The total effort between 1872 and 1918 involved the dredging of 19,700 feet of channel, the consequent removal of 348.000 cubic yards of earth, the removal of 37,000 channel stumps and logs. the removal of 36.000 leaning trees and shore snags, the cutting of 100.000 square yards of willows and brush. and the construction of a dam.

A CLARIFICATION

In question 62 from the Concerns. Questions and Statements Presented at the Public Involvement Workshops held in Longview. Hughes Springs, and Blanchard. we indicated that information concerning U. S. Coast Guard vessel controls and inspections was conrained in subchapters D and 0 of 48 CFR. To order this information from the Government Printing Office. you need to ask for parts 1-40 for subchapter D and parts 140-155 for subchapter 0.

GROUND WATER STUDY UNDERWAY

Beneath the area that would be affected by the Shreveport to Daingerfield waterway, there is an aquifer (the Cypress Aquifer) that is from 300-1000 feet deep. Above this aquifer is another one called the alluvial aquifer, which is composed of sand and gravel that was deposited during the Ice Age. The alluvial aquifer is found in the vallevs between the bluffs through which streams like Cypress Bavou run. The alluvial aquifer begins about five feet below ground and goes down about 30 feet. On top of the alluvial aquifer is a layer of silt that has been gradually deposited since about 10.000 years ago.

A waterway through this area would not affect the deep aquifer. However, it could affect the alluvial aquifer, because the alluvial aquifer is connected with the streams that flow over it. If the project were to be built, locks and dams would cause the water upstream of them to rise. This would cause increased pressure from above. which could force water from such streams as Cypress Bayou down into the alluvial aquifer.

A ground water study is underway to determine the present water levels and water quality in the alluvial aquifer. This study is a joint effort on the part of the U. S. Geological Survey (USGS). the Soil Conservation Service (SCS), and the Corps of Engineers. The Corps' effort is directed by Stephen Lee, a geologist who has been with the Corps for eight years.

The ground water study is being conducted using 27 shallow wells. The wells were installed in areas that would be most affected by water-level rises if locks and dams were constructed and where major structures would be built (see map). The wells are two-inch PVC pipe installed in the ground to a depth of 30 feet. Slots in the pipe enable water to enter so that the water levels can be measured and water can be sampled through the pipe (see diagram on next page).

The ground water in the valley of Cypress Bayou is about 3-5 feet below the ground surface. The SCS is using the wells to monitor ground water levels as they rise and fall. The USGS is using the wells to monitor ground water quality on a

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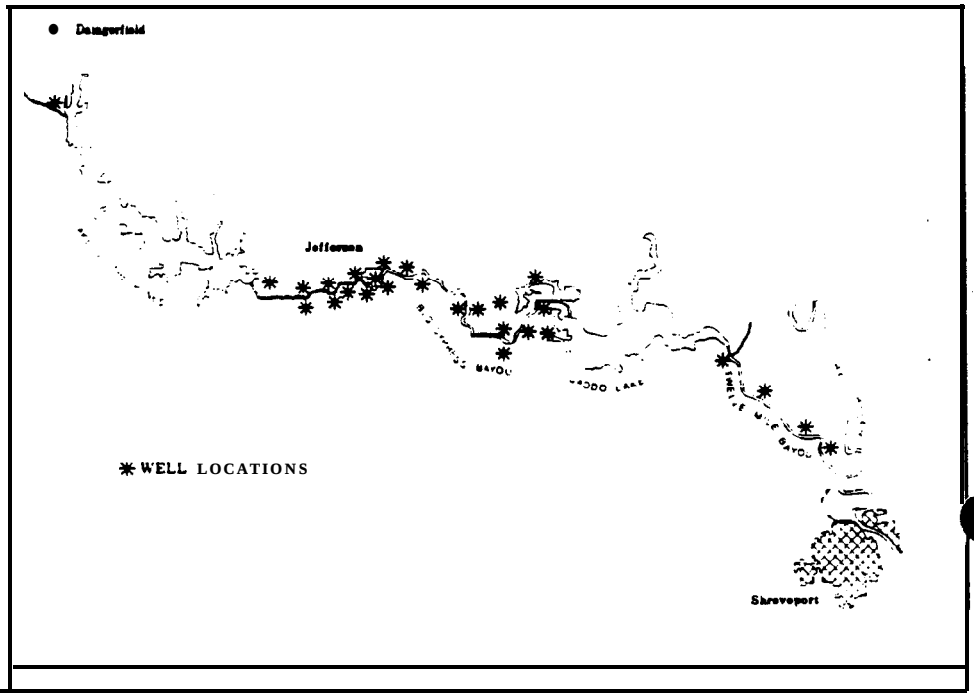

GROUND WATER

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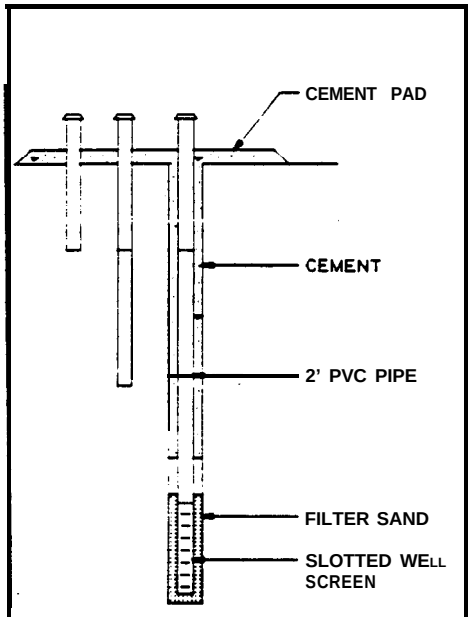
quarterly basis, testing the samples for basic qualities such as hardness and chlorides.

The purposes of the ground water study are: 1) to collect information needed for designing project structures: and 2) to identify the existing_ conditions within the alluvial aquiter so that any impacts from the project can be determined. Some current questions may also be answered. There are reports. for example. that ground water around Caddo Lake has been contaminated by saltwater that has



WELL DIAGRAM

risen along the outer casings of oil wells that have been driven through layers containing ancient seawater. The study will be able to determine whether such contamination has actual& taken place.

TERRESTRIAL HABITAT EVALUATION

Every living thing needs a place to live--a habitat. a home. And every species of fish and wildlife must have a home that meets its needs for food. water. and shelter. Each species has particular habitat needs. Gray squirrels. for example, are generally found in bottomland hardwood forests. whereas cottontail rabbits are generally found in more open areas such as grasslands. because bottomland hardwoods meet the needs of gray squirrels. and grasslands meet the needs of cottontail rabbits.

Habitat types are not uniform in quality. One area of bottomland hardwoods may have the ability to support a greater number of gray squirrels than another because of such things as a greater number of nut-bearing trees. Since some areas are better than others. there is an optimum, or best, habitat for each species in which that species can thrive.

A Habitat Evaluation Procedure (HEP) is a systematic way of evaluating the quality of different geographic areas in terms of their ability to support popuiations of fish and wildlife. These evaluations are used to estimate the probable impacts to fish and wildlife of any project that would affect the environment bv destroving or transforming any habitat areas.

HEPs are of two types: 1) terrestrial, which is concerned with the value of land to wildlife: and 2) aquatic. which is concerned with the value of lakes and streams to fish and other aquatic species. The terrestrial HEP field surveys for the Shreveport to Daingerfield Study were completed this summer, and the collected information is now being analyzed. The aquatic HEP is just beginning.

The terrestrial HEP for the study is a joint effort on the part of the Texas Parks and Wildlife Department. the Louisiana Department of Wildlife and Fisheries, U. S. Fish and Wildlife Service Ecological Services offices. the Environmental Protection Agency. and the Corps of Engineers. These are the agencies responsible for insuring that fish and wildlife resources are considered in any decisions relating to construction efforts that might emerge from the study.

The team came together and reviewed vegetation maps and other documents to determine the types of habitats that would be affected by such things as channel dredging and clearance of rights-ot-wav. The team then chose a number of indicator species for each habitat. type. Gray squirrel, for example, was chosen as one of the indicator species for bottomland hardwood forests.

Manuals have been prepared by the U. S. Fish and Wildlife Service for various indicator species describing the optimum (best) habitat for each species in terms of such things as food and cover. Qualities that make for good squirrel habitat include such things as size and number of nut-bearing trees. den trees, old snags, and distance to water.

One can go to a particular habitat area and determine how close the area is to an optimum habitat for the indicator species by comparing the characteristics of the area (e.g., amount of ground cover. number of rotten logs) to the ideal conditions for each species. .The study HEP evaluated 10 habitat types, using 2-6 indicator species and 3-26 evaluation characteristics for each habitat type.

Since everv foot of land could not be covered. transect lines were established perpendicular to the proposed channel routes. including alternate routings. These transects were one mile apart and extended one-fourth of a mile on each side of the routes. Circular areas encompassing two-tenths of an acre were

HABITAT

continued from page 3

then established randomly along the transects by the HEP team.

These circular areas were thoroughly investigated for the various habitat features that were suitable for each indicator species. These features are now being compared to optimum habitats for each of the indicator species to determine the value of each of the areas studied. These values are expressed in terms of habitat units (HUs), which are numeric estimates ranging from unsuitable to optimum habitat for the species in question.

These units will then be multiplied by the number of acres of each habitat type to establish a quantitative estimate of habitat losses that would be sustained if the navigation channel is built. Habitat losses must be made up through the purchase of mitigation lands or by including environmental enhancement features in a project, such as marsh creation through the use of dredged materials.

HEP offers a way to quantify the impacts of a project based on the quality of habitats for specific species. This is a more scientifically valid procedure than individual judgment or trying to place a dollar value on wildlife. Quantification of habitat values enables the agencies with responsibilities for fish and wildlife to share a common language in discussing impacts and to secure adequate compensation for any damage that might be done by a project.

WHY SO COSTLY?

We have been asked why the water quality and sediment samples cost $5.000 apiece. The primary reason is the number of parameters that are being tested for each sample. The analysis includes five different series of organics, heavy metals, solids, and nutrients; and the maximum number of analyses for a combined sediment and water sample is 324. This level of analysis is needed to appropriately address the concerns that have been expressed about a potentially wide range of pollutants in bottom sediments.

