



MINERAL LEASING PLAN
FOR SOVEREIGN LANDS ON
GREEN AND COLORADO RIVERS

FINAL

DIVISION OF FORESTRY, FIRE AND STATE LANDS

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I. INTRODUCTION

In January 1995, the Division of Forestry, Fire and State Lands (DFFSL) announced the withdrawal of sovereign lands from mineral leasing as part of a comprehensive planning process for management of minerals on those lands. Sovereign lands are defined by state law as "those lands lying below the ordinary high water mark of navigable bodies of water at the date of statehood and owned by the state by virtue of its sovereignty."⁽¹⁾ The ownership boundary as defined by the high water mark is referred to as the meander line. These lands include the beds of Great Salt Lake, Utah Lake, Bear Lake and the Jordan River and portions of the Bear River, Colorado River and Green River.

This plan is the first planning effort for the management of mineral resources with consideration of other resources by the DFFSL for sovereign lands on the Green and Colorado Rivers. The plan covers all lands of these rivers claimed as sovereign except those within Glen Canyon National Recreation Area. Excluding the 149 miles of sovereign lands within Glen Canyon National Recreation Area, claimed ownership of sovereign lands in the Green and Colorado Rivers totals approximately 300 miles. These riverbed lands form a thread of state ownership through a complex pattern of private, state and federal ownerships, with often opposing management goals.

Many of the adjacent lands, especially those managed by federal agencies like the National Park Service (NPS), Bureau of Land Management (BLM) or U.S. Fish and Wildlife Service (USFWS), have long-established management directions. In 1978-1979, there was a cooperative effort among state and federal agencies to complete a draft management plan for the Green and Colorado River. A river management plan was completed for Gray and Desolation Canyons in 1978. Its focus was on the recreational use of the river. Sovereign lands were involved only at Sand Wash and as the Green River emerged from Gray Canyon.

A Cooperative Agreement between the State of Utah and the BLM was drafted in 1979. This agreement was for the inventory and study of the Green and Colorado Rivers above Canyonlands National Park. This agreement recognized the difficulties involved in state ownership of the river with adjacent lands managed primarily the BLM. It also intended to integrate the many values of wildlife, withdrawals, minerals and human use.

In 1994, DFFSL was created as an entity to manage sovereign lands apart from state school and institutional trust lands. As such, DFFSL could plan for and manage these lands as public trust lands, with the broader view of how the region's many resources were interrelated with its mineral resources. To accomplish this, the Mineral Leasing Plan for the Colorado and Green Rivers reviews the history of mineral ownership and leasing, inventories mineral resources, and examines the existing management directions and conflicts among the various resources.

II. MANAGEMENT DIRECTIVES ON SOVEREIGN LANDS

A. Sovereign Lands

Sovereign lands are defined by state law as "those lands lying below the ordinary high water mark of navigable bodies of water at the date of statehood and owned by the state by virtue of its sovereignty."⁽²⁾ Ownership of the beds of navigable waters within the state begins at statehood in 1896 in accordance with the "equal footing" doctrine granting each state control and ownership of lands underneath those waters. Each state determines how the multiple resources within sovereign lands are to be managed for the public trust.

The BLM and its predecessor, the General Land Office, were responsible for surveying the public domain so that land could be conveyed into various ownerships.

Unappropriated lands remained under the management of the federal government. The BLM's Manual of Surveying Instructions, 1973 notes as follows: "Beds of navigable bodies of water are not public domain and are not subject to survey and disposal by the United States. Sovereignty is in the individual states. Under the laws of the United States the navigable waters have always been and shall forever remain common highways."⁽³⁾

The State Land Board, representing the state of Utah, regarded the Colorado, Green and San Juan Rivers as sovereign lands and asserted its view of ownership by issuing mineral and oil and gas leases on the beds of these rivers from the 1920s. Whether these river bed lands were sovereign would be decided in federal courts in 1931 and 1965. Map 1 shows the segments of these rivers which have been ruled to be sovereign lands. Figures 1 and 2 show the river profiles in relation to which portions were ruled navigable.

B. Public Trust Responsibilities on Sovereign Lands

Public trust principles guide the management of sovereign lands.⁽⁴⁾ Black's Law Dictionary defines public trust doctrine in terms of submerged or submersible lands to be preserved for public use in navigation, fishing and recreation.⁽⁵⁾ The state, as trustee for the people, bears responsibility of preserving and protecting the right of the public to the use of the waters for those purposes.⁽⁶⁾ There have been rulings by the courts which expand the definition of public trust uses on submerged lands to mean protection of visual, wildlife and open space values for the benefit of all the state's citizens.⁽⁷⁾ The introduction to Putting the Public Trust Doctrine to Work as prepared by the Coastal States Organization, describes the public trust doctrine as follows:

The Public Trust Doctrine provides that public trust lands, waters and living resources in a State are held by the State in trust for the benefit of all of the people, and establishes the right of the public to fully enjoy public trust lands, waters and living resources for a wide variety of recognized public uses. The doctrine also sets limitations on the States, the public and private owners, as well as establishing the responsibilities of the States when managing these public trust assets.

In general, public trust waters are the "navigable waters" in a State, and public trust lands are the lands beneath these waters, up to the ordinary high water mark. The living resources (e.g. the fish and aquatic plant and animal life) inhabiting these lands is also subject to the Public Trust Doctrine.⁽⁸⁾

The high water mark of the river along the navigable portions of the Green and Colorado Rivers is what defines the ownership boundaries of sovereign lands ⁽⁹⁾ (See Appendix A for discussion of high water mark). Because of Utah's arid landscape and the many river rapids and difficult terrain, the federal courts have had to rule as to what portions of the rivers would be considered navigable. As the course of the river changes over time, ownership may be affected by the natural processes of erosion, reliction and accretion.⁽¹⁰⁾ Western practices of water diversion and storage have had significant human-caused impacts on water flows and therefore on the placement and appearance of the high water mark along the river bank.

Most Utahns and many public land managers are unaware of what sovereign lands are and where they are located in the state. DFFSL's interactions have been with those parties interested in leasing minerals or rights of way on sovereign lands. There does exist, however, what the Coastal States Organization refers to as a "pyramid of authority over navigable waters." "At the top, and operating with the narrow scope of 'improvements to navigation' is the federal navigational servitude. Next is the State authority, as trustee, to manage its trust lands, waters and resources for the benefit of the public's various trust uses, including the authority to reasonably regulate riparian rights, or to deny them altogether. Finally riparian owners have certain rights..."⁽¹¹⁾ In this context, the 'federal navigational servitude' is defined as the "dominant servitude over navigable waters. 'The right of the United States in the navigable waters within the several States is, however limited to the control thereof for the purposes of navigation'" ⁽¹²⁾.

C. State Legislative Mandates for Sovereign Lands

Management directives for sovereign lands as defined by the state legislature have changed over the years. Management and disposition of minerals initially was a low priority relative to agricultural uses and water rights on or adjacent to sovereign lands. Legislation in 1917 allowed the sale of submerged lands but only if lakes or waterways were dewatered "to reclaim the bed thereof for agricultural purposes..." (Laws of Utah, 1917, Chapter 114).

The state soon asserted control over mineral resources on state lands, including sovereign lands. Authority for management and disposition of sovereign lands was given to the State Land Board. By 1925, submerged lands could also be sold if riparian landowners had made valuable improvements below the water's edge, but with mineral rights to be reserved to the state (Laws of Utah, 1925, Chapter 31) In 1933 legislation allowed sovereign lands to be sold for "public or quasi public use or service"(Laws of Utah, 1933, Chapter 46) as long as such sales did not interfere with navigation.

In 1988, the management direction for sovereign lands was changed by the state legislature to "sell or lease sovereign lands but only in the quantities and for purposes as serve the public trust and do not interfere with the public trust." 'Public trust assets' were defined as "lands and resources, including sovereign lands, administered by the division that is not part of the school or institutional trust lands".⁽¹³⁾ Specific management responsibilities are set forth in statute for sovereign lands within Great Salt Lake. For all other sovereign lands, statute allows to exchange, sell or lease sovereign lands, to set aside sovereign lands for recreational purposes and instructs the DFFSL to "develop plans for the resolution of disputes over the location of sovereign land boundaries". In addition, the DFFSL may enter into agreement with state agencies and private parties to establish boundaries.⁽¹⁴⁾

In 1994, the Division of Sovereign Lands and Forestry was created with the responsibility for management and planning of all mineral resources on sovereign lands in addition to responsibilities for comprehensive planning and coordination of activities of public and private entities. Statute instructed the DFFSL to manage lands and resources according to multiple use-sustained yield principles. 'Multiple use' is defined as "management of various surface and subsurface resources in a manner that will best meet the needs of the people of this state." 'Sustained yield' is defined as "the achievement and maintenance of high level annual or periodic output of the various renewable resources of land without impairment of the productivity of the land."⁽¹⁵⁾

Management of many of these resources has been delegated to other natural resource agencies--recreation and boating to the Division of Parks and Recreation; the various aspects of water resources to the Divisions of Water Resources, Water Quality, and Water Rights; and for wildlife to the Division of Wildlife Resources.

D. Federal Mandates which Affect Sovereign Lands

Federal laws such as the Clean Water Act and the River and Harbor Act of 1899 give federal agencies regulatory power over navigable waters for environmental regulation, protection of navigation and other purposes. For the Clean Water Act, the scope of federal authority is in fact broader than over "navigable" waters since it covers all waters of the United States, including tributaries to navigable waters.⁽¹⁶⁾ Other important federal laws include the Endangered Species Act which mandates protection of habitat for species formally listed as endangered, the Migratory Bird Treaty Act, the Bald Eagle Act, and the National Historic Preservation Act. Withdrawals of federal lands can be authorized by either Congress or executive action. Examples of withdrawal of federal lands which affect management of sovereign lands along the Green and Colorado River are Wild and Scenic River designation, wilderness study areas, reclamation and national recreation areas, recreation areas designated by BLM, oil shale withdrawals, and power site withdrawals.⁽¹⁷⁾

III. GOALS FOR NATURAL RESOURCE ADMINISTRATION

The purpose of the mineral leasing plan is to guide DFFSL in accomplishing the following goals:

A. Determine Public Trust Responsibilities on Sovereign Land in Green and Colorado Rivers.

- Define public trust doctrine and responsibilities as they apply to Green and Colorado Rivers.
- Reconcile public trust and multiple use/sustained yield directives in sovereign lands management.
- Create and support management direction for sovereign lands, utilizing standards for stewardship and ecosystem management.

B. Establish Ownership and Management Authority over Sovereign Lands on Green and Colorado Rivers

- Identify candidates for future Sovereign Lands Claims.
- Develop and maintain appropriate ownership and natural resource databases and maps.
- Establish and map the meander line from public land survey notes and plats along sovereign lands on Green and Colorado Rivers.
- Educate resource management agencies and members of public about location, boundaries and management objectives of sovereign lands on Colorado and Green Rivers.

C. Plan for Mineral Resource Development while Protecting other Resources on Sovereign Lands

- Guide the orderly allocation of resources on Green and Colorado Rivers.
- Define areas with greatest potential and most amenable for mineral development.
- Establish mineral leasing procedures for areas with high mineral potential.
- Foster coordination and cooperation in management of all resources on Green and Colorado Rivers with mineral lease applicants and local, tribal, state and federal agencies with management authority around or on Green and Colorado Rivers.
- Assure prudent operations during mineral operations and appropriate reclamation after mineral developments cease.
- Monitor and plan for long term impacts of mineral operations on sovereign lands.

D. Develop Management Strategy for Sovereign Lands as River Corridors

- Prepare and implement management plans for sovereign lands.
- Monitor and plan for long term health of river corridors.
- Establish the Division as a qualified recipient for donated lands and/or easements to be managed by the Division.

IV. ISSUES AND RESOURCE CONFLICTS ON SOVEREIGN LANDS

Issues Identified in Scoping Process for Green and Colorado Rivers

In December 1994, the DFFSL issued a press release advising the public that all sovereign lands were withdrawn from mineral leasing so that mineral leasing plans could be prepared for five separate areas throughout the state. The Green and Colorado Rivers were included in this withdrawal. In January 1995, the Division requested through the Resource Development and Coordinating Committee (RDCC) that the public and government agencies identify issues which should be addressed in each plan. State Identification Numbers for these five plans are UT950124-010, -020, -030, -040 and -050. The deadline to receive suggestions was May 1, 1995.

Issues identified in this scoping process were:

- How will DFFSL assure continued leasing and the rights of lessees to develop leases on sovereign lands?
- How will DFFSL address issues of access across federal lands; assure compliance with federal laws and policy with regard to endangered species?
- How will lessees be informed about federal laws and policies on adjacent lands?
- How will boundary lines between sovereign ownership and adjacent land owners be reviewed and defined?
- Will DFFSL fully evaluate mineral potential in relation to the benefits and problems associated with mineral leasing?
- How will DFFSL protect critical habitat for four endangered species of fish; protect riparian areas important for bald eagle wintering and nesting sites and cliff sites for peregrine falcon eyries; address issues of cumulative impacts by mineral leasing on other resources?

In addition to these issues, DFFSL identified additional issues from its history of management of these lands. All of these issues are addressed in the discussions below.

A. Public Trust Responsibilities on Sovereign Lands

Public trust responsibilities on sovereign lands have historically meant protection and management of navigation, commerce and fisheries. In recent decades, public trust has expanded to include protection of recreational values on navigable waterways and most recently, the protection of open space and biological resources. These public trust responsibilities are defined by court cases as well as state statutes. The state statute directs management of sovereign lands to follow multiple use, sustained yield principles and to protect the public trust. Thus, a range of values must be managed and protected.

Management of public trust resources has also been influenced by agreements the state or DFFSL has entered into regarding management of its sovereign lands. These include the cooperative agreement with the Department of Interior for Recovery Implementation

Programs for endangered fish and an interagency effort to effectively circulate rules and procedures for recreational dredging activities on the state's waterways, including sovereign lands. Management of public trust resources has been influenced by management decisions of other agencies, in particular the BLM.

The state's focus on multiple use expands the kinds of uses for which sovereign lands can be managed, and with less concern for the preservation of the natural waterway. DFFSL has focused its management efforts on mineral leasing and extraction. These are certainly commercial activities, but not those always considered in public trust doctrine, which seeks to preserve the character of the navigable waterways for public benefit. As with other managers of submerged or sovereign lands, DFFSL must determine what are its public trust responsibilities and what is the balance of management of those diverse resources. These would include issues of navigability, access and preservation of scenic and wildlife values.

