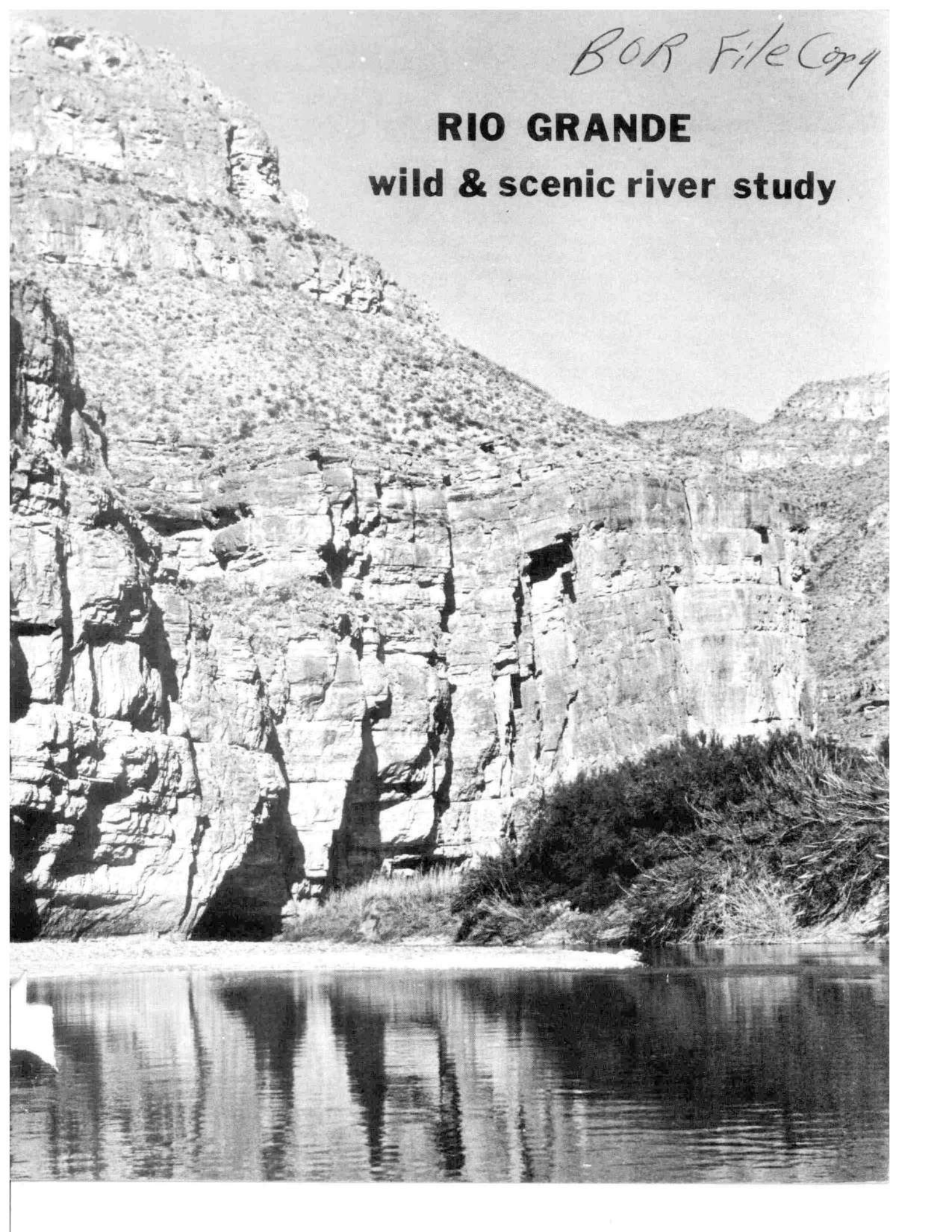


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**RIO GRANDE**  
**wild & scenic river study**



As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

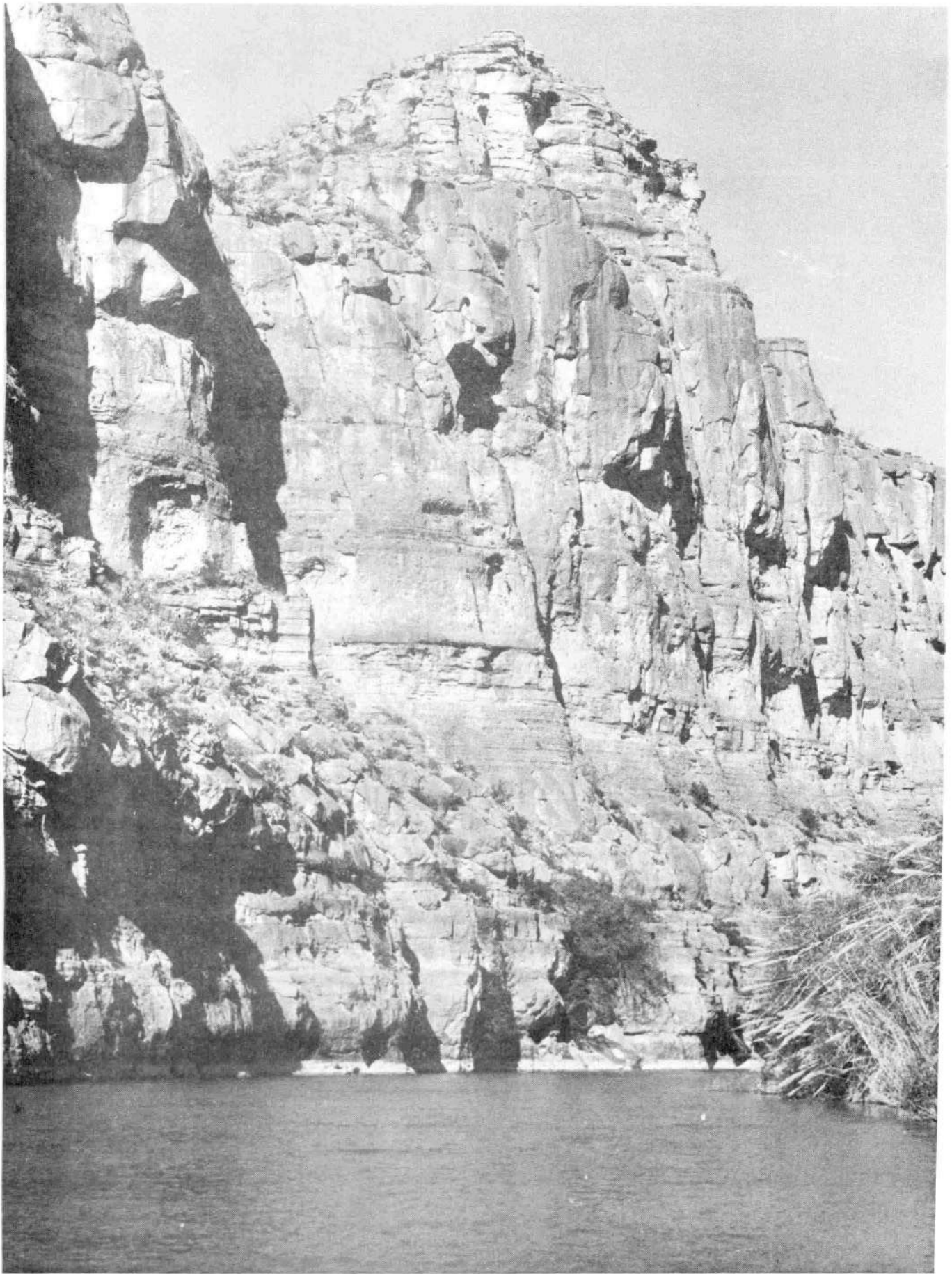


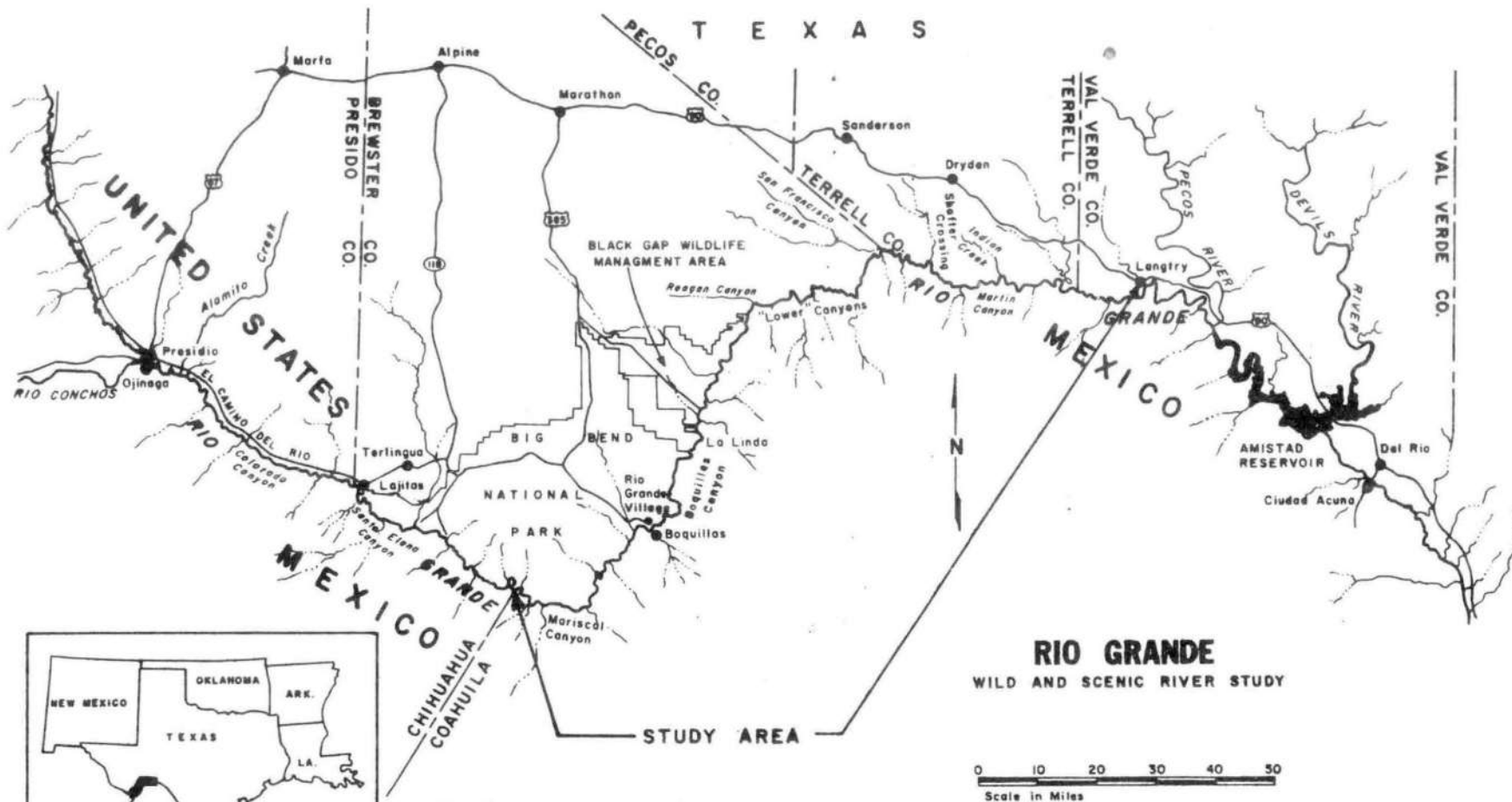
DEPARTMENT OF THE INTERIOR  
Thomas S. Kleppe, Secretary

Bureau of Outdoor Recreation  
John Crutcher, Director

# **RIO GRANDE**

## **Wild & Scenic River Study**





**NOTE**

LEGISLATIVE STUDY BOUNDARY ON EAST IS TERRELL-VAL VERDE COUNTY LINE. LANGTRY WAS USED IN FIELD INVESTIGATIONS AS AN EASILY IDENTIFIABLE SITE.

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# Introduction

On October 2, 1968, Public Law 90-542, the Wild and Scenic Rivers Act, was approved. This Act states:

It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.

Section 5.(a)(20) of the Act designates the following segment of the Rio Grande for potential addition to the National Wild and Scenic Rivers System:

The portion of the river between the west boundary of Hudspeth County and the east boundary of Terrell County on the United States side of the river: Provided, that before undertaking any study of this potential scenic river, the Secretary of the Interior shall determine, through the channels of appropriate executive agencies, that Mexico has no objection to its being included among the studies authorized by this Act.

The Act calls for a study to determine the suitability of the stream for inclusion in the National System, and, if the river meets the established criteria, recommendations pertaining to administration and management of the river and its environment.

## INTERNATIONAL DISCUSSIONS AND ESTABLISHMENT OF STUDY PARAMETERS

Shortly after passage of the Wild and Scenic Rivers Act, the Department of the Interior initiated discussions with the Government of Mexico, through the Department of State. In line with delegated authority, late in 1971, a determination was made by the U.S. Section of the International Boundary and Water Commission (IB&WC) and the Bureau of Outdoor Recreation, that of the river reach originally stipulated in the Act, only that segment from Alamito Creek to the east boundary of Terrell County appeared to merit consideration for inclusion in the National System. The river segment between the west boundary of Hudspeth County and Alamito Creek did not merit further consideration because it was essentially dry, and



the 5.3-mile segment above and the 13-mile segment below the Rio Conchos were to be relocated in accord with the Boundary Treaty of 1970.

In January 1972, the Government of Mexico expressed its willingness to cooperate in a study of that section of the Rio Grande between the Chihuahua-Coahuila boundary on the west and the headwaters of Amistad Reservoir on the east. The Government of Mexico also indicated its desire that the study be undertaken by the International Boundary and Water Commission and that the Commission give priority to maintaining the river as a boundary, stabilizing its course, benefiting from its waters, and to the communications needs between the two countries. In mid-1972, the Department of State accepted the limitations on the study as requested by Mexico.

After further discussions with Mexico late in 1972, it was determined that the United States would study the river and determine appropriate actions for its side. Upon completion of the study the report would be transmitted to the Government of Mexico through the International Boundary and Water Commission for review and comment. Areas of common concern for both countries would be explored after such review by Mexico. Thus, this study evaluates only the United States side of the Rio Grande from the Chihuahua-Coahuila state line to the headwaters of Amistad Reservoir.

#### BACKGROUND

In May 1973, Senators Bentsen and Tower of Texas co-sponsored Senate Bill 1790. The purpose of this bill was to amend the Wild and Scenic Rivers Act by placing a portion of the Rio Grande in Section 3(a) as a designated component of the National System. The river segment stipulated in the bill extends from the west boundary of Brewster County downstream to Shafter Crossing in Terrell County and would be administered by the Secretary of the Interior. No action was taken on the subject bill.

Interest in protecting free-flowing streams at the State level began in the late 1960's. The Senate Interim Committee on Park and Recreation Facilities, established by the 60th Texas Legislature, recommended the creation of a State system of wild and scenic rivers. Between 1969 and 1973, six bills were introduced to establish such a system; however, none were passed. In 1969, funds were appropriated by the Texas Legislature for a two-year waterway evaluation in order to determine the feasibility of establishing a statewide system of wild and scenic rivers. The responsibility for conducting this study was delegated to the Texas Parks and Wildlife Department. The results of the evaluation, contained in the publication "Pathways and Paddleways," indicated that

a detailed study should be undertaken to survey Texas streams and develop suggestions for the creation of a Texas Waterways System. This study, Texas Waterways, is now complete and findings indicate that a statewide waterways system is a valid concept for Texas, and a program is needed to give certain waterways priority attention to meet the demands of the public. Future action by the State of Texas on establishment of a waterways system is probable.

Interest by conservation groups in Texas and throughout the United States in the preservation of the Rio Grande as a wild and scenic river has been strong. Numerous articles in both State and national publications have been published on the Rio Grande and the need for its protection.

A reconnaissance group led by the Bureau of Outdoor Recreation and including representatives of the National Park Service, U.S. Forest Service, Soil Conservation Service, U.S. Section of the International Boundary and Water Commission, and the Texas Parks and Wildlife Department was formed in March 1973 to conduct the study called for by the Wild and Scenic Rivers Act.

Public information meetings were held by the reconnaissance group on December 11 and 12, 1973, in Austin and Alpine, Texas, respectively. The meetings were held in order to acquaint the public with possible alternative actions on the Rio Grande, and to obtain assistance in formulating recommendations concerning such alternatives. The majority of comments received at the Austin meeting favored inclusion of the study segment in the National System under Federal administration. Comments received at the Alpine meeting indicated a preference for no action. Over 700 individuals provided comments subsequent to the meetings with 36 percent preferring no action, 61 percent requesting inclusion in the National System, and 3 percent favoring protection through State and local actions.

# Summary of Findings and Recommendations

The Rio Grande from River Mile 842.3 (the Chihuahua-Coahuila state line approximately 16 miles upstream from Mariscal Canyon) to River Mile 651.1 (the Terrell-Val Verde County line) meets the established criteria for inclusion in the National Wild and Scenic Rivers System. It contains outstandingly remarkable scenic, recreational, geological, biological, and cultural values which should be protected for the benefit and enjoyment of present and future generations.

The Government of Mexico, after review of this study report and discussions through the International Boundary and Water Commission, advises that it has no objections to the recommendations of this report. Further, the Government of Mexico perceives no conflicts with such future developments as it may adopt on its side of this segment of the river.

It is recommended that:

1. The United States side of the qualified segment of the Rio Grande be included in the National Wild and Scenic Rivers System under Section 2(a)(1) of Public Law 90-542, as amended.
2. The United States side of the river be managed and administered by the National Park Service using the concepts presented in this report. A detailed management plan including lateral boundaries for the river corridor be filed with Congress within two years of inclusion of the segment in the National System.
3. The Governments of the United States and Mexico continue to timely advise of measures proposed by each so that they can be concordant.
4. As a component of the National Wild and Scenic Rivers System the qualified river reach be divided into five segments for classification purposes, two segments classified as Wild and three segments classified as Scenic.
5. The resource management area for the United States side of the river, excluding lands in Big Bend National Park, contain a minimum of 9600 acres. It is estimated that a minimum of 1950 acres be acquired in fee and 5500 acres controlled by less-than-fee or scenic easements. An additional 2150 acres are within the Black Gap Wildlife Management Area.
6. The development and management of the qualified river reach give primary emphasis to protecting and enhancing the outstanding biological, scenic, geological, cultural, and recreational values found along the riverway.

The foregoing recommendations are based primarily on the following factors:

#### Water Quality and Flow

The recommended river reach is in a free-flowing natural condition and has no water resource structures which unreasonably diminish the free-flowing nature of the stream.

There is a sufficient volume of water during normal years to permit full enjoyment of water related outdoor recreation activities generally associated with comparable rivers.

Water quality meets EPA-approved Texas Water quality standards which provide for contact recreation and propagation of fish and wildlife.

#### Flora and Fauna

The area represents a significant biological storehouse and contains an outstanding portion of the Chihuahuan Desert in Texas. It is isolated and represents an outpost of a rapidly dwindling and irreplaceable natural resource.

The flora and fauna of the area are remarkable for their diversity. The river lies in an arid region and provides the water requirements for many forms of fish and wildlife, including a wide variety of mammals, birds, reptiles, and amphibians. Of special interest are the endangered American Peregrine falcon and the rare mountain lion. Numerous threatened and endangered plant species are found in the area.

#### Recreation

The spectacular river canyons, the primitive character of the river, and its international flavor provide a stimulating environment for a high quality recreational experience.

The recommended segment is long enough (191.2 miles) to provide a meaningful recreation experience.

The riverway has potential for year-round recreation use.

#### History and Archeology

The area contains numerous historical and archeological sites which constitute a non-renewable source of retrievable data concerning man's presence in the river basin over the last 10,000 years. Unlike the majority of sites found along other sections of the river which have been subjected to various destructive forces, many sites along the

qualified river segment are undisturbed, thus enhancing their value as interpretive data sources for archeologists, paleobotanists, geologists, and ultimately the general public.

#### Other Important Considerations

A valuable opportunity exists for international cooperation between the United States and Mexico for protecting and managing an outstanding primitive resource.

The closest existing component of the National Wild and Scenic Rivers System is the upper Rio Grande in New Mexico, over 500 miles northwest of the study area. It is the only component of the National System in the southwest United States.

Access to the recommended segment is limited. This factor has helped the area to retain its primitive qualities.

# Concepts for a Riverway Program

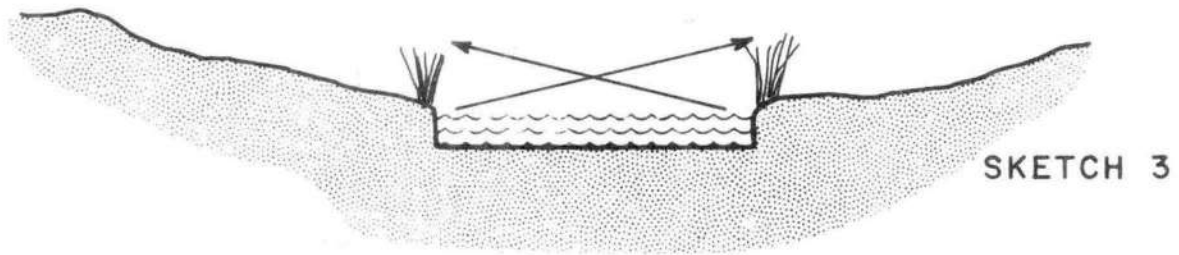
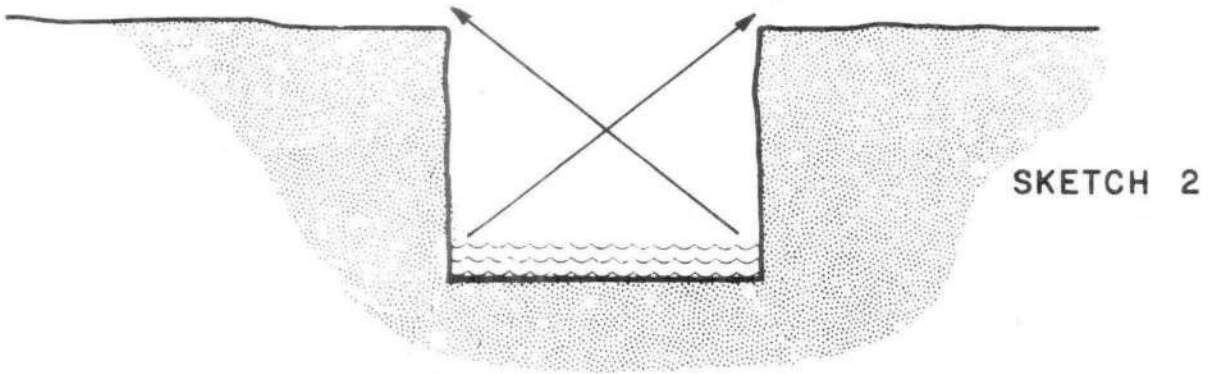
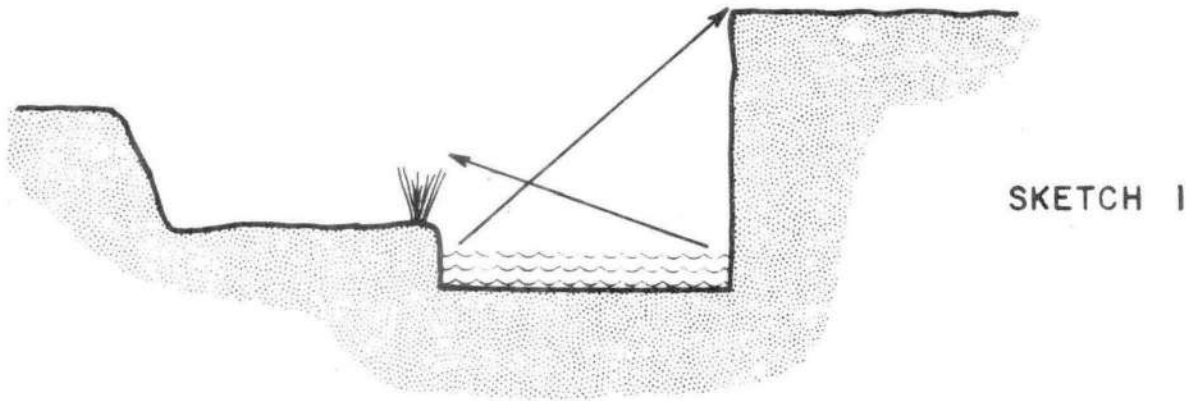
The following discussion is designed to provide a guide to management and development policies for the administration and preservation of the study segment as a component of the National Wild and Scenic Rivers System. All information is conceptual in nature, and the concepts presented should not be construed as the complete or final plan for the area concerned. A master plan for the ultimate management and protection of the riverway will be prepared with the assistance of all concerned agencies. The master plan should be afforded public review before its adoption and implementation.