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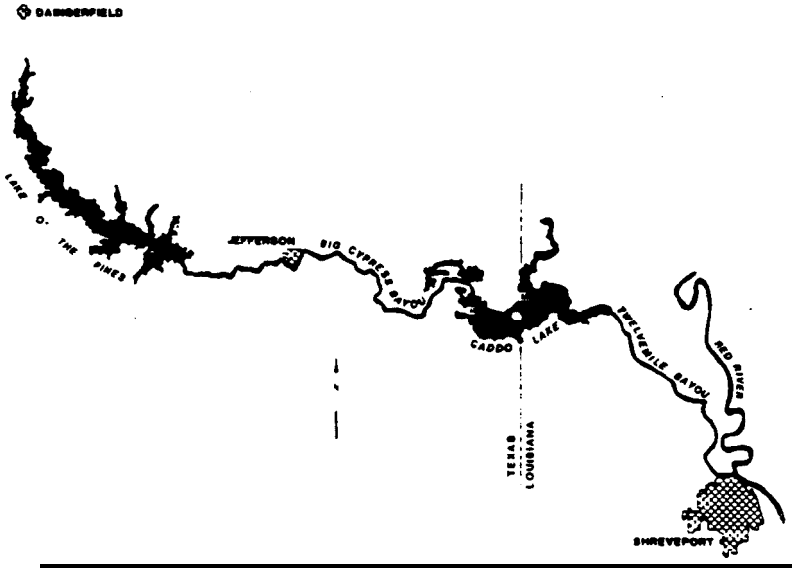


WATERWISE

No. 3

The Newsletter of the Shreveport to Daingerfield Study

Vicksburg District
Corps of Engineers

THE GREAT RAFT

The history of the Shreveport to Daingerfield area cannot be understood apart from the influence of the Great Raft on the Red River. The Great Raft produced the five lakes (Caddo, Cross, Clear, Shifttail, and Soda) that were known collectivelv as Sodo Lake, and it was the existence of these lakes that made steamboat navigation to Jefferson possible.

The Great Raft was a log jam on the Red River composed primarily of cottonwood trees. forming a dense mat whose interstices were filled with leaves and sediment. producing a solid mass through which the waters of the Red could not penetrate. The logs were obtained from the banks of the Red, which cut back and forth across its alluvial plain, consuming immense quantities of timber. The noise of falling trees in Spring was likened to the distant roar of artillery.

The raft was not stationary. It moved upstream at approximately one mile a year. This upstream movement was caused by the accumulation of logs at the head of the raft and decay of logs at the foot. which were carried off downstream. Were this not the case. the whole of the Red would have eventually been choked.

Precisely when the raft began is unknown. What is known is that it began when the Red flowed directly to the Gulf of Mexico. As the raft moved upstream, it caused the waters of the Red to divert to the east. forming a linkage with the Mississippi River about 500 years ago. Once this linkage was made. differences in water levels between the Mississippi and the Red produced an eddy on the Red where debris began to accumulate. beginning the raft that is known historicallv.

Although the raft as it was observed by early travelers and settlers was about 100 miles long at any one time, it was never a continuous mass. Rather, it was a discontinuous series of smaller rafts varying in length. The reason for this discontinuity is that raft segments tended to form at bends in the river.

The raft acted as a dam. raising water levels for many miles upstream. Immense pressure was exerted at bends in the river upstream of the raft. because the bends reached out into the alluvial plain of the Red, which sloped downward toward the bluffs to the east and west.

When enough pressure was exerted, a break would form in the natural levee of a bend, sending the water into the alluvial plain. As the water flowed out at the break, a slackwater condition was created between the break and the head of the raft. Debris quickly accumulated in the slackwater area near the break. forming a new raft segment. which soon closed the break and exerted further pressures upstream.

In this stepwise fashion. the Great Raft proceeded upstream. completely transforming the Red and its adjoining landscape in five major ways:

1. As the raft backed up the waters of the Red, sediments quickly dropped out and raised the bed of the river.

2. Where breaks occurred in the natural levees of the bends. distributaries were formed that carried the waters of the Red downstream until they rejoined the river below the foot of the raft.

3. When the raft reached the outlet of tributaries to the Red, outflowing water was blocked and backed up, and lakes would form covering portions of the tributary channels. Lakes were also formed or enlarged by distributaries flowing down into every available depression.

4. The distributaries brought with them immense quantities of Red River sediments, which were

continued **on page 2**

RAFT

continued from page 1

spread over the land and deposited in the beds of streams and lakes.

5. The newly formed lakes and sedimentary deposits from the distributaries killed the trees in the original forests.

As the raft left an area in its course upstream, a reverse process would set in. The sediments in the bed of the Red would be scoured out. reducing water levels on the river. Distributaries would be deprived of their function, and Red River water would be confined to the main channel. Lakes would drain. Tributary streams would eat into the sediments deposited in their beds. seeking the original stream bottom. Vegetation would reappear in areas that had previously been covered with water.

The Great Raft was an immensely 'destructive and creative force in the' Red River Valley for hundreds of years. It is without parallel in the annals of geography, and the raft lakes that it formed are not to be found anywhere else in the world..

(Photo courtesy LSU-Shreveport Archives)

NEW DEPOSITORIES ESTABLISHED

New depositories have been established at:

Caddo - Pine Island Oil and Historical Society Museum
207 Land Street
Oil City. Louisiana

Archives Department
Noel Memorial Library
LSU - Shreveport
One University Place
Shreveport. Louisiana

HYDROLOGY AND HYDRAULICS

Is there enough water to support barge traffic between Shreveport and Daingerfield. particularly in light of the release restrictions at Lake 0' the Pines? If the amount of water should prove to be scarce, what changes can be made in reservoir regulations or the design of the navigation project to provide maximum use of the available resources? If water should prove to be abundant, what project designs are most compatible with the water needs of wildlife, fisheries. and people, while at the same time meeting navigation needs?

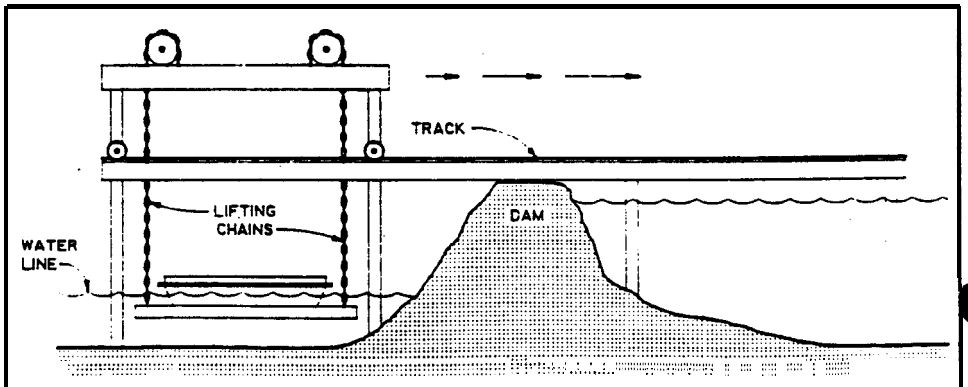
These are questions that are being addressed by the hvdrology and hydraulics investigations that are being conducted for the study under the direction of Freddy Pinkard, a hydraulic engineer with 13 years of experience with the Corps. Hydroiogy deais with the amount of water that reaches the ground; hydraulics deals with what happens to water after it reaches the ground. Together they provide an indication of the amount of water that is available in various places and at various times.

The first step in this analysis was to look at seasonal and yearly variations in rainfall to determine the gross amounts that are available over long periods. From this. was subtracted the amount that evaporates or is absorbed into the ground. It was then necessarv to look at drainage patterns to determine how much goes down which streams and into and out of which lakes. These figures were ground-checked using a fathometer on the streams.

After the existing and projected conditions over time were determined. these were compared to the needs of the authorized project in terms of channel design, the amount of water required by locks, and so on. Alternative channel routings were dealt with in a similar manner.

Various innovative structures are being considered for possible inclusion in the design of the project. Pump-back systems could be installed to continuously recycle water in the locks. Wet and dry barge lifts are being considered as alternatives to a standard lock at Lake 0' the Pines. The dry lift acts like an elevator, and the wet lift raises vcssels in a tank of water.

Another aspect of the hydrologic and hydraulic investigations is to determine the size of wakes and the impacts that would be produced by barge tows in various areas. This was a concern that was expressed in all of the public meetings. It is being addressed through the application of information from previous studies to the special conditions of the study area. The results of these efforts will be reported on in a subsequent issue of the newsletter.



DRY BARGE LIFT

CULTURAL RESOURCES INVESTIGATIONS

The Shreveport to Daingerfield area is rich in history and in archaeological resources. Indians inhabited the area for thousands of years, producing numerous prehistoric and historic sites. Later settlers established towns, transportation routes, farming operations, and industrial complexes such as the Caddo-Pine Island oil field that provide a fascinating historical and cultural background for the study area.

The purpose of the cultural resources investigations that are being conducted as part of the Shreveport to Daingerfield study is to identify any resources that might be affected by the navigation channel. These are currently reconnaissance-level investigations. They aim at identifying potential sites of interest and do not involve full-scale archaeological excavations.

The investigations are under the direction of Tommy Birchett, an archaeologist with 12 years of experience with the Corps. They are being conducted in three parts. The first part looks at historic geomorphology--the way that land forms such as bluffs and streams appeared thousands of years ago. This analysis is used to identify geographic features where prehistoric resources such as Indian villages would most likely be found.

The second part looks at the history and prehistory of the area by referring to books, reports. and maps, by consulting with the descendants of former inhabitants such as the Caddo Indians, by talking to area residents who are knowledgeable about the past, and by investigating artifact collections.

The geomorphologic and historic evidence is then brought together to identify high-probability areas for cultural resources that could be affected by any channel alignments, borrow and disposal activities for dredged materials, and any other construction efforts.

The third part consists of testing based on the previous two analyses. Transects are established and test holes are bored to see if any sites are hidden beneath the ground. In addition, the cultural resources of the area are assessed for eligibility in the National Register of Historic Places. These initial investigations would be used as a base for more intensive surveys if the navigation project proves to be feasible.

IN PERSPECTIVE

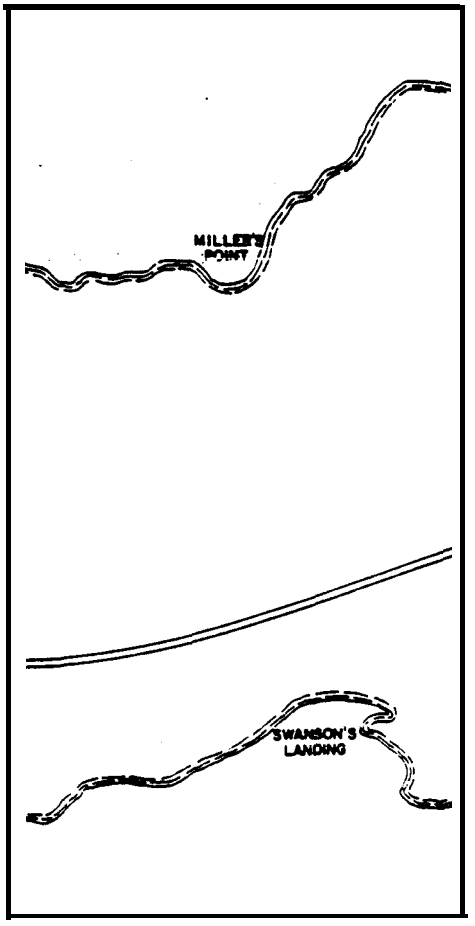
The idea of a navigation channel may suggest a very wide and very deep cut. However, through large waterbodies such as Caddo Lake, the Shreveport to Daingerfield channel would be relatively modest;

The authorized project is for a channel 200 feet wide and 9 feet deep. The channel through Caddo Lake would not involve concrete. It would not have a concrete bottom or concrete walls. Its top would be the existing surface level of the lake. Its bottom would be the bottom of the lake, dredged as many feet as necessary to provide the authorized depth.