B. Issues in Determining Ownership and Management Authority over Sovereign Lands

1. Managing Navigable Waters within or adjacent to Exterior Boundaries of Uintah and Ouray Indian Reservation

The federal district court case with regard to the tribal or individual allotment lands along the Middle Green River significantly impacts mineral leasing and development decisions by DFFSL for those lands "within the exterior boundaries of the Uintah and Ouray Indian Reservation in the State of Utah, as extended by the Act of March 11, 1948, 62 Stat. 72, or river-bed lands contiguous thereto and adjacent to either tribal lands or individual allotments including minerals". The text of the judgment is attached in Appendix B.

2. Determining Ownership of the Bed of the Colorado River above Castle Creek

Navigability of rivers in Utah as the basis for ownership of sovereign lands has been established through the federal courts. This is in contrast to many eastern states where rivers and coastlines were clearly navigable. The Green and Colorado Rivers, flowing through an arid and rough landscape, were ruled navigable in segments. One segment on the Colorado River from Castle Creek to the Utah-Colorado border still is claimed by both the state and federal governments. Until the DFFSL pursues ownership to all or part of this segment, management decisions will continue to be made by an agency which has several years of vested management history. Discussions about settling the ownership of this segment of the river have taken place between the Board of State Lands and Forestry and the BLM.

3. Identifying Sovereign Lands

Sovereign lands along the Green and Colorado Rivers are not differentiated on maps available to the public, even where ownership has been established. This will continue on most maps for public use because of the difficulty in marking sovereign land ownership

along the river corridors. However, maps acknowledging sovereign lands ownership need to be drafted and made available to the extent that the DFFSL wants to become involved in resource management issues. The DFFSL has hand drafted land plat books to record mineral leases and microfiche copies of the surveys establishing the meander line. It is presently working to get GIS data on the meander line from the BLM's Geographic Coordinate Data Base. There are however, several townships where no GCDB data yet exists or where the meander line of the rivers has not been surveyed, e.g., Westwater Canyon, Desolation Canyon, and Labyrinth Canyon. In addition, the information available to DFFSL is skeletal, with no attributes describing the GIS layers.

In its mineral leasing activities, the DFFSL is generally recognized as the owner of minerals. The exception to this has been for recreational gold dredging activities. To address this, the DFFSL has participated with other state and federal agencies to inform the public about where recreational dredging is permitted.

4. Defining and Identifying Ordinary High Water Mark

Locating the meander line on the ground is another significant issue in defining ownership and management authority. One part of this issue is locating or re-establishing the survey markers. Another is determining the extent that the river courses have changed due to natural or human caused events. Have for example, the depletions of water from the rivers by dams and diversion projects altered the high water mark? The DFFSL position is that human-caused depletion in flows do not affect title but may complicate mapping and identification of sovereign lands in the field.

C. Planning for Efficient Mineral Development

1. Ownership Issues

- Ownership of the bed of the Colorado River above Castle Creek has not been determined, either by agreement between the state and the federal government or by court ruling. The DFFSL has issued metalliferous mineral leases on the Colorado River. These are now all inactive. Along the Colorado River, there is likelihood that instead of obtaining mineral leases from the DFFSL, miners have filed placer mining claims under the 1872 Mining Law on lands ruled or claimed by the state as sovereign lands. This law governs issuance of mining claims on federal lands open to mining claims for locatable minerals. At present there are no active oil and gas leases above Castle Creek although there have been leases issued in the past. Under current agreements, BLM would issue new oil and gas leases in this area pending action by the state to establish whether the river in this stretch is sovereign lands.
- The surveyed meander may not accurately describe the current course of the river or there is uncertainty about where the ordinary high water mark lies. SITLA has issued metalliferous leases on lands adjacent to sovereign lands near Horseshoe Bend. The primary issue for DFFSL and SITLA to resolve involves the location of the meander line and sovereign land ownership as a result of changes in the

course of the river. A second issue is possible conflicts in lands management objectives between the two agencies.

- The BLM likewise has concerns about the location of the ownership boundary on BLM tracts adjacent to sovereign lands. The Cadastral Survey Staff of the BLM State office may have primary responsibility in resolving boundary issues. An additional concern for BLM and DFFSL alike are instances of mineral trespass in the case of mineral operations which occur on BLM lands or trespass by commercial/recreational boat operations which use lands below the ordinary high water mark.

2. Decisions or Concerns by Adjacent Landowners

- Decisions by upland landowners can control whether mineral development takes place on sovereign lands. DFFSL, following the example of previous state agencies managing sovereign lands, places a 'no surface occupancy' stipulation on all oil and gas leases. As a result, development of oil and gas resources can only take place if adjacent lands are leased and developed. This depends in turn on BLM management decisions and inclinations of private land owners. Federal and state wildlife or parks are also unlikely to allow mineral leasing within their management boundaries.

3. Agency Decisions

- In addition to land ownership and management decisions, mineral leasing on sovereign lands on river corridors is affected by agency actions representing other resources. Most significant of these actions is the declaration of the Green and Colorado Rivers as critical habitat for four endangered species of fish. Federal agencies are bound by law to manage lands to mitigate impacts on endangered species. The state also signed an agreement pledging to mitigate within the designated critical habitat for the four endangered species of fish. Habitat for two of these species, the Colorado squawfish and razorback sucker, occur in the alluvial meandering reaches of the regions basins and deserts. The designation as critical habitat will therefore have significant impact on leasing decisions and development for mineral resources on sovereign lands, especially in backwaters and gravel bars, which wildlife agencies regard as particularly sensitive.

4. Potential for Revenue Generation from Mineral Leasing

Revenues generated by mineral leases on sovereign lands in the Green and Colorado Rivers are modest. Annual royalties and rents are approximately \$24,000 compared with nearly one million dollars in royalties from Great Salt Lake leases.

- Only leases in the Uintah Basin have generated royalties. The state has received royalties and bonus bids in addition to lease rentals in the Horseshoe Bend and Brennan Bottom fields on the Green River. These monies are presently collected by School and Institutional Trust Lands because leases were in production and

part of existing units or communitizations before the establishment of DFFSL. After deducting administrative fees, the revenue is transferred to DFFSL. When these leases cease production, leases will terminate and the future leasing will be managed by DFFSL.

- For areas with oil and gas potential, there are opportunities for significant amounts in bonus bids. Many of these areas of interest are currently leased, but due to expire within the next one to five years if not producing. These leases attracted bonus bids in the Middle Green River near Uteland Buttes and West Willow Creek fields ranging from \$3,000 to \$35,000 (approximately \$15 per acre). In the Kane Creek area on the Colorado River, the state has received bonus bids ranging from \$17,000 to \$207,000 (approximately \$60 per acre). The Kane Creek leases include trust as well as sovereign lands.
- There is continuing interest in placer mining for gold on both the Green and Colorado Rivers. However, in the many years of leasing, the DFFSL has received only rentals from these leases. Surface occupancy restrictions have not been placed on metalliferous mineral leases but the lessee is required to abide by all state and federal regulations with regard to the leased lands. Some lessees have complained that this bars them from developing the lease. DFFSL should evaluate whether the low development potential and small revenues received are in proportion to the management time by DFFSL personnel and the oversight required by the Divisions of Oil, Gas and Mining, Water Resources and Water Rights.

5. Recreational Mining

- On the Green River, there is high interest in recreational gold dredging in the vicinity of Horseshoe Bend. The state has withdrawn both the Green and Colorado River from recreational gold dredging under its new permit system because the rivers have been declared critical habitat for four endangered species and because the DFFSL does not want mining activity without a mineral lease. In addition, the BLM enforces an oil shale withdrawal from filing of claims under the 1872 Mining Law on federal lands along the Green River by denying all claims for locatable minerals.

Table I-III summarizes the conflicts on each segment of the rivers. Appendix E examines each segment in more detail.

D. Issues of Managing River Corridor

Sovereign lands within the river corridors of the Green and Colorado are restricted in mineral leasing and development for a variety of reasons. Sovereign lands are narrow bands of lands passing through a variety of ownerships adjacent to the river. These upland owners, by decisions made about the kind and extent of development on their lands, determine whether mineral development can take place on sovereign lands. Landowners' interests range from protection as represented by national parks or wildlife refuges to interest in development expressed by individual landowners and managers for

state trust or tribal lands. This corridor of lands among landowners of diverse management goals may create restrictions on management but also can create opportunities to develop partnerships for the management of the river corridor.

Other resources which affect sovereign land management are the riparian values that are linked to the river corridors. The river channel which represents sovereign lands is only part (although an essential part) of the riparian corridor. These are wildlife, recreation associated with the river and sensitive species which could be classified as endangered species. There are also urban and agricultural uses along river corridors which could impact mineral development. Segments of both the Green and Colorado Rivers have been determined to be eligible for inclusion in the Wild and Scenic Rivers System. Two of these segments have also been determined to be suitable, one by the BLM and one by the NPS.

TABLE I. POTENTIAL RESOURCE AND MANAGEMENT CONCERNS ALONG SOVEREIGN LANDS ON MIDDLE GREEN RIVER (SEE APPENDIX E)

River Segment	Mineral Potential	Other Resources	Upland Ownership Patterns	Management Concerns involving Other Agencies
Dinosaur Nat'l Park to T6S R22E	<ul style="list-style-type: none"> • Low oil & gas potential • Interest in placer mining but low resource value; • Moderate sand & gravel potential near Jensen and Stewart Lake. 	<ul style="list-style-type: none"> • Viewshed, scenic, paleontological, geologic values near Dinosaur National Monument; • wetlands and riparian areas near Stewart Lake; • Agricultural lands; • Boat ramp at Split Rock; • Unimproved launch site at Stewart Lake and above Horseshoe Bend. 	<ul style="list-style-type: none"> • Federal lands managed by NPS at Dinosaur Nat'l Park, scattered BLM tracts; • Significant private ownership; • Individual Uncompahgre Ute Allotments in T6S, R22E. 	<ul style="list-style-type: none"> • ESA species at Dinosaur Nat'l Park; • Oil Shale withdrawal of lands barring mineral location below Stewart Lake; • Restrictive stipulations on BLM oil & gas leases in 100 year flood plain; • BOR proposals for critical habitat restoration and selenium abatement; • U.S. District Court Judgment C-201-62
Horseshoe Bend to Northern Boundary, Ouray Nat'l Wildlife Refuge	<ul style="list-style-type: none"> • Moderate oil & gas potential; existing oil & gas fields • Interest in placer mining but low resource value; • Moderate sand & gravel potential near Horseshoe Bend. 	<ul style="list-style-type: none"> • Extensive riparian and wetland area. 	<ul style="list-style-type: none"> • Federal lands managed by BLM; • Significant private ownership. 	<ul style="list-style-type: none"> • ESA species at Horseshoe Bend; • Oil Shale withdrawal of lands barring mineral location; • Restrictive stipulations on BLM oil & gas leases in 100 year flood plain and at proposed recreation site; • BOR proposals for critical habitat restoration; • U.S. District Court Judgment C-201-62

River Segment	Mineral Potential	Other Resources	Upland Ownership Patterns	Management Concerns involving Other Agencies
Ouray Nat'l Wildlife Refuge to southern boundary, Uintah and Ouray Indian Reservation	<ul style="list-style-type: none"> • Moderate oil & gas potential; • Moderate sand & gravel resources. 	<ul style="list-style-type: none"> • Extensive riparian and wetland areas; • Unimproved launch sites at Ouray and Ouray Nat'l Wildlife Refuge. 	<ul style="list-style-type: none"> • Federal lands managed by USFWS; • Tribal lands managed by Ute Tribe and BIA; • Private ownership; • Individual Uncompahgre Ute Allotments. 	<ul style="list-style-type: none"> • ESA species at Ouray Nat'l Wildlife Refuge; • No oil & gas leasing within Ouray Nat'l Wildlife Refuge; • Oil Shale withdrawal of lands barring mineral location; • BOR proposals for critical habitat restoration; • U.S. District Court Judgment C-201-62
Southern boundary, Uintah and Ouray Indian Reservation to Sand Wash	<ul style="list-style-type: none"> • Moderate oil & gas potential; existing oil&gas fields. 	<ul style="list-style-type: none"> • Extensive riparian and wetland areas; • Archaeologic resources; • Boat launch at sand Wash.. 	<ul style="list-style-type: none"> • Significant BLM ownership; • Private ownership near Pariette Draw and Willow Creek. 	<ul style="list-style-type: none"> • ESA species; • Oil Shale withdrawal of lands barring mineral location; • Restrictive stipulations on/LI>

TABLE II. POTENTIAL RESOURCE AND MANAGEMENT CONCERNS ALONG SOVEREIGN LANDS ON LOWER GREEN RIVER (SEE APPENDIX E)

River Segment	Mineral Potential	Other Resources	Upland Ownership Patterns	Management Concerns involving Other Agencies
Gray Canyon to northern boundary, T22S R16E	<ul style="list-style-type: none"> • Low oil & gas potential • Moderate sand & gravel potential near town of Green River. 	<ul style="list-style-type: none"> • Wetlands and riparian areas; • Agricultural lands; • Urban areas • Access and land exchange, Green River State Park; • Boat ramps at Green River State Park and Crystal Geysers 	<ul style="list-style-type: none"> • Scattered BLM tracts; • Significant private ownership • City of Green River. 	<ul style="list-style-type: none"> • ESA species; • BLM tracts designated for sale or disposal; • Open to location under 1872 Mining Law; • Determined by BLM as eligible under Wild and Scenic Rivers Act.
Northern boundary, T22S R16E to above Labyrinth Canyon	<ul style="list-style-type: none"> • Low oil & gas potential; • Moderate potash potential. 	<ul style="list-style-type: none"> • Riparian and wetland areas at mouth of San Rafael River. • Recreational use • Boat ramps at Ruby Ranch. 	<ul style="list-style-type: none"> • Federal lands managed by BLM; • Private ownership; • State trust lands. 	<ul style="list-style-type: none"> • ESA species; • Restrictive stipulations on BLM oil & gas leases in T24S; • Open to location under 1872 Mining Law; • Determined by BLM as eligible under Wild and Scenic Rivers Act. • Recreational and boating use.
Labyrinth Canyon	<ul style="list-style-type: none"> • Low oil & gas and mineral potential. 	<ul style="list-style-type: none"> • Riparian and wetland areas; • Recreational use and launch sites; • Boat ramps at Mineral Bottom; • Scenic values. 	<ul style="list-style-type: none"> • BLM ownership. 	<ul style="list-style-type: none"> • No leasing or no surface occupancy for oil and gas leasing; • T24-25S Open to Potash Leasing; • Open to location under 1872 Mining Law. • ESA species; • Determined by BLM as eligible under Wild and Scenic Rivers Act.