## RESOURCE MANAGEMENT AREA

Lands adjacent to the river on the United States side on which land use control and management programs should be established are defined for report purposes as the resource management area. The resource management area contains the minimum acreage necessary to protect the values which enable the study segment to qualify for inclusion in the National System. A minimum of 9600 acres, excluding lands in Big Bend National Park, should be included in the resource management area. It is estimated that a minimum of 1950 acres should be acquired in fee and 5500 acres controlled by less-than-fee or scenic easements. An additional 2150 acres at the Black Gap Wildlife Management Area would be included in the resource management area. These figures are estimates and it is expected that the National Park Service will refine them when a master plan is prepared. Average fee acquisition is approximately 10 acres per mile with average scenic easement acquisition approximately 29 acres per mile.

The determination of the minimum acreage necessary for the resource management area is based primarily on two factors, the "visual corridor" and the desire to include outstanding natural, historical, or archeological areas outside of the visual corridor.

The visual corridor is defined as the zone of adjacent land which has a visual impact on the river user and which should be protected from adverse use and development if the natural and scenic appeal of the riverway is to be retained. The width of the visual corridor varies depending on the height and angle of slope of adjacent riverbanks and bluffs, and on the amount of vegetative cover near the river's edge. Where canyon walls lie near the river, the land area subject to control would be immediately beyond the canyon rim. Where the river valley is broader and riparian vegetation determines the river user's perception of the corridor, only a narrow strip of land adjacent to the river is included in the visual corridor.



Typical Valley Cross Sections

## VISUAL CORRIDOR

Rio Grande Wild and  
Scenic River Study

Although falling outside of the visual corridor, areas of notable natural, historical or archeological values were included in the suggested resource management area. Inclusion of such areas was based on a desire to protect outstanding areas which possess the potential to enhance the river users' experience. The resource management area was expanded in some instances to provide protection for areas which, if adversely developed, could significantly affect desirable qualities contained in areas which fall within the visual corridor.

#### ACQUISITION POLICY AND LAND USE CONTROLS

Within the resource management area property rights would be acquired to provide stringent protection of the natural scene and to accommodate existing and potential recreational use. Fee acquisition would be confined to acreage needed to provide access and services to the general public and to protect the river and resource values which would be jeopardized by less-than-fee control. Other land areas along the river needed as part of a buffer zone would be controlled through scenic easements or less-than-fee acquisition. A scenic easement is an agreement or series of agreements whereby a landowner binds himself and all future owners of the land to refrain from using or developing his land in ways which would detract from the scenic beauty of the area. Such an easement permits an owner to retain use and possession of his land, subject to the restriction that the scenic character of the land remain unchanged. A scenic easement would not grant rights of ingress or egress to the general public. Land use control through scenic easement acquisition normally entails extensive negotiation with the landowners and requires thorough investigation before any agreement on the extent of such control for each tract can be reached. It should be noted that Section 15(c) of the Wild and Scenic Rivers Act defines a scenic easement as:

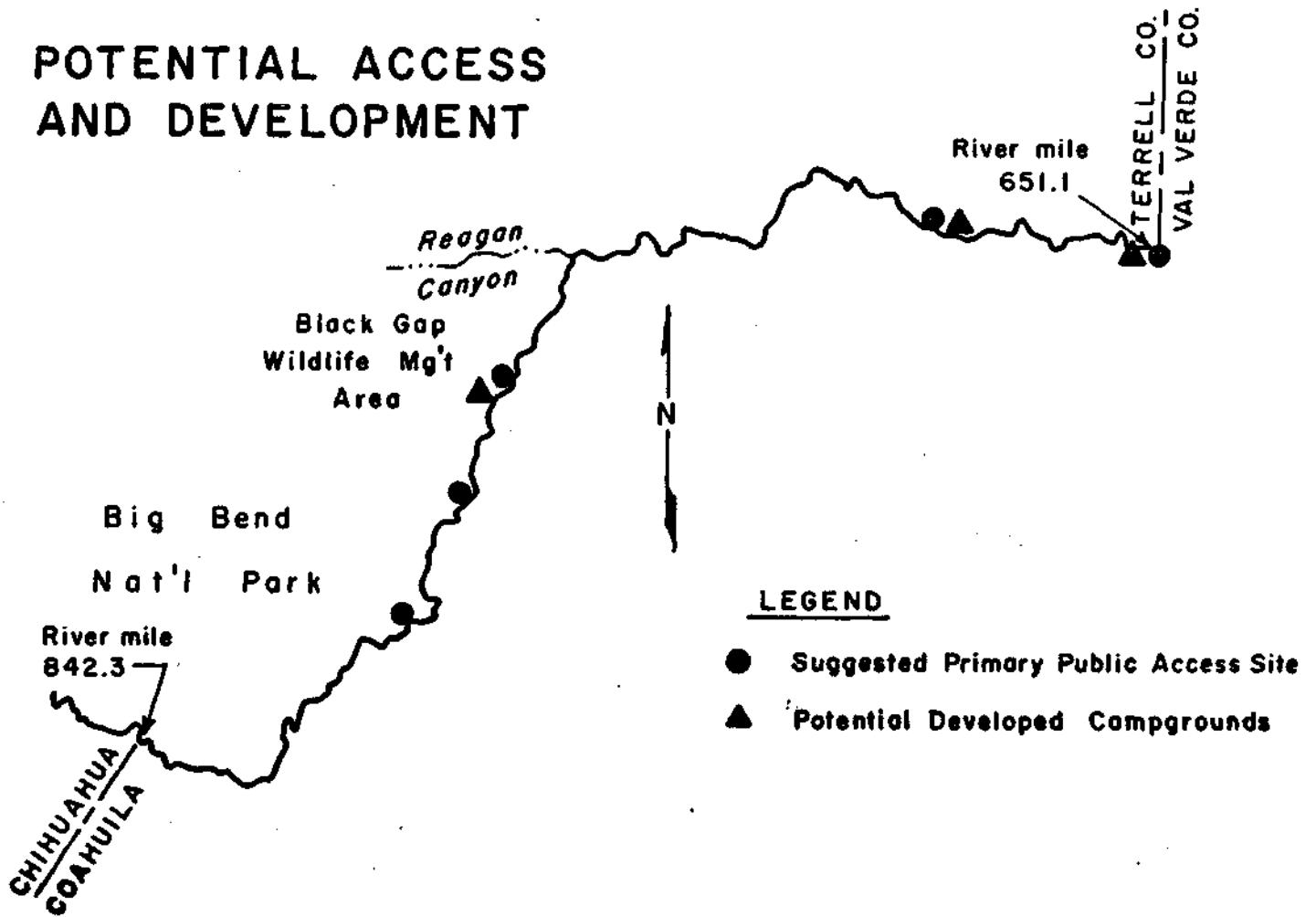
"...the right to control the use of land (including the airspace above such land) within the authorized boundaries of a component of the Wild and Scenic Rivers System, for the purpose of protecting the natural qualities of a designated wild, scenic or recreational river area, but such control shall not affect, without the owner's consent, any regular use exercised prior to the acquisition of the easement."

#### DEVELOPMENT

In order to protect the river environment and provide opportunities for river oriented recreation, suitable recreation facilities would be provided. The actual type and extent of such facilities would be determined by the National Park Service, and would be outlined in the master plan eventually developed regarding specific management programs and policies on the designated river segment.



# POTENTIAL ACCESS AND DEVELOPMENT



Any developments would be carefully weighed as to the possible consequences on the natural character of the river. Future resource managers would recognize the possibility of environmental degradation by recreational overuse as well as by unplanned commercial and residential use. An analysis of recreation use would be undertaken to develop optimum river use levels, and management guidelines would be established accordingly. In addition, a detailed inventory of historical, archeological, geological, biological, and other similar areas would be made and a program developed for their protection and interpretation. Public access would be provided only at a limited number of points on the river segment being managed. Public use facilities adjacent to the river at high and repeated use areas would be provided only to the extent that they are necessary to protect the river's resources from degradation by over use. All recreation facilities would be designed and located so as to protect the significant values for which the river area is established. Major public use facilities such as large campgrounds, interpretive centers or administrative headquarters would be located outside the immediate river environment.

Additional public access points would be provided at several points along the study segment. Such sites would be located near the downstream boundary of Big Bend National Park, near Dryden Crossing and

in the vicinity of the Terrell-Val Verde County line. These additional access points would allow river trips of various lengths and degrees of difficulty. Developed camping facilities would be provided at the access points to allow river users more flexibility in timing river trips. Primitive camping sites along the riverway would not be established until use levels demand such action. A system of periodic evaluation and monitoring focused on the outstanding values and more sensitive elements of the river environment would be developed to determine when and where additional facilities may be appropriate.

#### COSTS

Acquisition of fee and less-than-fee interests for the 7400 acres of privately owned land within the resource management area would cost an estimated \$1,100,000. This includes \$460,000 for fee acquisition and \$640,000 for scenic easement acquisition. Cost of the suggested development is \$1,300,000. Nearly 80 percent of suggested development costs are for additional access roads. The costs for operation and maintenance of the area are estimated to range from \$85,000 for the first year of operation to approximately \$620,000 for the fifth year.

#### MANAGEMENT

The Rio Grande forms the boundary between the United States and Mexico; therefore, management objectives must be consistent with the provisions of the treaty between the United States and Mexico relating to the boundary and to the utilization of the waters of the river by the two countries. Overall management objectives for a river protection program would be to:

1. Preserve the river in a free-flowing condition except as provided by treaties.
2. Protect scenic, geologic, fish and wildlife, archeologic, recreational, historical, cultural, scientific and other similar values along the riverway.
3. Preserve the essentially primitive character of the river canyon area.
4. Maintain or improve existing water quality.
5. Provide opportunities for river oriented recreation which are consistent with the primitive character of the surroundings and do not conflict with other river protection program objectives.

Programs and Policies - The Wild and Scenic Rivers Act and the guidelines established by the Secretaries of Interior and Agriculture established certain parameters for the management of designated components of the National System. Many of these restrictions vary depending on the classification of the designated segment. Therefore, each policy or program outlined might be modified to the extent deemed necessary by the National Park Service.

The following actions or concepts should be employed to meet suggested riverway objectives along the United States bank:

## 1. Structures

- a. Structures which would alter the free-flowing character of the river would not be permitted, except as provided in agreements with Mexico pursuant to treaties.
- b. Permanent alteration of natural channels which significantly affect the free-flow of water would not be permitted, except as provided in agreements with Mexico pursuant to treaties.
- c. Additional international bridge, powerline, pipeline or other similar crossings would not be permitted, except as provided in agreement with Mexico pursuant to treaties. If agreed upon by the two countries, they would be planned for environmental compatibility with the objectives of river designation.
- d. New residential or commercial structures would not be permitted in the resource management area.

## 2. Fauna and Flora

- a. Habitat management for fish and wildlife would reflect equal consideration of game and non-game species and no management practice would be allowed which might endanger the natural values of the river area.
- b. Threatened and endangered floral and faunal species would be protected in accordance with the Endangered Species Act of 1973.
- c. Hunting would be permitted (except in Big Bend National Park) under existing State regulation and authorities to the extent that public use, enjoyment, and safety would not be jeopardized.
- d. Fishing would be permitted under existing State regulations and authorities.
- e. Wildlife management needs would take priority over grazing needs.
- f. A detailed inventory of outstanding plant communities would be undertaken and a program developed for their protection and interpretation.
- g. Removal or burning of bankside vegetation would be allowed only if research indicates that such practices are necessary for management purposes.

## 3. Water

- a. Water withdrawals for livestock use or irrigation would be permitted only if such actions do not unreasonably diminish the free-flowing character or significantly affect existing natural values of the river area, except as provided by treaties.

- b. All resources, uses, and developments along the riverway would be managed so as to meet acceptable water quality standards set by the Texas Water Quality Board and approved by the Environmental Protection Agency.
  - c. A long term program for monitoring biological water quality characteristics would be established.
  - d. A continuous program would be established to monitor possible increases in heavy metal contamination.
4. Range
- a. Grazing in the river area would be permitted only to the extent that it would not degrade existing natural values along the river.
  - b. No concentrated domestic stock grazing detrimental to resource values would be permitted along the shoreline.
5. Minerals
- a. Surface resources of the riverway would be protected from mineral extraction incompatible with suggested riverway objectives.
6. General Management
- a. Unobtrusive fences, gauging stations and other management facilities would be permitted if they do not significantly affect the primitive character of the area.
  - b. Motorized travel would not be permitted in the river areas classified as wild, except for management and emergency purposes. The use of motorized watercraft for recreation purposes would be strictly controlled in river areas classified as scenic.
  - c. An information program would be developed to educate river users of possible hazards during river trips.
  - d. A river user registration and education system would be established to insure user safety through appropriate levels of skill and equipment preparation.
  - e. A detailed inventory would be undertaken of all cultural resources, including historical and archeological sites, and a program developed for their investigation, protection, and interpretation. Where appropriate, identified sites would be nominated for the National Register of Historic Places.

# Criteria and Alternative Analysis

## INTERNATIONAL CONSIDERATIONS

An essential consideration in the analysis of the study segment is its international character. Because the river forms the boundary between Mexico and the United States, actions affecting the river must consider the needs and desires of each country. The Mexican Section of the International Boundary and Water Commission advises that the region on its side is isolated and practically uninhabited so that its naturally wild and scenic conditions have been preserved, and the Mexican side of the river is expected to be preserved in its present condition for a prolonged time.

The function of this analysis is twofold--to analyze the study segment relative to possible inclusion in the National Wild and Scenic Rivers System, and to serve as a foundation on which continued coordination with Mexico might be based.

## QUALIFICATION FOR INCLUSION IN THE NATIONAL SYSTEM

The evaluation of a potential wild and scenic river is based on two documents: the Wild and Scenic Rivers Act, and the supplementary criteria developed by the Secretaries of Interior and Agriculture, Guidelines for Evaluating Wild, Scenic and Recreational Areas Proposed for Inclusion in the National Wild and Scenic Rivers System Under Section 2, Public Law 90-542. The Rio Grande from River Mile 842.3 (the Chihuahua-Coahuila state line, approximately 16 miles upstream from Mariscal Canyon) downstream to River Mile 651.1 (the Terrell-Val Verde County line) meets the criteria for inclusion in the National System as outlined in the subject documents.

The subject river segment is in a free-flowing natural condition and has no significant impoundments, diversions, straightening, riprapping or other modification works. No existing structures unreasonably diminish its free-flowing nature. The river unit which qualifies for inclusion is long enough to provide a meaningful experience. The river contains a sufficient volume of water during normal years to permit full enjoyment of water related outdoor recreation activities generally associated with comparable rivers. The scenic qualities of the river and its environment are outstandingly remarkable and generally pleasing to the eye. The study segment of the Rio Grande contains water of high quality and meets the minimum criteria for primary contact recreation. Water quality in the study segment also meets the "Aesthetics-General Criteria" as defined by the National Technical Advisory Committee on Water Quality. The total segment of the Rio Grande which qualifies for inclusion in the National Wild and Scenic Rivers System is 191.2 miles in length.

As noted earlier, the initial United States proposal for study included the Rio Grande from Alamito Creek to the east boundary of Terrell County. Due to agreements with the Government of Mexico, the river segment from Alamito Creek downstream to River Mile 842.3 (the Chihuahua-Coahuila state line) was not included in this evaluation. The segment excluded from study includes two noteworthy canyons, Santa Elena and Colorado. Santa Elena Canyon, nearly 15 miles in length, is sheer walled and spectacular, one of the most beautiful of the Rio Grande canyons. Colorado Canyon is rugged with many small rapids.

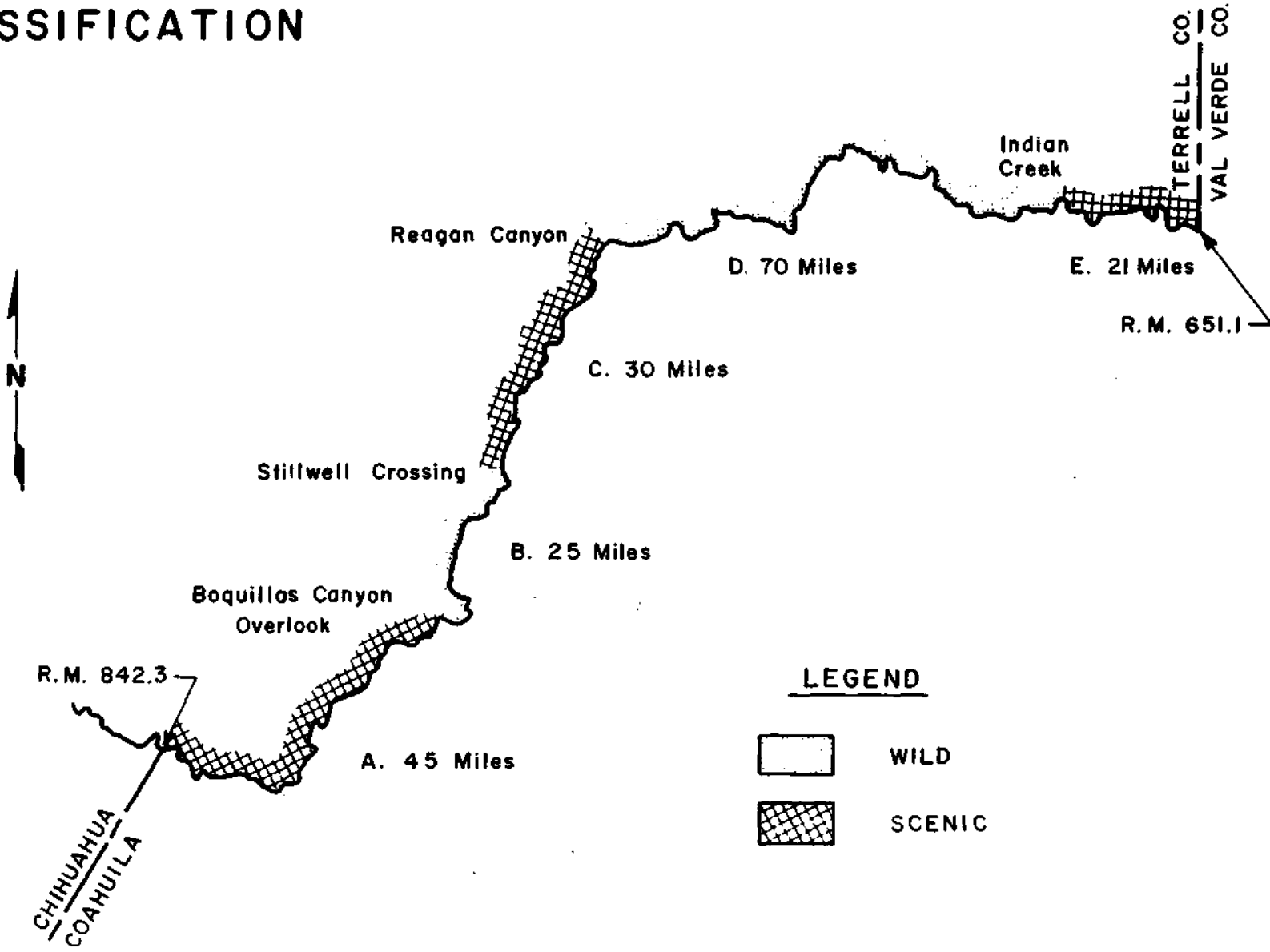
#### CLASSIFICATION

The Wild and Scenic Rivers Act stipulates that every river included in the National Wild and Scenic Rivers System shall be classified, designated, and administered as one of the following:

1. Wild River Areas - Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and water unpolluted.
2. Scenic River Areas - Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
3. Recreational River Areas - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Because of the river's diversity and the occasional evidence of man's influence, the approximately 191 miles of the Rio Grande eligible for inclusion in the National System has been divided into five segments for classification purposes. These segments and the characteristics which were primary determinants in the classification analysis are as follows:

# CLASSIFICATION



<u>Segment</u>	<u>Classification</u>
River Mile 842.3 to the Boquillas Canyon Overlook (45 miles)	Scenic
Boquillas Canyon Overlook to Stillwell Crossing (25 miles)	Wild
Stillwell Crossing to Reagan Canyon (30 miles)	Scenic
Reagan Canyon to the confluence of Indian Creek (70 miles)	Wild
Indian Creek to River Mile 651.1 (21 miles)	Scenic

- A. Scenic - The river segment from River Mile 842.3 to the Boquillas Canyon Overlook is free of impoundments, largely primitive, and largely undeveloped. It forms a portion of the southern boundary of Big Bend National Park and includes river access at six primitive fishing camps, the two small Mexican villages of San Vicente and Boquillas, and the recreation development at Rio Grande Village. This segment also includes Mariscal Canyon.
- B. Wild - The river segment from the Boquillas Canyon Overlook to Stillwell Crossing is free of impoundments, inaccessible except by trail, and has a primitive shoreline. This river reach encompasses Boquillas Canyon and no land access is available. Boquillas Canyon has been suggested for designation as a wilderness area under the provisions of the Wilderness Act.
- C. Scenic - The river segment from Stillwell Crossing to Reagan Canyon, although primitive in nature for most of its length, contains two areas of human impact. A fluorspar processing operation at LaLinda, Coahuila, and Heath Crossing, Texas, is the site of the only bridge crossing over the entire study reach. Several primitive fish camps provided in the Black Gap Wildlife Management Area also serve as access. Because of the amount of access and the localized impact of the mining and processing operations, this river reach is classified as scenic.
- D. Wild - The river segment from Reagan Canyon to the confluence of Indian Creek contains the area commonly referred to as the "lower canyons" of the Rio Grande. No public access is found in this reach, although a few unimproved ranch roads reach the river.



- E. Scenic - The river segment from the confluence of Indian Creek to River Mile 651.1, the Terrell-Val Verde County line has evidence of concentrated livestock grazing. In addition, several private access points and hunting and fishing camps are found in this reach. Due to these impacts, the 21-mile segment has been classified as scenic.

#### ANALYSIS OF ALTERNATIVES

Three alternative courses of action were considered for the study segment: (1) No action; (2) Protection through State and local action; and (3) Inclusion in the National Wild and Scenic Rivers System. The following discussion presents an analysis of each alternative.

No Action - The no action alternative assumes that the qualified segment of the Rio Grande would not be included in the National System, nor would State or local units of government take steps to manage the area for preservation and recreation purposes. The river segments within Big Bend National Park and the Black Gap Wildlife Management Area would continue to be managed under existing programs and authorities. All remaining riverside lands would be retained in private ownership. Current patterns of land use and development would be allowed to continue. Land use trends of ranching increasingly supplemented by private leases for hunting and fishing would also continue. It is probable that existing land ownership patterns would become more fragmented as large ranches are partitioned and sold for development or tax purposes. Recreational use of the river would undoubtedly continue to increase.

This alternative was rejected for several reasons. Uncontrolled bank-side development would lead to the eventual loss of the primitive values which presently are characteristic of the study segment. Although current resident landowners are strongly tied to the land and the ranching way of life, the increasing number of non-resident landowners indicates a trend toward speculation and a greater potential for development. The study segment is a resource of national interest, and ultimately the characteristics which make it so would be lost under the no action alternative.

Protection Through State and Local Action - Two options were considered under this alternative: (1) Protection through local action and (2) Inclusion in a State scenic rivers system.

##### Local:

Because the land area adjacent to the study segment is sparsely populated and local county governmental controls are minimal, it is highly unlikely that a meaningful river protection program could be developed at the county level. Brewster and Terrell counties had 1970 populations of 7,780 and 1,940, respectively. These counties have no zoning power, and it is highly unlikely that counties in Texas will obtain and implement zoning powers in the near future. In addition, the two counties do not have the funds necessary to administer and manage a riverway program.

State:

Bills to establish a statewide scenic rivers system in Texas have been introduced into the State legislature on several occasions. All such efforts have been unsuccessful to date; however, a statewide system may be established by the legislature in the future. The type and extent of protection which might be given the Rio Grande under a State system is uncertain.

Inclusion in the National Wild and Scenic Rivers System -  
Inclusion in the National Wild and Scenic Rivers System could be accomplished in several ways. Options for such action are both institutional (administrative) and spacial (river segments).