The illustration at the bottom of the page shows the approximate depth to which the channel would need to be dredged as it passed between Miller's Point and Swanson's Landing. The cross-hatched area would need to be dredged to provide the authorized depth. The present level of the lake would not change at all.

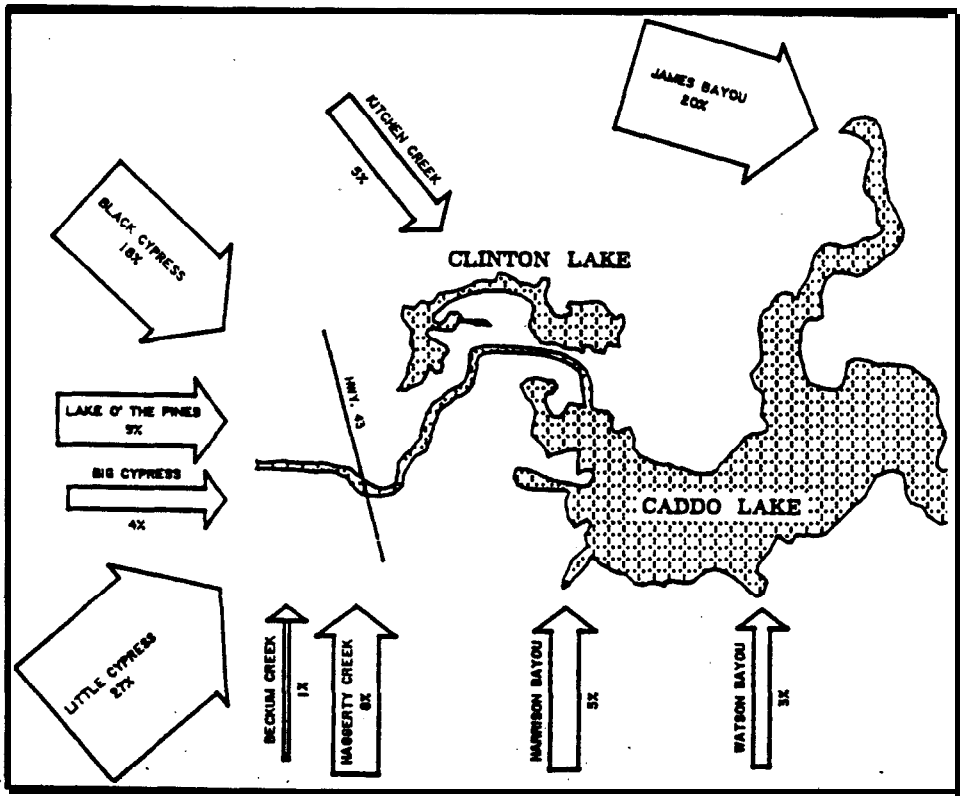
To get an idea of the size of the channel in relation to the lake, place the illustration on the floor of a room 15 feet wide. The walls of the room would be the banks of Caddo Lake.

Another way to envision the size of the channel is to refer to the illustration below, which shows the channel to scale passing between Miller's Point and Swanson's Landing. In reality, of course, someone looking out, at the channel would not see anything other than the surface of Caddo Lake, since the only modification to the lake would be in its bottom.



WHENCE THE WATER?

It is commonly thought that most of the water in Caddo Lake comes from Lake 0' the Pines. This is not the case, as can be seen by the following diagram, which shows the relative contribution of various sources. Actually, Lake 0' the Pines contributes less than one-tenth of the water that enters Caddo Lake. The largest contributors are Little Cypress Bayou, Black Cypress Bayou, and James Bayou. The figure for Big Cypress Bayou is formed by small creeks and runoff from the land between Lake 0' the Pines and Black Cypress Bayou.



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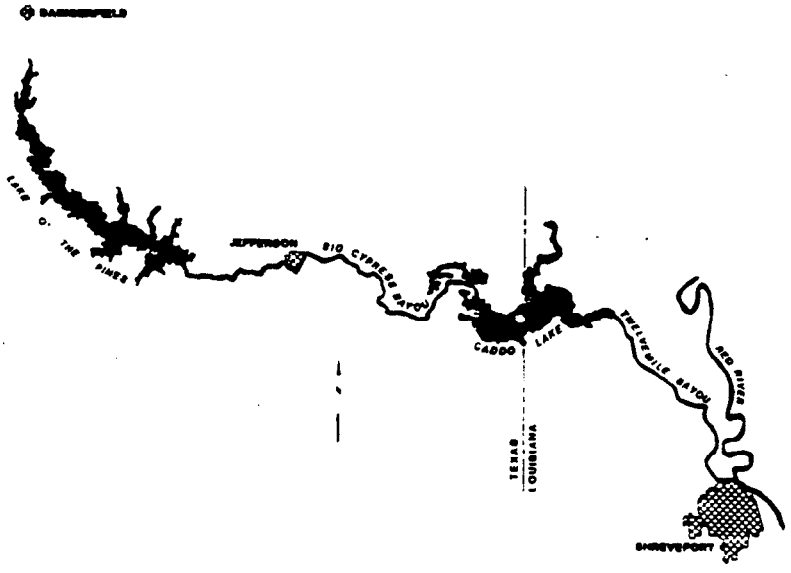


WATERWISE

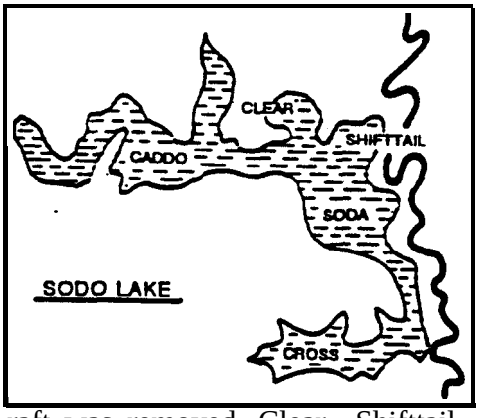
MO. 4

The Newsletter of the Shreveport to Daingerfield Study

Vicksburg District
Corps of Engineers

BEFORE THE RAFT

In the 1800s. the Shreveport to Daingerfield area was occupied by five large lakes (Caddo. Cross. Clear. Shifttail. and Soda) that were created by the Great Raft on the Red River and that were called Sodo by the Indians. When the



raft was removed. Clear.. Shifttail, and Soda disappeared forever. Cross became a cottonfieid. but was resurrected in the 1920s as a water supply source for Shreveport.

What was the Shreveport to Daingerfield area like before 1800 when the Great Raft brought the five lakes into existence? We must think of a time when there were only two major waterbodies in the area: the Red River and Cypress Bayou. which was a western tributary to the Red (see map below).

The Red River flowed sinuously through its valley, which was bounded to the east and west by bluffs. except at the points where tributary streams entered. To the west of the bluffs upon which Shreveport was later founded was a small valley through which a creek flowed that eventually became known as Cross Bayou. Higher up was a much larger valley that exnded far to the west. Through e is forested valley flowed a cypress-fringed stream that eventually became known as Cypress Bayou.

How do we know that this is the case. that Caddo and the four other lakes of the 1800s were not ancient. and that the area was occupied before the 1800s by only Cypress Bayou and the Red River and their forested vallevs?

First. there is the evidence of later accounts. three of which will be cited.

In 1849, Edward Smith. who was investigating sites for an English settlement. spoke to many people in the area and reports that Sodo Lake is of recent formation and that "many now living remember the period when the land was dry."

In 1872, H. C. Collins. a Corps geologist doing a survey for the "Cypress Bayou and Waterway Project," spoke to a resident of Swanson's Landing who had himself spoken to Indians who had come back to visit the country they used to occupy. These Indians said that they used to cultivate corn near Swanson's Landing in an area that now was completely covered by lake waters.

In 1904. Captain J. M. DeWare. President of the Jefferson Navigation Company. provided testimony to Congress on the need to reestablish navigation to Jefferson in which he-described the vallevs of Cypress Bavou and the Red River on the basis of conversations with the descendants of Indians who had lived in the area in eariier times: ."At that time. there was no chain of lakes. It was a dense forest--what the natives of the country called the 'first and second bottoms.' It was ail kinds of oak and cypress. and it was the Indian hunting ground."

Such statements could be dismissed as hearsay were it not for two pieces of evidence that are available to everyone today: the old channel of Cypress Bayou at the bottom of Caddo Lake and the stumps in Caddo Lake.

The stumps and the channel were thoroughly investigated by the Department of the Interior (DOI) in 1913-14 by a team of ecologists. geologists. and surveyors. These investigations were very sophisticated because they were done in relation to court cases concern-

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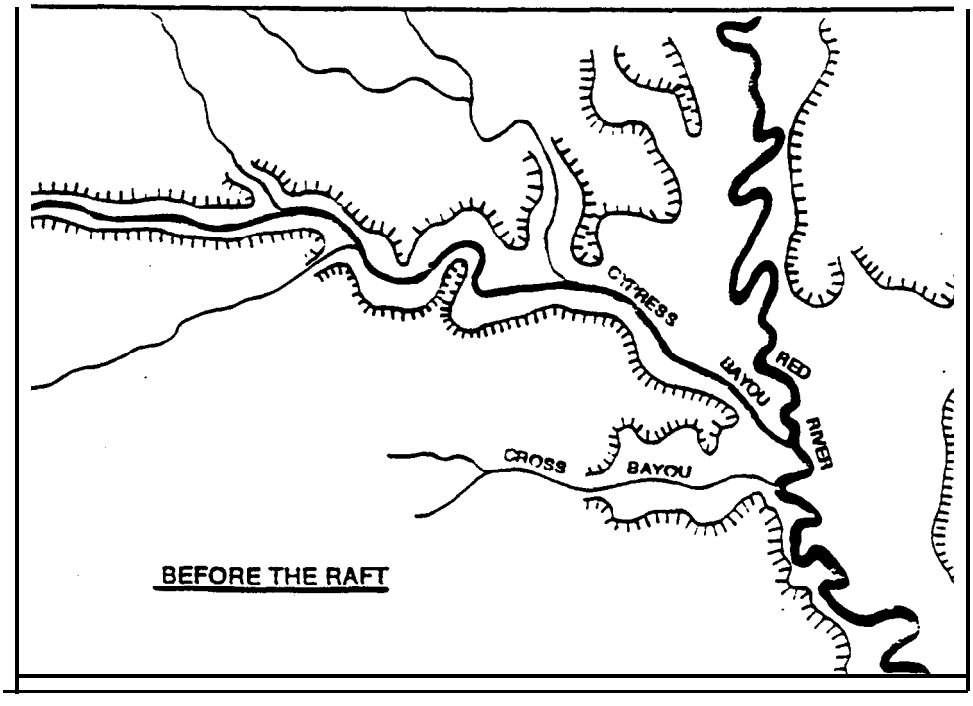

RAFT

continued from page 1

ing ownership of the oil-rich bottomlands of Caddo Lake. To determine ownership. it was necessary to reconstruct the history of the lake.