TABLE III. POTENTIAL RESOURCE AND MANAGEMENT CONCERNS ALONG SOVEREIGN LANDS ON COLORADO RIVER (SEE APPENDIX E)

River Segment	Mineral Potential	Other Resources	Upland Ownership Patterns	Management Concerns involving Other Agencies
Utah-Colorado State Line through Westwater Canyon	<ul style="list-style-type: none"> Moderate oil & gas potential; Placer mining claims. 	<ul style="list-style-type: none"> Riparian and wetland areas; High recreational use; Boat ramp at Westwater. 	<ul style="list-style-type: none"> Federal lands managed by BLM; Significant private ownership; School trust lands. 	<ul style="list-style-type: none"> ESA species; 'No surface occupancy' stipulations on BLM oil & gas leases in Westwater Canyon; Ownership of river bed lands has not been settled; Determined by NPS as eligible and suitable under Wild and Scenic Rivers Act.
T22S to Castle Creek	<ul style="list-style-type: none"> Low oil & gas potential; Interest in placer mining but low resource potential; Sand & gravel sites. 	<ul style="list-style-type: none"> High recreational use; Boat ramp at Castle Creek. 	<ul style="list-style-type: none"> Federal lands managed by BLM; Private ownership 	<ul style="list-style-type: none"> ESA species; 'No surface occupancy' stipulations on BLM oil & gas leases; Ownership of river bed lands has not been settled; Determined by BLM as eligible under Wild and Scenic Rivers Act.
Castle Creek to Canyonlands Nat'l Park	<ul style="list-style-type: none"> Moderate oil & gas potential Moderate potash potential and existing operations; Interest in placer mining but low resource potential; Sand & gravel sites. 	<ul style="list-style-type: none"> Riparian and wetland areas; Recreational use Several boat ramps; Geologic, scenic and archeological resources; Viewsheds for state and national parks; Agricultural lands; Urban areas. 	<ul style="list-style-type: none"> Federal lands managed by NPS and BLM; Private ownership; State trust lands; Nature Conservancy and state wildlife areas City of Moab. 	<ul style="list-style-type: none"> ESA species; Restrictive stipulations on BLM oil & gas leases; Determined by BLM as eligible under Wild and Scenic Rivers Act.

V. MANAGEMENT DIRECTIONS

A. Determine Public Trust Responsibilities on Sovereign Land in Green and Colorado Rivers.

Management Direction: Define Public Trust Doctrine and Responsibilities as they apply to Green and Colorado Rivers

- Define public trust as interpreted by courts in relation to state statutes and directives on multiple use/sustained yield.
- Define public trust management responsibilities with respect to navigation, commerce, fisheries, recreation, wildlife, open space in addition to minerals extraction.
- Address issues of protection of viewsheds, navigability, safety with Division of Parks and Recreation
- Address access to sovereign lands by initiating contacts with upland owners at determined points which allow for public enjoyment and use of river.
- Educate staff on public trust issues through conferences, contacts with other states with sovereign lands, and up-to-date information on definition of public trust, navigable waters and changes in ownership as river course changes.
- Educate public on doctrines of public trust, ecosystem management, and multiple use/sustained yield.
- Identify legal decisions/precedents for sovereign lands for states with significant history of water diversions and how that affects boundary issues.

Management Direction: Create and support management direction for sovereign lands, utilizing standards for stewardship and ecosystem management.

- Initiate discussions with USFWS, Bureau of Reclamation on proposed Recovery Implementation Program projects on Green River.
- Review State's compact with USFWS for critical habitat designation
- Research and implement methods for control of exotic plant species along Green and Colorado Rivers.

B. Establish Ownership and Management Authority over Sovereign Lands on Green and Colorado Rivers

Management Direction: Identify candidates for future sovereign lands claims

- Determine which lands on the Colorado River fit criteria for navigability based on past court cases and which are areas the Division can effectively manage.
- Decide whether to pursue state ownership of riverbed lands above Castle Creek by December 1998.
- Initiate contacts with the BLM at district, state and federal level to discuss land ownership issues.
- Involve area offices in identifying and researching lands for exchange.

- Determine criteria for land exchanges involving sovereign lands.

Management Direction: Review Federal Court Ruling on Tribal and Individual Allotment Lands.

- Contact Ute Indian Tribe and Bureau of Indian Affairs with regard to existing or proposed mineral leases on Green River.

Management Direction: Develop and maintain appropriate ownership and natural resource databases and maps.

- Obtain copies of BLM survey plats and notes for sovereign lands to distribute to Vernal and Moab offices and for Salt Lake City office.
- Obtain Geographic Coordinate Database for lands along Colorado and Green Rivers from BLM in usable format.
- Use Coordinate Geometry GIS applications to create meander from survey notes for sections not available or incomplete.
- Create maps, GIS data, and other descriptions of meander at appropriate scale and detail in context of land ownership for management actions, interagency actions, and public distribution.
- Provide access to and training for DFFSL lease management system; assure that all lease records are accurate and up-to-date and available to both area and central offices.

Management Direction: Establish and map the meander line from public land survey notes and plats along sovereign lands on Green and Colorado Rivers

- Compare land surveys with current maps of the Green and Colorado Rivers to determine what changes have occurred in river course.
- Inventory areas of conflicting ownership claims along meander.
- Establish criteria to determine on-the-ground location of the boundary between sovereign lands and adjoining land along navigable portions of Green and Colorado Rivers, including:

Evidence of ordinary high water mark at statehood such as

- BLM ownership plats and survey plats
- GCDB meander data superimposed over other GIS map data
- Location of meander corners and monuments from public land surveys.
- Average high spring flows at statehood (prior to construction of dams and water diversion projects).

Evidence of ordinary high water line at present such as

- Lines of vegetation, impressions in river banks and soil, and lines of debris which indicate elevation of average high spring flows.

Evidence of natural and gradual change in river course such as

- Aerial, digital orthophoto mapping and on-the-ground investigations with GPS compared to surveyed meander line.
- Use GPS and aerial mapping to determine where high water line lies in relation to maps and surveyed meander line.
- Work with BLM Cadastral Survey staff to jointly review and resolve boundary discrepancies.
- Work with BLM Cadastral Survey staff to complete land surveys on unsurveyed townships.
- Work with BLM Cadastral Survey staff to remonument surveyed meander in areas of high use or other significance (e.g. Locating surveyed meander near Uintah and Ouray Indian Reservation or individual allotments extending into river bed.)
- Provide on-the-ground assistance to area offices to determine location of meander/ordinary high water mark and boundary changes due to reliction and accretion from Attorney General's office and from third party consultants.
- Provide GPS units and laptop computers with Arcview programming to pull up maps of meander on site.
- Authorize land surveys by area offices, third parties and/or UDOT to re-establish meander corners.

Management Direction: Educate resource management agencies and members of public about location and boundaries of sovereign lands on Colorado and Green Rivers

- Distribute maps of sovereign ownership through BLM, USGS and UGS public rooms and bookstores.
- Provide maps to resource management agencies regulating recreational activities near or on sovereign lands on Colorado and Green Rivers.
- Participate in public education seminars (eg. recreational dredging groups) to discuss sovereign lands issues such as mineral ownership, access, public trust issues.
- Assure that all DNR news releases with regard to sovereign lands refer to state ownership and responsibilities.
- Design displays for all area visitor centers to promote higher visibility of DFFSL in region.

C. Plan for Efficient Natural Resource Development

Management Direction: Define areas with greatest potential and most amenable for mineral development.

- Increase routine contacts with BLM's State Office, Utah Geological Survey, and Division of Oil Gas and Mining about oil and gas plays, designation of units or communitization agreements and other indicators of oil and gas development to assure inclusion of sovereign lands where appropriate.
- Work with Utah Geological Survey and Uintah and Grand counties to inventory sand and gravel resources within meander line.
- Investigate history of sand and gravel mining within meanders of Green and Colorado Rivers.
- Withdraw lands within existing wildlife management areas and areas with the more important wildlife, recreational and scenic values from new mineral leasing. These areas are shown on Maps 2-7 as Category 4 - No New Leasing.

Management Direction: Guide the orderly allocation of resources on Green and Colorado Rivers.

- Categorize sovereign lands within in meander line of Green and Colorado Rivers as follows:

Category 1 - Open. No significant resource conflicts identified. Open to hydrocarbon or mineral leasing with standard lease stipulations. Because of the history of 'no surface occupancy' for oil and gas leases on river bed lands and issues surrounding dredging activities for metalliferous minerals, there are no Category 1 lands on the Green and Colorado Rivers.

Category 2 - Stipulations. (Minerals (including Common Variety Minerals) other than Oil, Gas & Hydrocarbons) Areas with mineral potential where resource conflicts or agency regulatory restrictions identified. DSLF will consult with appropriate agencies to draw up lease stipulations at time of lease tract nomination.

Category 3 - No Surface Occupancy. (Oil, Gas & Hydrocarbons). Areas with mineral potential but with significant resource conflicts identified. Areas will be leased but with no surface occupancy allowed. Lessees can access oil and gas by directional drilling or from leases adjacent to such areas.

Category 4 - No New Leasing. Areas with low mineral potential and with significant wildlife, recreational or scenic values. Existing mineral leases will continue but no new leases will be offered.

Category 5 - Ownership Review or U.S. District Court C-201-65. Areas where state ownership or lease management authority are in question. Existing leases will continue but ownership must be established before additional leases are offered **or** leasing

procedures must be reviewed and clarified to conform with U.S. District Court judgment C-201-65 at the time area is nominated for lease.

Leasing categories are shown on Maps 2-7.

Management Direction: Establish mineral leasing procedures for areas with high mineral potential

- Establish a tract nomination and leasing process for oil, gas and hydrocarbon resources as follows:

1. All sovereign lands on Green and Colorado Rivers will remain withdrawn from oil, gas and hydrocarbon leasing until nominated for lease.

2. Lands in oil, gas, and hydrocarbon leasing category 3 as identified in Maps 3, 5 and 7 will be offered for competitive lease following nomination by interested parties. DSLF can adjust or specify minimum acreage to efficiently lease the resource.

3. At the time of nomination, lands will be evaluated for conformance with the mineral leasing plan within 60 days after nomination is received. Evaluation will include appropriate tract size, minimum bid, proximity to existing fields or units, and consultation with other agencies to work out restrictions or stipulations as necessary. Nominated tracts will be offered on simultaneous listing after a three week notification period on the last Monday of the month. Any lease stipulations will be advertised in the competitive bid process.

- Establish a leasing process for other minerals (including common variety minerals) as follows:

1. All sovereign lands on Green and Colorado Rivers will remain withdrawn from mineral leasing until nominated for lease.

2. Lands in mineral leasing category 2 as identified in Maps 2, 4 and 6 will be offered for competitive lease following nomination by interested parties. DFFSL can adjust or specify minimum acreage to efficiently lease the resource.

3. At the time of nomination, lands will be evaluated for conformance with the mineral leasing plan within 60 days after nomination is received. Evaluation will include appropriate tract size, royalty, leasing or sale instrument, minimum bid, and consultation with other agencies to work out restrictions or stipulations as necessary. Nominated tracts will be offered on simultaneous listing after a three week notification period on the last Monday of the month. Any lease stipulations will be advertised in the competitive bid process.

- Consult with all public and private landowners or resource managers in vicinity of oil and gas/mineral tract nomination.

Management Direction: Foster coordination and cooperation in management of all resources on Green and Colorado Rivers with mineral lease applicants and local, state and federal agencies with management authority around or on Green and Colorado Rivers

- Coordinate tract nominations through the Resource Development Coordinating Committee.
- Negotiate memorandum of understanding with appropriate agencies for review of mineral development proposals in all leasing categories as shown on Maps 2,4 and 6.

Evaluate, in cooperation with BLM District offices, how accessible riverbed lands are to exploration, given management of adjacent lands and 'no surface occupancy' restrictions in leases.

- Begin discussion with US Bureau of Reclamation, Army Corps of Engineers and US Fish and Wildlife about what mineral or sand and gravel operations are feasible within guidelines of Recovery Implementation Programs for endangered fish.
- Work in consultation with the Divisions of Water Rights, Oil, Gas and Mining, Wildlife and the U.S. Fish and Wildlife Service to determine permitting options for placer mining operations.
- Determine if recreational dredging permits possible or if conflicts with ESA and environmental restrictions are too high.
- Establish policy for permitting recreational gold panning (no power equipment) on sovereign lands in Green and Colorado River.
- Coordinate and communicate to Parks and Recreation the timing and impacts of structures and/or operations on the river that may inhibit safe navigation, and prevent reasonable public access. There should be some process to alert river users and our river rangers of any conflicts, hazards or problems; and do so in such a timely manner to allow a reasonable management response and site mitigation.
- If possible, structures and operations should be off the river, within the state corridor, so that disruptions and obtrusive sound, exhaust, storage, vehicles, tailings, fugitive dust, waste and other corruptive influences are mitigated or screened from view.
- Information should be entered on a GIS system and georeferenced: made available to other agencies for analysis and reference; i.e., data on geology, minerals, operation, aspects of interpretive interest to the public.
- Where possible, popular and well established public river camping areas should be protected and reserved for recreational use. As a condition of mineral exploration, corporations/individuals should provide some service or facility to the public; i.e., restrooms, removal of waste, reconditioning sites, emergency

- communications, interpretation of exploration activities (education/interpretive), etc.
- The documented expectation of the river user is one of adventure, solace, back country/wilderness-like experience. Where possible, these values should be vouchsafed for river users. Early communication to river users (notices, pamphlets, apprising rangers and river concessionaires) will mitigate or mollify complaints and problems.