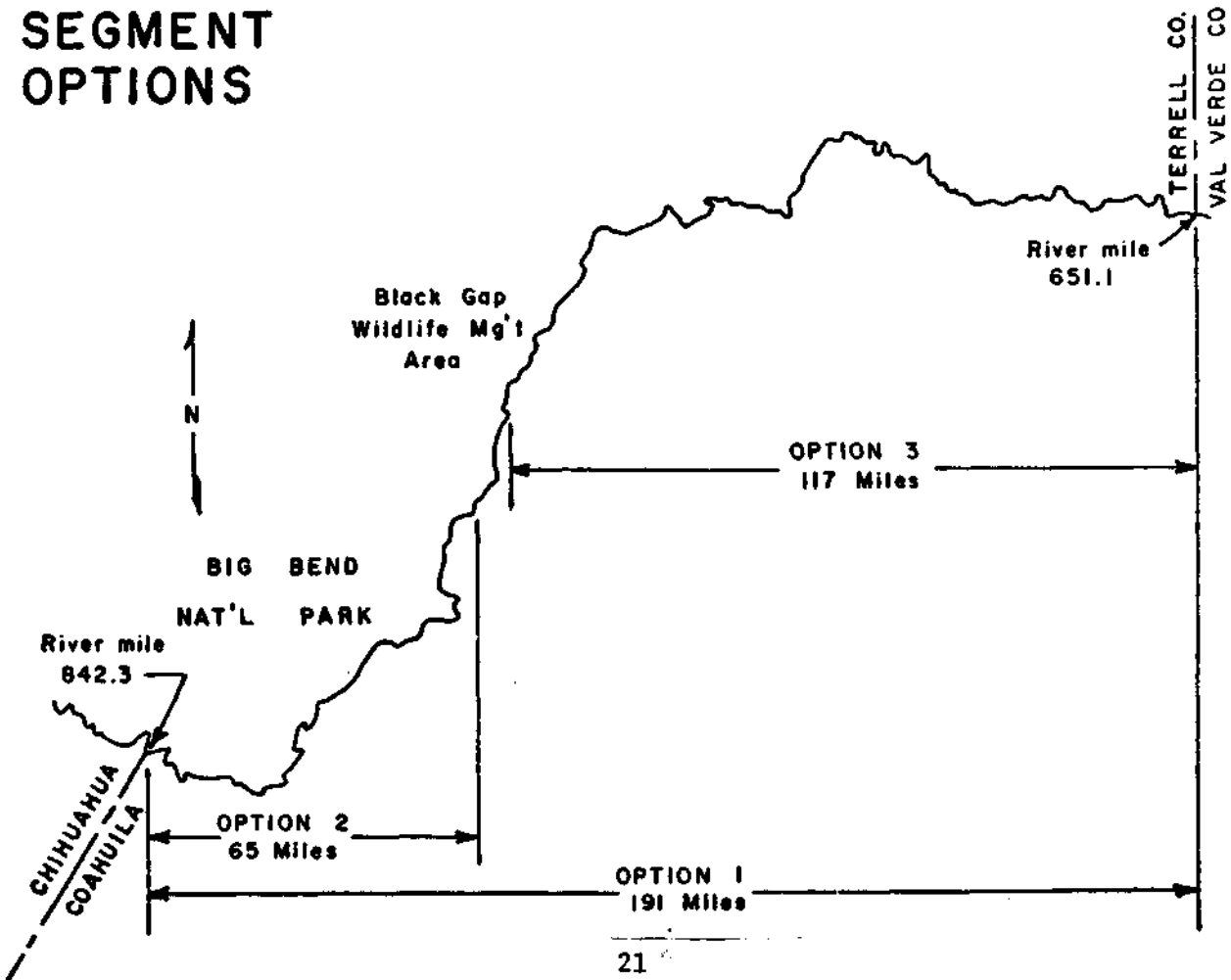
- 1.) Administrative Options - Administrative options considered include:
  - a.) Administration by the Federal Government - Under this type of administration an agency of the Federal Government would prepare a master plan for the river segment to be designated, acquire the necessary lands or interests in lands, and construct and maintain recreational facilities where appropriate. Funds for land acquisition, development, and management would come from monies appropriated by Congress specifically for the designated segment. The President and Congress must approve administration and management of the riverway program by a Federal agency. Federal administration would provide a direct vehicle for continued coordination with the Government of Mexico on aspects of river management and protection.
  - b.) Joint administration by the Federal Government and the State of Texas - This administrative option envisions a Federal-State partnership in administration of a riverway program. Existing areas managed by the respective levels of government would continue to be so managed. A riverway master plan would be jointly prepared which would delineate those river segments for which each agency would have administrative responsibility. Both State and Federal funds would be used for acquisition, development, and management. Federal participation in such administration would necessitate approval by the President and Congress.

- c.) Administration by the State of Texas - This option would entail complete State administration and management of the designated riverway segment, outside of Big Bend National Park. The National Park Service would continue to administer the river area inside the park. The State would prepare a riverway master plan, and implement the provisions of that plan. Funds used for implementation would be obtained from normal State appropriations and applicable Federal grant programs. A State-administered component of the National Wild and Scenic Rivers System is possible through the provisions of Section 2(a)(ii) of the Wild and Scenic Rivers Act. This provision stipulates that the Secretary of the Interior may designate a State-administered stream as a National System component upon application of the Governor, after approval of the State legislature. Such areas must be administered at no expense to the Federal Government. The Texas legislature has not officially recommended any action relating to the scenic qualities of the Rio Grande. This factor, coupled with no State scenic rivers system and State recreation funding priorities trending toward growing urban needs, makes administration by the State infeasible.

2.) Segment Options - Segment options considered include:

- a.) From River Mile 842.3 to River Mile 651.1 (the Terrell-Val Verde County line) - This option contains the entire river reach which qualifies for inclusion in the National System, a distance of 191.2 miles. Approximately 65 miles of river frontage are in Big Bend National Park (34%) and 22 miles lie in the Black Gap Wildlife Management Area (11.4%), for a total public river frontage ownership of nearly 46%.
- b.) From River Mile 842.3 to the downstream boundary of Big Bend National Park - This option contains only that portion of the study segment presently included in Big Bend National Park, a distance of 65 miles. No private lands would be acquired and additional facility development would be minimal.
- c.) From the upstream boundary of the Black Gap Wildlife Management Area to River Mile 651.1 (the Terrell-Val Verde County line) - This option excludes all lands within Big Bend National Park and the river segment containing Stillwell and Heath Crossings. Total segment length is 117 miles, of which approximately 19% is in public ownership. This segment includes the presently unprotected "lower canyons" area and Martin Canyon.

## SEGMENT OPTIONS



In order to compare all segment options relative to possible acreage, acquisition, recreation facilities, and cost, a summary of comparison factors was developed. It should be noted that the acreage figures given under resource management area include the minimum number of acres necessary to provide for public use and to protect the qualities which enabled the river reach to qualify for inclusion in the National System. The 9600 acres listed under "Resource Management Area Minimum Acreage" includes 2150 acres already under public ownership within the State's Black Gap Wildlife Management Area. The 2150 acres is not included in the suggested minimum easement acreage.

Table 1  
Comparison Summary - Segment Options

Comparison Factors	River Mile 842.3 to River Mile 651.1	River Mile 842.3 to the Downstream Boundary of Big Bend National Park	Black Gap Wildlife Area to River Mile 651.1
Length	191 miles	65 miles	117 miles
Percent of River Frontage in Public Ownership	46%	100%	19%
Resource Management Area Minimum Acreage	9600 acres*	Entire area is within Big Bend National Park	9100 acres
Suggested Minimum Fee Acquisition	1950 acres	0	1940 acres
Average Fee Acquisition	10 acres/mile	0	17 acres
Suggested Minimum Easement Acquisition	5500 acres	0	5010 acres
Average Easement Acquisition	29 acres/mile	0	43 acres
Estimated Acquisition Costs	\$1,100,000	0	\$1,025,000
Estimated Development Costs	\$1,300,000	\$25,000	\$1,272,000
Total Costs	\$2,400,000	\$25,000	\$2,297,000

\*Does not include area within Big Bend National Park.

# Physical Characteristics

## FLOW CHARACTERISTICS

The Wild and Scenic Rivers Act provides that rivers recommended for inclusion in the National Wild and Scenic Rivers System must be in a free-flowing natural condition. In addition, such streams must possess a sufficient volume of water during normal years to permit full enjoyment of water-related outdoor recreation activities generally associated with comparable rivers.

The river channel is a series of channel sections, some with pools several feet deeper than the average channel depth, of from two to four feet, and occasional riffles, rapids and small falls (Upper Madison and Lower Madison Falls). Upper Madison Falls has two sections, each with drops of about six feet, and Lower Madison Falls has a drop of about 10 feet. The channel has a width of generally 170-180 feet, is narrower in some rock canyons, and wider in curved sections or where small islands exist. Average gradient in the study segment is approximately four feet per mile.

Data from two International Boundary and Water Commission gaging stations were used to analyse river flows. These stations are located at Johnson Ranch (13 miles upstream from the Chihuahua-Coahuila state line) and at Langtry, Texas. The flow at the Johnson Ranch gaging station has a longtime annual average of 925 cubic feet per second (cfs) with a long-time average annual flow of 1,400 cfs at the Langtry gaging station. The most significant factor in the differences in flow between the two stations is spring inflow, averaging 322 cfs for the period 1948 to 1968. Foster Ranch gaging station is located in the study reach; however, because it has only been in operation since 1961, long term data were not available.

Optimum flows for floating this river segment, either by raft, canoe, or kayak, range from 200 to 3000 cfs at the Johnson Ranch gage. With discharges smaller than 200 cfs there will be an increasing number of portages, and with lower stream velocities more paddling will be required by rafts. At flows over 3000 cfs, caution must be exercised by boaters due to the increased velocity and, consequently, greater danger of damage in rapids. Flows at Johnson Ranch fall in the optimum use range approximately 76 percent of the time. In the downstream one-half of the study segment, flows can be expected to be in the optimum use range approximately 85 percent of the time. It should be noted that National Park Service policy in Big Bend National Park allows no one to float the Rio Grande if the depth is in excess of five feet at Rio Grande Village (approximately 3000 cfs at the Johnson Ranch gage). This policy has been established to insure the safety of the river user.

The percent of time flows are equalled or exceeded for various discharge rates is shown in Table 2.

Table 2

Percent of Time Discharge Is Equalled or Exceeded  
(Optimum Floatability 200-3000 cfs)

<u>Discharge</u>		<u>Johnson Ranch</u>	<u>Langtry Station</u>
100 cfs		92 %	100 %
200 cfs		81 %	100 %
300 cfs		69 %	98 %
500 cfs	Optimum Range	48 %	83 %
700 cfs		34 %	63 %
1000 cfs		21 %	38 %
2000 cfs		9 %	13 %
3000 cfs		5 %	8 %
4000 cfs		4 %	5 %

Table 3 summarizes historic rates of flow by month at the Johnson Ranch Station. This data indicates those months when high or low flow are most likely to occur.

Table 3

Historic Flows At Johnson Ranch Station\*  
(units-cubic feet per second)

<u>Month</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Mean</u>
January	184	1,923	568
February	139	2,015	598
March	72	1,882	450
April	8	1,242	232
May	0	911	333
June	55	1,741	649
July	96	4,878	1,187
August	200	3,727	1,390
September	157	10,278	2,478
October	80	18,813	1,917
November	144	2,219	754
December	155	1,151	545

\* Period 1948-1970

Of special interest is the source of flows in the study segment. For the average annual flows reaching the Johnson Ranch station, approximately 77 percent is from the Rio Conchos; 4 percent originates in the Rio Grande upstream from the Rio Conchos, and 19 percent comes from unregulated tributaries. For the average annual flows reaching

the Langtry station, the Rio Conchos provides 49 percent; unregulated tributaries below the Rio Conchos provide 25 percent of the flows; spring inflows provide 23 percent, and only 3 percent originates in the Rio Grande upstream from the Rio Conchos.

The Rio Grande upstream from the Rio Conchos has no flow for periods of from several days to several months, resulting from reservoir regulation above El Paso, water uses in New Mexico and in the El Paso-Juarez Valley, and evapotranspiration losses and minor irrigation uses in the 213-mile reach between the El Paso-Juarez Valley and Rio Conchos. The Rio Grande again becomes a perennial stream in the Presidio-Ojinaga Valley with the inflows from the Rio Conchos. Other tributaries downstream from the Rio Conchos have a minor seepage flow or no flow except following periods of rainfall. Mexico has constructed three large reservoirs in the 26,404 square mile Rio Conchos drainage basin. Their storage capacities and locations are shown in Table 4.

Table 4

Reservoirs in the Rio Conchos Basin, Mexico

Reservoir Name	Began Operation	River Distance from Study Area Miles	Conservation Capacity Ac.Ft.	Flood Control Capacity Ac.Ft.
Boquilla	1913	363	2,417,500	0
F.I. Madero	1948	307	344,600	0
L. L. Leon	1968	226	280,800	405,300

The only significant diversions from the Rio Grande in the reach between the El Paso-Juarez Valley (Fort Quitman gaging station) and the study area are by pumping from the river in the Presidio-Ojinaga Valley for irrigating about 4,000 acres, and for irrigating about 2,000 acres in the Redford-El Mulato Valley. These small areas do not materially affect flows in the river, and no significant expansion of irrigated areas is probable.

Larger floods generally occur in the period May through October; however, smaller flood discharges have occurred in all months. The major historic floods usually have resulted from extended periods of steady rainfall on the watershed. Smaller Rio Grande flood peaks from large tributary discharges also occur from high intensity, relatively short duration, rainstorms. Historic floods have risen over 24 feet in the canyon at Johnson Ranch and over 45 feet in the canyon at Langtry. As an example of the intensity, the flow recorded at Langtry station in June 1954 rose in a period of 4 hours from less than 1,000 cfs to approximately 169,000 cfs.





*The Rio Grande upstream from the Rio Conchos has no flow during some periods.*



*A five-foot weir at the Foster Ranch gaging station, immediately downstream from the Terrell-Val Verde County line.*

## WATER QUALITY

The Rio Grande from the Chihuahua-Coahuila state line to the headwaters of Amistad Reservoir meets the "Aesthetics-General Criteria" as defined by the National Technical Advisory Committee on Water Quality.

Data on the physical, biological, and chemical water quality characteristics of the study segment are collected by the U.S. Section of the International Boundary and Water Commission and the Texas Water Quality Board. Permanent water quality sampling stations are found at the Foster Ranch upstream from Langtry, two miles upstream from the Johnson Ranch near Santa Elena Canyon, and below the confluence of the Rio Conchos with the Rio Grande.

Texas Water Quality Standards, prepared by the Texas Water Quality Board, were approved by the Environmental Protection Agency in October 1973. These standards indicate that the Rio Grande between the confluence of the Rio Conchos and the headwaters of Amistad Reservoir is suitable and is used for contact recreation, propagation of fish and wildlife, and domestic raw water supply. The standards specify the following values for the subject river reach: (1) chloride-average not to exceed 150 mg/l, (2) sulfate-average not to exceed 200 mg/l, (3) total dissolved solids-average not to exceed 1200 mg/l, (4) dissolved oxygen-not less than 5 mg/l, (5) pH range - 6.5 to 8.5, (6) temperature-maximum of 93 degrees, and (7) fecal coliform/100 ml-logarithmic average not more than 200.

The river reach has very little suspended silt during low flow periods. Conversely, tributary flows following rains result in significant concentrations of suspended silts. Thus, the river water can be expected to be clear during low flow periods and to be very turbid during high flow periods.

The DuPont Corporation obtains fluorspar from mines in Mexico with an ore processing plant located adjacent to the Rio Grande at LaLinda, Mexico. Water used in the processing plant operation passes through two detention ponds before discharge into the river. No water quality data are available in the immediate area of this discharge, and a data system should be established to monitor possible changes in water quality.

Heavy metal analyses have been conducted by the Texas Water Quality Board on Terlingua Creek and the Rio Grande above and below the confluence of Terlingua Creek to evaluate the influence of the abandoned mercury mine at Terlingua. Results indicate that the mercury levels are higher in this vicinity, probably due to natural erosion of mercury-containing soils in the area. A study completed late in 1973 by Dr. James Houston and Gerald Dumas of Sul Ross State University on mercury levels

in the Rough Run-Terlingua Creek area contained the following conclusions: (1) Overall normal pollution level of mercury is less than one microgram of mercury per gram sample, (2) Mercury is primarily associated with the fine particles of the samples (silt), and (3) Mercury level rises significantly during rainy periods due to transportation of mercury-bearing silt by water. The study recommends that: (1) Mercury analysis continue on a quarterly basis to monitor any change in normal pollution level of mercury, (2) Soil and silt samples be separated by sieving and mercury content of each fraction be determined, (3) Samples be analyzed for organic mercury content, (4) A study be made of small animals and fish in the area to determine the mercury level in their systems.

Upstream from the study area three communities have the potential to affect water quality. Presidio (population 1,050) and Redford (population 107) do not have sewage collection and treatment systems. Ojinaga, Chihuahua (population 12,757) has a sewer system serving most of the city which discharges to a 2-cell, 5-acre lagoon. Effluent from the lagoon is used for irrigation of adjacent fields and very little water reaches the river. These communities lie nearly 100 miles upstream from the study area. The Cities of Marfa and Alpine are approximately 60 and 70 miles respectively from the Rio Grande and provide adequate treatment for their wastewater.

#### GEOLOGY AND SOILS

Geology - The geology of the study area is complex and varied, contributing in large measure to the scenic and recreational values of the stream and its surroundings. The upper 140 miles of the study area lie within the Mexican Highlands physiographic province which consists mainly of Cretaceous age rock. This rock has been folded and faulted to form a series of northwestward trending "step blocks" and anticlines through and around which the Rio Grande has cut its channel to form a series of spectacular canyons with walls up to 1,850 feet in height. About 70 percent of the river length is confined within canyon walls with virtually no flood plain and thus affords the river traveler many interesting and varied views of the geological periods through which he is passing.

The two predominate Cretaceous Formations are the massively bedded Georgetown and Edwards limestone formations which form towering cliffs. The Maxon, Walnut, Comanche Peak, and Kiamichi Formations are also exposed; however, these formations are relatively thin and form slopes, between and below the cliff forming Georgetown and Edwards Formations. These rocks, so well exposed by the incision of the river, are entirely sedimentary in origin. The massive and predominate limestones were originally deposited as flat lying calcareous mud on the bottom of the sea which covered the entire region about 100 million years ago. Sub-

sequent uplifting, folding, faulting, and erosion have produced the present day topography. In addition to the main Rio Grande canyon, tributaries to the river on both the Mexican and U.S. sides have cut canyons down to the river level and contain many interesting and unique geological features such as "pouroffs" (near vertical rock waterfalls), potholes etched in the rock floors, buttresses, overhangs, caves, solution cavities, and "honeycombed" rock.

Erosion by water has sculptured the exposed rock surfaces and, combined with other climatic agents, has produced rocky talus slopes at the base of the limestone cliffs which support desert type vegetation. Jointing in the massive limestones has allowed limestone blocks up to 1,000 feet in height to fall into the river bed creating boulder strewn rapids. Other rapids are formed by boulder outwash from side canyons.

Many springs flow directly into the river. Most are hot springs with water temperatures from 17 to 35 degrees F. above normal groundwater temperatures. These springs appear to be associated with faults and evidently are discharging water that has risen from depths of 1,000 to 1,500 feet.

At the upstream end of the study area the river is deeply incised in narrow and precipitous Marsical Canyon, composed mainly of Georgetown limestone which has been folded upward into a large anticlinal fold. Notable within the canyon are polished white boulders. San Vicente and Hot Springs Canyons are short and incised through the flaggy Boquillas Formation. A short distance downstream from the Mexican town of Boquillas, the Rio Grande has cut through the extensively faulted Del Carmen Mountains, forming Boquillas Canyon which is approximately 12 miles long. The canyon walls are near-vertical and the adjacent topography attains high elevations through folding and stepfaulting. The Edwards, Kiamichi, and Georgetown Formations are exposed in the canyon walls. Downstream from Boquillas Canyon the river flows across a relatively broad and open flood plain or "vega" consisting of alluvium resting on rocks of the Glen Rose Formation. Near the confluence with Reagan Canyon the flood plain narrows abruptly, and the river remains in a continuous section of essentially flat lying Georgetown and Edwards limestone. The river and its tributaries are incised 500 -1,500 feet below a plateau-like surface which is interrupted by several anticlinal and monoclinal folds. The portion of the river within the Mexican Highlands province ends below San Francisco Canyon.

The river segment from San Francisco Canyon to the end of the study area lies in the westernmost portion of the Edwards Plateau physiographic province, an area of relatively undisturbed level-lying sediments. The river remains within a canyon section with the walls formed of massive Georgetown limestone, but is flowing across the uppermost portion of the Georgetown. Therefore, the walls are much lower and are capped with the younger and less resistant Del Rio and Buda Formations. At several places along the river the Georgetown Formation projects out into the river in a series of incised cliffs which have vertical faces approximately 50 feet in height.



*Downstream from Boquillas Canyon the river flows through a broad flood plain or "vega".*



*Nearly 70 percent of the study segment is confined within canyon walls*

Soils - The principal soils occurring in the river bottom belong to the Gila-Glendale Association. These soils are deep, calcareous loams, clay loams, and fine sandy loams developed on recent alluvium. These soils are subject to flooding and runoff is rapid. Included in this association are small areas of gravelly and sandy stream washed materials occurring as sand and/or gravel bars. This association extends the entire length of the study area.

The upland soils within Big Bend National Park belong mainly to the Badlands-Vieja Association, and consist of nearly barren dissected clay basins with hardly any soil development and very active geologic erosion. The use of this association for camping and related recreational activities is limited by the large and small stones and loose, clayey surface.

The remaining uplands within Big Bend National Park are in the Nickel-Conutio Association. The Nickel-Conutio Association consists of light colored, gravelly, calcareous soils on the undulating and rolling hills in the northeastern part of the Park and in the Black Gap Wildlife Management Area to Reagan Canyon.

The Ector-Lozier Association occurs from Reagan Canyon to Langtry. This association consists of dark and light colored, shallow, stoney soils on undulating to steep hills that occur within the canyon sections of the river. Included in the association are limestone rock outcrops as well as the talus covered slopes at the base of the rock outcrops. The soils of this association are subject to erosion when overgrazed or disturbed, and are slow to recover. Disturbance such as road construction paths and trails, strip mining, etc., in this association can potentially contribute to severe gully erosion.

#### MINING

Very little data is available on the mining and mineral resources of the river corridor under study; therefore, the mineral potential of the area is uncertain.

One active mining operation exists along the river. The DuPont Corporation obtains fluorspar from mines in Mexico with an ore processing plant located adjacent to the Rio Grande at La Linda, Coahuila. Fluorspar deposits have been mined in numerous areas in Mexico from San Vicente Mountain east to the Sierra del Carmen Range. No fluorspar deposits have been identified near or adjacent to the Rio Grande in the United States. Because of the occurrence of fluorspar in adjacent areas the potential exists that such deposits may be discovered along the river corridor.

According to Maxwell (1968) quicksilver or mercury production played a significant role in the development of the Big Bend region. Mining of the quicksilver ore, mostly cinnabar, began in 1896 primarily at the



*Fluorspar is mined and processed adjacent to the river at La Linda, Mexico and transported by truck across the Rio Grande for use in the United States.*

Chisos mine in Terlingua, approximately 30 miles northwest of the study segment. Until sustained mercury production ceased in 1946 the Terlingua mining district yielded about one-fourth of the total mercury production in the United States, and production has been renewed intermittently in recent years, depending on the economics of the mercury market. Some mercury production, primarily in the 1920's, came from the Mariscal mine located approximately eight miles north of Mariscal Canyon. This mine has long been abandoned. Presently there are no active mercury mining operations in or adjacent to the study area; however it is possible that future discoveries may be made.

Beds of coal are found in the Terlingua Creek area approximately 20 to 35 miles northwest of the study segment. Sub-bituminous-grade coal was mined 12 miles northeast of Terlingua and converted into producers gas for use as fuel in the mercury operation at Terlingua. No coal deposits have been identified within the confines of the study area.

The U.S. Geological Survey has indicated the presence of petroleum in Big Bend National Park; however, Maxwell states the following when discussing quicksilver ores:

"Some ores in the area (the Boquillas Formation, principally in the eastern and southeastern part of the park) contain small amounts of petroleum and there has been some small seepage of solid bituminous material from the adjacent rocks. Udden (1918) compared the occurrence of some quicksilver ores which are present at the crests of anticlines in porous limestones below impervious clay, with the accumulation of petroleum, which also commonly occurs in porous strata on anticlines."

No exploitable occurrence of gas or oil has been reported within the river corridor.