The DOI found that the channel at the bottom of Caddo Lake was a typical alluvial channel that meandered over its valley and built its own alluvial banks. The DO1 was even able to find some of the ancient channel bends that had been cut off as Cypress Bayou migrated across its valley. Obviously, the channel preexisted the lake. because such a channel cannot be formed in a lake bottom. The sediments within the lake bed that were deposited from upstream sources after Cypress Bayou was drowned by Caddo Lake were only a few inches thick. indicating that the lake must have been very recent.

Everyone knows that Caddo Lake is filled with stumps, many of which are still upright. rooted in the place where the trees originally grew. The DOI found that these stumps were the remains of four closely related tree types. On the old banks of Cypress Bayou there were stumps of cypress trees. Immediately adjacent to the channel. there were stumps of cypress. water locust, and willow. On slightly higher ground (still in the lake bed) were stumps of overcup oak. red gum. and cottonwood. Still higher up within the lake bed were stumps of loblolly pine and post oak. The state of decay of all these stumps was a clear indication that Caddo Lake is not very old.

The stumps in the bed of Caddo Lake are the remnants of the forest that occupied the valley floor. These types of trees constitute what is known as a bottomland hardwood forest. Such forests do not grow in permanent water, but rather thrive in valleys that are subject to periodic flooding from the streams that flow through them.

When Caddo Lake invaded the forested valley of Cypress Bayou. all the trees were killed. with the exception of a few cypress on the channel banks. The stumps and the channel that are now hidden beneath lake waters provide conclusive evidence for what the area looked like before the raft.

REPORT DEPOSITED

Since the Department of the Interior report mentioned in the previous article is important to the history of Caddo Lake. copies have been placed in the depositories.

AQUATIC HABITAT EVALUATION

Issue 2 of *Waterwise* described the terrestrial (land) habitat evaluation procedure (HEP). Readers may have been surprised that a study concerned with animals does not attempt to determine how many of what type are in the study area. but rather the quality of their habitat. Apart from the immense practical difficulties involved in a survey of animals. they are not directly affected by a construction project in the sense that they can move elsewhere. What is affected by a project and therefore needs to be evaluated is the habitat. for animals cannot live without a place appropriate to their needs.

An aquatic habitat evaluation. which will look at the water dimension of habitat. is just getting underway. It will be conducted by the Aquatic Habitat Group of the Waterways Experiment Station in Vicksburg with the assistance of the Texas Parks and Wildlife Department. the Louisiana Department of Wildlife and Fisheries. the U.S. Fish and Wildlife Service. the Environmental Protection Agency. and Dr. Neil Douglas of Northeast Louisiana University.

This study will be much like the terrestrial HEP in the sense that the emphasis will not be on fish. but rather on the quality of their habitats in the study area. Indicator species of fish for particular aquatic habitat types have been chosen by the study team. the quality of the existing habitat to support these species will be determined by field surveys. habitat units (HUs) will be developed as a numeric estimate of value. and these units will be used to estimate habitat losses that would be produced by the navigation project.

The only difference between the aquatic and terrestrial analyses is that fish will be taken by such procedures as gill netting or seining to produce a refined determination of the quality of existing habitats and a better understanding of potential project effects.

Five indicator species were chosen for lake and reservoir habitat evaluation: spotted gar, threadfin shad, channel cattish. bluegill, and largemouth bass. Eight species were chosen for stream habitat evaluation: chain pickerel, ironclad shiner. blacktail shiner. spotted sucker. flathead catfish. spotted bass. blackside darter. and slough darter.

These species were not chosen because of their commercial or recreational importance. Rather. they were chosen because there is good information on their habitat needs and because they are representative of a number of different species that occur in the same habitats. The blackside darter. for example. is representative of a group of fishes (including the white and yellow bass) whose habitat is swift streams with sand or gravel bottoms.

As with the terrestrial HEP. the aquatic HEP will enable the agencies with responsibilities for fish and wildlife to share a common language in discussing impacts and to secure adequate compensation for any damage that might be done by a project.

STUDY UPDATES

• Geologic maps of the study area are being produced as part of the ground water investigations. They are ready and wiil soon be placed in the depositories. The U.S. Geological Survey is continuing to collect ground water data on a monthly basis.

• Geomorphologic maps of how land forms looked thousands of years ago are being produced as part of the cultural resources investigations. They will soon be ready and wiil be placed in the depositories.

• Fieldwork for the terrestrial habitat evaiuation has been completed. and the information is currently being interpreted. Land use and vegetation maps are nearing completion and will be placed in the depositories.

• The sediment samples that were collected as part ot the sediment/water quality study have been analvzed by the Waterways Experiment Station. and the resulting data have been sent to the Vicksburg District for interpretation. Preliminarv interpretation of these data indicates that there are no poilutants in the sediments of any of the waterbodies of the study area at levels sufficient to cause concern to the public or to make dredging dangerous.

Water quality samples are continuing to be collected by the U.S. Geological Survey. Because of concerns expressed by interested agencies and individuals. additionai sediment samples at greater depths will be taken this month. The analysis and interpretation of all of the sampies will not be completed until towards the end of the year. at which time a full report will be placed in the depositories. Look for subsequent issues of the newsletter for additional information on this important subiect.

IN PERSPECTIVE

Manv concerns have been expressed' in the public meetings/workshops and afterwards with respect to the potentiai effects of a navigation channei on the water levels of the lakes and streams of the studv area. All of these concerns deal with issues that are important in determining whether a navigation project is feasible.

• A concern has been expressed that the operation of a lock at the foot of Caddo Lake would reduce water ieveis on the lake. This is a ieasonanie assumption because water is released throueh locks. Given a finite supply of water. lockages would eventually run the lake dry.

This concern must first be placed in perspective. Caddo Lake is a large lake, containing about 50 billion gallons of water. Water released through one lockage would reduce water levels on Caddo Lake bv about one hundredth of an inch. Using a high estimate of 300 lockages a month would reduce water levels on the lake by three inches a month. This figure might seem high until it is realized that about six inches are lost to evaporation each month during the summer.

Most importantly. these figures assume that there is a finite supply of water in the lake. However. water is constantly entering the lake from sources such as Cypress Bayou and Jeems Bavou. Operation of a lock at the foot of Caddo Lake would have no measurable effect on the water levels of the lake. because water lost through lockages would be replaced from upstream sources,

• A concern has also been expressed that digging a channel through Caddo Lake would drain the water out of the lake. This is a reasonable concern because water will enter anv cut made in a lake. Everyone knows that if you have a little pond in your backyard and you die a deep hoie in the center of it. all of the water will drain into the hole. A similar fate is envisioned for Caddo Lake.

Again. this concern must be put into perspective. Caddo Lake is very large, and the modest dimensions of the channei that would pass through it were iilustrated in the last issue of *Waterwise.* It should also be recognized. that most of the channel from top to bottom would not require dredging and would mereiy occupy the water that is already in the lake.

The dredging that would be needed in the bottom of the lake would remove soil, and the displaced soil would be replaced by water. Given the 50 billion gailons of water in the lake, the dredging that would be required to produce the authorized channel depth would consume approximately one percent of the water in the lake.

This would be a one-time event that would have no perceptible effect on lake levels. In addition. since water would be entering the lake from upstream sources as the channel was being dredged. the dredging activities would have no actual effect on iake Ieveis.

• The maior factors controiline water levels on Caddo Lake are the amount of water entering the lake and the dam at the foot of the lake. None of the alternatives presently being considered would affect water leveis on Caddo Lake or Lake 0' the Pines. This is not the case for Cypress Bayou above Jefferson. where the effects of a lock and dam near Jefferson would impact existing low-water stages. These effects will be described in a later issue of the newsietter after the needed technical information has been developed.

ENDANGERED SPECIES

In 1983. the Fort Worth District of the Corps of Engineers conducted an assessment of endangered species at Caddo Lake in connection with a request by the Cypress Valley Navigation District for a permit to dredge additional boat lanes. As part of this assessment. the U.S. Fish and Wildlife Service (USFWS) identified two potentially affected species that were listed as endangered: the bald eaeie and the American alligator. Since that time, the American alligator has been reclassified as threatened.

In its Planning Aid Report for rhe Shreveport to Daingerfield Study, the USFWS lists five species of plants and animals that may occur in the Cypress Bayou Basin as endangered, threatened, or as candidate species for inclusion on the threatened and endangered species list: bald eagle, red-cockaded woodpecker. Arctic peregrine falcon. piping plover. and aster.

Threatened and endangered plant and animal species throughout the study area will be investigated as part of the Shreveport to Daingertieid Study. A. special investigation of mussels (clams) in the lakes and streams of the area will get underway this month under the direction of Dr. Drew Miller of the Waterways Experiment Station in Vicksburg.

Nationally, many freshwater mussel species are being reviewed for possible inclusion on the USFWS's list of threatened and endangered species. Mussels are abundant in Lake 0' the Pines. and at one time there was a thriving pearl industry on Caddo Lake.

Area residents have expressed an interest in mussels. They are intrinsically important as species and also important in thc food chain. They are also highly sensitive to dredging because they move slowly. This investigation wiil provide new information on a little-known biological feature of the study area.

NEW DEPOSITORY ESTABLISHED

A new depository for study materials has been established at:

Atlanta Public Library
101 West Hiram
Atlanta. Texas 75551

SPEAKERS AVAILABLE

Speakers are available for organizations or groups that would like to discuss any aspect of the study. Simply contact Marty Garton, the study manager, at (601) 631-5446.