Management Direction: Assure prudent operations during mineral operations and appropriate reclamation after mineral developments cease.

- Include special stipulations in areas designated as Category 2 for new leases and in readjusted mineral leases necessary to: provide temporal or seasonal restrictions on development activities or lease operations; assurance compliance with ESA critical habitat designations, allow for public access; and ensure appropriate mitigation.
- Include provisions in all new and readjusted leases to address significant resource issues. These include: navigability; submission of plan of operations at the time of new development; bonding and reclamation requirements; requirements for cultural and biological surveys before disturbance of shore areas; and monitoring requirements to track and measure long term impacts of each operation on the riverine ecosystems.
- Review all leases at the end of primary term to determine if lease should continue or be terminated based on diligence and leasing category recommendations.
- Include in all new mineral leases readjustment clauses which allow periodic review of lease impacts on other resources. Lease and rule provisions will set parameters for modification or action by the Division if monitoring data indicate corrective measures are necessary.
- Work closely with DOGM from inception of lease nomination to assure maximum economic recovery, protection of correlative rights and prevention of waste of mineral resources.
- Work closely with DOGM at the time any plan of operations is proposed for any mineral development to assure all Division rules, lease terms and DOGM rules are observed or that proper action is taken to waive or modify rules.
- Enforce, and if necessary rewrite, rules requiring plan of operations before development begins and reclamation when operations cease, working with DOGM to assure coordination of efforts.
- Implement appropriate bonding requirements over those required by DOGM when DFFSL judges that a significant or extraordinary environmental risk or the potential for default in payments of royalties and rents exists.
- Review DOGM mining and reclamation rules for mineral operations and adapt DFFSL rules, leases and leasing policy to incorporate DOGM's reclamation and bonding standards.
- Review county regulations for sand and gravel and draft rules as necessary to govern sand and gravel operations on sovereign lands.

Management Direction: Monitor and plan for long term impacts of mineral operations on sovereign lands

- Create partnerships with mineral lessees to monitor long term impacts and trends of mineral development on sovereign lands within Green and Colorado Rivers.
- Select variables to monitor using data, expertise or management responsibility for the affected resources to be provided by lessee, UGS, DWR, USFWS, and P&R..
- Establish indicators of change and parameters of tolerance to indicate when reevaluation of on-going practices should be made.
- Identify a range of actions to be taken at critical points as defined by established parameters.

D. Develop Management Strategy for Sovereign Lands as River Corridors

Management Direction: Prepare and implement management plans for sovereign lands.

- Lead planning teams for stream and river segments in vicinity of sovereign lands to assure stakeholder involvement in planning for river corridors.
- Participate in any updates of BLM Resource Management Plans for eastern Utah.
- Initiate partnerships with state, federal, tribal, private, commercial parties to assure integrated management of sovereign lands as represented by river corridor.
- Pursue role as mediator or facilitator in resolving land management conflicts among users along river corridor.
- Determine value of minerals in priority with other uses and resource values.
- Determine impact of mineral development on other resources.
- Establish a "zone of influence" with regard for management of diverse resources along sovereign lands
- Explore role of sovereign lands and possibilities of partnerships to manage riverbeds as connecting diverse landscapes, resources, and ownership patterns.
- Identify common concerns or areas with high resource conflicts and form partnerships or enter into MOUs with agencies with management responsibilities to resolve these.

Management Direction: Monitor and plan for long term health of river corridors.

- Create partnerships with other landowners and state and federal agencies to monitor long term impacts and trends of mineral development on sovereign lands within Green and Colorado Rivers.
- Select variables to monitor using data, expertise or management responsibility for the affected resources to be provided by lessee, UGS, DWR, USFWS, and P&R..
- Establish indicators of change and parameters of tolerance to indicate when reevaluation of on-going practices should be made.

- Identify a range of actions to be taken at critical points as defined by established parameters.

Management Direction: Establish the Division as a qualified recipient for donated lands and/or easements to be managed by the Division.

- Acquire federal or private lands through conservation easements, exchanges or other instruments to implement ecosystem and resource management objectives.
- Establish sovereign lands management to complement values in these areas.

VI. HISTORY OF EXPLORATION

A. Exploration and Development

The Colorado and Green Rivers have played prominent roles in Utah's history beginning with early explorers. The Green River has had many names during its 200 year history of European and American expansion. The earliest Spanish explorers named the river Rio de San Buenaventura and mapped it as flowing west to the Pacific from northern Utah, a mistake which was corrected by John C. Fremont's explorations in 1843-1844. The Green River was referred to as the Spanish River, Colorado River of the West, and Seeds-Kee-Dee Agie by American fur trappers. William Ashley established the name as the Green River, using the name given it--Rio Verde--by a party of New Mexican fur trappers he met in 1825.⁽¹⁸⁾

The Colorado River above the confluence of the two rivers was named the Grand River until it was renamed by the Colorado Legislature in 1921 with the subsequent approval by Congress. According to Philip Fradkin in his book [A River No More, the Colorado River and the West](#), the Utah legislature considered renaming of Green River as the Colorado river in the spring of 1921, just prior to the Colorado legislature's action. Hydrologically, the Green River is the "master stream" or main stem of the "Colorado" River because it drains a greater area and is longer than the Grand River portion of the Colorado River.⁽¹⁹⁾

The Green River was floated by William Ashley from southern Wyoming to the Uintah Basin in 1825, followed by many trips by other fur trappers before the famous exploration of the Green and Colorado Rivers by John Wesley Powell in 1869 and 1871.⁽²⁰⁾ Powell, however, explored the rivers from Green River, Wyoming to the mouth of the Virgin River. During the second expedition in 1871, Powell and his crew provided the scientific and descriptive observations that outlined the importance of the rivers for the western region--remoteness and inaccessibility in many reaches of the rivers; the geology, natural history, archeological sites; water resources for irrigation and settlement.

Robert Brewster Stanton led the next exploration expedition along the Colorado River in 1889. In contrast to Powell's explorations, Stanton was interested in the economic potential of the rivers. Stanton's party embarked from Green River, Utah with the intent

of surveying the Colorado River for a railroad route through the canyons of the Colorado. Stanton was also interested in the mineral potential along the Colorado River and staked several mining claims during his two expeditions.⁽²¹⁾

In his account of the 1869 Powell expedition, Jack Sumner had noted the presence of "flour" gold in the gravel bars of the Colorado River from the mouth of the Dirty Devil River to Lee's Ferry.⁽²²⁾ Several others prospected for this gold with the largest operation set up by

Hoskaninni Mining Company from 1901-1902. Stanton was the engineer for this project, which was a considerable financial failure.⁽²³⁾ From these earliest mining developments came the "giant sluice" theory--that the rivers drained large areas rich in mineral resources, washing down in particular flour gold.

B. Commercial Development

The first oil well in Utah was drilled close to the city of Green River and adjacent to the river in 1891.⁽²⁴⁾ This well was soon plugged and abandoned. Oil seeps had also been noted along the San Juan River in 1883 by E. L. Goodridge and a "gusher" well was drilled by him in 1908. This was the discovery well for the Mexican Hat field, adjacent to and within the meander area of the San Juan River.⁽²⁵⁾ Intense prospecting for oil along the Colorado River below Moab and the San Juan River began in the 1920s.⁽²⁶⁾

As early as 1907, the U.S. Geological Survey and the U.S. Bureau of Reclamation were also conducting surveys to identify dam sites for water storage and power generation. These were done in cooperation with Southern California Edison along the Colorado River and with Utah Power and Light along the Middle portion of the Green River. These efforts identified and planned for several dams along both rivers and culminated in the building of Boulder Dam along the Lower Colorado River.⁽²⁷⁾ Glen Canyon Dam was authorized in 1956 by the Colorado River Storage Act, after conservationists defeated a proposal for a dam in Dinosaur National Monument. The dam was intended to supply power and to store water under the Upper Colorado River Compact which was negotiated in 1948 to allocate waters of the Colorado River drainage among the states of Wyoming, Colorado, Utah and New Mexico.⁽²⁸⁾ The Central Utah Project was also authorized by the Colorado River Storage act with the Vernal Unit completed in 1962 and the Jordanelle dam, part of the Bonneville Unit, just recently completed.⁽²⁹⁾

Recreational use is the most recent development along the Green and Colorado Rivers. Private parties and commercial tours began running the rivers from the 1890s, reaching significant numbers by the 1930s. As the numbers of private and commercial trips increased in the 1960s, licensing, permits and regulations were put into place.⁽³⁰⁾ In late 1970s, cooperative management plans among state and federal agencies were completed to address the numbers people using the rivers and to allocate permits for entry. One of the recommendations of these plans was the suspension of oil and gas activities in Grey and Desolation Canyons because of the high recreational use.

VII. HISTORY OF LAND OWNERSHIP

A. Navigability of the Grand, Green, San Juan and Colorado Rivers

The interest in oil and gas exploration brought into the forefront the conflicting claims held by the State of Utah, represented by the State Land Board and the federal government, represented by the General Land Office. During the 1920s, both the state and federal government issued mineral leases or oil prospecting permits for lands within the meander lines of the Colorado and San Juan Rivers. The State Land Board claimed these as state lands through sovereign land doctrine. A suit was initiated in federal court about ownership during this period, citing in its complaint "that the state of Utah claims title adverse to the United States in these river beds...and that Utah without consent or authority of the United States has executed and delivered numerous oil and gas leases covering portions of these river beds and purporting to give exclusive rights and privileges." Utah countered that title to the river beds was with the state because of "the navigability of the rivers."⁽³¹⁾ The issue to be decided before a Special Master was whether the four rivers--the Colorado River below the confluence with the Green and Grand Rivers, the Grand River below Castle Creek, the San Juan below Chinle Creek, and the Green River below Township 23 South--were navigable at the time Utah became a state.

The Special Master's report on these rivers focused on whether they were "navigable in fact when they are used, or are susceptible of being used, in their ordinary condition, as highways for commerce, over which trade and travel are or may be conducted in the customary modes of trade and travel on water."⁽³²⁾ In 1910, Lt. Charles T. Leeds of Engineer Corps investigated the navigability of Green and Grand Rivers for the War Department under provisions of River and Harbor Act of 1909. His report determined that sections of the rivers were navigable within the state but not across state lines. The United States admitted the rivers were "not surveyed but traceable" but argued that to be designated as sovereign lands, waters must be navigable across state lines, not just within the state to meet navigability for commerce and trade. The Federal arguments also focused on the wildness of the rivers, citing their fluctuations in flow, presence of sand bars and other obstacles to navigation, and "the desolate, broken country with riparian lands high above river to preclude access", "uninhabited and uninhabitable". There were no commodities produced, no markets which could use the river.

Utah conceded many of these contentions but asserted ownership. The state admitted that the State Land Board was issuing leases and prospecting permits but was not allowing drilling within the river beds.

The Special Master ruled that the history of nonuse does not equal non-navigability. The criteria used to determine whether the rivers were susceptible of being used for navigation were width of the river channel, the amount of flow and for what periods, the nature of obstacles to navigation in the river and the drop in elevation over the length of the rivers. Based on these criteria, the Special Master determined that of the rivers in dispute, Cataract Canyon on the Colorado River from the confluence of the Green and

Grand Rivers to Mile 176 above Lee's Ferry, Arizona and the San Juan River from Chinle Creek were not navigable. The Colorado River was ruled navigable from the Utah-Arizona Border at Mile 27.8 miles to Mile 176.5 above Lee's Ferry and from Mile 212.3 to Mile 295.95 above Lee's Ferry. The Green River was ruled navigable from the confluence with the Colorado River to Mile 95 above the confluence.

The ruling by the Special Master was appealed by both parties to the U.S. Supreme Court. In 1931 the court followed the recommendations of the Special Master except to add a 4.2 mile stretch of the Colorado River below the confluence of the Green and the Grand as navigable. The decision stated:

It is true that the region through which the rivers flow is sparsely settled. The towns of Green River and Moab are small and otherwise the country in the vicinity of the streams has but few inhabitants. In view of past conditions, the government urges that the consideration of future commerce is too speculative to be entertained. Rather it is true that, as the title of a state depends upon the issue, the possibilities of growth and future profitable use are not to be ignored. Utah, with its equality of right as a state of the Union, is not to be denied title to the beds of such rivers as were navigable in fact at the time of the admission of the state either because of the location of the rivers and the circumstances of the exploration and settlement of the country through which they flowed had made recourse to navigation a late adventure or because commercial utilization on a large scale awaits future demands. The question remains one of fact as to the capacity of the rivers in their ordinary condition to meet the needs of commerce as these may arise in connection with the growth of the population, the multiplication of activities, and the development of natural resources.⁽³³⁾

B. Navigability of the San Juan River above Chinle Creek

In 1959, the United States brought suit in U.S. District Court to "quiet title in the United

States to the land constituting the bed of the San Juan River in Utah from the boundary line between Colorado and Utah downstream to the mouth of Chinle Creek, a distance of approximately 55 miles..."⁽³⁴⁾ The discovery well for the Greater Aneth field was drilled in 1956, followed by several other successful wells in the area. Utah was joined by several mineral lessees as defendants in that case. The State Land Board was apparently reluctant to invest much money in the suit, seeking to make the oil and gas lessees assume the witness costs or renegotiate their leases to provide for higher royalty payments.⁽³⁵⁾

The court ruled that the San Juan River was not navigable in this stretch of the river as the Supreme Court had ruled in its 1931 decision about the San Juan River below Chinle Creek. The decision was appealed by Utah and its mineral lessees to the U.S. Court of Appeals. That court affirmed the District Courts decision on May 10, 1962 citing that the river was unstable in its flows and its braided channels. In addition, it denied Utah's appeal that it not share in the cost of the proceedings.⁽³⁶⁾

C. Navigability of the Green River above Township 24 South

In the same period that suit was filed for the San Juan River, the United States filed suit in Federal District Court to quiet title for the Green, Duchesne, and White Rivers. Again, there had been discoveries in the Horseshoe Bend of the Green River (Brennan Bottom field in 1954 and the Horseshoe Bend field in 1964) as well as production from the Natural Buttes field on the White River since 1952.⁽³⁷⁾ Both the State Land Board and the BLM had issued mineral and oil and gas leases on the bed of the Green River.