No sand and gravel extraction operations presently exist in the riverbed of the Rio Grande. Because of the international nature of the stream, the prohibition on channel modification, and the long distance from a significant market area, it is unlikely that sand and gravel extraction will occur in the study area.

#### CLIMATE

The climate is typical of the arid and semi-arid areas of the southwestern United States. Summer temperatures are high, often exceeding 100 degrees, and can be uncomfortable to the river user. Winter daytime temperatures are mild, but drop sharply at night. The average daily high is 102 degrees in July and 66 degrees in January, and rapid and wide changes in temperature may occur with the passage of cold fronts. Spring and fall temperatures are moderate and ideal for all forms of outdoor activity. Temperatures on the river are from 5 to 10 degrees higher than in the surrounding uplands.



Precipitation is low, generally averaging less than 9 inches per year. Most of the precipitation falls in thundershowers during the summer months, with about 60 percent occurring during the months of June through September. Heavy summer rains pose a definite hazard to river users due to the possibility of rapidly rising water levels and velocities. Relative humidity is low and normally averages 50 percent. The area receives abundant sunshine, averaging 78 percent of the possible.

#### FLORA AND FAUNA

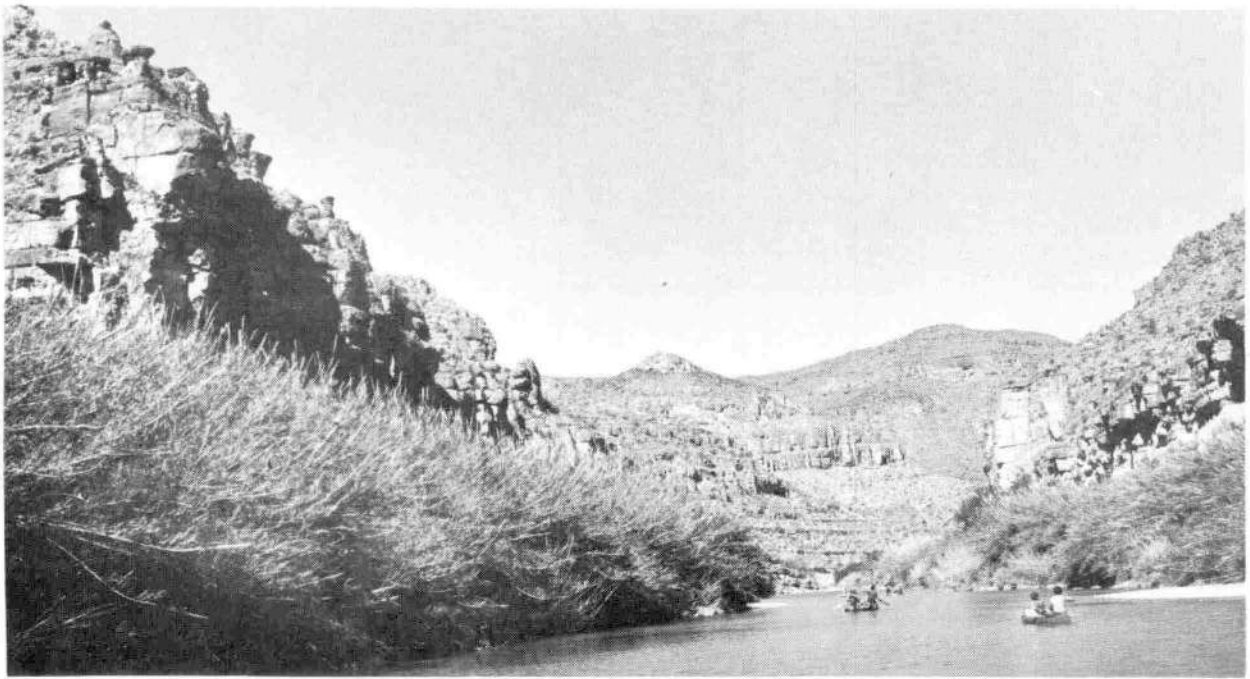
Flora - The study segment lies in the Chihuahuan Desert, one of the largest and most diverse deserts in North America.

Within the confines of the canyons are a number of distinct and yet integrated plant communities which constitute an area rich in species composition and uncharacteristic of the desert.

Growing along the river in a relatively continuous band and often forming an impenetrable green barrier are giant reed, common reed, seepwillow, southwestern blackwillow, buttonbush and sandgrape. In the lower one-third of the canyon elevation velvet ash, thicket creeper and poison ivy form a second wall of greenery. Between this wall and the talus slopes is a zone marked by Bermuda grass frequently interlaced with the reeds, grassburs, huisache, seepwillow, mesquite, tornillo, salt-cedar, tree tobacco and lotebush.

Progressing away from the river the vegetation of the talus slopes is the first which is truly characteristic of the desert. Among the more common plants are: lechuguilla, hechtia, sangre de drago, guayacan, blackbrush and catclaw acacia, lippia, Torrey croton, spiny hackberry, Gregg buckthorn, cloak ferns, Indian mallow, agarita, desert rue, myrtle croton, chino grama, lantana, lotebush, ephedra, ocotillo, ceniza, guayule, desert yaupon, candelilla, feather dalea, persimmon, creosotebush, javelina bush, resurrection moss, little-leaf sumac, wolfberry, ruellia, slim-leaf goldeneye, and sida and various cacti. Perhaps the most surprising aspect of the talus slope community is the remarkable variety of cacti to be found growing among the rocks. Several of the most common species are: tasajillo, blind pear, cobacactus, dog cactus, long-spined prickley pear, brown-spined prickley pear, button cactus, strawberry and devils-head cacti, spinemound cactus, pitaya, and fishhook cactus.

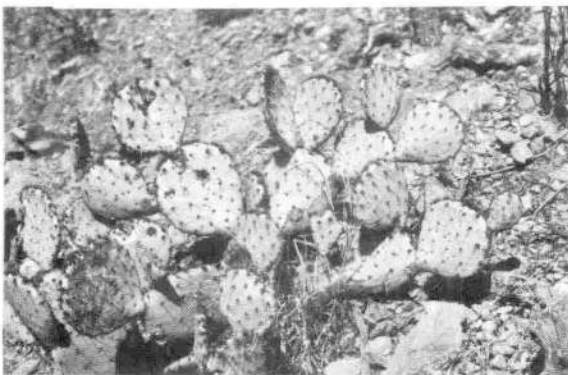
Cracks in the sheer walls of the narrow side canyons shelter a distinctive and in some cases unique plant community whose main components are: coyotillo, rock nettle, evergreen sumac, blackbrush acacia, trompillo, candelilla, Mexican buckeye, spiny hackberry, poison ivy and baccharis-leaf penstemon. Two rather special members of this community are cliff thistle and cliff bedstraw. Both are rare and endemic to limestone cliffs in the Trans-Pecos Region.



*The river is bordered for much of its length by a dense barrier of "river cane."*

*The study segment displays a wide diversity of plant life including:*

*spiny-fruit prickly pear*



*rainbow cactus*



*lechuguilla*



Narrower, more protected side canyons support a tremendous diversity of species. A sample of the more common species readily demonstrates this diversity: persimmon, Mexican buckeye, coyotillo, mountain laurel, sotol, Torrey yucca, soaptree yucca, Gregg ash, blackbrush acacia, Torrey croton, littleleaf leadtree, slim-leaf goldeneye, evergreen sumac, trompillo, Texas kidneywood, beebush, spiny hackberry, guayacan, wolfberry, redbud, catclaw acacia, cenizo, agarita, butterflybush, silktassel, lippia, lantana and meodora. Various cacti, ferns, grasses and annual wildflowers are also present.

Unfortunately, the uplands have borne the brunt of man's impact. Perhaps the best example of what the upland should look like can be found at the summit of Burro Bluff. Here chino grama and side oats grama are common; tanglehead prospers in wetter areas. Present also are hairy and red grama. Although grasses predominate, cacti and lechuguilla are still in evidence as are many of the typically desert shrubs and sub-shrubs such as allthorn, feather dalea, blackbrush acacia, creosotebush, yucca and ocotillo.

By contrast, the vast majority of the upland has been nearly depleted of all grasses save such hardy species as slim tridens, fluffgrass, falsegrama, and three-awns. The once desert grasslands are now of little or no economic value. The grasses have been replaced by tenacious brushy species such as ocotillo, yucca, and creosotebush. Much of the groundcover is composed of lechuguilla.

The ephemeral, short-lived, desert plants are frequently the most arresting feature of the desert. In the spring the riverbank is lined with the large but delicate flowers of the evening primrose. Talus slopes may be accented with the brilliant red of the Indian paintbrush, or with the delicate yellow or white of stickleaf mentzelia. Climbing snapdragon, Mexican navalseed or silky evolvulus accent most of the slopes. Many stark, dry flood plains can be startling sights when covered with thousands of flowering globemallows, twistflowers, dozedaisy's, desert baileya, or macheranths.

Several plant species in the area are recommended for further study as possible candidates for the Endangered or Threatened Species Lists in the Smithsonian Institution's "Report on Endangered and Threatened Plant Species of the United States (1975)." These species are Shiner's brickellia (Brickellia shineri), Cliff Thistle (Cirsium turneri), Boke's button cactus (Epithelantha bokei), cliff bedstraw (Galium correllii) and maravillas milkwort (Polygala maravillasensis). Emorya suaveolens requires further study to determine if it qualifies as Endangered or Threatened. Several additional species may be found upon more intensive investigation.

The study area represents a biological storehouse and contains an outstanding portion of the Chihuahuan Desert in Texas. The canyon environment is a biological refuge - the extent of which will be in doubt until and unless extensive studies are undertaken in the near future.

Fauna - The Rio Grande provides the water requirements for many forms of wildlife in a region where the occurrence of water is an exception rather than the rule. The river provides a natural corridor through rough, arid terrain and is a valuable resting area for many migratory bird species, as well as a permanent home for numerous wildlife species. In contrast to the arid, brush-covered slopes and cliffs vegetation along the river is usually lush and often forms a dense thicket; however, this habitat is frequently limited to several yards in width. Therefore, game birds and mammals are not plentiful on the river. Javelina, quail, mourning dove and white-winged dove are frequently observed. Only a few mule deer utilize the land adjacent to the river, probably due to illegal hunting (outside Big Bend National Park).

Signs of raccoon, bobcat, coyote, ringtail, gray fox, and striped skunk are commonly observed. The mountain lion (Felis concolor stanleyana) is rare in this area primarily because much of the land adjacent to the river is sheep country and man's utilization of this region often is contradictory to the welfare of this species. In spite of this conflict, this area is one of the last strongholds of the mountain lion in Texas and his welfare should be considered in all planning activities for the river. Beaver are abundant in the upper portion of the study segment. They decrease to an uncommon status about midway in the study area. This pattern is seemingly proportional to the density of willow, their major forage species and to the increased influence of man on the lower portions of the river segment under study. Small mammals are common in the hills and talus slopes adjacent to the river. Several species of bats are numerous along the river and their feeding habits can be observed each evening and morning.

The riparian corridor is heavily used by birds, especially as a stopover during migration. Numerous colonies of cliff swallows use the area, sometimes nesting in spectacular concentrations. Owls, hawks, falcons, and vultures are common residents. The calls of the canyon wren and black phoebe accompany the river user. Even though the river runs through excellent golden eagle habitat, there are few golden eagles for the same reason that there are few mountain lions. The osprey and sharp-shinned hawks utilize the river during migration. Red-tailed and sparrow hawks are abundant as the cliffs support eyries that are completely protected from predation. Prairie falcons are occasionally seen soaring along the cliffs. A few of the last remaining resident American peregrine falcons (Falco peregrinus anatum) in Texas frequent the cliffs along this section of the river. This endangered species feeds almost exclusively upon the abundant bird life. The American peregrine falcon is on the official list of Worldwide Endangered Fauna published by the Secretary of the Interior in accordance with provisions of the Endangered Species Act of 1973. Complete protection of the American peregrine falcon from disturbance should be a major factor in all decisions concerning riverway planning.

The Mexican wolf (Canis lupus baileyi), although not known to occur in the study area at the present time, has been found in northern Brewster County in recent years. The Mexican wolf is a candidate for the Endangered species list.

Poisonous snakes found in the study area are the black-tailed, western diamondback and rock rattlesnakes and the Trans-Pecos copperhead. Other snakes include the bull snake, Big Bend patch nose snake, spotted night snake, Texas glossy snake, Texas long nose snake and Trans-Pecos rat snake. The soft-shelled turtle and leopard frog are common in the aquatic habitat of the study segment.

There is an abundance of game fish, including bass and channel catfish. Also, river carpsuckers, carp, bullhead catfish, alligator and long-nosed gar are plentiful. Presently, this section of the river receives little fishing pressure, and only several hundred people fish the U.S. side annually. Channel catfish fishing is excellent in some stretches of the river, especially near the deeper portion when turbidity levels are low.

The endemic Big Bend mosquitofish (Gambusia gaigei) is found in an isolated pond adjacent to the flood plain near Rio Grande Village in Big Bend National Park. This fish is officially listed as Endangered.

Two fishes are definite candidates for the Endangered or Threatened list. The Chihuahua shiner (Notropis chihuahua) is known in the United States only in the Park, and occurs in the lower reaches of Tornillo and Terlingua Creeks. The bluntnose shiner (Notropis simus) may be extinct. If it still occurs, it will be found in the Rio Grande itself.

Three possible candidates for the Threatened list are found in the study area. The Mexican stoneroller (Campostoma ornatum) is a fish found in Alamito Creek, Presidio County, Texas, and in Terlingua and Tornillo Creeks within the park. The Concho River pupfish (Cyprinodon eximius) is known from Terlingua Creek above the study area but may occur in clear-flowing streams within the study area. Lastly, the Big Bend turtle (Pseudemys scripta gaigeae) is found from Big Bend National Park eastward approximately to Laredo and south of the Rio Grande in several waterways of Mexico.

Several problems exist that adversely affect wildlife on this portion of the Rio Grande. Over-grazing on both the American and Mexican sides is a continuous problem that must be resolved. Presently some of the riparian vegetation is being burned and heavily grazed. If this practice becomes extensive, some wildlife species will be reduced in proportion to the deterioration of their required habitat. Watershed deterioration, increased siltation, soil loss, run-off into the Rio Grande, and the destruction of wildlife habitat are unavoidable consequences unless conservation measures are undertaken.

# Socio-Economic Characteristics

## POPULATION AND ECONOMY

In 1970 nearly 232,000 people lived within 150 miles of the study area and approximately 1,500,000 were within 250 miles (United States only). As shown in the following table, the urban river user must travel significant distances to reach the Rio Grande.

Table 5

Distances and Driving Time From Texas Metropolitan Areas to the Rio Grande\*

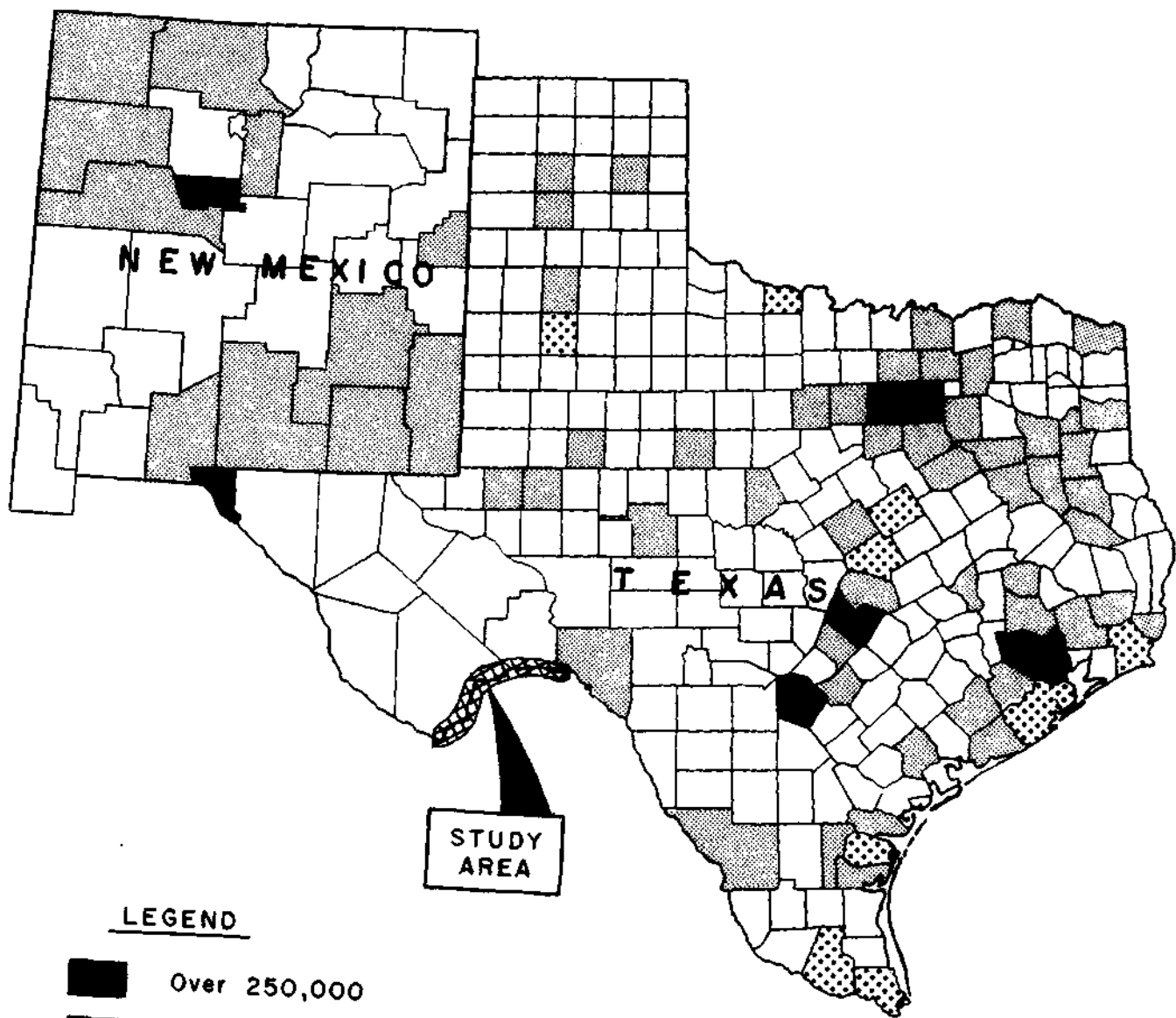
<u>Area</u>	<u>Population</u>	<u>Distance (Miles)</u>	<u>Approximate Driving Time (hours)</u>
Odessa	78,000	222	4:00
El Paso	322,000	329	7:00
San Antonio	654,000	406	8:00
Austin	252,000	474	9:00
Dallas	844,000	559	11:00
Houston	1,233,000	603	12:00

\* Distance to park headquarters, Big Bend National Park.





The study area lies in three counties, Brewster, Terrell, and Val Verde. Brewster County is the largest county in Texas containing a land area approximately equal to the States of Connecticut and Rhode Island. Population in 1970 was 7,780, of which nearly 6000 live in the county seat of Alpine. Median family income for Brewster County in 1970 was \$5,643, compared to median family income of \$8,490 for the State of Texas. Primary components of the economy are ranching (cattle, sheep, and goats), tourism, retirement developments, hunting leases, and Sul Ross State University. Nearly five percent of those employed work directly for Big Bend National Park.

Terrell County had a 1970 population of 1,940, of which approximately 1200 persons live in Sanderson, the county seat. The county has had a steadily declining population, from a high of over 3000 people in 1950 to the current figure. Median family income was \$6,577 in 1970. The primary business is cattle, hogs, sheep and goat ranching.

Val Verde County has experienced a population increase to nearly 27,500, and can be expected to expand still further due to the drawing power of the recently completed Amistad Reservoir. Median family income was \$6,472 in 1970. The county economy is based on tourism, Federal military installations, and sheep, cattle, goat, and poultry operations. Val Verde County is the leading sheep producing county in the United States.



**LEGEND**

-  Over 250,000
-  100,000 - 250,000
-  25,000 - 100,000
-  Below 25,000

0 50 100 150  
SCALE IN MILES

**POPULATION DISTRIBUTION  
BY COUNTY**

Rio Grande Wild and  
Scenic River Study

DATA SOURCE:  
U.S. Bureau of the Census

## LAND USE

The major land use categories shown in Table 6 are based on a corridor one mile wide on the United States side of the Rio Grande from River Mile 842.3 to Langtry, Texas. Land use is shown for 1963 and 1973 in order to indicate possible trends.

Land Use - Table 6\*

<u>Use</u>	<u>Acreage</u>		<u>Per Cent</u>	
	<u>1963</u>	<u>1974</u>	<u>1963</u>	<u>1973</u>
Ranching	59,600	39,000	55	36
Residential	40	40	--	--
Wildlife**	22,735	41,165	21	38
Recreation	1,080	3,250	1	3
Big Bend National Park	<u>24,915</u>	<u>24,915</u>	<u>23</u>	<u>23</u>
Total	108,370	108,370	100	100

\* Data were obtained from rancher interviews and ranch plans developed by the Soil Conservation Service of the Department of Agriculture

\*\* Includes 15,155 acres of the Black Gap Wildlife Management Area

The trend along the corridor is toward more lands available for wildlife purposes and recreation and the reduction of the number of acres devoted primarily to ranching.

Ranching - This is defined as the use of land primarily for livestock grazing, including small irrigated pastures that are grazed. Lease hunting of deer, antelope, javelina, quail, and doves is prevalent, but ranching is the dominant use. Cattle and sheep are the most common types of domestic grazing animals found in Brewster, Terrell, and Val Verde counties. The river canyons upstream from San Francisco Canyon are seldom used by domestic livestock for grazing or water. Concentrated livestock grazing on both sides of the river is more evident in the lower reaches of the study segment. All of the areas used for ranching are leased for deer hunting during the hunting season.

Ranching has had the largest historical effect on the study area. The present vegetation along the Rio Grande differs greatly from the highly developed plant communities which once characterized the area. Retrogression probably began with the first heavy grazing by domestic livestock of early Spanish settlers. A subsequent history of continuous, heavy grazing, associated with droughts and the harsh environment of the area, contributed to continued deterioration of the original vegetation and gradual replacement by the present vegetation.



Stocking rates for cattle on a given site generally vary according to fluctuation in annual forage production and direction of plant succession. Stocking rates may vary from 3 to 20 animal units per section on the more productive soils, or from 1 to 6 animal units per section on the low producing, shallow, upland soils.

Plant succession is very slow in the desert climate along the Rio Grande. There are various range management alternatives that can be used to accelerate plant succession. Sound grazing management practices such as proper grazing rates and long deferment periods are essential to improving and maintaining higher stages of plant succession. Complete exclusion of grazing, in most instances, would probably not significantly improve vegetative conditions over that under sound conservation grazing management.

Residential - The residential areas include Langtry, Texas with a population of about 136, and a housing area for employees of the DuPont Company in the United States across from the DuPont La Linda Mill in Mexico. Recently some ranches have been sold to development corporations for subdividing or second home development; however, no development has begun at this time. Cabins used temporarily by ranch workers or hunters were not considered residential for purposes of the land use tabulation. As land values increase due to development potential ranch sales and fragmentation can be expected to increase.

Wildlife - Acreage contained in the wildlife land use category is used exclusively for big game and other forms of wildlife; hunting is allowed seasonally. Such areas are not used for livestock grazing. Acreage figures include 15,155 acres contained in the Black Gap Wildlife Management Area. Due to the availability of fish and wildlife and the ruggedness of the lower canyons of the Rio Grande, many landowners have developed fish and wildlife related recreation areas as primary or secondary land uses. In several areas primitive fishing and hunting camps have been constructed on or near the Rio Grande. The success of these hunting and fishing areas in the past three to six years has caused a significant land use change from ranching to wildlife. Possible explanations for this change include the increased value of hunting and fishing leases in comparison to returns from normal ranching operations, and the greater number of absentee landowners without the ability or desire to operate and manage a ranching operation.

Recreation - These areas include the narrow flood plains along the Rio Grande used for fishing, camping and boating activities.

Big Bend National Park - This area is not used for livestock grazing nor is hunting allowed. Land use in the Park is primarily resource protection and development for public recreation use.



Major public landholdings include Big Bend National Park and,



the Black Gap Wildlife Management Area.

## LAND OWNERSHIP

Table 7 shows the current landownership occurring in the Rio Grande study area, based on a corridor one mile wide on the Texas side.