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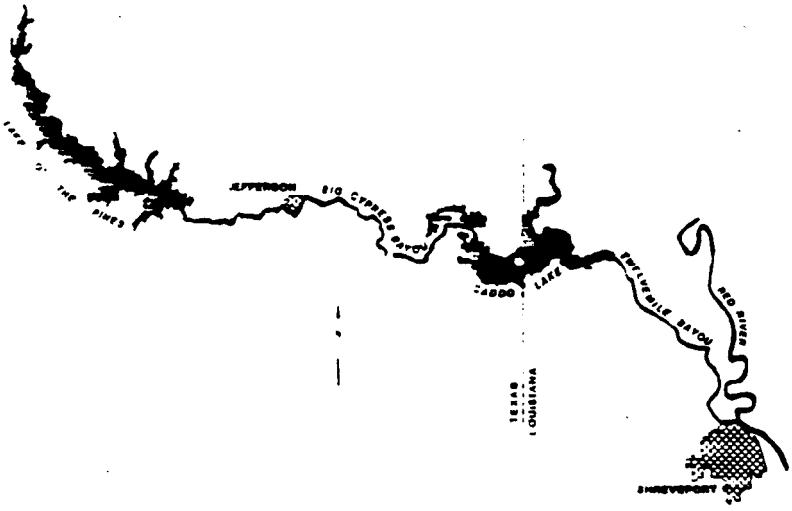

WATERWISE

No.5

The Newsletter of the Shreveport to Daingerfield Study

Vicksburg District
Corps of Engineers

THE CADDO INDIAN VILLAGE

The Kadobadacho. or Great Chiefs, of the Caddo Nation ieft their home in the Great Bend of the Red River in Arkansas in 1790 because of disease and Osage depredations and moved south, joining a related tribe. the Petit Caddo, on the floodplain of the Red River above present-day Shreveport. In 1800, when the Great Raft began to affect the area. the Caddos moved to higher ground on Sodo Lake (a complex of five lakes that later came to be called Caddo, Clear, Cross, Shifttail, and Soda). They lived there until the early 1840s, when they sold their land to the United States and moved to a reservation in Oklahoma.

In 1805, the Caddo Village was composed of 100 warriors, 100 old men and strangers, and 250 women. Adding children, the village would have been sizeable. In' spite of its importance, there is no record of a white man ever having visited it, and no contemporary accounts give its exact location. As a consequence, the village site was sought for many years without success.

All of the Caddoan tribes of the 1800s were agriculturalists who raised such things as corn, beans, and pumpkins, using pointed sticks, rather than hoes, to punch holes in the ground to plant seeds. They also fished and traveled and hunted by horseback. They lived in thatched wattle and daub huts supported by wooden poles. These huts were widely dispersed over many miles. sometimes forming small clusters. which was compatible with agricultural practices. They also traded heavilv with distant white settlers, exchanging furs and hides for guns. riding equipment. and a wide varietv of household items. Eariier traditions of pottery making and arrowhead chipping were abandoned.

Beginning in 1991, Claude McCrocklin, a Shreveport archeologist, conducted a preliminary survey of an area north of Caddo Lake on James Bavou and found a number of house sites spread out over four miles from Monterey Lake west (and therefore mostly in Texas). These sites contained the right types of artifacts from the 1800-1840 period to indicate that they could be components of the Caddo Indian Village, and there are no records of white settlers having been in that area during that period. McCrocklin found chipped biface tools of European ceramics and bottle glass that were obviously of Indian making. In addition, he found colorful polished pebbles that were unique to other Caddo Indian villages that have been investigated.

These preliminary findings suggest that the Caddo Indian Village has been located. However, since there were many Indian tribes in the Sodo Lake area. the James Bayou site may not be Caddoan. and if Caddoan, not Kadohadacho. For a clearer indication that this is the correct site, it is necessary to turn to seven pieces of evidence presented in accounts that were written in the early 1800s:

1. All contemporary accounts agree that the village was on Sodo Lake.

2. Most speak of it as being distant from the Red River, and two say that it is on the western portion of Sodo Lake. which suggests a location on Caddo Lake.

3. Two say that is located on a small creek, with one of these saying that the creek is pirogue-navigable in the rainy season. James Bayou is the only stream entering Caddo Lake that fits this description.

4. Wiiam Darby's 1816 map of Louisiana shows the village in Texas on James Bayou (but on the south side).

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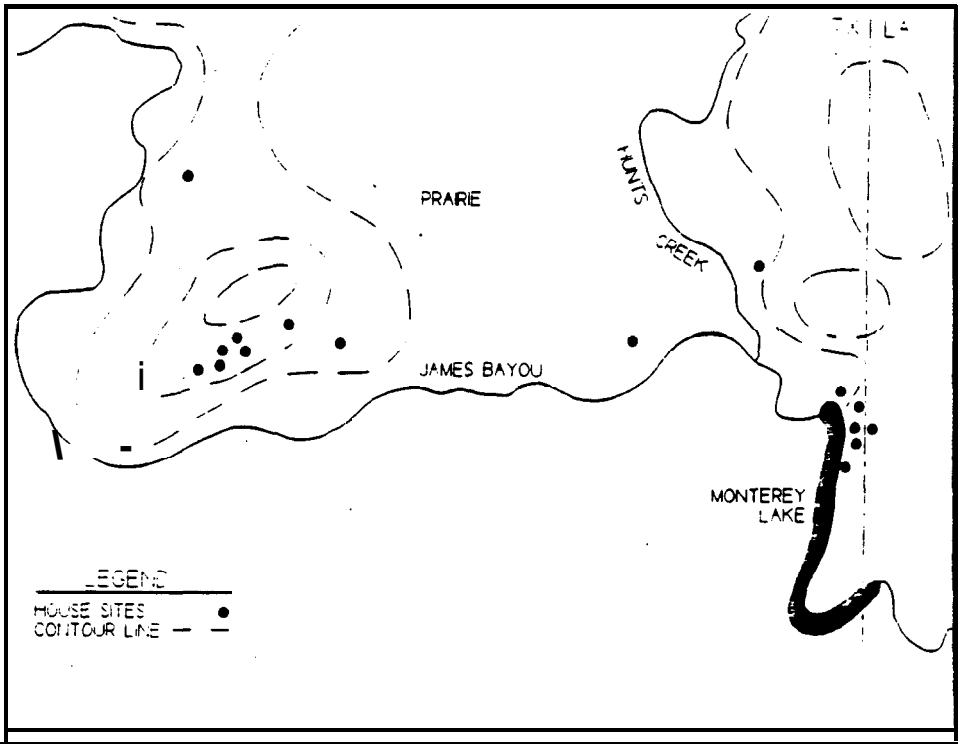

VILLAGE

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5. The viliage was called Shachildni-ni. or Timber Hill. There is a prominent timbered hill on the James Bayou site.

6. One account says that the agricultural activities took place on a flat prairie of white clay soil. The James Bayou site is the oniy place near Caddo Lake that has such a prairie.

7. Maps and contemporary accounts indicate that there was a trail from the Caddo Village to the Coushatta Village on the Red River. The survevors who estabiished the boundary between the United States and the Republic of Texas in 1841 pinpoint this trail as leading into the James Bayou site.

When the archeological and historic evidence is taken together. it is obvious that the. James Bayou site is the Caddo Indian Village. Further investigations are needed to determine the extent of the site and its exact composition.

SPEAKERS AVAILABLE

Speakers are available for organizations or groups that would like to discuss any aspect of the study. Simpiy contact Marty Garton. the study manager, at (601) 63 l-5446.

NEW DEPOSITORIES ESTABLISHED

New depositories have been established at:

Dallas Public Library
1515 Young Streer
Dallas, Texas

Fort Worth Public Library
300 Taylor Street
Fort Worth. Texas

RECREATION DEMAND STUDY

Lake 0' the Pines offers an exceilent example of the recreationai opportunities that can be offered by a Corps project. The lake itself is a resource used for many different types of recreation. The water outlet gate at the dam is a favorite fishing spot. And there are numerous parks. boat ramps, picnic facilities. and swimming areas.

Although a navigation channel is not a reservoir. it offers similar types of recreationai opportunities. First. there are the opportunities directly connected with the structural features of such a project. A lock and dam above Jefferson. for example, would provide an upstream pool of water that could be used for recreational fishing.

In addition. there are opportunities for a variety of collateral facilities, such as boat ramps, picnic areas, parks. trails, fishing piers, and nature centers. The list of potential collateral facilities is quite large, and what gets built in conjunction with a navigation project is limited largely by what the general public and state and local agencies desire.

Such facilities are not free, however. The are constructed on the basis of a 50/50 local-Federal contribution. In order for the Federal Government to provide its share. a need for the desired facilities must be shown through what is called a recreational demand study. Such a study for the Shreveport to Daingerfield area is presently being conducted by the Fort Worth District Corns of Engineers for the Vicksburg District.

Many state and national survevs have already determined the desires of different population groups for different types of recreationai activities. The challenge of the present study is to rransiate these desires into an estimate of demand for the particular types of opportunities that could be afforded by the Shreveport to Daingerfield project.

This is done by establishing a market area. which in this case would include Dallas. because of its already heavy usage of Caddo Lake State Park. Estimates are made of the recreational needs of the population within the market area. Existing recreational facilities and their current usage are identified. The needs are then compared to the existing resources. If the needs exceed the capacity of current resources to handle them. a need for the provision of new resources can be justified.

It then becomes necessarv to determine whether the envisioned project can meet those needs. One of the primary determinants of usage is the distance of the potential users from the resource. In general, the further the distance that must be traveled, the less the propensity to use the resource. This factor must be taken into consideration in establishing real demand for the opportunities that would be offered by a particuiar project.

Finally. a benefit/cost ratio is develoned for the envisioned resources in which the value afforded to people by the new recreational facilities is compared to the cost. This cost includes not only the direct cost for the facilities, but also any reductions in present recreational activities that would be caused by the project. A dam above Jefferson. for example, would diminish the capacity for stream canoeing.

This study wiil include a general description of the types of facilities that would be needed, their costs. and their general location. More specific pians would be prepared if the navigation project proved feasible and local interests ...red the envisioned facilities.

-UPSTREAM FLOWS

Historically, Caddo Lake was always considered to extend from its present foot up Cypress Bayou to the confluence with Black Cypress Bayou, where the old town of Smithland was located. It is represented that way on old maps, and property deeds refer to land in Smithland on Ferry Lake (an old name for Caddo Lake).

This was because the water was essentially flat between the foot of the lake and the point of confluence. The water level in this area was heaviiv influenced by Red River water diverted by the Great Raft. From Black Cypress to Jefferson. water levels were more dependent on the amount of water coming down from the upstream drainage area of Cypress Bayou.