A progress report to the Utah State Land Board in December 1961, reported:

The resources present in the area under consideration should make a strong case for multi-purpose river development if the facts are assembled and made available. The Green River flows through an area which contains vast deposits of coal, oil shale, and bituminous sands...The waters of the River are needed to provide cooling and condensing requirements for steam generation of electricity and various other industrial needs.⁽³⁸⁾

The progress report recommended that the State Land Board consider trading lands under these rivers, if the state were to acquire title, for "other tracts that would provide a more advantageous grouping..."⁽³⁹⁾ In 1964, The Utah Bureau of Economic and Business Research completed a review of mineral, agricultural and industrial potential along the Green River corridor entitled Navigability of the Green River Management of its Waters for Resource Development. The study was financed in part by the State Land Board at the request of the Attorney General of Utah. The focus of the report, rather than to establish that the Green River was navigable or in its natural state could support commercial utilization, was to recommend the construction of a series of reservoirs from Split Mountain to just below the mouth of the Price River. Resources such as oil shale, bituminous sandstones, and coal could not be accessed by the "usual types of transportation systems, i.e. roads and railroads" but the river by the construction of these reservoirs could become an "effective highway for commerce" for their development.⁽⁴⁰⁾ The District Court ruled in 1965 that the White and Duchesne Rivers were not navigable at statehood. The stretches of the Green River in Dinosaur National Monument and in Desolation and Gray Canyons were also determined to be nonnavigable. The Green River was determined to be navigable as it flowed out of Dinosaur National Monument (Mile 312 above the confluence above the Green and Colorado Rivers) and across the Uinta Basin to Sand Wash (Mile 212.7 above the confluence) and as it emerged from Gray Canyon (Mile 129 above the confluence) across the San Rafael Desert to where the river crossed the boundary of Townships 23 and 24 South (Mile 95 above the confluence).⁽⁴¹⁾

The judgment placed the following stipulation on lands adjudged to be navigable:

Wherever, by decree of this Court in this action, the State of Utah is awarded the minerals underlying the bed of the Green River within the exterior boundaries of the Uintah and Ouray Indian Reservation in the State of Utah, as extended by the Act of March 11, 1948, 62 Stat. 72, or river-bed lands contiguous thereto and adjacent to either tribal lands or individual allotments including minerals, the State of Utah will not issue mineral leases to

said river-bed lands except to the Ute Indian Tribe of the Uintah and Ouray Reservation or its nominee.⁽⁴²⁾

D. Navigability of Colorado River above Castle Creek

The United States, which has brought suit on all cases to determine sovereignty in the state, has not filed suit to quiet title to the bed of the Colorado River above Castle Creek. Utah claims ownership of this stretch of the Colorado River and has issued mineral and oil and gas leases along it. The Division of State Lands and Forestry (now DFFSL) issued seven metalliferous lease and five oil and gas leases. Metalliferous mineral leases were interested in "flour gold" in Colorado River. These leases did not result in royalty payments and none is now active. The BLM has several placer mining claims of long standing along the Colorado River in the vicinity of Westwater Canyon and near Potash. These may extend below the ordinary high water mark or surveyed meander line. There have been no significant mineral or oil and gas discoveries, events which in Utah triggered previous actions by the United States to quiet title to riverbed lands.

At a meeting of the Board of State Lands and Forestry in October 1988, the question of navigability of this segment of the river was discussed with the BLM District Manager Gene Nodine. According to board minutes, the BLM believed all of the Colorado above Castle Creek except Westwater Canyon would fit the criteria of navigable as set by the federal courts. Determining boundaries, in their view, might be the more difficult task. The Board discussed the possibility of a "friendly suit" to determine ownership.⁽⁴³⁾ In 1993, the Division of State Lands and Forestry and BLM agreed that BLM would continue to manage these riverbed lands as federal public land pending a decision by the state to file a suit in District Court for a quiet title action based on navigability.⁽⁴⁴⁾ The state has not yet made that decision.

E. Exchange of Sovereign Lands for Federal Lands

Canyonlands National Park was established by act of Congress on September 12, 1964, encompassing Canyonlands along 46 miles of the Green and approximately 30 miles of the Colorado Rivers below Township 26 South. The act which established the park also provided for exchange of trust and sovereign lands out of the park for federal lands of equal value. On January 22, 1965, at the same time that ownership of the Middle Green River was being determined and thirty-four years after ownership of these segments of the rivers had been determined, the state completed negotiations with the federal government for trade of segments of the Colorado River for federal lands.⁽⁴⁵⁾

F. Sovereign Lands in Glen Canyon National Recreation Area

Glen Canyon Dam was completed in the early 1960s and Lake Powell took the place of the Colorado River from Cataract Canyon to the Arizona/Utah State line. This has effectively barred mineral or oil and gas leasing on the lower Colorado River. The Board of State Lands and Forestry approved a withdrawal of these lands from mineral leasing on October 15, 1987 until December 31, 1988. No mineral or oil and gas leases have

been issued on this section of the Colorado River since the withdrawal of lands nor has interest been expressed by the mineral industry. The state is preparing an exchange proposal.

VIII. SOVEREIGN LAND OWNERSHIP BOUNDARIES

A. History of Land Surveys

The General Land Office and subsequently the BLM were responsible for the cadastral survey of the public domain. These surveys, begun on public domain lands in 1785, were for "ascertaining the mode of locating and disposing of lands in the western territory.." ⁽⁴⁶⁾ These surveys were based on a rectangular grid, with "north and south lines run according to the true meridian, and by others crossing them at right angles, so as to form townships of six miles square, unless where the line of an Indian Reservation...or the course of navigable rivers, may render this impracticable; and in that case this rule must be departed from no further than such particular circumstances require." ⁽⁴⁷⁾

Powell, as director of the U.S. Geological Survey, recommended a survey system based on streams and water courses rather than the rectangular grid system. He proposed halting the development of western lands until such a survey was complete. Powell believed that land ownership should be tied to access to water along streams and springs. Diversion of water along larger water courses would be done cooperatively among users with federal oversight. ⁽⁴⁸⁾ Powell also wanted state and territorial boundaries to be defined by river drainage. Powell viewed the western region as arid, capable of sustaining limited settlement. In his recommendations to Congress in 1874, he estimated that there was enough water in the upper Colorado River drainage to irrigate 2.8% of the land. ⁽⁴⁹⁾ Powell was successfully opposed in these views by western landowners and political leaders. These leaders, represented by William E. Smythe, a newspaper editor, and Sen. William M. Stewart from Nevada, saw unlimited potential for the west if water could be developed. ⁽⁵⁰⁾

Original land surveys for the meander line of the Green River in the Uintah Basin for the General Land Office began in 1878 and were completed in 1910 as far as Desolation Canyon. Resurveys of several of these townships and original surveys of incomplete portions below Horseshoe Bend were conducted in the 1950s and 60s under the General Land Office's successor agency, the Bureau of Land Management. Land surveys for the meander line of the Green River from the mouth of Gray Canyon to Canyonlands National Park boundary were done beginning in 1881 and completed by 1955. However, the river meander line in portions of Township 25 South and all of Township 26 South have never been surveyed. Survey notes show no resurveys done of this segment of the river. Land surveys for the meander line of the Colorado River began in 1878 and were mostly complete by the 1930s. Resurveys of the portions of the River in Westwater Canyon were done in 1910 and 1966. ⁽⁵¹⁾

B. Definition of Meander Line

Sovereign lands are the lands below the ordinary high water mark along those portions of the rivers that were navigable at the date of statehood. The boundary of ownership of sovereign lands is the ordinary high water mark at the time of statehood. DFFSL rules define the ordinary high water mark as follows: "The high water elevation in a lake or stream at the time of statehood, uninfluenced by man-made dams or works, at which elevation the water impresses a line on the soil by covering it for sufficient periods to deprive the soil of its vegetation and destroy its value for agricultural purposes or other tests as may be applied by the courts. This 'ordinary high water mark' may not have been adjudicated by the courts."⁽⁵²⁾

The surveyed meander is not the legal equivalent of the ordinary high water mark, although it may be the best evidence of its historic location. This ordinary high water mark or meander line was surveyed by the General Land Office and its successor, the Bureau of Land Management. The surveys were completed over a sixty year period, with some portion of sovereign lands along the Green River still not surveyed. There have been resurveys as well in some areas of the rivers to clarify or adjust the meander line. Because of difficulties in and time elapsed since doing the surveys, there is some question whether those surveys accurately describe the river at present. The physical markers of where the surveyed meander line lies are also difficult to locate. Appendix A cites language from several authorities and court rulings concerning the definition of the ordinary high water mark. This Appendix also briefly quotes a text on the fluvial processes which define the river channel and its banks.

Another uncertainty in locating the legal boundary of sovereign lands is that the course of the Green and Colorado rivers has changed due to a combination natural and human causes. The courts' criteria have been that changes in ownership can come about only because of gradual and natural changes in the river, not human-caused changes--rules of accretion and reliction.

Phillip Lear writes about changes in ownership as the course of a navigable river changes as follows: "Regarding beds underlying navigable water bodies, the rule seems to be that the state's title shift with the river...The rationale is that the state must exercise dominion and control over navigation as part of its public trust duty; thus, when a navigable river changes its course or channel, the state's title shifts with the bed."⁽⁵³⁾

Since the 1950s, the Green and Colorado Rivers have been significantly affected by dam and diversion projects. After the construction of Flaming Gorge Dam in 1962, the "average peak flow of 1- to 7-days' duration was reduced by more than 6,000 cfs [from approximately 22,000 to 16,000 cfs], and the average peak flow of 15-days' duration was also reduced by nearly 6,000 cfs."⁽⁵⁴⁾ Even more remarkable reductions in peak flow have occurred on the Colorado River. The peak flows have declined by 15,000 cfs, from historic flows of 33,000 cfs to current peak flows averaging 18,000 cfs.⁽⁵⁵⁾ The primary effect on sovereign lands is to reduce both the flow and the fluctuation of flow rather than

marked changes in the river courses. However, the reductions in flow could have an impact on the ordinary high water mark in the time since statehood.

C. Map Information About the Meander Line

The BLM, as the administrator of the remaining federal lands not passed into other ownership or dedicated management, maintains land plats of federal ownership and land grants to states and private parties. These plats identify the surveyed meander line and which segments of the rivers have been ruled navigable by the courts. The plats are derived from the survey plats from the various public land surveys done by the General Land Office and the BLM. Sovereign land ownership can therefore be traced on the plat maps maintained by the BLM. The BLM Cadastral Survey Staff has responsibility for reviewing meander lines in consultation with other landowners, using BLM title plats and other sources of information on land ownership.

Topographic maps at 1:24,000 scale prepared by the U.S.G.S. show meander and witness corners but not the meander line. Maps of surface management status at the 1:100,000 scale prepared by the BLM do not show the meander line, and do not identify which segments are navigable or sovereign land ownership on any maps generally available to the public. This is due to the lack of awareness of what sovereign lands are and to the difficulty in mapping as separate ownership the thread of sovereign lands along navigable rivers.

Based on the survey notes and plats, the BLM is developing a geographic information systems (GIS) data base to describe the public land survey using AutoCAD. This is referred to as Geographic Coordinate Database (GCDB). These data have been converted to the state's GIS format so that they may be viewed in ArcInfo and ArcView. Missing from this data base are meander line in townships in Westwater, Desolation, and Labyrinth Canyon, which have never been surveyed.

The DFFSL has obtained microfiche copies of the survey plats for all sovereign lands from the BLM. These will be printed out and bound into reference material on the historical surveys that define sovereign lands boundaries. The DFFSL also has its own river plat book with the river meander line hand drafted, township by township. The DFFSL has used this to issue mineral leases, while relying on BLM survey plats to estimate acreage within leases. This reflects the DFFSL's historical emphasis on minerals and oil and gas development in its management of the Green and Colorado Rivers.

Ultimately, the DFFSL should be able to produce maps with the surveyed meander line from GIS data obtained from the BLM's GCDB. This digital information on the meander, once available and complete, will be a beginning point and an approximation of sovereign land ownership.

IX. MINERAL RESOURCES ON SOVEREIGN LANDS

A. Physiographic provinces and subdivisions

The Green and Colorado Rivers drain the Colorado Plateau physiographic province. This province is divided into several subdivisions based on the geology of the plateau. The courts in determining what segments of the rivers were navigable looked at the width of the river channel, the amount of flow and for what periods, the nature of obstacles to navigation in the river and the drop in elevation over the length of the rivers. Segments of the Green River determined to be navigable therefore cross basin subdivisions and exclude the canyon lands in the Book Cliffs. Stretches of the Green River in the Uinta Basin, the Mancos Shale Lowland and Green River Desert subdivisions are designated as sovereign lands. The Colorado River below Castle Creek travels through the Salt Anticline and Inner Canyonlands subdivisions, which includes rough country and canyons along the Colorado River but still meet the Special Master's criteria in the 1931 Supreme Court decision for navigable or susceptible of being navigable. The state traded sovereign lands in most of the stretches of the Green and Colorado Rivers that flow through the Inner Canyonland subdivision.

State ownership of the Colorado River above Castle Creek has not yet been recognized by the United States. This section of the river flows through Westwater Canyon in the Uncompahgre Extension subdivision and through the Salt Anticline subdivision.

B. Mineral Resources, Middle Green River

Oil and Gas Resources

Leasing, primarily for oil, gas and hydrocarbons, within the meander line of the Green River first began in the early 1950s before ownership of any part of the Green River had been established. As a consequence, lands within the meander of the Green River were leased by both the State Land Board claiming ownership as sovereign lands and the BLM claiming federal ownership. The action filed in 1962 by the federal government in Federal district court to determine ownership of the bed of the Green River was probably spurred by the discovery of oil and gas along the bed of the Green River. The discovery well for the Brennan Bottom field which includes segments of the Green River in T7S R20 and 21E was completed in 1954. The discovery wells for the Horseshoe Bend field within the Uinta and Green River formations were completed in 1959 and 1964 respectively. ⁽⁵⁶⁾

The Uinta Basin has historically been an area of significant oil and gas production since the early 1950s. Oil and gas were discovered below the Green River in the Green River formation in the mid 1950s and later in the Uinta, Wasatch and Mesa Verde formations. Significant fields in the vicinity of the Green River which are producing from the Green River, Uinta, or Wasatch formations include Red Wash, Natural Buttes, Horseshoe Bend, Brennan Bottom, and Wonsits Valley. Table IV summarizes production information for these fields in the vicinity of the Green River. Map 6 shows the location of these fields.