Table 7

<u>Ownership</u>	<u>Acres</u>	<u>Percent</u>
State of Texas	18,400	17%
Federal Government	25,185	23%
Private	63,735	59%
Unknown	<u>1,050</u>	<u>1%</u>
Totals	108,370	100%

The land owned by the State of Texas is controlled by two governmental agencies. The Texas Parks and Wildlife Department's Black Gap Wildlife Management Area has about three-fourths of the State administered land under its jurisdiction. This area is utilized for wildlife research purposes. A narrow band of river frontage through the Management Area has been developed to include fishing shelters which are open to the public. The remaining State lands within the corridor are administered by the Texas General Land Office. These are leftover lands that were either never sold or that have reverted back to the State for various reasons. These tracts of land range from 100 to 600 acres in size and are scattered along the river in Brewster and Terrell Counties. About 50 percent of the tracts are leased by adjacent landowners for grazing purposes. The remaining 50 percent is either inaccessible or not suitable for grazing purposes, which has been the only feasible use for this land. Currently very little management or control over these lands is being exercised by Texas and they are often difficult to locate or inspect.

Federal lands along the river are primarily under the control of the National Park Service at Big Bend National Park. The other federally owned land is a 270 acre lineal strip along the river upstream from Langtry. This land is administered by the International Boundary and Water Commission in conjunction with Amistad Reservoir and is principally contained within steep canyon walls. Approximately 710 acres of streambed are in Federal ownership and nearly 1375 acres are in State ownership.

Presently, only 41 private landowners are found along the study segment in the United States. Over 50 percent are absentee owners and the number of absentee owners has increased significantly since 1960. A trend toward fragmentation of large land holdings and possible speculation is evident. Such fragmentation is shown in the change from 25 landowners in 1960 to the current 41 landowners in 1973, an increase of 64 percent. It should be noted that four large land transactions took place between 1970 and 1973.

Due to a lack of precise surveys about one percent of the study area shown on available maps has been unclassified. This land has either been declared nonexistent or in conflict and has been removed from the county tax roles with State approval, or is carried on an unrendered role.

### ACCESS

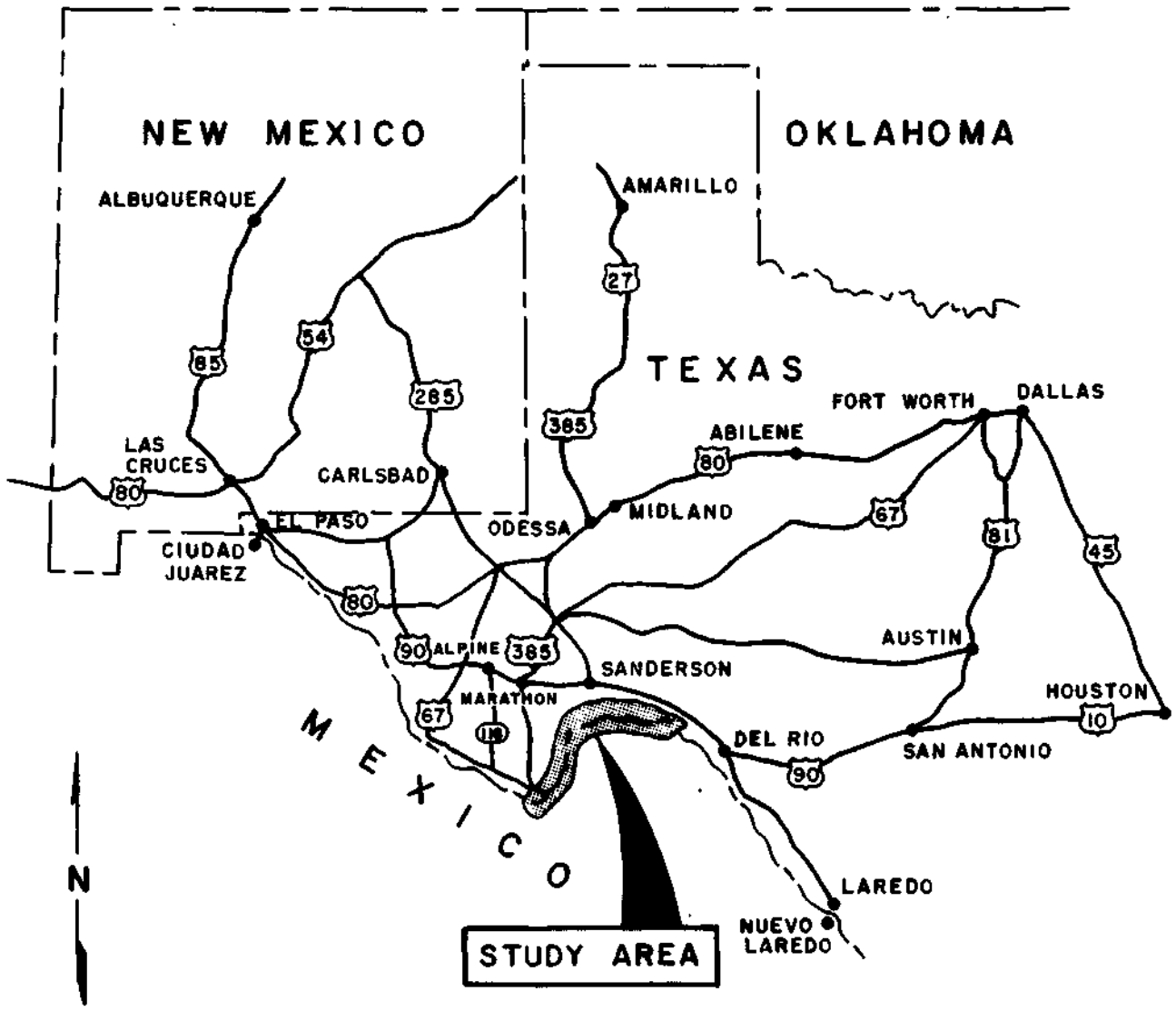
Regional Access - Access to the sparsely-populated Big Bend Region of Texas is limited. The only major east-west highway in the region is U.S. 90, which is located 15-75 miles from the study segment. The major north-south routes include U.S. 335, which terminates in Big Bend National Park, U.S. 67, ending at Presidio, and Texas Route 118 which terminates near the northwestern boundary of the National Park at Study Butte. The only other paved roads of significance in the Big Bend region are Ranch Roads 170, 2810, 169, and 2627. Primary access to and circulation within the region is by private automobile. The nearest major airport at which commercial flights are available is in the Midland-Odessa area, over 200 miles from the study area. General aviation facilities are found at small airports near Del Rio, Alpine and Marfa. Railroad (Amtrack) and transcontinental bus service is available to Del Rio, Alpine and Marathon.

The Government of Mexico is presently constructing a high standard road between Boquillas, located 22 miles southeast of Big Bend National Park headquarters, and Musguiz, a town 130 miles into the Mexican interior. This new route will provide access from the Big Bend Region to the interior of Mexico.

Access to the River - Because of the rugged nature of the study segment, public access is extremely limited. No major roads or railroads parallel the river and only one bridge, a private structure at La Linda, Coahuila, crosses the 191 miles of river under study. Two paved roads reach the river, one at Rio Grande Village in Big Bend National Park and the other, Ranch Road 2627 at La Linda.

Access is provided to the river on unimproved roads, often passable only by four-wheel drive vehicle, at several points in Big Bend National Park. Such roads in the Park are seldom patrolled, are often closed during stormy weather, and a park permit must be obtained for overnight use along the roads. The unimproved River Road, passing through the southern end of the Park from near Rio Grande Village to Castolon, provides access to seven fishing camps along the study segment.

An unimproved road provides access to the river in the Black Gap Wildlife Management Area. This road serves 25 fishing camps provided by the Texas Parks and Wildlife Department. This route is appropriate only for high-clearance or four-wheel drive vehicles.



**REGIONAL TRANSPORTATION NETWORK**  
 Rio Grande Wild and Scenic River Study



*A primitive road leads to the river in the Black Gap Wildlife Management Area.*



*A few unpaved private ranch roads lead to the rivers edge.*

## RECREATION FACILITIES AND USE

Existing recreational use of the study area outside of Big Bend National Park is minimal. Until recently very few people were aware of the recreation potential of the Rio Grande downstream from the Park. Before 1965 it is probable that fewer than 100 people had canoed or rafted the "lower canyons" (estimate by Texas Explorers Club). In the mid 1960's this area became better known through the activities of Texas conservation organizations and through articles in national publications. With recognition of the area's potential, recreational use has increased. It is estimated that 200 to 300 people floated the lower canyons in 1973. Only 130 canoeists registered at the Black Gap Wildlife Management Area, the major access to the lower canyons. The remaining river users gained access across private land.

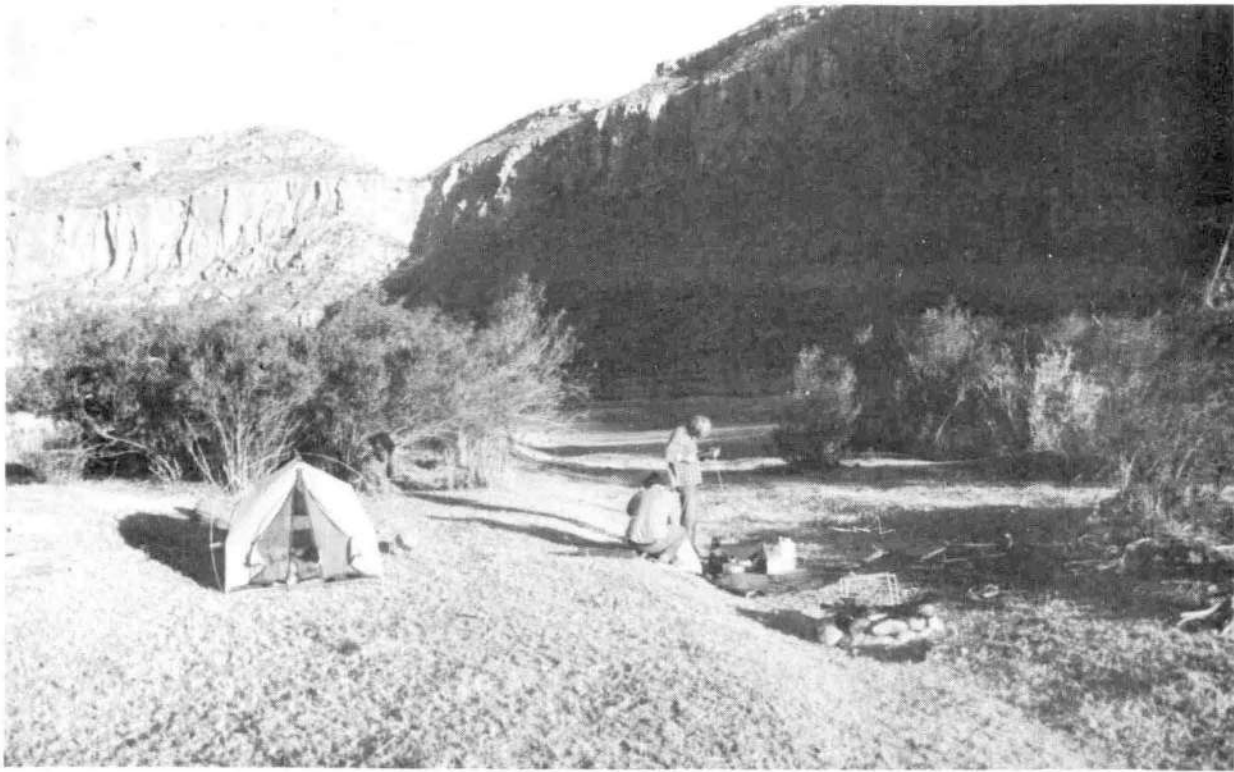
The number of people who obtained permits for float trips in Big Bend National Park increased from 3996 in 1969 to 4850 in 1973, an increase of approximately 22 percent. Based on increases in recreation use noted at other recently established wild and scenic river areas (1968 to present), a large, though undefinable, increase in use is expected along the Rio Grande. Such increases at other river areas are attributed to national attention and publicity given to components of the National System and the additional public access and facility development provided.

An early task when detailed planning is initiated by the agencies responsible for administration will be to identify levels of use which will not jeopardize the values which enabled the river to qualify for inclusion in the National System.

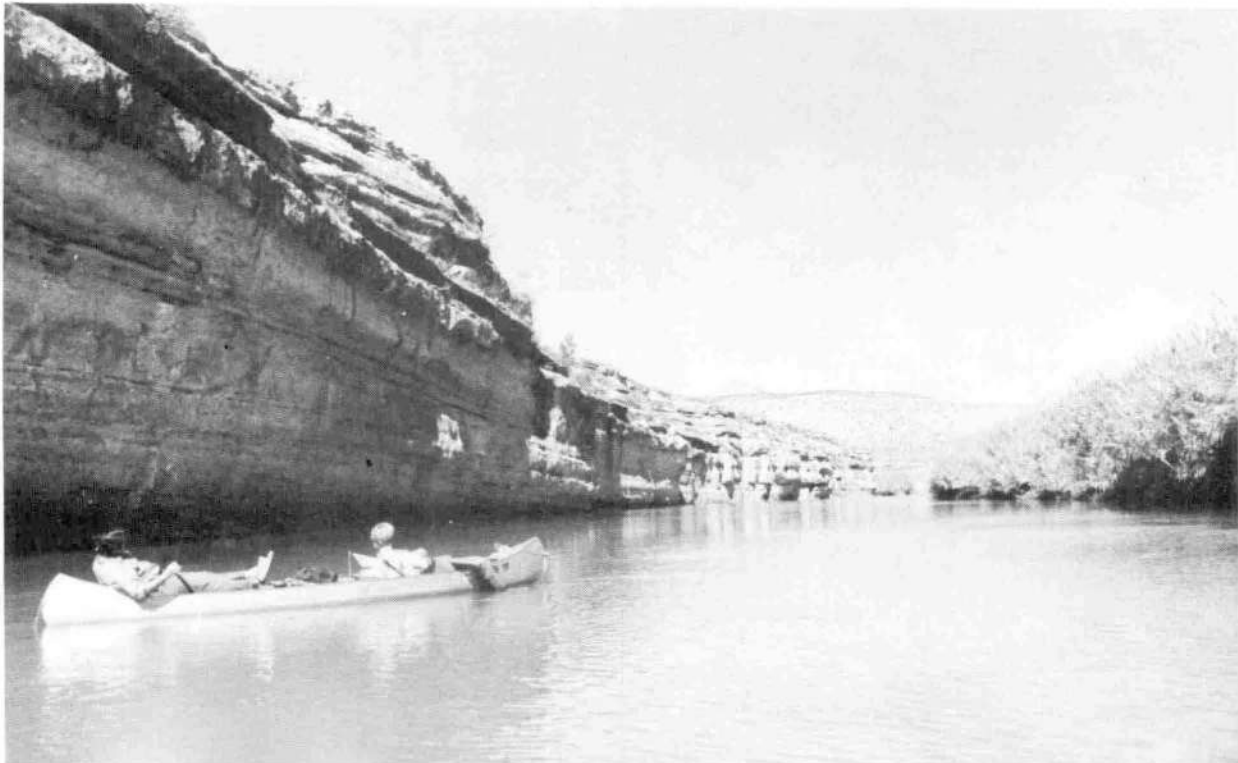
Although most of the developed recreational facilities in the area are confined to Big Bend National Park, a number of minor recreational facilities are present further downstream. A general description of each recreational facility located in the vicinity of the study area is provided.

Big Bend National Park - In order to preserve an area with outstanding natural and cultural qualities, the citizens of the State of Texas purchased the southern portion of the Big Bend country and deeded it to the Federal Government. This area was authorized as Big Bend National Park in 1935 and officially established in 1944. Prior to 1944 a portion of the area was known as Texas Canyons State Park.

Presently the Park includes over 708,000 acres of both lowland Chihuahuan Desert and mountain scenery, and is the only National Park which contains an entire mountain range, the Chisos Mountains. The Park also includes spectacular scenery and geologic features and possesses an outstanding array of Southwestern flora and fauna.



*Recreational use of the Rio Grande*





Recreation facilities on or near the river in Big Bend National Park are found primarily at Rio Grande Village. This complex is open all year and includes a 99 site Type A campground (sites have a parking space, grill, picnic table, and access to sanitary facilities and potable water supply), a group campground, a 24 space trailer village, picnic area, general store and service station, and a self-guided nature trail. A primitive road traverses the southern end of the park and at several points provides access to fishing camps provided by the National Park Service. Seven such fishing camps are found along the study segment. Other river-related recreation facilities include the Boquillas Canyon Overlook and a short trail into Boquillas Canyon.

It is estimated that about three-quarters of the park visitors are Texans. Visitation at Big Bend National Park has increased significantly as shown in Table 8.

Table 8

<u>Calendar Year</u>	<u>Visitors</u>
1967	173,000
1968	192,000
1969	200,000
1970	173,000
1971	247,000
1972	290,000
1973	341,000

The National Park Service has recommended that 533,900 acres within Big Bend National Park be added to the National Wilderness Preservation System and that an additional 25,700 acres be designated as potential wilderness additions. Two of the units proposed for wilderness designation are adjacent to the reach of the Rio Grande under study; a 22,100 acre area which includes seven miles of the north side of Mariscal Canyon, and an elongated wilderness unit of 131,000 acres which encompasses the United States portion of Boquillas Canyon. The President and Congress of the United States are expected to take action on the subject proposal in the near future. Wilderness designation will complement any river protection programs proposed on the study segment.

Black Gap Wildlife Management Area - Black Gap is operated as an experimental wildlife management area by the Texas Parks and Wildlife Department. The unit consists of 102,258 acres of which 75,885 acres are owned by the State and 26,373 acres are leased. Special studies concerning various species of wildlife are conducted, including a study designed to re-establish desert bighorn sheep in Texas.

The management area is not specifically for use by recreationists; however, 25 partially enclosed and covered shelters and barbecue pits are provided. Black Gap has close to 22 miles of riverfront which are available to fishermen. Approximately 250 miles of unimproved roads interlace the management area and provide limited access to the

river at various places. A primitive road follows the river for approximately 12-18 miles from Maravillas Creek to Horse Canyon and provides access to the fishing and camping shelters located along the river. All activities of recreationists are strictly monitored to prevent interference with wildlife management activities. Recreationists must register at the headquarters and are requested to restrict their activities to within 300 yards of the river and to the roads. Yearly visitation figures of recreationists for the period from 1968 to 1972 are shown in Table 9.

Table 9

	<u>Fishermen</u>	<u>Campers</u>	<u>Canoeists</u>
1968	389	27	-
1969	661	34	-
1970	846	69	-
1971	902	101	20
1972	1000	450	106
1973	1378	249	130

Amistad Reservoir - The recreational facilities on the United States side of Amistad Reservoir are administered by the National Park Service. Two developed areas are presently being utilized extensively. Visitation figures for these two areas are as follows:

<u>Diablo East Recreation Area</u>		<u>Rough Canyon Recreation Area</u>	
1971	388,395 visitors	1971	71,858 visitors
1972	305,268 visitors	1972	156,376 visitors
1973	233,603 visitors	1973	146,100 visitors

The Diablo East Area has primitive camping sites available. The Rough Canyon Area has no public camping facilities; however, a private campground is in operation near the area.

Seven future developed areas on Lake Amistad are presently in the planning stages. Presently these plans are tentative. Developed areas are planned both in the Langtry area and near the confluence of the Pecos River with the Rio Grande. In addition, three commercial campgrounds are found near Amistad Reservoir, all of which are located in the vicinity of U.S. Highway 90.

Langtry - This is a small town in Val Verde County and is the terminus of the study area. A dirt road leads to within one-fourth mile of the river at Langtry and canoes may be carried up a hill to this road. In addition, two trailer parks in Langtry have facilities for camping. Also present in Langtry is the Judge Roy Bean Visitor Center operated by the Texas Highway Department. The visitor center has proven to be very popular, as indicated by the following yearly visitation figures:

1969	67,363 visitors
1970	74,992 visitors
1971	76,388 visitors
1972	92,612 visitors
1973	102,817 visitors

Private Areas - John's Marina is located on the Rio Grande south of Dryden and may be reached via an unimproved dirt road. This is a fishing camp and no facilities are provided, although an area for primitive camping is available. Other landowners along the study area have unimproved dirt roads which go down to the river. Permission may sometimes be obtained to gain access to these roads and the river.

Of special importance are the numerous private hunting and fishing leases which are found in the study area. Ranch lands are leased for hunting purposes primarily in two manners, a day-hunt lease or a yearly lease. Under a day-hunt lease, reservations are usually needed, fees are charged on a daily basis, and the hunter must check in and out with the landowner. In some cases an additional fee is charged for game taken. A yearly lease gives the lessee exclusive hunting rights on a specific parcel of land throughout the appropriate season. Because of the greater cost of a yearly lease such agreements are often used by hunting clubs or groups of individuals. Fishing leases are established in the same manner as hunting leases. Hunting and fishing leases have encouraged the construction of fishing and hunting camps near the Rio Grande. In some cases the landowner can obtain a greater monetary return from leases than from normal ranching operations; therefore, an increase in this activity is expected.

### Recreation Potential

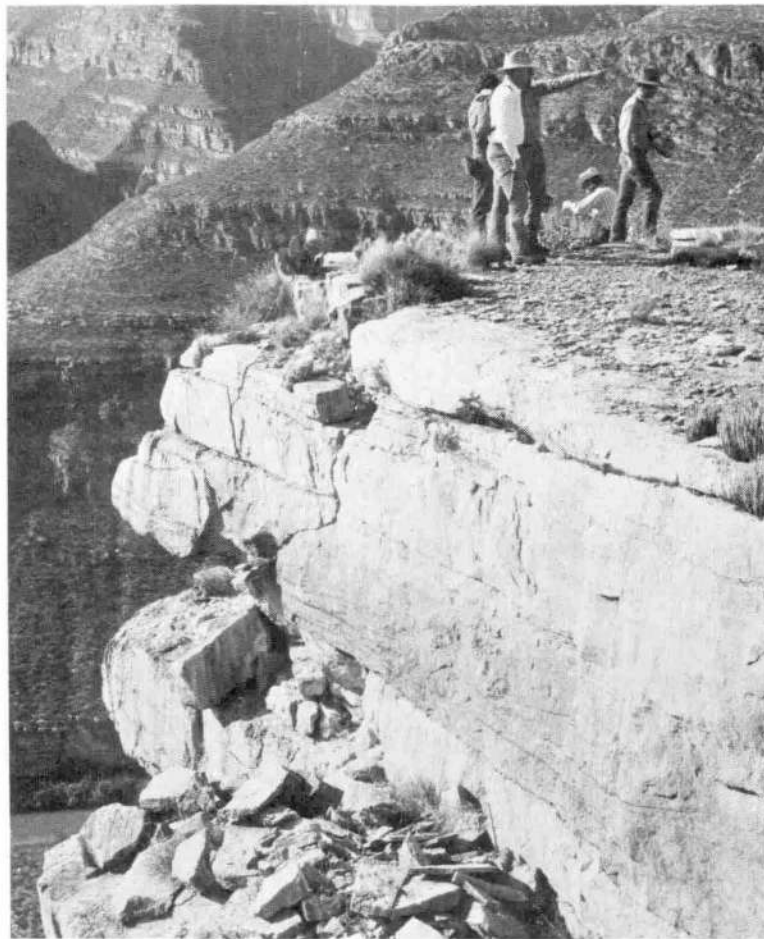
Limiting Factors - The recreation potential of the Rio Grande is limited by several factors. Due to the relative isolation of this section, and the rough and rugged terrain, access and development for recreation use is restricted. In addition, the study area is removed from major metropolitan areas so that it is normally only those recreationists seeking a primitive experience who are attracted to the area.

The Rio Grande during some periods is highly turbid, containing many suspended particles which give the river a very murky and muddy appearance. Rises in water levels and subsequent turbidity are not normally conducive to water contact sports, with the exception of float trips. The potential for danger on float trips is greater when water levels are high due to increased water velocities and the presence of more exciting yet dangerous rapids and waterfalls. The extreme isolation of this section of the river presents a very serious problem for persons who might incur injuries.

Fishing is also limited by the high turbidity of the river. Suspended particles in the water do not create ideal circumstances for most species of game fish; therefore, fishing is mostly limited to catfish, bass and various species of rough fish.



*The challenge of whitewater and,*



*the opportunity to explore a primitive environment.*

Lack of communications with river users in the Rio Grande canyon makes early warning of flash floods nearly impossible. River users must observe caution in the main river area in the immediate vicinity of and below larger tributaries, and be cautious of selecting campsites in the tributary canyons. Recreationists planning to float the river should check in at appropriate entrance points and obtain information on flow conditions and possible hazards.