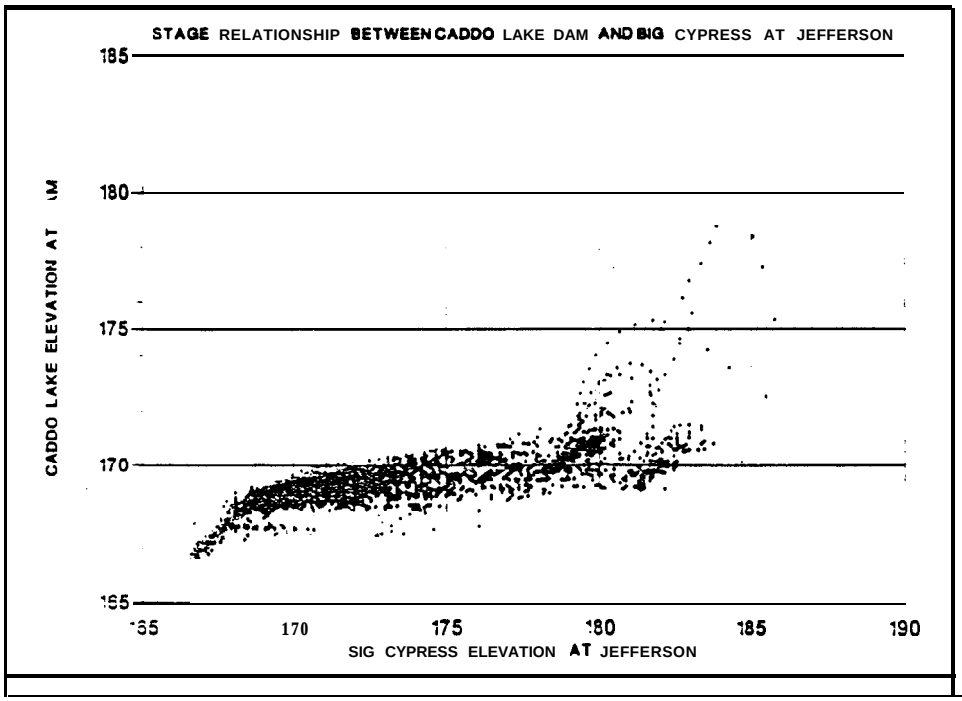
Since the raft was destroyed in 1873 and the area is no loneer affected by Red River water, the situation has obviously changed dramatically in some ways. But, the slope of the land has not changed, and the dam at the foot of Caddo Lake serves essentially the same function as the raft in determining water ieveis upstream.

As a consequence. the water levels between the foot of Caddo Lake and the confluence of Big Cypress and Black Cypress continue to be as flat as they always have been. and the water levels in the vicinity of Jefferson continue to be influenced by upstream flows.

The diagram at the bottom of the page shows the relationship between water elevations on Caddo Lake at the dam and Cypress Bayou at Jefferson from 1963 through 1978. Each point represents the intersection of the two gauge readings. There are actually 5,433 points on the diagram. but most have been obscured because they have been superimposed on each other on the left side of the diagram.

What the diagram shows is that the normal situation between the foot of Caddo Lake and Jefferson is one of slack water. For more than half of the points, the water level at Caddo Lake is within two feet of the water level at Jefferson. Since there are about 40 river miles between Jefferson and the foot of Caddo Lake, this constitutes a fail of about one-twentieth of a foot per miie. In contrast, the fall on the Red River at Shreveport is about 14 times that amount.

Of even greater interest is the fact that for 28 percent of the points, the water level on Caddo Lake at the dam is at least one-tenth of a foot higher than the water level at Jefferson. This occurs onlv during low-water periods. It provides a condition for upstream flows. a phenomenon actually observed at the northern end of the lake by the historian of Caddo Lake. Fred Dahmer.



GEOLOGIC MAPS

A set of geologic maps of the study area has been produced as part of the ground water investigations. Titled Geologic ***Reconnaissance of the Shreveport, Louisiana to Daingerfield, Texas Reach, Red River Waterway***, the maps were prepared by the Corps' Waterways Experiment Station in Vicksburg.

The maps are in color and illustrate the surface soils and underly ing sand. clay, and rock formations. Cross-sections show surface elevations and the depths at which various formations are found. Of particular interest are the illustrated surface features. such as the abandoned channels of Cypress Bayou. which are described in terms of their characteristics and how they were formed. The maps have been placed in the depositories.

COMMENTS SOLICITED

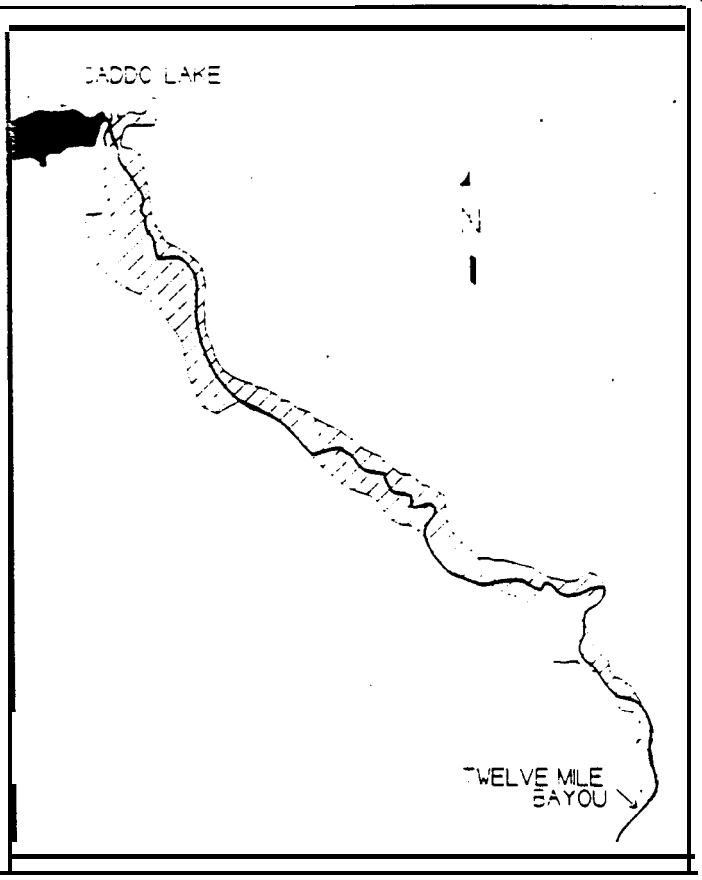
Do you have any comments on the newsletter or suggestions for topics that you would like to see covered? If so, call Marty Garton at *(601)* 631-5446 or write to 3515 I-20 ***Frontage Road, Vicksburg. MS 39180-5191.***

WETLANDS DELINEATION

Wetlands are extremely important natural resources and must be taken fully into consideration in evaluating the feasibility of a navigation channel. The first step in any consideration of wetlands is to determine where they are. The wetlands of the study area were identified (delineated) in 1991. However, after the delineation, Federal criteria concerning what is a wetland changed.

As a consequence, the wetlands of the study area have been redelineated. This was done by looking at soil and vegetation types and the number of days inundated annually. Maps of these wetlands have been prepared, and copies will be placed for public review in the depositories. A simplified version of one of these maps appears to the right showing the wetlands of the Twelvernile Bayou area between the bluffs and the levee.

The Waterways Experiment Station in Vicksburg is presently looking at the functional value of these wetlands. This study will describe the general value of wetlands and determine precisely how these wetlands function within the study area ecosystem. This information will be used to determine project impacts, to identify ways to avoid or minimize the impacts, and to design mitigation measures if needed.



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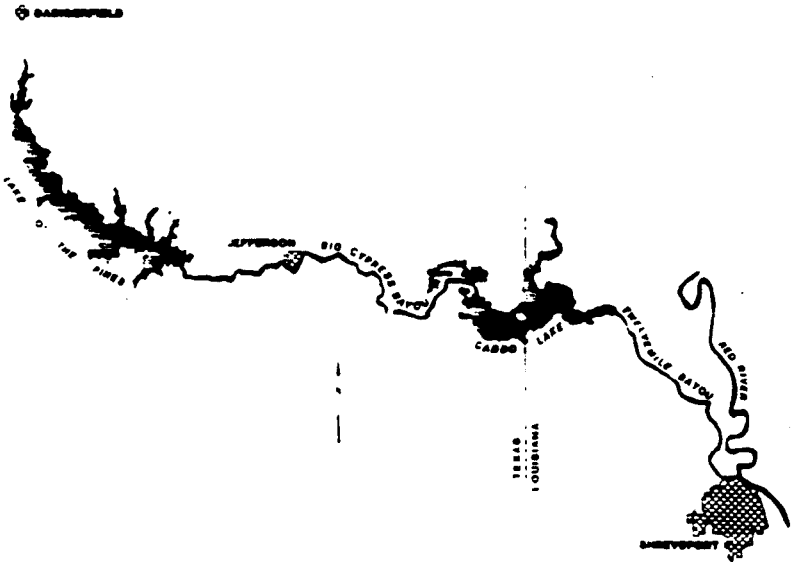

WATERWISE No. 6

The Newsletter of the Shreveport to Daingerfield Study

Vicksburg District
corps of Engineers

SOD0 LAKE *ORIGINS*

During the 1800s, the area northwest of Shreveport was occupied by the Sodo Lake complex, which consisted of Cross, Soda, Shifttail, Clear, and Caddo lakes.

Sodo Lake was not formed by an earthquake. From the journal of the Freeman and Custis expedition, it is obvious that Sodo Lake was in existence in 1806, well before the New Madrid quakes, which began in December 1811. In addition, there is no evidence of recent seismic activity, and there is contrary evidence in the form of upright stumps in the lake bed.

Sod0 Lake was not ancient. No maps depict the lake prior to William Darby's 1816 map of Louisiana The investigation of Caddo Lake by the Department of the Interior (DOI) in 1914 concluded that the stumps in the lake bed were part of a hardwood forest in the valley of Cypress Bayou before the lake came into existence, and their state of decay indicated that the lake had been recently formed. In addition, age analysis of the trees that came into existence along the shore after the lake was formed indicated that the lake could not have originated before the late 1700s.

It is now generally accepted that Sodo Lake came into existence during the historic period by the actions of the Great Raft on the Red River. It remains to determine the precise mechanism and date of formation.

It is generally assumed that the many lakes that formed along the Red River during the raft period were caused by the physical blockage by the raft of streams entering the Red. This cannot be the case for Sodo Lake because the Freeman and Custis expedition pointed out that the head of the raft was below Tweivemile Bayou in 1806, when the lake was already in existence. In addition, Sodo Lake did not disappear after the raft was removed from the Twelvemile Bayou area in 1834 by Captain Henry Shreve.

A second thesis is that Sodo Lake came into existence through ponding of the water of Cypress Bayou, initiated by the upstream rise on the Red caused by the raft. Although this may have been a factor in the lake's origin, it should be noted that after Shreve removed the raft, it did not reform below the mouth of Twelvemile Bayou. The lake continued in existence throughout the 1800s when upstream rises in the vicinity of Twelvemile Bayou were no longer a factor.

What is missing from this picture is the widely recognized faet that throughout the 1800s, Sodo Lake owed its existence to the distributary system on the west side of Red River, which brought the waters of the river down into the Sod0 Lake area. The importance of the distributaries is further illustrated by the fact that Sodo Lake did not disappear after the raft was finally destroyed in 1873. The process of its disappearance began only after the distributaries were progressively closed in the late 1800s.

Because of the importance of the distributaries in the maintenance of the lake throughout its life, it is reasonable to look for an explanation of lake origins in terms of the beginning of the distributary system.