The oil and gas potential in the Green River above Horseshoe Bend in state ownership is categorized as "Low-value or unknown/unranked areas" by a U.S. Bureau of Mines report entitled Availability of Federally Owned Minerals for Exploration and Development in Western States: Utah, 1988. However, segments of the Green River falling within Townships 6 and 7 South and 8, 9 and 10 South are categorized as "Moderate Value Known Mineral Deposit Areas (KMDA)".⁽⁵⁷⁾ Sovereign lands in these townships pass through the Horseshoe Bend area to the Ouray National Wildlife Refuge and from Pariette Draw to Sand Wash.

The Vernal Office of the BLM defines these townships as high potential rather than "moderate value". In the Horseshoe Bend area, the BLM predicts development drilling, primarily for oil, "within and adjacent to the following fields: Horseshoe Bend, Brennan Bottom, and Gusher. Minor development drilling may occur at Halfway Hollow and Twelve Mile Wash fields. Below Pariette Draw, the BLM in its Diamond Mountain Resource Management Plan predicts development drilling in the River Bend and Island Units. In addition, the BLM identifies hydrocarbon resources including methane gas and tight gas sandstone. Tight gas sandstone reservoirs "have been designated by the State of Utah, the U.S. Geological Survey, and the BLM with the concurrence of the Federal Energy Regulatory Commission in the following areas:

10S 18E Sections 1-4, 9-16, 22-27

10S 19E Sections 5,6,7,8

9S 18E Sections 34,35,36

9S 19E Sections W½ 28,29,31,32⁽⁵⁸⁾

These sections include sovereign lands. Map 8 shows this area of potential.

TABLE IV. OIL AND GAS FIELDS PRODUCING FROM GREEN RIVER & UINTA FORMATIONS IN VICINITY OF SOVEREIGN LANDS ON GREEN RIVER^{*1}

FIELD/ FORMATION	DISCOVERY DATE	CUMULATIVE OIL PROD	CUMULATIVE GAS PROD	ESTIMATED ULTIMATE OIL RECOVERY	ESTIMATED ULTIMATE GAS RECOVERY
BRENNAN BOTTOM/ GREEN RIVER	March 4, 1954	1.4 MMBO	1.9 BCFG	1.6 MMBO	~
HORSESHOE BEND/ GREEN RIVER & UINTA	October 30, 1964 June 1, 1959	1.5 MMBO	22.0 BCFG	~	~
NATURAL BUTTES/ GREEN RIVER	Recompleted December 18, 1980	3.2 MMBO	6.0 BCFG	~	1 BCF/well
RED WASH/ GREEN RIVER, WASATCH, MESA VERDE	February 5, 1951	77.0 MMBO	434.0 BCFG	106.0 MMBO	~
WONSITS VALLEY/ GREEN RIVER, UINTA, MESA VERDE	October 8, 1962	45.8 MMBO	23.7 BCFG	48.0 MMBO	~

^{*1} Utah Geological Association, Oil and Gas Fields of Utah, ed. by Bradley G. Hill & S. Robert Bereskin, 1993, Division of Oil Gas and Mining, Summary of Production Report by Field, December, 1997.

(MBO = Thousand Barrels of Oil, MMBO = Million Barrels of Oil, BCFG = Billion Cubic Feet of Gas)

There has been continuing interest in oil and gas leasing on sovereign lands in the Uinta Basin over the past ten years with approximately 40 leases extending from the town of Jensen to Sand Wash, where sovereign lands ownership ends for the Green River in the Uinta Basin. There are sixteen active leases on sovereign lands in the Uinta Basin. Eight of these leases are active but not producing. Map 9 shows the distribution of active leases on sovereign lands in the Uinta Basin. Rents from these active leases are approximately \$3,500 per year, with a total of \$50,000 paid in one-time simultaneous bids.

Production from riverbed leases in the Uinta Basin is from the Brennan Bottom Unit and from communitization agreements in the Horseshoe Bend area. There are eight producing riverbed leases within these two areas representing annual royalty revenues of \$11,000 . These leases are presently managed by the School and Institutional Trust Lands Administration (SITLA). When the leases cease production or are terminated, management of mineral rights will revert to DFFSL. Table V estimates cumulative and annual royalty payments for each area.

West Willow Unit and River Bend Unit have been established by BLM with the Green River as a western boundary of the units. There are two active leases on riverbed lands adjacent to the River Bend Unit. Table VI summarizes active leases managed by DFFSL.

There are five communitization agreements which could include riverbed lands. Four of these include producing leases managed by SITLA. One active lease is adjacent to a communitization agreement managed by Conoco.

TABLE V. SOVEREIGN LANDS LEASES MANAGED BY SITLA

FIELD	SOVEREIGN LANDS LEASES	OWNERSHIP OF LAND ON WHICH WELL IS SITED	YEAR PRODUCTION BEGAN	EXPIRATION DATE	AMOUNT PAID IN SIMULTANEOUS BIDS	ESTIMATED RENTS & ROYALTIES FROM FIELD
Brennan Bottom	ML 3318	BLM	1953	Held by Production	None	\$1,500.00/yr
	ML 3319	BLM	1953		None	
Horseshoe Bend	ML 2534	BLM	1967	Held by Production	None	\$10,000.00/yr
	ML 34628	BLM	1986		\$250	
	ML 37088	BLM	1988		None	
	ML 37653	BLM	1985		\$18,000	
	ML 40226	Fee	1985		\$14,000	
	ML 40230	BLM	1986		\$24,000	
Not designated (Lower Green River)	ML 46145	No well identified (Trust/ Sovereign Lands leases)	~	10/03/2003	None	Rents only \$888.00/yr
	ML 46146				None	
Not designated (Colorado River)	ML 46363	No well identified (Trust/ Sovereign Lands leases)	~	2/28/2004	\$22,329	Rents only \$7,000.00/yr
	ML 46364				\$17,600	
	ML 46365				\$207,680	
	ML 46366				\$91,550	
	ML 46368				\$87,170	

Metalliferous Mineral Resources

The U.S. Geological Survey, the Utah Geological Survey and the BLM cooperatively maintain a data base of identified mineral occurrences across the state referred to as CRIB data. These data show small isolated occurrences of gold or uranium below Dinosaur National Monument, Horseshoe Bend and near Pariette Draw. All are listed as inactive. The resource management plan prepared by the BLM confirm this assessment. Placer deposits of fine gold, according to the BLM management plan, "do occur in alluvium along the Green River...(T)he deposits on the Green River have the highest development potential in the future. Operators are taking advantage of developments in new extraction techniques, working at a handful of marginally profitable operations along private lands along the river."⁽⁵⁹⁾

Even with no commercial production or geologic evidence for precious metals, there is interest in gold dredging along stretches of the Green River. On sovereign lands on the

Middle Green River there is only one active lease for metalliferous minerals (defined as any mineral from which metal would be extracted). This lease is in the vicinity of Dinosaur National Monument. The lessees are interested in dredging for gold on sovereign lands but there has been no production from the lease. Another metalliferous mineral lease, first leased in 1976, expired in October 1996 without production.

TABLE VI. SOVEREIGN LANDS LEASES MANAGED BY DIVISION OF FORESTRY, FIRE AND STATE LANDS

FIELD/ AREA	SOVEREIGN LANDS LEASE	LEASE TYPE	EXPIRATION DATE	AMOUNT PAID IN SIMULTANEOUS BIDS	ESTIMATED RENTS & ROYALTIES PAID
Horseshoe Bend	SOV-0001-200	Oil, Gas & Hydrocarbon	7/31/2004	None	\$470/year
Uteland Butte	ML 45244-SV	Oil, Gas & Hydrocarbon	3/31/2004	\$9,932	\$900/year
West Willow Creek	ML 45243-SV	Oil, Gas & Hydrocarbon	3/31/2004	\$35,473	\$2,250/year
No field designated (Middle Green River)	ML 45713-SV ML 46362-SV	Oil, Gas & Hydrocarbon	8/31/2002 2/28/2004	None \$1,089	\$600/year
No field designated (Lower Green River)	ML 45868-SV	Oil, Gas & Hydrocarbon	4/30/2003	None	\$100/yr
No field designated (Colorado River)	ML 45468-SV	Oil, Gas & Hydrocarbon	10/31/2001	\$4,200	\$245/year
Dinosaur Nat'l Park	ML 45383-SV	Metalliferous	7/31/2001	None	\$140/year

The Gold Prospector's Association of America lists Horseshoe Bend as an area attractive for recreational gold dredging in its annual Gold Prospector's Mining Guide. In recent years, this has created problems with unauthorized dredging along Horseshoe Bend by recreational gold prospectors. Land ownership around Horseshoe Bend complicates the issue since lands adjacent to the river include school trust, private, BLM as well as split estate on some areas. The mining guide identifies riverbed lands at Horseshoe Bend as managed by the BLM.

Other Mineral Resources

The Uinta Basin has other mineral resources: phosphate and coal north and east of Vernal, gilsonite veins which trend north to southeast across the Uinta Basin, isolated occurrences of uranium, oil shale deposits in Book Cliffs and Tavaputs Plateau, bitumen deposits within Uintah and Ouray Indian Reservation and near Pariette Draw, the Naval

Oil Shale Reserve below Sand Wash. However, the narrow strip of sovereign land ownership, even if the river passes through areas of high mineral potential, makes mineral extraction difficult from these bedded deposits on sovereign lands. This is in contrast to oil and gas development which allows unitized production, even with 'no surface occupancy' restrictions on the lease.

CRIB data indicate several sand and gravel occurrences on riverbed lands with most sites concentrated near Jensen and the Ouray National Wildlife Refuge near Leota. The sites are identified as small to medium in resource size, with not much development of the resource.

BLM management plans show deposits in the Horseshoe Bend area extending to the Ouray National Wildlife Refuge.⁽⁶⁰⁾ The DFFSL has received expressions of interest industrial sand deposits near Horseshoe Bend. Map 10 shows the location of these deposits.

C. Mineral Resources, Lower Green River

Sovereign lands in the Green River Desert form the county boundaries between Emery and Grand counties. This segment of the river extends from T20S, R16E (twelve river miles above the railroad bridge at Green River UT) to the boundary of Canyonlands National Park. There are three active oil and gas leases on sovereign lands along this length of the river. Two of these leases are managed by SITLA and one by DFFSL. (See Tables V and VI).

No leases have produced in this segment of sovereign lands and interest in leasing has been low since the mid 1980s with only twenty three oil and gas leases in that time period. Seven of these leases reached the end of their primary term this year and were relinquished. These relinquished leases produced approximately \$2,000 per year in rents with no simultaneous bids. Map 11 shows the location of active oil and gas leases on sovereign lands.

Utah's first oil well was drilled just below the town of Green River and along the river in 1891. Despite this early activity, there have been no significant oil and gas discoveries within the Green River Desert physiographic province other than the Salt Wash field, which began production in 1961. This field lies just to the east of the Green River in T23S, R17E. The field has produced 1,400,000 barrels of oil with estimated ultimate recovery of 1,600,000 barrels. The field has high operating expenses and problems with saline water from the Paradox formation.⁽⁶¹⁾

The oil and gas potential in all of the Green River in state ownership below Gray Canyon is categorized as "Low-value or unknown/unranked areas" by a U.S. Bureau of Mines report entitled Availability of Federally Owned Minerals for Exploration and Development in Western States: Utah, 1988. The report identifies the Salt Wash field as "Moderate Value Known Mineral Deposit Areas (KMDA)".⁽⁶²⁾

There have been no leases for other minerals along the lower Green River in recent years. CRIB data show five identified sand and gravel deposits, none of which have been significantly developed, occurring along the river near the town of Green River.

Within the Green River Desert physiographic subsection, UGS identifies potash resources as part of the Paradox Basin. The U.S. Bureau of Mines report categorizes most of these resources as being "Low value or unknown/unranked areas" except a segment in Townships 23 and 24, which are categorized as "Moderate value KMDA". ⁽⁶³⁾

There has been no interest expressed in these resources by potential lessees. In any case, the narrow strip of river does not contribute significantly to production or ability to produce for these bedded deposits, even when adjacent lands are being mined.

UGS identifies a district of uranium occurrences at T25 and 26 S, R17 and 18 E along the Green River in Labyrinth Canyon. This is within the Inner Canyon lands physiographic subdivision. CRIB data show sites along the Green River of uranium and vanadium prospects but with little development. These are identified as deposits of small or medium size, occurring in channels in the Chinle Formation along cliffs above the river. Some of these prospects also have copper values associated with the uranium and vanadium. These occurrences would be subject to mining claims because of their location above the river's high water mark. There is some possibility that very fine grained flour gold is present but not in amounts that could be economically recovered under current technology. Map 12 shows these occurrences of metalliferous minerals.

D. Mineral Resources Colorado River (Grand River segment)

From Utah-Colorado State Line to Castle Creek

Above Castle Creek to the Utah-Colorado state line, state ownership of the Colorado river bed lands has not been established. The Division of Sovereign Lands and Forestry and BLM agreed in 1993 that BLM would manage these river bed lands as federal public land pending the decision of the state to file a suit in District Court for a quiet title action based on navigability. There are no active leases on this portion of the Colorado River and not a significant amount of leasing for several years. Sovereign lands records show a total of twelve leases in the past fifteen years, all now terminated. Five of these were oil, gas and hydrocarbon leases, and seven were metalliferous mineral leases. The U.S. Bureau of Mines [Availability of Federally](#)

Owned Minerals in the Uncompahgre Extension physiographic subdivision as "Moderate Value Known Mineral Deposit Areas (KMDA)" for oil and gas. ⁽⁶⁴⁾ Map 14 shows the extent to the area. There is little evidence of mineral resources within the meander line except for interest in placer gold. There are several recently active placer mining claims that follow the course of the river. The BLM is currently investigating the validity of the Pussycat claims in Westwater Canyon. The other groups of placer claims are the Sophie T and Anderson claims in townships 21 and 22 south. The river runs through the Thompsen Uranium District, but occurrences of uranium are in the Morrison formation in

the cliffs above the river.⁽⁶⁵⁾ The U.S. Bureau of Mines report indicates low or no value for mineral deposits such as potash or coal on this segment of the river.⁽⁶⁶⁾

CRIB data maintained cooperatively by the Utah Geological Survey, the BLM and the U.S. Geological Survey indicate two large sand and gravel deposits which have been mined in recent years near the mouth of Castle Creek in Township 24 South, Ranges 22 and 23 East and other sand and gravel deposits in Township 23 South, Range 24 East. The CRIB data shows these as previously mined but currently inactive. The BLM management plan for the Grand Resource area shows two locations on the Colorado River above Castle Creek which are categorized as sale areas.⁽⁶⁷⁾ These are shown on Map 16.