Opportunities - The Rio Grande has numerous recreation potentials and opportunities. Numerous archeological and historical sites are present, both of which are major attractions to recreationists. Many caves, showing signs of past human habitation and numerous unique biological and geological formations offer enticement for exploration. Rock collectors and climbers are also attracted to the area, and the outstanding natural qualities of the land have great potential to increase human knowledge through scientific study.

Although the quality of fishing is occasionally limited by the high turbidity of the water, ample opportunities for fishing are present, as evidenced by the visitation figures of fishermen to Black Gap Wildlife Management Area. The study area has potential for establishing a limited number of quality camping areas in keeping with the primitive character of the river. The relative absence of any type of quality deterrents, except at high water levels, is highly favorable for recreational use.

Existing uses of adjacent lands complement recreational use of the river corridor. A large portion of the study area is presently under public ownership and control, and the section contained within Big Bend National Park is already dedicated to recreational use. In addition, isolated sections of land are owned by the State of Texas and are administered by the General Land Office. These lands could possibly be obtained for riverway protection and recreation purposes. The remainder of the lands bordering the study area are owned by private landowners and ranching activities predominate. Presently these ranching activities are not greatly disturbed by recreational use on the river. Recreational usage is largely restricted to the river and its canyons, thus allowing normal ranching activities to proceed on the uplands. However, should a riverway program be established, it is essential that river users be informed of possible conflicts with ranching operations and that programs be established to minimize such conflicts.

An outstanding asset of the Rio Grande is its scenic qualities. The river has cut magnificent canyons from the face of the desert. These canyons are spectacular, and tributaries have carved side canyons which offer extraordinary opportunities for exploration of the rugged environment adjacent to the river. The many caves, "pour-offs," water sculptured rocks and botanical and geological displays provided by the tributary canyons are an important facet of the recreational opportunities afforded by the Rio Grande. Numerous rapids have been formed which provide excitement and challenge for even the most experienced river runners. A few of these rapids require a portage, even at normal water levels.

## HISTORY AND ARCHEOLOGY

History - The history of the study area has been affected by Indian, Spanish, Mexican, and American influences.

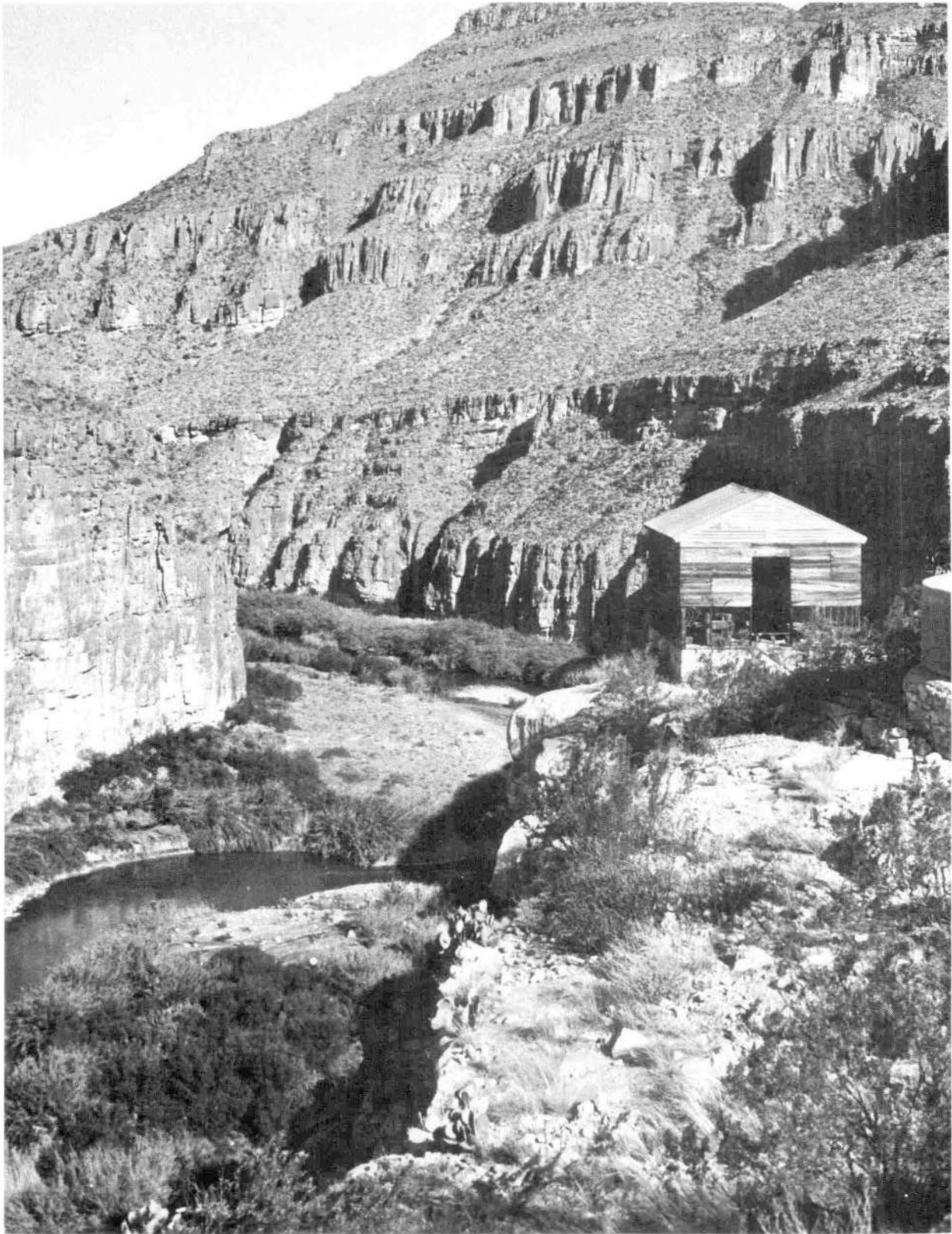
Long before Europeans were aware of the Rio Grande-Big Bend country it was inhabited by Indian groups practicing agriculture and living in caves and, in subsequent periods, pit houses. Later, the area was the home of various tribes of Eastern Apaches. After the decline of the Spanish "presidio" system in the mid 1800's, the Indians became especially aggressive. Noteworthy, in this regard, were the Comanches who raided throughout the Big Bend Country and into the northern Mexican states of Coahuila, Chihuahua, and Durango. The Comanche Trail, the route used on such raids, crosses the study area near the Brewster-Terrell County line and just west of Mariscal Canyon.

The first European to pass near the study area was Alvar Nunez Cabeza de Vaca, a Spanish explorer, who crossed the Big Bend area in the early 1500's. Spanish influence increased throughout the area in subsequent years as a result of increased exploration, and the establishment of missions and "presidios," or forts, along the Rio Grande. One such fort, The Presidio de San Vicente, was built in 1774 approximately 10 miles upstream from Rio Grande Village. Today all that remains of the Presidio are ruins.

Until the war between Mexico and the United States in 1846 involvement of Americans in the history of the study area was minimal. However, several events took place which changed the pattern of authority on the Rio Grande. The Republic of Texas was successfully formed in 1836 and entered the Union in 1845. Disagreement over the western boundary of the new state soon resulted in war with Mexico. In 1848 the Treaty of Guadalupe Hidalgo established the center of the deepest channel of the Rio Grande as the international boundary from El Paso to the Gulf of Mexico.

Grazing history along the Rio Grande dates back to the early Spanish missions established between 1670 and 1690. These Spanish missions had become major centers of livestock concentration by 1700. Historical records indicate that by 1900, some U.S. ranges, and certainly those along the Rio Grande, had already been subjected to 200 years of continuous, heavy grazing. As grasses were depleted the desert lands increased.

A unique facet of the continuing Rio Grande history is woven around the use of the candelilla plant (*Euphorbia antisyphilitica*) for the production of wax. Used first in the early part of the 20th century in sealing wax, electric insulations, and ammunition water-proofing, its importance continues today as an ingredient of polishes and chewing gum. Candelilla wax is obtained by boiling the plant in a solution of water and sulphuric acid. Mystique surrounds the operation since the government of Mexico



*Asa Jones Waterworks*

utilizes a quota system in production and sale while no such controls occur in the United States. Vats and other evidences of the Candelilla operations are found throughout the study area.

An excellent example of an abandoned candelilla operation is the Asa Jones Waterworks, located near the confluence of Arroyo San Rosendo. Asa, a local rancher during the first half of the century, constructed a device to haul water from a spring at the river's edge to the top of the cliff. Two series of pipelines between pumping stations carried the valuable water to a holding tank almost 1,000 feet above the river. Other watering tanks located throughout the ranch were supplied from this one. A candelilla wax camp, complete with vats and other ruins, still lies adjacent to the holding tank at the top of the cliff. Few sites attest to man's ingenuity like this pumping operation.

Another site of historical interest is Burro Bluff, rising more than 1200 feet in a sheer cliff directly above Upper Madison Falls. At the downstream side of the bluff is an old trail built there by cattlemen for access to the Texas side of the river. This trail, the "Schubbach Trail," like Asa Jones Waterworks, attests to the frontier ingenuity evident in the lower canyons.

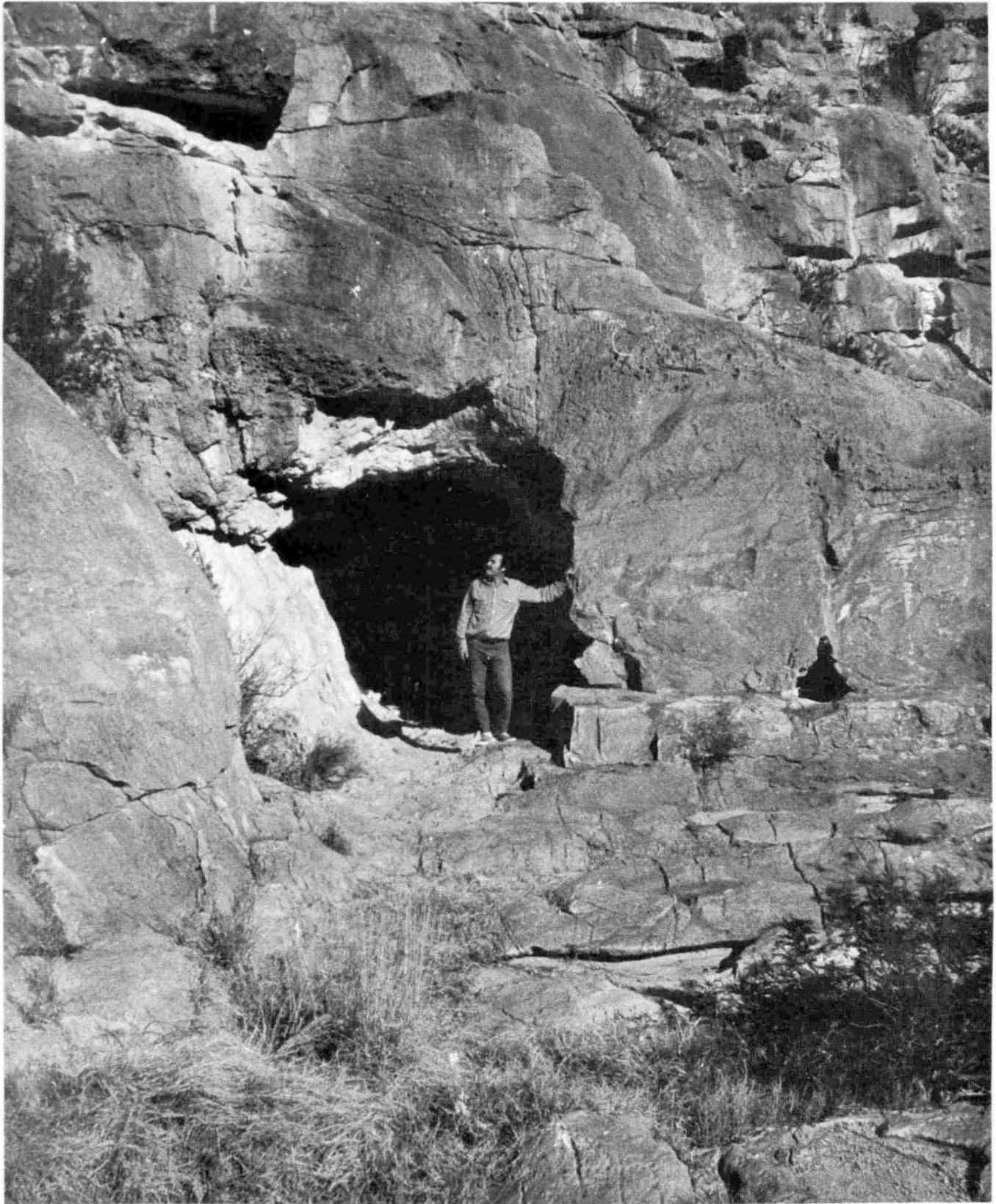
The historical resources of the study area, from the Indian and Spanish presence through the boundary survey and the candelilla operations, are significant. These resources plus the existence of Mexico on one side of the river greatly enhance the experience of the river user. Future planning for the riverway will identify and nominate where appropriate significant cultural resources to the National Register of Historic Places in accordance with Executive Order 11593.

Archeology - The canyons and bluffs of the Rio Grande and its tributaries contain numerous archeological sites. Archeological studies at Amistad Reservoir and in Big Bend National Park have established sequences of prehistoric habitation.

Occupation began with Paleo-American big game hunters, possibly as early as 10,000 to 12,000 years ago. Hunting-and-gathering groups of the Archaic stage ranged through the area from about 6,000 B.C. to 500 A.D. The Neo-American stage began sometime after 500 A.D. with the introduction of the bow and arrow and a slight shift in the way of life. Hunting-and-gathering continued as the mode of subsistence for the Neo-American Indians.

At the time of European contact the area was occupied by Coahuiltecan Indians who ranged through the area in small bands. After departure of the Coahuiltecan Indians, Apache Indians occupied the area. Basically, then, this area was occupied for thousands of years (from 6,000 B.C. to 500 A.D.) by people of the Desert Culture tradition, whose subsistence was based on hunting and gathering wild plant foods.





*The canyons of the Rio Grande contain numerous archeological sites.*

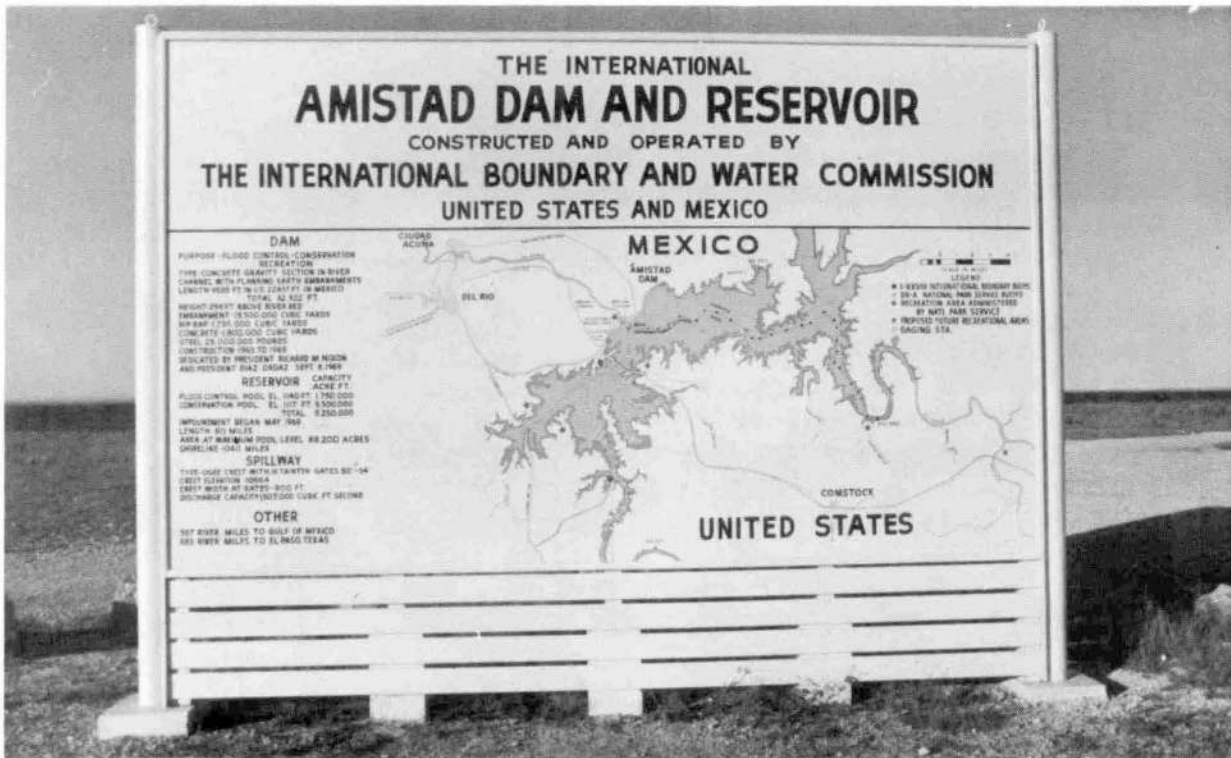
Rock shelters are common in limestone cliffs along the Rio Grande, and some were used for thousands of years. Cultural deposits in these sites are often several feet thick, and occasionally contain artifacts representing all cultural stages. Because of the dry environment of many of the rock shelters, an abundance of perishable materials are preserved in them. Such items as sandals, cordage, matting, quids, and wooden implements such as fire drills and arrow shafts give a rather complete picture of the material culture of the prehistoric occupants. Mortars and metates found at rock shelters and open sites indicate seed grinding activities, while projectile points commonly found reflect the importance of hunting. Many pictograph sites have been recorded and studied in this portion of the Rio Grande. Open sites are common also and consist of campsites and burned rock or midden sites. The abundance of ring middens or sotol pits illustrates the importance of sotol and lechuguilla as a staple food.

The study area contains numerous historical and archeological sites which constitute a non-renewable source of retrievable data concerning man's presence in the river basin over the last 10,000 years. The Texas Historical Commission has recorded more than 100 sites in the area. Unlike the majority of sites found along other sections of the river which have been subjected to various destructive forces, many sites in the study area are undisturbed, thus enhancing their value as interpretive data sources for archeologists, paleobotanists, geologists, and ultimately the general public. Increased recreation in this area will result in increased vandalism and destruction of scientific values of many of the sites. Steps should be taken to initiate an archeological study and to protect and interpret the wealth of archeological resources found in the area. Archeological resources should be nominated to the National Register of Historic Places in accordance with Executive Order 11593.

#### EXISTING PLANS AND PROGRAMS

The Wild and Scenic Rivers Act requires that river studies authorized by the Act be coordinated with any water resources planning involving the same river which is being conducted pursuant to the Water Resources Planning Act. Presently, no such planning effort is taking place on the study segment.

The only potential water resource project is a storage dam authorized by the 1944 Water Treaty. This treaty provides that three storage dams shall be constructed in the following reaches on the Rio Grande - Santa Helena Canyon to the Pecos River, Eagle Pass to Laredo, and between Laredo and Roma. The subject treaty further states that, "One or more of the stipulated dams may be omitted, and other than those enumerated may be built, in either case as may be determined by the Commission, subject to the approval of the two governments." Falcon Dam was placed in operation in 1953 and is in the Laredo to Roma reach of the river. Amistad Dam began operation in 1968 and is located between the first two treaty mentioned reaches of the Rio Grande. The studies by the two governments preceding selection of the Amistad site included consideration of 45 dam sites between Del Rio and a point 7 miles upstream of Lajitas, Texas. The Amistad site was selected because of its strategic location below the confluence of the Pecos and Devils Rivers, the sources of the largest recorded floods on the Rio Grande.



*Amistad Dam and Reservoir was authorized by the 1944 Treaty*



*Amistad, a term meaning friendship in Spanish, signifies the cooperative nature of the project.*

Although a third major storage dam is possible under the 1944 Water Treaty, such a reservoir is not contemplated by the two governments at this time.

A work plan for Sanderson Canyon Watershed (Public Law 83-566 project) has been developed by the Rio Grande-Pecos River, Big Bend, and Trans-Pecos Soil and Water Conservation Districts and the Commissioners Courts of Terrell, Pecos, and Brewster Counties. This work plan proposes installing, over a ten year period, needed land treatment measures, eleven floodwater retarding structures, and approximately 1800 feet of channel modifications near Sanderson, Texas. When implemented, the work plan will reduce sediment delivery into the study segment and thereby improve water quality.

#### TREATY CONSIDERATIONS AND WATER RIGHTS

Treaty Considerations - Because the Rio Grande forms the boundary between the United States and Mexico, numerous international treaties and agreements affect the river and the use of its waters. The most important agreements of this nature are discussed below.

The Treaty of Guadalupe Hidalgo (1848) established the Rio Grande from the Gulf of Mexico to the southern boundary of New Mexico as the international border. It also stipulates that navigation of the river shall be free and common to both countries.

The 1944 Water Treaty outlines the rights of the two countries with respect to the waters flowing into the Rio Grande. The United States was allotted all of the waters entering the river from its principal tributaries. It was also allotted one-third of the flow from six principal Mexican tributaries above Falcon Dam, include the Rio Conchos. However, this allotment must not be less than an average of 350,000 acre-feet annually in cycles of 5 years. The remainder of all other flows is divided equally between the two countries. Because the Rio Conchos is only one of the six named Mexican tributaries, and the primary source of water for the study segment, Mexico has the option of determining from which tributary water is released to comply with the 350,000 acre-foot treaty requirement. Therefore, the Mexican Government can, theoretically, control completely the flow reaching the Rio Grande from the Rio Conchos, thereby allowing no flow at times. Such an event is considered highly unlikely.

The 1944 Water Treaty also provides for the joint construction of works on the main channel of the Rio Grande. A discussion of major storage dams is included in the report section, Existing Plans and Programs. This treaty includes a provision that the International Boundary and Water Commission study, investigate, and prepare plans for flood control works

between Fort Quitman and the Gulf of Mexico and that each government agrees to construct such works as may be recommended by the Commission and approved by the two governments. These works may include levees along the river, floodways and grade control structures, and works for the canalization, rectification, and artificial channeling of reaches of the river. At the present time, no such works are being considered for the study segment. The 1944 Water Treaty further states that either government may divert and use its allotted water and may construct the necessary works for such diversion between Fort Quitman, Texas and the Gulf of Mexico. Thus, although no large diversions are presently known or contemplated, both Mexico and the United States have the privilege of making such diversions in the future. The treaty does not alter or control the distribution of water to users within the individual states.

The other major treaty affecting the study segment is the Boundary Treaty of 1970. This treaty defines the international boundary as:

"...along the middle of the channel occupied by normal flow and, where either of the rivers has two or more channels, along the middle of the channel which in normal flows has the greater or greatest average width over its length, and from that time forward, this international boundary shall determine the sovereignty over the lands on one side or the other of it, regardless of the previous sovereignty over these lands."

The 1970 Boundary Treaty also provides that works can be constructed by either country to prevent a large tract of land from being detached. However, because of the small areas of land in the canyons of the study segment, and due to the rock canyon walls precluding substantial lateral boundary movement, it is unlikely that boundary preservation or restoration works will be constructed in the canyons.

Water Rights - Texas law declares that water in all water courses is public water subject to public control. The Texas Water Rights Commission administers a permit system which allows various entities in the State of Texas to obtain permission to divert and use unappropriated water allocated to the United States when it is available from a stream. In many cases private riparian landowners have established their right to use portions of the public waters by historical or long-term use. Over the years this has resulted in often ambiguous water rights.

By order entered February 22, 1971, the Texas Water Rights Commission found that an adjudication of all claims of rights to water allocated to the United States would be in the public interest. An investigation and report was ordered on water uses from that segment of the Rio Grande and its contributing Texas tributaries, except the Pecos and Devils Rivers, between Amistad Dam upstream to the diversion at the Dave Gill Dam in Hudspeth County, Texas.

Diversion of water within the study reach is minimal. The Texas Water Rights Commission has identified one permit and two water right claims in the study segment as follows: (1) A municipal permit to 780 acre-feet per year of Rio Grande Water to be diverted at Rio Grande Village, owned by the National Park Service, (2) An assertion of a right to irrigate 481 acres at Stillwell Draw in Brewster County. The extent of this water right must await the outcome of adjudication proceedings, (3) An assertion of a right to irrigate 56 acres locates about 20 miles west of Langtry, Texas. Again, this right is being contested by the State of Texas and must await the results of adjudication.