The first distributary to bring Red River water down into the Sodo Lake area was Cottonwood Bayou, which formed at the first large bend above Shreveport. This bayou is designated a crevasse channel on geologic maps and was said to be deep in the DO1 report.

The Red River is an alluvial--- river, moving back and forth on its floodplain. As with all alluvial rivers, it constructed its own ievee. The land west of the river above Shreveport slopes downward toward the bluffs, and the valley of Cypress Bayou that is now occupied

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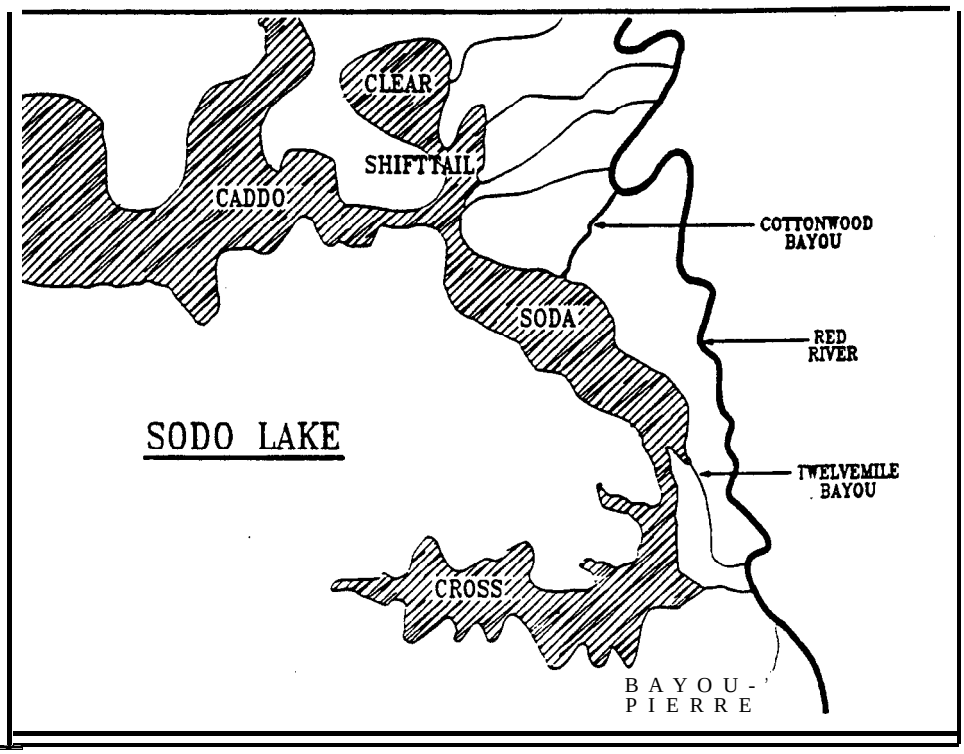


SODO

continued from *page i*

by Caddo Lake is even lower. Any break in the natural levee of the Red would have caused its waters to rush downhill, settling in low areas.

The potential for a break is increased by the distance that a bend reaches out into the Red River floodplain for the further out the bend, the greater the difference between the water elevation in the river and the surrounding floodplain area. The first large bend above Shreveport reaches far out into the Red River floodplain

It may be hypothesized, therefore, that Sodo Lake came into existence through a break in the first large bend above Shreveport, sending the waters of the Red into the low depressions of its floodplain (forming Soda, Shifttail, and Clear lakes) and into the valley of Cypress Bayou (forming Caddo Lake).

It appears that a precondition for the break in the bend would be the closure by the raft of the Bayou Pierre outlet below Shreveport, which would be conducive to higher upstream water rises. According to John Sibley, an early Natchitoches resident, the Bayou Pierre outlet did not close until 1798.

This would provide a probable date of 1800 for the formation of Sodo Lake, which is confirmed by an 1812 letter by Sibley. A date of 1800 would be compatible with the Caddo Indian legend of the lake's formation and what we know about the date of their movement from the Red River floodplain to their home on Caddo Lake.

Unfortunately, this date is incompatible with the DO1 analysis, which placed lake origins in 1777 on the basis of an analysis of tree ages. The complete DO1 reports, along with maps and photographs, will be placed in the depositories so that the public can review the evidence for themselves.

ALTERNATIVES

The Shreveport to Dainger-field Studv is a reevaluation study for a portion of the Red River Waterway, which was authorized in 1968 and is nearing completion up to Shreveport- The authorized project calls for a 9-foot-deep by 200-foot-wide channel.

The authorized Shreveport to' Daingetfield project would cut into Twelvemile Bayou from the Red River just above the X-220 bridge, move up Twelvemile Bayou and through Caddo Lake up to its northern end, and move up Big Cypress Bayou and through Lake 0' the Pines to its northern end, where a turning basin would be established. Structural features would include a lock through the existing dam at Caddo Lake, a lock and darn on Big Cypress above Jefferson, and a lock through the existing dam at Lake 0' the Pines.

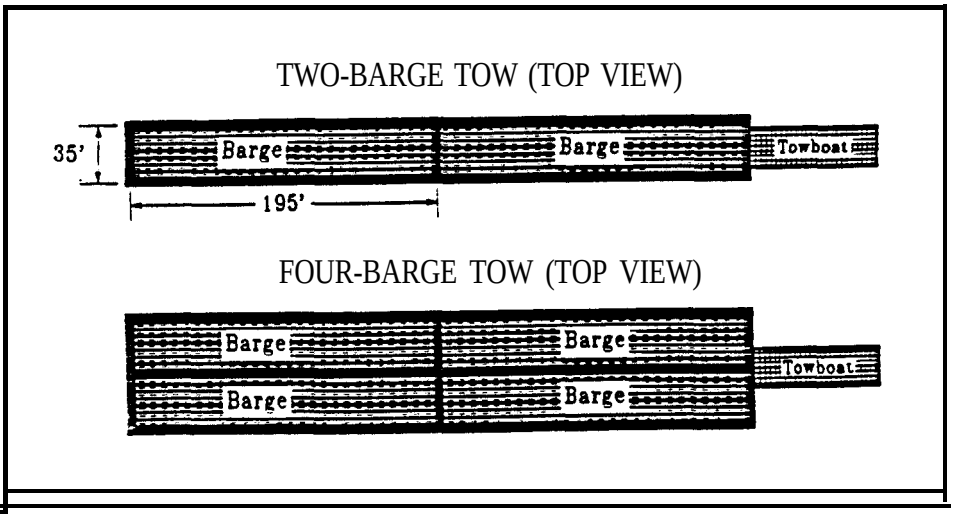
Alternatives to the authorized project are being considered. These alternatives are concerned with. channel routing, structural features, channel dimensions, and the length of the project.

With respect to channel routing, an overland cut could be made from the Red River directly west to Caddo Lake, which would avoid Twelvemile Bayou completely. In addition, an overland cut could be made above the Longhorn Army Ammunition Plant from Goose Prairie on Caddo Lake to Big Cypress Bayou in the vicinity of Caddo Lake State Park, which would avoid the northern end of the lake. If this alternative was pursued, a gate would be placed on the Big Cypress (upstream) entrance to the cut to maintain normal flows to the northern end of Caddo Lake. These are the major channel routing alternatives. Other minor changes to the authorized route are being considered throughout its extent.

With respect to structural features, a lock and dam could be placed on Twelvemile Bayou just above Shreveport, rather than putting a lock in the dam at Caddo Lake. This alternative would extend Caddo Lake nearly down to Shreveport. *Another* alternative would be to establish a dry barge lift rather than a conventional lock at Lake 0' the Pines, which would conserve water. For the lock and dam above Jefferson, a pool elevation of 185 feet mean sea level is being considered, which would provide for a small, thin lake up to Lake 0' the Pines.

Two different alternative tow sizes are being evaluated: 2-barge tows and 4-barge tows. A 2-barge tow would be composed of two barges end-to-end with a towboat in back, which would be approximately 480 feet long by 35 feet wide. A 4-barge tow would be two barges square, producing dimensions of 480 feet by 70 feet

Both of these tow sizes are ca-



able of accommodating the tonnages and commodity types that have been identified for potential movement on the Shreveport to Daingerfield waterway. Since a 4-barge tow can carry twice as much as a Z-barge tow, implementation of the 2-barge alternative would require a greater number of tows on the watenvay. The 4-barge alternative, on the other hand, would require greater modification to existing channels, since longer tows require larger structures (such as locks) and greater turning radiuses when going around bends.

Both tow alternatives would require a channel nine feet deep, which wouid actually have to be cut a bit deeper to provide appropriate clearances. There is, however, a difference with respect to channel width. The 2-barge tow would require a channel 130 feet wide, whereas the 4-barge tow would require a channel 150 feet wide. These are minimum widths at the 9-foot project depth. At bends, the bottom dimensions for both alternatives would be larger, depending on the radius of the bend.

Lastly, alternative project lengths are being considered. It could be that a navigation project would be feasible from Shreveport to Jefferson, but not above, since the dam and two locks above Jefferson would be very expensive. Stopping the watenvay below its authorized terminus will be considered in terms of the attendant costs and benefits.

ECONOMICS

The benefit/cost (B/C) ratio is the key element in determining the feasibility of a project. The B/C ratio is a ratio of annual project benefits to annual project costs. To be economically justifiable, annual project benefits must be equal to or exceed annual project costs. Thus, the B/C ratio must be 1:1 or better. In money terms. this means that every dollar spent on a project must secure national benefits of at least one dollar.

Most of the public interest in navigation projects stems from public expectations about new firms that will come to an area to make use of a waterway. Although this is au important factor in public interest, induced development is not taken into consideration in the development of a B/C ratio. Prediction of the movement of firms is difficult. More importantly, the movement of firms from one area of the country to *another is* not a national benefit and therefore cannot be taken into consideration in the economic evaluation of a Federal project.

The major national benefit secured through a navigation project is increased economic efficiency obtained by transportation cost savings for existing firms already in the geographic area that will be affected by a project.

Barge transportation is, of course, slow in comparison to other transportation modes such as rail and truck Thus, barges generally carry time-insensitive high-volume products and raw materials. However, barges have certain advantages over other transportation modes, Four barges have the same carrying capacity (6,000 tons) as 60 *jumbo rail cars* and 150 large semi trailer trucks. In addition, barges are fuel-efficient.. A barge can move one ton 500 miles on a gallon of gas, compared to 200 miles for a rail car and 50 for a truck

Determination of transportation cost saving is a two-step process. First, the potential users of a waterway must be contacted to see if they have any incoming or outgoing commodities that could make use of barge transportation. Second, for firms responding affirmatively, it must be determined whether the shift to barge transportation would provide any transportation wst savings and, if so, by what amount

In order to obtain these figures for the Shreveport to Daingerfield Study, the Economics section of the Vicksburg District contacted over 50 firms within a 50-mile radius of the project area. These. firms were of the type and size that use barge transportation in other areas of the country. Of the firms contacted, 28 said they would be interested in using the waterway.