CRIB data also show small prospects for gold, manganese, uranium and vanadium at or near the riverbed, none of which have been developed or mined. Most of these reported occurrences are in Townships 23 and 24 South, Ranges 23 and 24 East. Map 16 shows metalliferous and sand and gravel prospects. BLM records in the Utah State Office do not establish whether any part of mining claims or oil and gas leases issued by them extend onto riverbed lands.

From Castle Creek to Canyonlands National Park boundary

There has been greater interest in oil, gas and hydrocarbon leasing on sovereign lands from Castle Creek to the boundary of Canyonlands National Park. Fifteen oil and gas leases have been issued on riverbed lands in the past 10 years, six of which are still active although not producing. Five of the six active leases were leased in March 1994 and are managed by SITLA because the leases combine trust and sovereign lands. These leases attracted significant interest, resulting in over \$425,000 in simultaneous bids among the five leases. The largest bid on a lease was \$207,680 for 1,760 acres, 13 acres of which were on sovereign lands.

The leases, including those recently terminated, managed by DFFSL earned approximately \$5,000 in annual rents and \$10,000 in simultaneous bids. (See Tables II and III) All the leases are in Townships 26 and 27 South, Ranges, 20 and 21 East, with most of the leases just east of Dead Horse Point, an area of high exploration interest within in recent years. Map 13 shows the locations of these leases.

There are two units as designated by the BLM in the vicinity of but not adjacent to sovereign lands. These are Kane Springs, a large field near Dead Horse Point, and Canyon Largo. These two units coincide with areas the U.S. Bureau of Mines designated as having moderate potential for oil and gas resources.

There are six or seven sites for sand and gravel in Townships 24 and 25 South, Ranges, 21 and 22 East, ranging from small to large according to CRIB criteria. These are all inactive but have had previous development.

As with other sovereign lands on the Green and Colorado Rivers, there are several small and nonproducing prospects for uranium, vanadium, (some with associated copper) and gold, primarily in Township 27 South Range 20 East. There are also small reported occurrences for magnesium and potassium in Township 26 South, Range 20 East. Map 15 shows these prospects.

The U.S. Bureau of Mines Availability of Federally Owned Minerals identifies potash resources in the Inner Canyon lands physiographic subdivision as "Moderate Value KMDA".⁽⁶⁸⁾ For almost 40 years, Texas Gulf and its predecessors have produced potash and associated products from its solution mining operation adjacent to the Colorado River. Included in its leases was one sovereign lands lease which the company dropped in 1995 after 40 years. The DFFSL offered readjustment terms with a significant increase in minimum royalties which the company opted not to accept. The lease never produced although adjacent trust lands leases have been unitized and in production for many years. The company cited problems getting the necessary permits from the BLM to extend their solution mining operations under the Colorado River for lack of production. Map 15 shows areas of potash resources and site of existing potash operations adjacent to Colorado River.

X. OTHER RESOURCES ON SOVEREIGN LANDS

A. Wildlife resources

Wetlands of Utah describes riverine systems as those "contained within a channel...The green vegetation zones found around rivers, creeks, or springs are known as riparian zones. Despite being somewhat uncommon, riparian zones are among the most productive habitats for plants and wildlife. In a region with low annual precipitation, these areas provide an oasis of life."⁽⁶⁹⁾ Associated with riverine systems, especially in flat areas are wet river margins, referred to as palustrine or pond-like systems. Riverbed lands designated as sovereign lands cross relatively flat areas so that there are important palustrine systems within or adjacent to sovereign lands. Important vegetation in these areas are cottonwoods, river birch, and willows.⁽⁷⁰⁾

Wetlands and deciduous woodlands along sovereign lands are an important inventory of lands in Utah which are high in value for wildlife but small in area. Combined, wetlands and deciduous woodland comprise less than 1% of the vegetation cover types in the state. The Utah State University Utah Gap Analysis calculates that 16.79% of Utah's wetlands and 3% of deciduous woodlands are in a protected status. The Gap Analysis is an "evaluation process..for determining the protection afforded biological diversity in given areas. It uses geographic information systems (GIS) to identify 'gaps' in biodiversity protection that may be filled by the establishment of new preserves or changes in land use practices."⁽⁷¹⁾

Among the areas with protected management status along navigable stretches of the rivers are Stewart Lake Wildlife Management Area and Ouray National Wildlife Refuge

on the Green River and Scott Matheson Wetlands Preserve on the Colorado River. The Gap Analysis identifies another 24% of wetlands and 34% of deciduous woodlands along riverbed lands in "moderately protected status", defined as those lands managed by the BLM, the U.S. Forest Service and the Department of Defense. The remaining portions of lands are in unprotected status, defined as "managed for intensive human use."⁽⁷²⁾ These are lands in private or state ownership or within Indian reservation boundaries. The Gap Analysis does not identify sovereign lands as state-owned. Along the Green and Colorado Rivers, the upland ownership of segments identified by the Gap Analysis as riparian or wetlands is often private, since human settlement is centered on areas that are attractive to wildlife. Appendix C examines biological resources along various segments of the Green and Colorado Rivers.

B. Critical Habitat Designation for Endangered Species

In 1993, the USFWS completed a draft proposal for designation of critical habitat in the Colorado River basin of four Colorado River endangered fish--the razorback sucker, Colorado squawfish, humpback chub, and bonytail. On March 21, 1994, the final rule establishing the Colorado River drainages except Lake Powell for critical habitat designation was published. Sovereign lands in the Uinta Basin, the Green River Desert and on the Colorado River from the Utah-Colorado border are designated as critical habitat for two of the four fish species, the razorback sucker and Colorado squawfish. The final rule also provides critical habitat designation for the bony-tailed chub and humpback chub in Westwater Canyon on the Colorado River. These species were "adapted to the natural environment that existed prior to the beginning of large-scale water projects and introduction of nonnative species. This natural environment was characterized by highly fluctuating seasonal and annual flows, distinctly different habitat types (i.e., white water, lower gradient and meandering main channels, off-channel backwaters, and others) and varying water quality (i.e., sediment load, temperature, salinity, etc.)"⁽⁷³⁾

The USFWS describes the status of the four fishes in the Upper Colorado drainage basin as follows:

Natural Colorado squawfish populations survive only in the Upper Basin, where their numbers are relatively high only in the Green River Basin of Utah and Colorado...Razorback sucker and bonytail chub populations throughout the Basin consist predominantly of old adult fish...Humpback chub populations in the Little Colorado River, Black Rocks, and Westwater Canyon in the Colorado River appear relatively stable in number of fish, but declines have occurred in other locations.⁽⁷⁴⁾

To date, recovery efforts include: construction of hatchery facilities at Ouray National Fish hatchery, restocking of fish in historical ranges, purchase of land and water rights, modification of dam flows for the benefit of fish, construction of fish passageways, restoration of wetlands, breaching of levees along the Green River to allow access to flood plain habitat. The habitat along river corridors is important to other endangered, threatened or sensitive species. Some of these species include: peregrine falcon, bald

eagle, southwestern willow flycatcher, whooping crane, and many other plant and animal species. Cottonwood groves along the two rivers are important winter roosting areas for bald eagles. In addition, there are bald eagle nesting sites along the Colorado River above Westwater Canyon. There are several peregrine nesting sites in Labyrinth Canyon and along the Colorado River.⁽⁷⁵⁾ Appendix A gives a more comprehensive listing of these species and where they are found along the river corridors.

C. Recreation

Recreation opportunities along the Green River have been identified in BLM Resource Management Plans for the Book Cliffs management area (Middle Green River for this plan):

Recreation opportunities along the Green River consist of river floating, fishing for channel catfish, and limited deer, duck, and goose hunting. Most float boating takes place from Split Mountain Campground at Dinosaur National Monument downstream to the town of Jensen. In 1982, permits were issued to 220 people. The river segment from Ouray to Sand Wash (31 miles) has limited popularity and use ranges from 50 to 150 people per year. [1983 data]⁽⁷⁶⁾

The Diamond Mountain Resource Management Plan, which covers BLM lands on the west side of the Green River, confirms the limited use of the 102 miles of the Green River between Split Mountain and Sand Wash although "having the potential of becoming a very popular river rafting area by people preferring slow-moving water."⁽⁷⁷⁾ There are two commercial boat ramp facilities along this reach of the Green River, one at Split Mountain near Dinosaur National Monument and the other at Sand Wash. In addition, there are several unimproved launch sites near Stewart Lake, above Horseshoe Bend, within the Ouray National Wildlife Refuge and near the town of Ouray.⁽⁷⁸⁾

In contrast to the low use of the Middle and Lower Green River, the Moab District BLM reports 24,000 passenger days per year (1985 data) along the Colorado and Dolores Rivers. In its 1985 resource management plan, the Moab District recommended the construction of seven restroom facilities along the Colorado River to reduce sanitation problems.⁽⁷⁹⁾ This is a problem in sovereign land management as well, since camping and recreational use can occur below the ordinary high water mark. This is complicated by the fact that BLM has assumed authority for management of river-based recreation, issuing permits to commercial river operations. The Division of Parks and Recreation requires registration by guides and their employees. To assure proper management and adequate facilities, a coordinated plan needs to be developed among federal, state and county entities.

On the lower Green River, commercial boat ramp sites exist at Green River State Park, Crystal Geyser, Ruby Ranch and Mineral Bottom. On the Colorado River, commercial boat ramp sites exist at Westwater, Castle Creek, Sandy Beach, Government Take Out, River Bridge Ramp, Canyonlands by Night and Potash Ramp.⁽⁸⁰⁾ See Tables I-III and Appendix E.

The Vernal District BLM notes in the Book Cliffs plan that there is "limited public access to the river"⁽⁸¹⁾ and proposes sites at Horseshoe Bend and below the mouth of Pariette Draw on the Green River.⁽⁸²⁾ Access issues are complicated by the uncertainty of where the boundary is between sovereign lands and the adjacent uplands. This is a particular concern if the upland ownership is private or in restricted management like the Ouray National Wildlife Refuge. Reduced flows since the construction of water diversions and projects and low summer flows create benches of land between the river and the high water mark which can be used for public access and use.

D. Scenic and Viewshed Values

The river corridor along both the Green and Colorado Rivers is important for scenic and viewshed values. Managers of state and national parks express concerns about preserving these values for visitor experience. Representatives from Dinosaur National Monument cite "endangered species and their habitats, solitude, absence of man-made sounds, night skies, scenic vistas and pastoral scenes, water and air quality, cultural resources, and the general naturalness of the area."⁽⁸³⁾ Managers at Dead Horse Point State Park cite the "incredible vista seen from the numerous overlooks in the park. A major portion of the view is the Colorado River and its canyon."⁽⁸⁴⁾ These concerns would apply to other parks such as Arches and Canyonlands National Parks as well.

E. Other Resources

The Green and Colorado River corridors are important for other resources as well. The BLM's Diamond Mountain Resource Management plan identifies the segment from Ouray National Wildlife Refuge as an "Archeological High Density Zone", with a predicted density of 10 to 40+ archeological sites per square mile.⁽⁸⁵⁾ BLM lands adjacent to the Colorado River from the Utah-Colorado state line to the boundary of Canyonlands National Park Power and the Green River from below Pariette Draw to Sand Wash and from below the town of Green River to the mouth of the San Rafael River are designated as for power withdrawals and management by the Bureau of Reclamation. The waters of the rivers themselves are subject to water appropriation and the Upper Colorado River Compact to be used for industrial, agricultural, and domestic uses.

In addition to mineral leases on sovereign lands, the DFFSL issues: grazing permits; rights of entry for commercial recreational use; surface leases for boat ramps and marinas and easements for bridges and pipeline/utility crossings.

XI. PATTERNS OF LANDOWNERSHIP ALONG GREEN AND COLORADO RIVERS.

As with other sovereign lands in the state, land ownership and management patterns along the Green and Colorado Rivers are complex. For the most part, the courts ruled that riverbed lands in the state's basins were navigable and therefore sovereign lands. In contrast, lands within inaccessible canyons were ruled not navigable. The river bed lands

ruled navigable were also the areas that attracted settlers and therefore the adjoining lands passed into private ownership: in the Uinta Basin, near the towns of Green River and Moab, or any place along the rivers where access to water coincided with lands suitable for agriculture or settlement. The area with the fewest ownership and management conflicts is certainly the Colorado River below Cataract Canyon: under the waters of Lake Powell and surrounded by lands managed by the NPS or included in the Navajo Indian Reservation.

A. Ownership along the Middle Green River

The federal government is the largest landowner in the Uinta Basin. The BLM manages approximately 40% of the land area as public domain. However, along the river corridor from Dinosaur National Monument to the southern boundary of the Uintah and Ouray Indian Reservation, BLM manages only about 20% of the adjacent lands. As a result, a much larger share of lands along this stretch of the Green River are held by collage of private, state and federal interests (other than BLM). On the northern end of the Uinta Basin in Dinosaur National Monument, the National Park Service manages 3% of the lands in the river corridor. The USFWS manages the Ouray National Wildlife Refuge with conservation goals at least similar to the NPS's goals. Adjacent lands in the river corridor within the refuge represent approximately 18% of river corridor land from Dinosaur National Monument through the Uintah and Ouray Indian Reservation. (USFWS manages less than a .5% of lands in the Uinta Basin).