The study segment is a legally navigable stream; therefore, the State of Texas owns the bed of the Rio Grande to the center of the channel, except where transferred to the Federal Government. The state, therefore, is the proper entity to issue mineral or gravel permits involving the bed and bottom of the Rio Grande. Such permits would be contingent upon the mineral extraction not causing a change in the international boundary.



OFFICE OF THE GOVERNOR  
DIVISION OF PLANNING COORDINATION

JAMES M. ROSS  
DIRECTOR

DOLPH BRISCOE  
GOVERNOR

August 5, 1975

Secretary Kent Frizzell  
United States Department of Interior  
Office of the Secretary  
Washington, D. C. 20240

Dear Secretary Frizzell:

The Study and the Draft Environmental Impact Statement (DEIS) on the Rio Grande National Wild and Scenic River Project has been reviewed concurrently by the Governor's Division of Planning Coordination and by interested State agencies pursuant to the Office of Management and Budget Circular A-95 and the National Environmental Policy Act of 1969.

The review participants submitted the following comments which warrant your consideration:

1. The Texas Water Rights Commission (TWRC) noted that the State is statutorily responsible for considering water rights impacts in a much larger area of the Rio Grande Basin than the area that is covered in this document. The TWRC also stated that the EIS should include a detailed discussion of the implications of the Wild and Scenic Rivers Act of 1968 on State water rights. The TWRC requested that the document include a statement of assurance that the State's jurisdiction over its waters and its processes and programs for water rights adjudication, appropriation and permitting will not be vitiated by future implementation and determinations pursuant to the above referred Act.
2. The Texas Parks and Wildlife Department (TP&WD) noted that their department had actively participated in the development of the preliminary draft of the study report as well as this EIS. The TP&WD noted that both the report and the EIS appear to be technically correct and each contains feasible recommendations; however, the TP&WD expressed their concern that future construction along the river may ultimately require a downgrading of the proposed "Wild and Scenic River" classification.
3. The General Land Office (GLO) supported the objective of preserving the area for future generations and expressed a desire to cooperate in accomplishing the goals of the proposed program.

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However, the GLO stated that they must maintain their constitutional responsibility to produce revenue for the State Permanent School Fund from the extensive State owned land which would be affected by this proposal.

4. The Texas Water Quality Board (TWQB) commented favorably and noted that stream standards established by their agency had been incorporated into the draft statement. The TWQB also noted that the impact on water quality would be minor.
5. The Texas Water Development Board (TWDB) stressed the desirability of promoting a similar park facility on the Mexican side of the river to provide for consistent management and to avoid conflicts should activity on the Mexican side be inconsistent with the objectives of the proposal.
6. The Texas Historical Commission (THC) stated that the draft statement includes adequate procedures to protect and preserve cultural resources within the area.
7. The University of Texas Rare Plant Study Center (RPSC) noted that the draft statement contains data provided by their center. They commented that because the current data base is so limited, a more thorough biological survey should be made, particularly in the area downstream from Boquillas. The RPSC stressed the need to provide a wild and scenic rivers system that will provide for biological studies and prevent the extinction of threatened and endangered species.
8. The West Texas Council of Governments (WTCOG) commented favorably on the proposal but noted that consideration should be given to acquiring all affected land rather than obtaining scenic easements. The WTCOG also expressed a desire to review the detailed master plan when developed, and noted that their favorable comment on this EIS did not imply endorsement of the total project.

The Bureau of Economic Geology also participated in this review. The comments of the review participants are enclosed to assist you in your planning effort.

The Division of Planning Coordination concurs in the broad objectives of preserving valuable scenic areas of the State. It should be recognized, however, that the State is statutorily responsible for the administration of its resources. Firm assurances must be provided to insure that these responsibilities are not impinged upon by future implementation and determination under Public Law 90-542. In considering the inclusion of the pro-



posed area in the National Wild and Scenic River System, there is need to correlate this plan with the water and land area implications of the international boundary. The EIS would be enhanced by including a more complete explanation of the interrelationship of this proposal with possible future water resource projects under the provisions of the 1944 Water Treaty with Mexico. As a minimum, it is essential that the EIS include a more complete analysis of the implications of Public Law 90-542 on Texas water rights.

We appreciate the opportunity to review the Study and the Draft Environmental Impact Statement. If we can be of further assistance, please let us know.

Sincerely,



JAMES M. ROSE  
Director

JMR/bss

Enclosures

cc: Mr. Rolland B. Handley, U. S. Department of Interior  
Mr. Joe D. Carter, TWRC  
Mr. Clayton T. Garrison, JP&WD  
Hon. Bob Armstrong, GLO  
Mr. Hugh C. Yantis, TWQB  
Mr. Harry Burleigh, TWDB  
Mr. Truett Latimer, THC  
Dr. Keith Arnold, U.T.  
Mr. E. Ray Hill, West Texas Council of Governments



DEPARTMENT OF STATE

Washington, D.C. 20520

April 4, 1975

FOR

cc: FW

u/s (Lyons)

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The Honorable  
William W. Lyons  
Deputy Under Secretary  
United States Department  
of the Interior  
Washington, D.C. 20240

Dear Mr. Lyons:

Thank you for your letter of February 4 (D4219-Rio Grande River) soliciting the views of the Department of State regarding the proposed report "Rio Grande, Wild & Scenic River Study." You pointed out that the report had been prepared in consultation with the U.S. Section of the International Boundary and Water Commission. The Department in turn is incorporating the views of the U.S. Section in this letter.

We understand that the report is designed to serve both as a submission to the Congress and as a basis for further discussion with the Government of Mexico through the Commission. In respect to the former purpose, our only suggestion is that you might want to caution the Congress, in an appropriate manner, that even if the Government of Mexico should have no objection to our objectives and its own objectives should be in accord with ours at this time, and hence the qualified segment of the river might be included in the National Wild and Scenic Rivers System as you recommend, there will almost certainly be no assurance that at some future time the objectives of the Government of Mexico may not be in conflict with ours. The Department nevertheless concurs in your recommendation, in the hope that our objectives may be as fully realized as practical in the circumstances.

We believe that the report will admirably serve as a basis for discussion within the International Commission of the objectives of the two Governments and related issues. The report seems to present the U.S. objectives satisfactorily and reflect the Section's suggestions to recognize existing treaties and confine our objectives narrowly to the U.S. side of the river.

U.S. Commissioner Friedkin has accordingly submitted copies of the report to the Mexican Commissioner. I enclose a copy of the Commissioner's covering letter for your information and records. He and the Country Director for Mexico, John T. Dreyfuss, will keep the Department of the Interior informed of further developments.

With best wishes,

Sincerely,



William D. Rogers  
Assistant Secretary for  
Inter-American Affairs

Enclosure:

Letter to the Mexican Commissioner, March 11, 1975



OFFICE OF THE COMMISSIONER  
UNITED STATES SECTION

INTERNATIONAL BOUNDARY AND WATER COMMISSION  
UNITED STATES AND MEXICO

200 IBWC BUILDING  
4110 RIO BRAVO  
EL PASO, TEXAS 79998

MAILING ADDRESS:  
P. O. BOX 20003

MAR 11 1975

Engineer David Herrera Jordan  
Commissioner for Mexico  
International Boundary and Water Commission  
Post Office Box 10525  
El Paso, Texas 79995

My dear Mr. Commissioner:

I am pleased to refer to our exchange of letters of March 2 and 17, 1973, and to our subsequent informal discussions, relating to a study by each country of the reach of the Rio Grande from the Chihuahua-Coahuila boundary to the headwaters of Amistad Reservoir, with a view to cooperating to maintain its wild and scenic state, to the extent each country finds compatible with its interests.

Enclosed for your consideration and advice are two copies of a proposed report which evaluates the United States side of the river in the stated reach for inclusion in my country's National Wild and Scenic Rivers system. This report was prepared by the Bureau of Outdoor Recreation of the United States Department of the Interior. The report refers to the Terrell-Val Verde County line in Texas, as the approximate headwaters of Amistad Reservoir. The report respects the boundary and water treaties between our two countries and presents the United States concepts for a program for its side of the river. The overall management objectives for the United States side as stated in the report would be to:

1. Preserve the river in a free-flowing condition except as provided by treaties.
2. Protect scenic, geologic, fish and wildlife, archeologic, recreational, historical, cultural, scientific and other similar values along the riverway.
3. Preserve the essentially primitive character of the river canyon area.
4. Maintain or improve existing water quality.
5. Provide opportunities for river oriented recreation which are consistent with the primitive character of the surroundings and do not conflict with other river protection program objectives.

The report further lists the actions or concepts which should be employed to meet the suggested riverway objectives along the United States side, with a

view to coordinating with Mexico for similar objectives on the Mexican bank insofar as they would be in Mexico's interest.

I would very much appreciate your advice as to whether Mexico would have any objection to the objectives contained in the report for the United States side of the stated reach of the Rio Grande, and whether Mexico's objectives in the same reach would be in conflict with the United States objectives contained in the report. Would you kindly also consider and advise which of those objectives contained in the report Mexico may find to also be in the interest of, and applicable in its country.

Subject to Mexico's views, it is hoped that our Commission can identify objectives of common interest to our two countries so that each country may adopt measures, to the extent it finds necessary on its side, to achieve the goal of maintaining both sides of the stated reach of the Rio Grande in a wild or scenic state, to protect, to the extent possible, the natural beauties of this reach. If, as I would hope, that our two countries do have this common goal, then as we tentatively discussed, it would seem desirable that our Commission report its findings to our respective Governments with the recommendation that each declare its side of the reach as a wild and scenic river, and that the two Governments cooperate for its preservation in that state, as each finds necessary in its country.

I would gratefully receive your views in this matter. I am, my dear Mr. Commissioner,

Sincerely,

J. F. Friedkin  
Commissioner

Enclosure:  
Report - In duplicate

✓ ccc: Country Director Dreyfuss



DEPARTMENT OF STATE

Washington, D.C. 20520

October 31, 1975

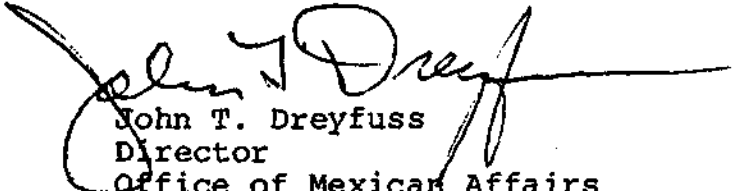
Mr. Robert L. Eastman, Chief  
Division of Resource Area Studies  
Bureau of Outdoor Recreation  
Department of the Interior  
Washington, D.C. 20240

Dear Mr. Eastman:

I am pleased to enclose for your information and the files of your Department a translation of a letter dated July 7, 1975 received from the Mexican Commissioner on the International Boundary and Water Commission regarding the proposed inclusion of a part of the international reach of the Rio Grande in the National Wild and Scenic Rivers System.

The Mexican Commissioner has informed United States Commissioner J. F. Friedkin that he would have no objection to the inclusion of his letter in the Interior Department's report to the Congress on this proposal. This Department accordingly concurs in its public release.

Sincerely yours,

  
John T. Dreyfuss  
Director  
Office of Mexican Affairs

Enclosure:  
Translation of letter from  
Commissioner J. Herrera Jordan,  
dated July 7, 1975 (2)

Translation

S E A L  
UNITED MEXICAN STATES  
SECRETARIAT  
of  
FOREIGN RELATIONS

INTERNATIONAL BOUNDARY AND WATER COMMISSION  
MEXICO AND UNITED STATES  
Mexican Section

No. 1347/75  
File 3391-X-228.3/2

Ciudad Juárez, Chih., July 7, 1975

Engineer Joseph F. Friedkin,  
United States Commissioner,  
International Boundary and Water Commission,  
P. O. Box 20003,  
El Paso, Texas. 79998

My dear Mr. Commissioner:

I have the pleasure of referring to your courteous communication of March 11, 1975, and to our informal conversations relative to the study of a reach of the Rio Grande, from the boundary of the States of Chihuahua and Coahuila to the tail of the Amistad Reservoir, to preserve its wild and scenic state.

I received with your communication two copies of the study prepared by the Bureau of Outdoor Recreation, of the United States Department of the Interior, which was reviewed by the competent authorities of my Government.

As a consequence of that review, and referring particularly to the three points of the study which you mentioned to me in our conversations, I take pleasure in advising you of my Government's opinions:

Point a.- Whether there is any reason for objection on the part of the Mexican Government to the measures which the United States plans to adopt in its territory.

Opinion.- The Government of Mexico cannot object to the measures which the United States may adopt in its territory, as long as these do not cause Mexico any problems, which in this case cannot be foreseen.

Point b.- What measures would the Government of Mexico be disposed to adopt in its territory for the purpose of maintaining in a wild and scenic state the reach of the Rio Grande comprised in the United States study?

Opinion.- In Mexican territory, the region bordering the reach of the Rio Grande comprised in the United States study is isolated and to the moment practically uninhabited, which is the reason the naturally wild and scenic conditions in the region in reference have been preserved. At the present time, Mexico cannot commit itself to adopt particular measures to preserve those conditions, because its plans would have to be based on national interests which depend on the future development of the region, a development which to a greater or lesser degree, it should be anticipated, shall affect

them. However, as refers to Mexico, a change in conditions is not perceived which would favor an important increase in population and, because of it, it is believed that, even without adopting special measures, the Mexican side of the river will be preserved in its present conditions for a more or less prolonged time.

Point c. What would be the concordant measures which each Government would take in its respective territory to maintain the wild and scenic conditions of the reach of the Rio Grande already mentioned?

Opinion.- According to the future development of the region, with the passage of time, the Government of Mexico shall successively be implanting the measures which it may consider beneficial, of which timely advice shall be given to the Government of the United States, so that concordant measures can be taken. As permitted following attention to its own interests, the Government of Mexico shall always take into account, in the projects which it may develop, the plans to preserve in a naturally wild and scenic state the reach of the Rio Grande comprised by the study.

I remain, my dear Mr. Friedkin,

Very truly yours,

(signed) D.Herrera J.  
David Herrera J.  
Commissioner

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Translated 7/11/75 MLM - 5  
cc: ARA/MEX; Del Rio; Secy.





DEPARTMENT OF AGRICULTURE  
OFFICE OF THE SECRETARY  
WASHINGTON, D. C. 20250

FOR  
Agriculture  
EE

June 16, 1975

Honorable Stanley K. Hathaway  
Secretary of the Interior

Dear Mr. Secretary:

This is in response to Deputy Assistant Secretary Lyons' February 4 letter requesting our views on your Department's proposed report for the Rio Grande River.

Information in the report indicates that the reach of river studied fully meets the criteria for inclusion in the National Wild and Scenic Rivers System. However, we do have some concern with the generalized nature of the evaluation of impacts on private agricultural and other activities if the plan is implemented. If the plan is carried out, 7,450 acres of private lands would be directly affected. Approximately 1,950 acres would be acquired in fees at an estimated cost of \$460,000, and scenic easements or less-than-fee control would be acquired on 5,500 acres for \$640,000. We feel the report is deficient in that it fails to discuss, except in a general way, the present and anticipated uses of these lands and what would be precluded if the Rio Grande is included in the National System. Undoubtedly, some uses would be foreclosed or curtailed in order to protect and preserve the river environment. The opportunity costs associated with the uses that would be precluded are in addition to the costs for land acquisition and facility development. In general, the quantitative information needed to assess the impacts of the proposed action is lacking.

In the alternatives section of the report, various administrative options are discussed. It seems that a joint Federal-State administrative arrangement is the most viable alternative. The Texas Parks and Wildlife Department already controls approximately 22 miles of frontage on the river and provides recreation opportunities in the form of fishing camps along the segment they control. A joint Federal-State administrative arrangement would offer an opportunity to exhibit a cooperative effort to protect and manage a high quality natural resource.

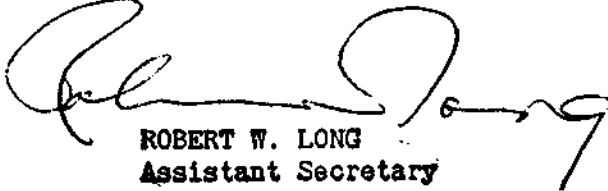
Honorable Kent Frizzell

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The Principles and Standards, which became effective October 25, 1973, are applicable to wild and scenic river studies. The study report does not conform to the Water Resources Council's phase-in procedures for the Principles and Standards, since it lacks the prescribed addendum and the abbreviated display accounts.

On balance, the proposal to include the Rio Grande River in the National Wild and Scenic Rivers System has merit. There is no apparent conflict between the proposed designation and plan for the river and programs or projects of this Department. We have no objection to the proposal, and appreciate the opportunity to review the report.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert W. Long". The signature is fluid and cursive, with a large initial "R" and a long, sweeping tail.

**ROBERT W. LONG**  
**Assistant Secretary**



DEPARTMENT OF THE ARMY  
OFFICE OF THE CHIEF OF ENGINEERS  
WASHINGTON, D.C. 20314

REPLY TO  
ATTENTION OF:

DAEN-CWP-V

14 April 1975

Honorable William W. Lyons  
Deputy Under Secretary of the Interior  
Washington, D. C. 20240

Dear Mr. Lyons:

In response to your letter to Secretary Callaway (D4219-Rio Grande River) dated 4 February 1975, we have reviewed your proposed report on the Rio Grande Wild and Scenic River Study.

Inclusion of the Rio Grande from River Mile 842.3 to River Mile 651.1 in the National Wild and Scenic River System would not conflict with any studies or plans of the Department of the Army. Your proposal has considerable merit and we agree that this segment of the Rio Grande would make an excellent addition to the System.

Sincerely yours,

MARVIN W. REES  
Colonel, Corps of Engineers  
Executive Director of Civil Works



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT  
 REGIONAL OFFICE  
 1100 COMMERCE STREET  
 DALLAS, TEXAS 75202

FOIR

April 22, 1975

REGION VI

IN REPLY REFER TO:

6C

Your Reference:  
 D4219-Rio Grande  
 River

Mr. William W. Lyons  
 Deputy Under Secretary  
 Department of the Interior  
 Washington, D. C. 20240

Dear Mr. Lyons:

The Dallas Regional Office of the Department of Housing and Urban Development has reviewed the Department of Interior's proposed report, Rio Grande: Wild and Scenic River Study, and wholeheartedly concurs with and supports the recommended actions contained therein. However, we do wish to cite the following concerns regarding the proposed undertaking:

1. Since the United States controls only one side of the river, this country's actions to protect the river's wild and scenic aspects could possibly be effectively negated by actions on the Mexican side unless the Mexican Government is also willing to take appropriate and effective protective measures.
2. Although we recognize the scenic easement process as an extremely valuable and useful tool in the protection of wild and scenic areas, in this situation we wonder if it will provide sufficient protection from the detrimental effects of livestock grazing in that Section 15(c) of the Wild and Scenic Rivers Acts states that "such control (scenic easement) shall not affect, without the owner's consent, any regular use exercised prior to the acquisition of the easement."

The proposed report has also been reviewed by this Department's Dallas Area Office, within whose direct jurisdiction the proposed project is located. That Office's comments follow:

"We would like to add our endorsement of the subject proposal to bring that segment of the Rio Grande River extending from the Chihuahua/Coahuila State Line to Langtry, Texas, under the Wild and Scenic River Act.

- "1. The river courses through one of the most unique topographic areas of the State. Seventy (70) percent of the river traverses perpendicular gorges.
- "2. It is a river able to provide pleasure to both 'float-trips' and 'whitewater-trips.'

- "3. Because of the rugged topography, the area can sustain and protect relatively segregated wildlife resources while providing recreation opportunities to the human population in other parts of the park.
- "4. Diversity in recreation resources is a fundamental need in Texas. Golf, tennis and similar 'game-type' recreation facilities are easily available through local private and public agencies, but the pleasures to be derived from the long stretches of our rivers has to be an interregional public responsibility and often assisted Federally because of the national implications of use.

"This project, along with the Big Thicket in East Texas and the Coastal Zone Recreation Proposals (for South Texas), will assist in meeting interregional demands for diversity in recreation."

Material furnished by our Dallas Area Office on Texas population growth is attached.

Sincerely,



Travis Wm. Miller  
Environmental Clearance Officer and  
Assistant Regional Administrator for  
Community Planning and Development

Attachment

POPULATION PRESSURES OF TEXAS

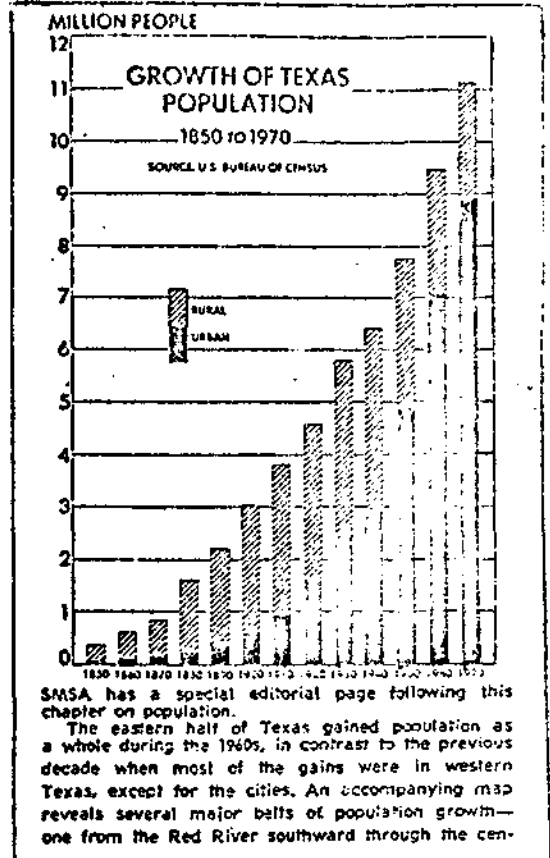
1. Texas has had more than a 16 percent increase in urban population in every decade since 1850 with exception of that decade ending 1940. (See Table I). The United States has had only a maximum of 13 percent growth per decade.

2. Texas population was 79.7% urban in 1970 compared to 75.0% in 1960 and 62.7% in 1950. This urban population needs the change wild and scenic areas can offer even more perhaps, than the rural population.