It was then necessary to conduct a transportation rate analysis for each of the commodities proposed by each of the 28 firms for transportation on the waterway. In a rate analysis, one looks at the present wst of transportation for each wmmodigtype in terms of its origin and destination and then compares that cost to the wst of an equivalent movement by barge. If barge is cheaper for that particular wmmodity movement, there is a transportation wst savings that can be expressed in a dollar figure.

The rate analysis for the Shreveport to Daingerfield Study was conducted by Mid-South Rate Analysts. Such analyses are generally conducted by private firms because they require highly specialized knowledge of the transportation industry and must take a multitude of transportation cost factors into consideration. Because of the complex nature of rate analysis, additional analyses of the same information were conducted by the Vicksburg Distria using a transportation costing model from Reebie Associates and by rate specialists with the Tennessee Valley Authority.

As a result of the transportation rate analysis, it was found that 15 of 28 firms interested in using the waterway would not benefit significantly from barge transportation. (that is, they would not achieve transportation cost savings by use of barges). This left 13 firms that would achieve transportation cost saving if barge transportation was presently available.

The 13 firms could ship or receive about 4.3 million tons of commodities by barge with transportation savings. These tonnages are constituted by 16 commodity types that can be grouped as follows: Coal and Coke -- 1.2 million tons; Construction Materials -- 50,000 tons: Lumber and Wood Products -- 282,000 tons; Primary Metals -- 1.6 million tons; Paper and Allied Products -- 50,000 tons; and Food and Kindred Products -- 1.1 million tons. The wst savings that would be achieved by a shift in transportation modes for these commodities would range from $24-$28 million in the first year of the project for the alternative tow sizes evaluated (2-barge and 4-barge tows).

Every construction project has a lifespan. For the Shreveport to Daingerfield waterway, this would be 50 years. Transportation cost savings would accrue to these commodities each year throughout the 50-year period from 2005 (the projected year for completion of construction) to 2054.

However, since things change in the economic sphere, it is necessary to

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ECONOMICS

continued from page 3

develop a conception of what the Shreveport to Daingerfield area will look like over the 50-year period with and without the project and, assuming the project is built, how the tonnage figures would change over time. Several methods were employ& including use of projections by the Bureau of Economic Analysis of the Department of Commerce and the Inland Waterway Review and analysis of trends with respect to similar projects in other areas.

This analysis produced a projection of 5-6 million tons of commodities hat would move on the waterway by he year 2054. Because of the importance of steel and poultry products (primarily poultty feed) to the present and projected tonnage figures, a special study of the associated industries in the study area was conducted by a private firm (Geo-Marine of Plano, Texas). This study considered the national and international competitive arenas and concluded that the area's steel and poultry industries would be viable in the long-term.

In order to produce a B/C ratio, it is necessary to compare annual benefits to annual costs over the project life. On the benefit side, any net gains to recreation or to fish and wildlife must be included. On the cost side, construction costs are primary, including interest and amortization. Other costs include operation and maintenance, replacements (for example, if a lock gate needed to be replaced during the 50-year period), mitigation (the cost to compensate for any negative environmental impacts), and any net losses to recreation or fish and wildlife.

Project benefits and costs are being developed but have not yet been completed.

TECHNICAL WORKSHOPS

A series of technical workshops for the Shreveport to Daingerfield Study is being planned. Each workshop would be devoted to a single technical area (such as recreation, water quality, hydrology, the environment) and would be conducted by the technical personnel working on the study.

The purpose of these meetings will be to enable the public to secure a greater understanding of the technical findings that are being produced by the study, to ask questions related to these findings, and to provide comments on the various technical areas.

All workshops will be open to the general public. Notifications will be provided to all names on the study mailing list.

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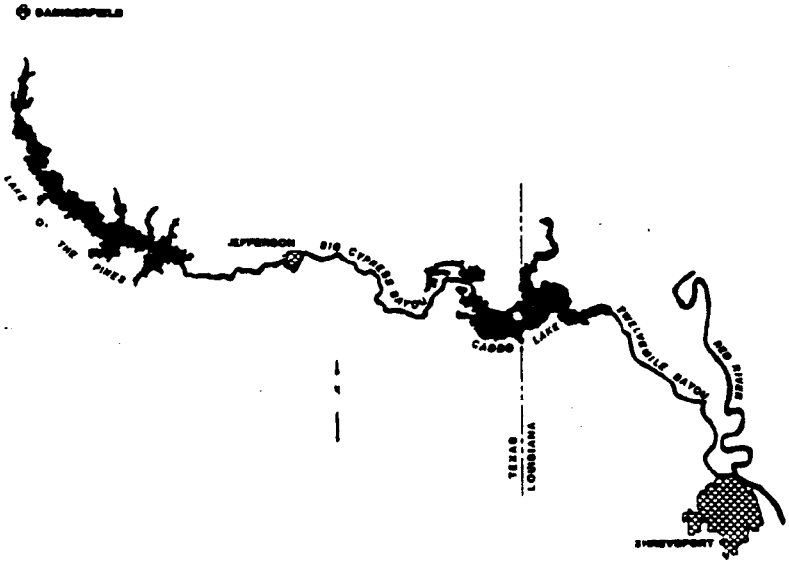


Appendix G

TECHNICAL WORKSHOP POSITION PAPER

TECHNICAL WORKSHOPS

1. Technical workshops were selected as a means to establish a format so that interested members of the public could have a greater understanding of what was transpiring in the technical areas of the study and a greater ability to ask questions about those technical areas. The persons who have expressed the greatest interest in the study and who are anxious to follow it more closely would like to see meetings devoted to particular aspects of the study. These people are genuinely interested in the study and the implications for the study area of the technical findings, whatever their provisional position on the project. The newsletter is not a satisfactory mechanism for meeting this desire, since it excludes important findings that are provisional and does not offer an opportunity to ask questions.

2. The formation of a series of technical workshops to discuss specific aspects of the study would greatly facilitate the public involvement aspects and insure an open forum. The institution of the aforementioned mechanism would allow the public continuous participation in the study.

3. The technical workshops would be held once a month in a central location. Each meeting would be devoted to a single technical area and would be conducted by the person(s) responsible for that technical area. Status reports on the study would not be given. It is advisable that no persons other than the technical staff be present, unless they can contribute to the discussion.

4. Attendance would be unrestricted. All of the people on the mailing list would be informed of the meetings by postcard. This would not give rise to large meetings, since the audience would be self-selective in terms of its interest in a particular technical area.

5. Meetings would be devoted to topics such as the recreational aspects of the study, since this technical area is positive and of great interest. Meetings could also be devoted to water quality, concerns ‘about the potential for hazardous spills (the Coast Guard could be invited to conduct this session), environmental aspects, and economic aspects. Other technical areas could be added or substituted. These meetings would be arranged and monitored by the public involvement specialists, who would work closely with the Vicksburg District technical staff to insure that the issues of concern to the public are addressed.

Appendix H

TECHNICAL WORKSHOP NOTICE

TECHNICAL WORKSHOP NO. 1

Shreveport to Daingerfield Navigation Study
Vicksburg District Corps of Engineers

The first technical workshop for the Shreveport to Daingertield Study will be held in Shreveport on Tuesday. October 20 and in **Kellyville** on Wednesday, October 21.

The subject of the first workshop is hydrology. The purpose of this workshop **will** be to discuss how the authorized project and various alternatives would affect water levels and water flows in the streams and lakes of the study area.

The discussion will be led by Freddy Pinkard. a hydrologist with the Vicksburg District. and by Marty **Garton.** the study manager. The presentations in Shreveport and in **Kellyville** will be exactly the same.

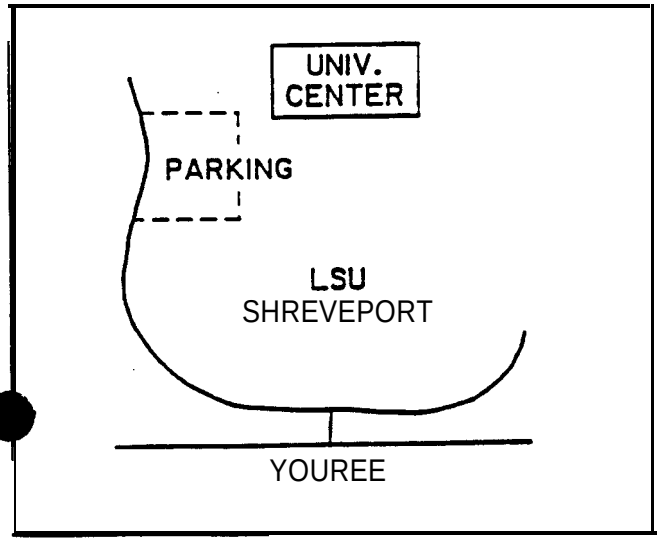
This is the first in a series of workshops, each of which will be devoted to a single technical area (such as recreation or water quality) and will be conducted by the technical personnel working on the study.

Although all workshops wiil be open to the general public, they are not designed to measure public opinion with respect to support or opposition to the overall navigation project.

The purpose of these meetings is to enable the public to gain a greater understanding of the technical findings that are being produced by the study and to ask questions and provide comments related to these technical findings.

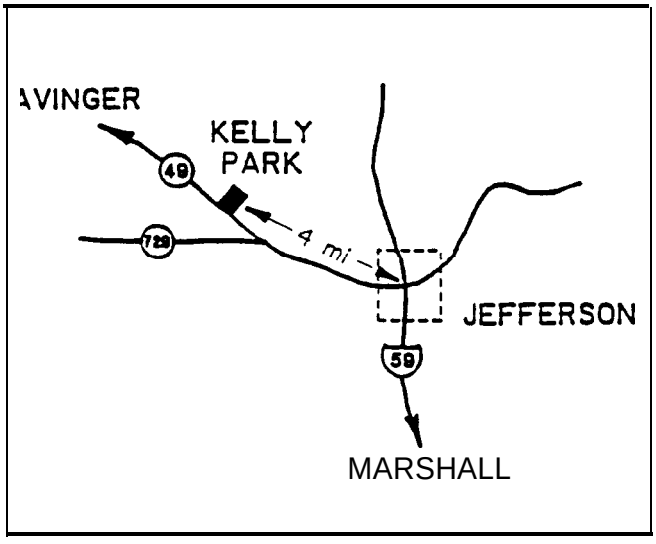
SHREVEPORT

Time: Tuesday, October **20.** 1992. at **7:00** p.m.
Place: Bossier-Caddo Rooms. University Center. LSU Shreveport



KELLYVILLE

Time: Wednesday, October 21. 1992, at 7:00 p.m.
Place: Kelly Park Auditorium



For more information. contact Marty Garton. Study Manager with the Vicksburg District. at **601/631-5446**.