**RESIDENT POPULATION BY STATES  
1970 AND 1960**  
(Source: U.S. Census Bureau)

State—	1970	1960	Numerical Change	Percentage Change
United States	202,164,772	179,323,175	22,841,597	12.7
Alabama	3,444,165	3,266,740	177,425	5.4
Alaska	302,173	224,167	78,006	34.8
Arizona	1,772,461	1,402,131	370,330	26.4
Arkansas	2,273,904	1,784,272	489,632	27.4
California	19,953,134	15,717,204	4,235,930	27.0
Colorado	2,207,259	1,753,947	453,312	25.8
Connecticut	3,032,217	2,535,234	496,983	19.6
Delaware	548,104	448,292	101,812	22.8
D.C.	756,510	763,835	-7,441	-1.0
Florida	6,709,443	4,951,540	1,837,863	37.1
Georgia	4,582,575	3,943,116	646,459	16.4
Hawaii	789,913	622,772	167,141	27.0
Idaho	713,098	667,191	45,907	6.9
Illinois	11,113,978	10,081,139	1,032,839	10.2
Indiana	5,193,607	4,652,491	541,116	11.6
Iowa	2,825,041	2,757,537	67,504	2.4
Kansas	2,249,071	2,178,611	70,460	3.2
Kentucky	3,219,311	2,638,156	581,155	22.0
Louisiana	3,443,180	3,257,928	185,252	5.7
Maine	923,653	949,265	-25,612	-2.7
Maryland	3,922,371	3,102,489	821,782	26.5
Massachusetts	5,682,170	5,143,572	542,598	10.5
Michigan	8,875,033	7,622,194	1,051,839	13.8
Minnesota	3,805,041	3,413,654	391,387	11.5
Mississippi	2,216,912	2,178,141	38,771	1.8
Missouri	4,577,391	4,319,813	257,578	5.9
Montana	694,409	474,767	219,642	46.3
Nebraska	1,433,791	1,411,350	22,441	1.6
Nevada	498,739	285,270	213,469	74.8
New Hampshire	737,681	656,921	80,760	12.3
New Jersey	7,148,164	6,064,782	1,083,382	17.9
New Mexico	1,016,000	951,020	64,980	6.8
New York	18,170,740	16,782,304	1,438,436	8.6
North Carolina	5,081,052	4,558,158	522,894	11.5
North Dakota	617,731	672,449	-54,718	-8.1
Ohio	10,652,017	9,706,397	945,620	9.7
Oklahoma	2,559,253	2,323,244	236,009	10.2
Oregon	2,021,325	1,768,697	252,628	14.3
Pennsylvania	11,733,909	11,319,366	414,543	3.6
Rhode Island	949,723	852,431	97,292	11.4
South Carolina	2,570,560	2,332,594	237,966	10.2
S. Dakota	656,257	632,514	23,743	3.7
Tennessee	3,924,164	3,567,062	357,102	10.0
Texas	11,195,720	9,579,472	1,616,248	16.9
Utah	1,037,273	878,827	158,446	18.0
Vermont	444,771	387,581	57,190	14.7
Virginia	4,448,474	3,986,945	461,529	11.6
Washington	3,429,191	2,872,714	556,477	19.4
W. Virginia	1,744,237	1,657,421	86,816	5.2
Wisconsin	4,477,931	3,751,777	726,154	19.4
Wyoming	332,418	300,263	32,155	10.7

TABLE II

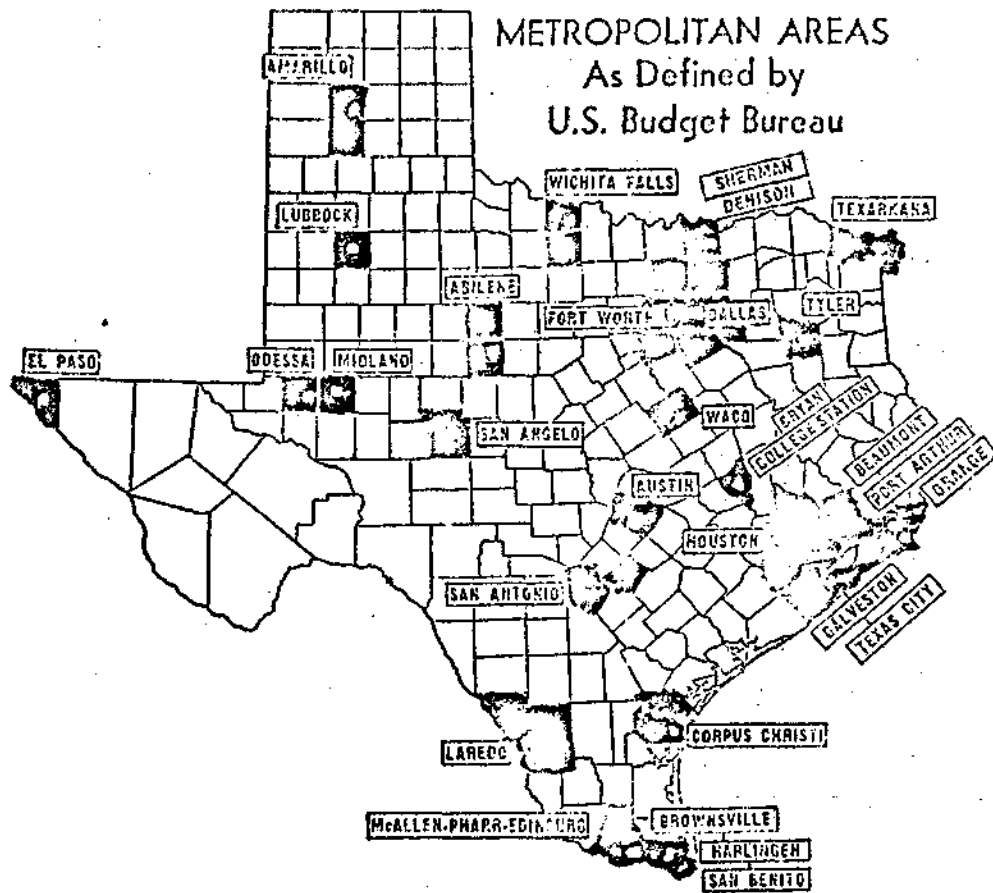


SMSA has a special editorial page following this chapter on population.  
The eastern half of Texas gained population as a whole during the 1960s, in contrast to the previous decade when most of the gains were in western Texas, except for the cities. An accompanying map reveals several major belts of population growth—one from the Red River southward through the cen-

TABLE I

3. The growth of Texas in comparison to other states is shown on Table II. Many of the Texas SMSA areas have shared in the post World War II population growth that has occurred in that "belt" that extends generally from San Diego, thru Phoenix/Tucson, Dallas/Houston to Atlanta.

4. Texas has "24" Standard Metropolitan Statistical Areas. See Table III for population figures. In terms of regional or inter-regional park and recreation needs Texas is not presently able to service the 24 SMSA's. It also needs to meet its interstate responsibilities in preserving sizable, unique environmental areas. Much needs to be done to preserve the best "natural resources" for the recreational and cultural demands of the future which is almost here. (Table III on following page).



**POPULATION OF TEXAS SMSAs, 1970 AND 1960**

(- Denotes loss)

	1970	1960	Percent Change
Amarillo	113,959	120,377	-5.3
Lubbock	144,396	149,493	-3.4
Wichita Falls	295,516	217,136	39.3
Sherman-Denison	315,943	306,016	3.2
Texarkana			
Abilene	140,368	151,098	-7.1
Bryan-College Station	57,978	44,895	29.1
Corpus Christi	264,832	266,594	6.8
Dallas	1,555,950	1,119,410	38.9
El Paso	359,291	314,070	14.4
Fort Worth	762,036	573,215	32.9
Galveston-Texas City	169,612	140,264	21.0
Houston	1,985,031	1,418,323	39.9
Laredo	72,559	64,791	12.5
Lubbock	129,295	156,271	14.7
McAllen-Pharr-Edinburg			
Brownsville	181,535	186,904	0.3
Harlingen	65,433	67,717	-3.4
San Benito	91,805	96,995	0.9
San Antonio	71,042	64,630	9.9
San Angelo	854,014	716,369	20.6
Sherman-Denison	83,725	73,043	13.9
Texarkana	101,198	91,657	10.4
Tyler	97,076	86,350	12.4
Waco	147,553	150,091	-1.7
Wichita Falls	127,621	129,658	-1.6

**RANK OF TEXAS SMSAs AMONG 243 IN U.S.**

The following table showing the rank of Texas SMSAs is from a longer table in the Population Chapter showing the population and rank of all 243 SMSAs in the U.S.

Source: U.S. Bureau of Census

SMSA	Rank in U.S.	
	1970	1960
Houston	13	15
Dallas	16	20
San Antonio	38	39
Fort Worth	43	50
El Paso	82	60
Beaumont-Port Arthur-Orange	95	66
Austin	103	125
Corpus Christi	111	103
McAllen-Pharr-Edinburg	155	137
Lubbock	157	153
Galveston-Texas City	163	171
Waco	177	158
Amarillo	181	160
Brownsville-Harlingen-San Benito	184	157
Wichita Falls	193	182
Abilene	207	169
Texarkana	217	211
Tyler	219	218
Odessa	222	212
Sherman-Denison	229	229
Laredo	236	236
San Angelo	238	237
Midland	241	234
Bryan College Station	242	243

TABLE III



THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

March 3, 1975

*Thanks  
No Response  
Needed*

Honorable W. W. Lyons  
Deputy Under Secretary  
of the Interior  
Washington, D. C. 20240

Dear Mr. Lyons:

Thank you for providing us with a copy of the Department of the Interior's proposed report on the Rio Grande River, Texas, pursuant to the provisions of the Wild and Scenic Rivers Act.

This report has been made available to the Federal Highway Administration and the U.S. Coast Guard, the components of this Department which might have some interest in the proposal. Any comments which those agencies may have will be forwarded to you within the appropriate time period.

Sincerely,

*John W. Barnum*  
John W. Barnum  
Acting Secretary

BOR Mail Control No. 13244



UNITED STATES GOVERNMENT

File M/211  
Rio Grande

DEPARTMENT OF TRANSPORTATION  
OFFICE OF THE SECRETARY

# Memorandum

DATE: APR 2 1975

SUBJECT: Interior's Proposed Report on the Rio Grande River, Texas

In reply refer to: TES-72

FROM : Director, Office of Environmental Affairs

TO : Joseph Fromme  
Environmental Review Officer  
Department of the Interior

The subject report has been reviewed by this Department. The report is an effort to include 191.2 miles of the Rio Grande River as a Wild and Scenic River under P. L. 90-542. The distance is from river mile 842.3 to mile 651.1

The probability of commercial navigation on this stretch of river is considered negligible. Therefore, this Department has no adverse comments to make about this study.

*Eugene L. Lohr, for*  
Martin Convisser

APR 14 1975



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

FOK

JUL 22 1975

cc to  
SC on  
7/28/75

Mr. William W. Lyons  
Deputy Under Secretary  
of the Interior  
U.S. Department of the Interior  
Washington, D.C. 20240

Re: Wild and Scenic Rivers

Dear Mr. Lyons:

We would like to comment on the Wild and Scenic River Study on the Rio Grande River, Texas. Earlier, EPA Region VI, Dallas, commented on the associated Draft Environmental Impact Statement.

We concur with the length of the river segment proposed for inclusion in the National Wild and Scenic Rivers system, and with the proposed management and administrative arrangements. However, it is difficult to assess the scope of the proposal without more information on the location of the boundary of the resource management area planned for the land adjacent to the river. It would be helpful if future drafts of the study provide that information.

The flourspar plant in La Linda, Mexico, may have a detrimental effect on water quality in the proposed wild and scenic segment. Mexico and the United States should agree on a monitoring program to determine the effect of the plant's effluent and what, if any, protective measures are needed.

At your service,

Eckardt C. Beck  
Deputy Assistant Administrator  
for Water Planning & Standards

FEDERAL POWER COMMISSION  
WASHINGTON, D.C. 20426

IN REPLY REFER TO:

Honorable Rogers C. B. Morton  
Secretary of the Interior  
Washington, D.C. 20240

Reference: D4219 - Rio Grande

Dear Mr. Secretary:

This is in reply to Deputy Undersecretary Lyons' letter of February 4, 1975, transmitting for the Commission's comments, pursuant to the provisions of the Wild and Scenic Rivers Act (PL 90-542), the proposed report of your Department on the Rio Grande, Texas.

The cited report concludes that the reach of the Rio Grande beginning a short distance upstream of the Amistad Reservoir and extending upstream for 191 miles meets the criteria for inclusion in the National Wild and Scenic Rivers System. Thus, the report recommends that, provided that Mexico has no objection, the United States side of this reach be included in the national system. The reach would be divided into five segments, two of which would be classified as wild and three would be classified as scenic.

The Federal Power Commission staff has reviewed available information on the Rio Grande to determine the effects of the proposal on matters affecting the Commission's responsibilities. Such responsibilities relate to the development of hydroelectric power and assurance of the reliability and adequacy of electric service under the Federal Power Act, and the construction of natural gas pipelines under the Natural Gas Act.

Review by the Commission staff indicates that there are no existing electric generating plants, power transmission lines, or natural gas pipelines within the reach of the river proposed for inclusion in the National Wild and Scenic Rivers System.

SEC. 1001 (a) (1) (A) 14285

(RECEIVED)  
D. Elton 4/4/84

Honorable Rogers C. B. Morton -2-

As noted in the cited report, the 1944 Water Treaty between the United States and Mexico provided for the possible development of a reservoir project within the reach proposed for wild and scenic river designation. The International Boundary and Water Commission has considered the development of a reservoir within this reach of the river at the Agua Verde site. Some 75,000 kilowatts of hydroelectric capacity could be developed at this site. However, there are no known plans to develop the Agua Verde site.

Staff review shows that there are no other known undeveloped hydroelectric or steam-electric power plant sites within this reach of river. Also there are no known plans to construct electric transmission lines or natural gas pipelines in the area. As noted in your Department's proposed report, power line or pipeline crossings which may be required in the future would be limited in number and would be planned for environmental compatibility with the objectives of wild or scenic river designation.

Based on its consideration of the proposed report of your Department and the review by its own staff, the Commission advises that it has no objection to the proposed inclusion of this reach of the Rio Grande in the National Wild and Scenic Rivers System, provided that necessary crossings of the river by electric transmission lines or natural gas pipelines would be permitted in the future.

Sincerely,



John N. Nassikas  
Chairman

## Rio Grande Supplemental Analysis

### 1. Purpose

This supplemental analysis provides a brief summary of various alternative plans for including a portion of the Rio Grande in the National Wild and Scenic Rivers System. Displays are provided which identify the effects of the various alternatives on the planning components (i.e. preserving a free-flowing river, providing quality recreation opportunities and diversity, and controlling land use in the river corridor). The quantitative and qualitative impacts of each component are arrayed into four accounts, vis. National Economic Development (NED), Environmental Quality (EQ), Social Well Being (SWB) and Regional Development (RD).

### 2. National Economic Development Objective Plan

Proposals for water resources utilization which would significantly and, for all practical purposes, irreversibly alter the potential uses of water and related land resources of an area, must consider alternatives which range from developing those resources for optimum national economic return to preserving and enhancing the natural environmental conditions. Similarly, the Water Resource Council's Principles and Standards planning procedures would be applied to proposals for wild, scenic and recreational rivers when such designation would foreclose water resource development opportunities emphasizing national economic development.

Proposals to establish wild, scenic and recreational rivers may not involve an irreversible commitment of resources over the long term or significant conflicts in the preferences of society for the utilization of water and related land resources of the area. Bureau of Outdoor Recreation guidelines require that conflicts be identified early in the planning process as a result of public involvement, review of previous studies of the area, and participation by other agencies on the planning team. In the absence of conflicts, planning would be for preservation of the natural values and enhancement of recreation opportunities. The range of alternative plans would relate only to the environmental quality objective. When plans would preclude potential future development of economic activities such as timber harvesting, mining, private recreation, or production of other goods and services, the values which would be enhanced, foreclosed, or curtailed by plan implementation will be identified in the appropriate accounts of alternative plans under the environmental quality objective.

The Rio Grande Wild and Scenic River study was coordinated closely with the International Boundary and Water Commission because actions affecting the river, which forms a portion of the United States/Mexico border, must consider the needs and desires of each country. By treaty of 1944, water development projects of various types could be constructed along the study reach by either the United States or Mexico, acting jointly or singly under provisions of the treaty. Designation of the Rio Grande would not usurp these agreements; the possibility for water development projects on the study reach will remain as long as the treaty is in effect. The International Boundary and Water Commission advises that, at the present time, there are no plans for water resource development along the study reach. Consequently, in the absence of any known conflicts regarding use of the water along the study reach, a national economic development objective alternative was not formulated.

### 3. Environment Quality Objective Plan

The environmental quality objective plan is the recommended plan. In summary, 191.2 miles of the Rio Grande and approximately 9600 acres of adjacent land on the United States side of the river would be included in the National Wild and Scenic Rivers System. Two reaches would be classified and administered as "wild" and three reaches would be classified and administered as "scenic". Administration of the designated river would be the responsibility of the National Park Service in cooperation with the International Boundary and Water Commission, the State of Texas and local units of government. The proposal envisions a detailed management plan to be developed and submitted within two years following designation and that such management plans place primary emphasis on the primitive qualities of the free-flowing river by protecting the scenic, geologic, biologic, archeologic, historical, cultural and scientific values of the river. Recreation facility development and use would be planned to be consistent with those protective purposes.

Two additional spacial alternatives are considered under the environmental quality objective. The first would designate only 65 miles of river from river mile (RM) 842.3 to the downstream boundary of Big Bend National Park. The second would designate only 117 miles from the upstream boundary of the Black Gap Wildlife Management Area to RM 651.1. Management plan considerations for these two alternatives are the same as for the recommended plan.

RIO GRANDE  
ENVIRONMENTAL QUALITY ACCOUNT

Component	Without Plan	Recommended Plan	F.M. 842.3 to Big Bend NP Boundary	Black Gap WMA to R.M. 651.1
Preserve free-flowing river except as provided for by treaty with Mexico	River segments within Big Bend NP and Black Gap WMA would continue to be managed under existing authorities. State and local units of government probably would not take steps to preserve the river area in a wild or scenic condition.	Designate 191.2 miles of River as component of National system. Recommended reach extends from RM 342.3 to RM 651.1. Two River segments totaling 96 miles would be classified as "scenic".	Designate 65 miles of River as a component of National system. Reach extends from FM 842.3 to the downstream boundary of Big Bend NP. One segment totaling 45 miles would be classified as "scenic" and one segment totaling 20 miles would be classified "wild".	Designate 117 miles of River as a component of National system. Reach extends from the upstream boundary of Black Gap WMA to RM 651.1. One 70 mile segment would be classified as "wild" and two segments totaling 47 miles would be classified as "scenic".
Control land use on the United States side of the river corridor		Protect a visual corridor of adjacent land from adverse use and development in order to retain the natural and scenic appeal of the stream corridor. Areas of outstanding natural, historical or archeological significance which are contiguous to but outside of visual corridor are included in the resource management area. Final boundaries will be determined during master planning process.		
a) acquire fee simple title	0	1950 acres	0	1940 acres
b) acquire scenic easements	0	5500 acres	0	5010 acres
c) execute cooperative agreements	0	2150 acres	0	2150 acres
Provide for high quality outdoor recreation opportunities associated with the river		An analysis of recreation use will be undertaken after establishment of the riverway to determine optimum river use levels which are consistent with the maintenance of a quality environment. Major public use facilities will be located outside of the river corridor so as to protect the wild and scenic values for which the riverway is established. Minor impacts on water quality may result from increased recreation use of the river. Additional use may also slightly increase the incidence of littering. Approximately 105 acres of land would be cleared under the recommended plan to provide additional access points and campgrounds. These areas would be located back from the river in order to maintain the primitive view from the river.		
Protect rare or threatened species and provide for continued biological diversity.	Further reduction of habitat for wildlife and flora will take place adjacent to the Rio Grande as over-grazing continues along segments outside of Big Bend NP and Black Gap WMA.	Protect habitat for several species of plants which have been identified in the "Report on Endangered or Threatened Plant Species of the United States" (1975) which was prepared under Section 12 of the Endangered Species Act of 1973. These species include (1) shiner's brickellia, (2) cliff thistle, (3) hoke's button cactus, (4) cliff bedstraw, and (5) marovillas milkwort.  The stream corridor provides habitat for two species officially listed as endangered: (1) American peregrine falcon and (2) Big Bend mosquito fish. Since nesting peregrines are easily disturbed by human activity, increased recreation use of the riverway during critical periods in the nesting cycle may have an adverse impact on the species unless management programs are adopted to restrict activities within sight of occupied aeries.		

RIO GRANDE  
SOCIAL-WELL-BEING ACCOUNT

Component	Without Plan	Recommended Plan	L.M. 842.3 to Big Bend NP Boundary	Black Cap MMA to R.M. 651.1
Preserve free-flowing River except as provided for by treaty with Mexico				
Control land use on the United States side of the river corridor	The present trend toward fragmentation of large land holdings and an increasing proportion of absentee landowners will continue. These trends may indicate the beginning of land speculation pressures along the River.	Fee acquisition and scenic easements will consolidate management control in the stream corridor. Designation as a Wild & Scenic Rivers System component may encourage some speculation along adjacent lands for recreation subdivision development.	Effects will be similar to "without plan" consideration.	Effects will be similar to the "recommended plan".
Provide for high quality outdoor recreation opportunities associated with the river  a) access	Two access points are now available (Rio Grande Village and Black Cap). No further access or campground development is anticipated in the absence of plan implementation.	Three new access points and two new campgrounds will allow river users more flexibility in planning trips of various lengths and degrees of difficulty. Primitive campsites will not be developed until use levels demand such action. One existing campground will be upgraded.	One new access point will be provided at the downstream boundary at Big Bend NP.	Two new access points and two new campgrounds will be provided to allow greater use of the lower canyons area. One existing campground will be upgraded.



RIO GRANDE  
SOCIAL-WELL-BEING ACCOUNT (Continued)

Component	Without Plan	Recommended Plan	F.M. 842.3 to Big Bend NP Boundary	Black Gap WMA to R.M. 651.1
b) use	The current trend of 5% annual increase in use by river floaters will continue in the Big Bend NP area. Use of the lower canyons will remain at its present low levels (200-300 persons per year). In 1973 some 5000 people floated portions of the river.	Slight increases in currently increasing use trends are projected for the river as a whole, however, the lower canyons will experience relatively large percentage increases in use although absolute numbers of people will still be relatively small). By year 10 following designation some 12,000 people will float portions of the riverway.	The effect will be similar to the "without plan" consideration.	The effect will be similar to the "recommended plan".
Protect historical and archeological resources on the United States side of the river	Historical and archeological resources located inside of Big Bend NP will be protected through existing NPS management policies. Resources downstream of the Park boundary will not be afforded any protection. Sites inside the Park boundary include the Hot Springs area. The Texas Historical Commission has recorded over 100 archeological sites along the study reach.	A detailed inventory of historical, archeological, geological and biological resources will be made as part of the master planning process and a program for their protection and interpretation will be developed within two years following riverway establishment. Increased use may subject historical and archeological sites to increased vandalism if protective management procedures are not implemented.  Areas of significance include: Asa Jones Waterworks Burro Bluff Hot Springs	Areas of significance include: Hot Springs	Areas of significance include: Asa Jones Waterworks Burro Bluff

RIO GRANDE  
NATIONAL ECONOMIC DEVELOPMENT ACCOUNT

Component	Without Plan	Recommended Plan	R. I. 842.3 to Big Bend NP Boundary	Black Gap WMA to R.M. 651.1
<p>Preserve free-flowing river except as provided for by treaty with Mexico</p>		<p>The 1944 Water Treaty between the United States and Mexico provides for the possible development of a storage dam within the study reach. The International Boundary and Water Commission has investigated development of such a reservoir at the Agua Verde site, however, there are, at present, no known plans to develop this site. The Treaty also provides for works such as levees, floodways, grade control structures and works for canalization, rectification and artificial channeling of reaches when these works are recommended by the International Boundary and Water Commission and are approved by both governments. Thus, although no plans are presently extant for works which would impair the free-flowing condition of the Rio Grande, both Mexico and the United States will continue to have the privilege of making diversions in the future. Designation of the Rio Grande as a component of the Wild and Scenic Rivers System would be subordinate to these treaty considerations.</p>		
<p>Control land use on the United States side of the river corridor</p>		<p>Continuation of present trends:</p> <p>a) Conversion of land use from grazing to private wild-life, hunting, and fishing areas. The rate of change and monetary impact have not been determined.</p> <p>Maximum loss to grazing would be 1950 acres and 5 to 34 animal units per year.</p> <p>Effects are similar to "without plan" consideration.</p> <p>Effects are similar to "recommended plan".</p> <p>b) Land in private ownership provides local property tax revenues.</p> <p>Conversion of 1950 acres to public ownership results in an estimated \$150 annual local property tax revenue loss.</p>		
<p>a) Acquire fee simple title and scenic easement</p>	0	\$1,100,000	0	- \$1,025,000

RIO GRANDE  
NATIONAL ECONOMIC DEVELOPMENT ACCOUNT (Continued)

Component	Without Plan	Recommended Plan	R.M. 842.3 to Big Bend NP Boundary	Black Gap WMA to R.M. 651.1
Provide for high quality outdoor recreation opportunities associated with the river	Continuation of present trends	Increased tourism in the area may create new service oriented business opportunities such as canoe and raft rental, guides and outfitters, etc. The greatest impact would be in Terrell County since, in Brewster and Val Verde counties, tourism is already a major component of the economy.		
a) Develop facilities for outdoor recreation and access roads	0	- \$1,800,000	- \$ 25,000	- \$1,272,000
b) Estimate of annual operation and maintenance costs	0	Year 1 - \$85,000	Substantially the same as "without plan"	Substantially the same as "recommended plan".

RIO GRANDE  
REGIONAL DEVELOPMENT ACCOUNT

Component	Without Plan	Recommended Plan	F.M. 842.3 to Big Bend NP Boundary	Black Gap WMA to R.M. 651.1
Preserve free-flowing river except as provided for by treaty with Mexico	All effects fall into the National Economic Development, Environmental Quality or Social-Well-Being accounts.			
Control land use on the United States side of the river corridor	Conversion of land use from grazing to private wildlife, hunting and fishing will continue its present trend. The effect on the local economy has not been determined, however it will probably be slight.	Effect on local economy of losing up to 34 animal units of grazing has not been determined, however it will probably be slight since it is small in relation to grazing capacity that will continue to be available in the region.	Effects are similar to "without plan" consideration.	Effects are similar to "recommended plan".
Provide for high quality outdoor recreation opportunities associated with the river	No change in present trends.	National Park Service expenditures for development, operation and maintenance will increase the flow of Federal money into the local economy. The impact from different plans has not been determined. While the amount of dollars and new jobs created in the area will be small in number, there may be a noticeable impact owing to the small size of the local economic base. It should be noted that Big Bend National Park (current maximum 154 employees) provides 5 percent of the employment in Brewster County.		