At the other end of the management spectrum are lands in private ownership (35%, in contrast to about 7% in the Uinta Basin) and trust lands managed by School and Institutional Trust Lands for the economic benefit of Utah's schools (9%). The Bureau of Indian Affairs is charged with trust responsibilities in managing tribal lands within the Uintah and Ouray Indian Reservation (20%). With respect to tribal ownership, the federal judgment describes reservation and individual allotment lands and states that for "the minerals underlying the bed of the Green River within the exterior boundaries of the Uintah and Ouray Indian Reservation in the State of Utah, as extended by the Act of March 11, 1948, 62 Stat. 72, or river-bed lands contiguous thereto and adjacent to either tribal lands or individual allotments including minerals, the State of Utah will not issue mineral leases to said river-bed lands except to the Ute Indian Tribe of the Uintah and Ouray Reservation or its nominee." ⁽⁸⁶⁾

From the southern boundary of the Uintah and Ouray Reservation to where sovereign lands end at Sand Wash adjacent land ownership is almost entirely federal lands managed by the BLM . Along this section of the river, BLM manages approximately 90% of the adjacent river corridor lands. Another 6% are managed by the state as school trust lands and 4% in private ownership.

Map 17 shows land ownership patterns along the Middle Green River.

B. Ownership along the Lower Green River

The BLM has a more significant share of land ownership patterns along the Green River from Gray Canyon to the border of Canyonlands National Park, with management authority for approximately 90% of the land in the Green River Desert and Mancos Shale Lowlands. Private land ownership in the Green River Desert accounts for only 3% of the land area. However, it is concentrated along sovereign lands at the city of Green River and at the mouth of the San Rafael River and therefore accounts for a more significant share of lands--more than 30%--adjacent to sovereign lands. There are small tracts of state trust lands scattered along the length of the river representing about 7% of land ownership adjacent to the river. BLM manages the remaining river corridor lands. Map 18 shows land ownership patterns in this segment.

C. Ownership along the Colorado River

The BLM manages approximately 70% of lands along the Colorado River north of Canyonlands National Park. Along the river at both ends of Westwater Canyon and near Moab, there are several sections in private ownership. Private ownership in lands adjacent to the Colorado River is approximately 20%. The Colorado River borders Arches National Park for several miles and passes through private and state trust lands near Dead Horse Point. The ownership and management patterns are therefore relatively straightforward. Map 19 shows the land ownership along sovereign lands in this segment.

XII. MANAGEMENT AUTHORITY OF STATE AND FEDERAL AGENCIES AFFECTING SOVEREIGN LANDS

The DFFSL's role and direction as the manager of sovereign lands is greatly affected by decisions made by other state and federal agencies, often without DFFSL participation in those decisions. In part this is due to the DFFSL's prior focus on management of mineral resources on the Green and Colorado River. The DFFSL has issued mineral leases as lease applications are submitted or through a competitive bid process so that other resource issues or concerns of adjacent landowners are not addressed.

However, there are other reasons why the DFFSL has played such a limited role in management of sovereign lands along the Green and Colorado Rivers. Important among these reasons are lack of awareness of who owns riverbed lands, the uncertainty about where sovereign lands boundaries lie, and the piecemeal pattern of sovereign lands ownership as well as ownership of lands adjacent to the rivers. Another significant factor is that a significant portion of lands in eastern Utah is in federal ownership, most of which is managed by the BLM. This section summarizes decisions and recommendations made by public agencies and landowners which influence DFFSL policy and management options.

A. BLM Management, Public Lands

The BLM manages resources on public lands which represent from 40 to 80% of the lands adjacent to sovereign lands in eastern Utah. The BLM is also responsible for management of mineral resources for other federal agencies. Besides the significant amount of land, the BLM has for many years written and implemented land management plans to guide resource decisions in the area. In the Uintah Basin, the BLM has completed the Book Cliffs and the Diamond Mountain Plans published in 1985 and 1995 respectively. In the Green River Desert and along the Colorado River, the BLM has completed the Grand Resources Area management plan in 1985. The Moab District will update the Grand Resources Area management plan in the near future.

Public lands along the river corridor in the Uinta Basin are open to oil, gas and mineral leasing with restrictions above Ouray National Wildlife Refuge, closed to any mineral leasing within the refuge and open to oil and gas leasing from Ouray to Sand Wash with severe restrictions because of designation as an Area of Critical Environmental Concern. Public lands along the river corridor below section 12, T6S R22E are closed to location of mining claims. The BLM also considers cumulative impacts of any proposed development and can restrict use of BLM lands adjacent to sovereign lands for use as access or development of facilities.

In the Green River Desert, lands adjacent to sovereign lands are open to oil and gas leasing in townships 20-23 South with some stipulations. Lands are closed to oil and gas leasing in the vicinity of the town of Green River and in Labyrinth Canyon, or leased with 'no surface occupancy' restrictions. BLM management plans allow potash leasing in Labyrinth Canyon. All public lands adjacent to the Green River are open to mineral location under the 1872 Mining Law.

Along the Colorado River, BLM management plans are similar: public lands in townships 20-23 allow oil and gas leasing with 'no surface occupancy' stipulations only; below that township, BLM allows oil and gas leasing with special stipulations. All public lands are open to mineral location. However, when BLM updates the Grand Resources Management Plan, more restrictive management of mineral and oil and gas resources is likely for some of the stretches of the rivers because of high recreational use and scenic values. Appendix C examines BLM management decisions along sovereign lands on the Green and Colorado Rivers in greater detail.

B. BLM Minerals Management, Other Federal Lands

The BLM has management responsibility for mineral leasing on federal lands within the refuge. There is one federal oil unit, the Brennan Bottom Unit, in the northern part of the refuge. The unit was approved in 1954 and is still producing. The unit operator, Chevron USA Inc, has plans for a waterflood for continued production.⁽⁸⁷⁾ The unit includes leases on sovereign lands which are currently being managed by the SITLA. These leases have been in existing units or communitization agreements for many years and are in late stages of production.

In 1984, the Secretary of the Interior directed that there would be no new leasing of federally-owned oil, gas or minerals on wildlife refuge lands outside of Alaska. The exception to this withdrawal from leasing is if operations on adjacent lands are draining oil and gas resources from lands within a refuge. The Vernal District has designated lands within the Ouray National Wildlife Refuge as closed to oil, gas and mineral leasing within the Diamond Mountain Resource Planning area and leasing with 'no surface occupancy' within the Book Cliffs Resource Planning area.⁽⁸⁸⁾

C. Wild and Scenic River Designation on Federal Lands

The Wild and Scenic Rivers Act was passed by Congress in 1968. The Act's purpose was to set aside "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 the free flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations." Rivers must be both eligible ("free-flowing" with one or more "outstanding remarkable" value) and suitable (whether designation is the best way to manage the eligible river corridor). Depending on the "type and degree of human development associated with the river and adjacent lands", eligible rivers will be categorized as wild, scenic or recreational.⁽⁸⁹⁾

Congress must approve any rivers recommended by federal agencies for designation in the Wild and Scenic River System. Areas so designated or under study are withdrawn for water or power projects. Areas under study are withdrawn for a specified period of time from mineral leasing or entry under the 1872 Mining Law within a quarter mile of the river's banks. The administering federal agency can recommend a mineral leasing and management policy for those areas ultimately approved by Congress.

For navigable stretches of the Green and Colorado Rivers, BLM has determined:

- the Green River from Dinosaur National Monument to Ouray is eligible but not suitable;
- the Green River from Ouray to the Carbon County line is eligible and suitable;
- the Green River from the town of Green River to Canyonlands National Park is eligible but suitability has not been determined;
- the Colorado River from the Grand-San Juan County line to the north boundary of Canyonlands National Park is eligible but suitability has not been determined.

In addition, the National Park Service, in the 1970s, determined that the Colorado River from the Utah-Colorado state line to the confluence with the Dolores River was both eligible and suitable. No action has been taken by Congress to designate any of these segments as part of the Wild and Scenic River System. How such a designation would affect state authority as manager of sovereign lands is not known.

D. U.S. Fish and Wildlife Service

The USFWS has significant management responsibilities because of its management of the 12,467 acre Ouray National Wildlife Refuge and because in 1994, all of the Colorado and Green Rivers were declared critical habitat under the Endangered Species Act (ESA) for four species of native fish.

In addition to managing the Ouray National Wildlife Refuge, the USFWS is responsible for overseeing implementation of the ESA for the four endangered Colorado River fish. In 1994, the Green and Colorado Rivers in Utah were designated as critical habitat for four endangered species of fish. These are: Colorado squawfish, bonytail, razorback sucker and humpback chub. Even prior to the critical habitat designation, the USFWS prepared recovery plans for three of the four listed species.

A Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin was also completed. Several states, including the state of Utah, signed cooperative agreements in 1988 with the Department of Interior and the Western Area Power Administration to implement the plan. The program (referred to as the RIP) provides for consultation by all parties of the cooperative agreement with the USFWS on water projects under Section 7 of the Endangered Species Act. This section requires federal agencies to consult with the USFWS on any "actions that may affect critical habitat and insure that their actions are not likely to destroy or adversely modify critical habitat. The goal of the consultation is to determine a "prudent and reasonable alternative to avoid likely destruction or adverse modification of critical habitat."⁽⁹⁰⁾

Other tools provided by the Endangered Species Act are land acquisition in Section 5, federal grants to states or research in Section 6, prohibition of taking of endangered species in Section 9 and permits for scientific or research purposes in Section 10.⁽⁹¹⁾ Actions which the USFWS believes would "appreciably diminish the value of critical habitat" are "actions that would reduce the volume and timing of water, destroy, or block off spawning and nursery habitat, prevent recruitment, adversely impact food sources, contaminate the river, or increase predation by and competition with nonnative fish." Table VII summarizes the types of activities that could impact critical habitat for endangered fishes and gives examples of reasonable and prudent alternatives for mitigation of adverse impacts. The USFWS states, however, that Section of the Act applies only to federal actions and that each federal action must be evaluated on a case-by-case basis.

E. U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers has regulatory authority to protect the quality of inland waters and wetlands. Waters under their jurisdiction are "essentially all surface waters such as navigable waters and their tributaries, all wetlands adjacent to these waters, and all impoundments of these waters." Until 1968, the primary responsibility of the Corps was to protect navigation. Various environmental protection laws enacted in the late 1960s broadened the regulatory role of the Corps of Engineers.

For sovereign lands in Utah, the U.S. Army Corps of Engineers has authority to act under the following sections of federal law: 33 CFR - Navigation and Navigable Waters; 40 CFR - Protection of the Environment; Sections 9 and 10 of the Rivers and Harbors Act of 1899, and Section 404 of the Clean Water Act. Taken together, these laws give the Corps authority to review and approve construction of any structure in navigable waters or the deposition of dredged or fill material in the waters of the United States or adjacent wetlands.⁽⁹²⁾

F. Other Federal Agencies

Other agencies with some regulatory or management responsibility for resources within or adjacent to sovereign lands are the U.S. Bureau of Reclamation, the NPS, and the Bureau of Indian Affairs. The Bureau of Reclamation is primarily a manager of water resources. The BLM does manage federal lands withdrawn for reclamation purposes near Dinosaur National Monument. The Bureau of Reclamation's role is to measure water resources and flows and to control flows from storage reservoirs and hydroelectric sites. As with the other federal agencies, its role has expanded from planning and building water projects to include environmental protection and wildlife enhancement projects.

TABLE VII. SUMMARY OF ACTIVITIES WITH POTENTIAL TO IMPACT CRITICAL HABITAT FOR ENDANGERED COLORADO RIVER BASIN FISHES - EXAMPLES OF REASONABLE AND PRUDENT ALTERNATIVES

Activities with Expected Adverse Impacts	Activities with Low Expected Impacts	Activities with Expected Beneficial Impacts	Examples of Reasonable and Prudent Alternatives
<p>Construction and operation of hydroelectric facilities.</p> <p>Irrigation.</p> <p>Flood control.</p> <p>Bank stabilization.</p> <p>Oil and gas drilling.</p> <p>Aggregate and placer mining.</p> <p>Recreational placer mining</p> <p>Grazing.</p> <p>Stocking or introduction of nonnative fishes.</p> <p>Municipal water supplies.</p> <p>Resort facilities.</p> <p>Pumping, diverting or removing water for any purpose.</p>	<p>Recreational activities such as boating, hiking, fishing, nature appreciation.</p> <p>Commercial activities such as:</p> <ul style="list-style-type: none"> • River float trips • Guided sport fishing • Excursion boat tours 	<p>In stream flow protection.</p> <p>Development of backwater or cove habitat that benefits native species. (Abandoned gravel pits have served this purpose.)</p> <p>Eradication of nonnative fishes.</p>	<p>Relocate the proposed activity to another location or outside of critical habitat.</p> <p>Modify the project (physically/operationally).</p> <p>Provide offsetting measures to either Colorado River endangered fishes or the critical habitat area by actions such as:</p> <ul style="list-style-type: none"> • acquiring water rights from other sources to offset proposed depletion. • implementing water conservation measures so that no net loss of water occurs. • enhancing constituent elements so that a net benefit to Colorado River endangered fishes occurs. • undertaking recovery actions identified in recovery plans, Recovery Implementation Programs, or other approved management plans or activities.

Source: U.S. Fish and Wildlife Service, Federal Register, Vol 59, No. 54, " Endangered and Threatened Wildlife and Plants,"p. 13387.

The NPS and the Bureau of Indian Affairs have management authority for minerals on substantial tracts of lands adjacent to sovereign lands along the Green and Colorado River. These two agencies also represent two management views--one for the preservation of biological, geologic and cultural resources and the other for development and extraction of mineral resources. Sovereign lands are adjacent to National Park lands for approximately 4 miles along Dinosaur National Monument, and form the southern border of Arches National Park for 8 to 10 miles. Canyonlands National Park boundaries mark the end of sovereign lands on the Green and Colorado Rivers due to exchange of river bed lands for other lands in 1965, where the park was created.

The Bureau of Indian affairs manages mineral resources on behalf of the Ute Tribe. Approximately 8 miles of sovereign lands run within reservation boundaries. There is one active (but not producing) sovereign lands oil and gas lease in this area.

G. State Agencies

Several state agencies, most of them within the Department of Natural Resources, have management authority for a variety of resources associated with the Green and Colorado Rivers. These natural resource agencies include the Divisions of Wildlife Resources, Water Rights, Water Resources, Oil Gas and Mining, and Parks and Recreation. None of these has land management authority for lands on the Green or Colorado Rivers, except Parks and Recreation which manages Green River State Park on sovereign land on the old river bed. Parks and Recreation and DFFSL are negotiating an exchange of this land for lands adjacent to Black Rock on the southern side of Great Salt Lake.

Parks and Recreation in addition to managing state parks, also has responsibilities for boating safety and enforcement of litter and pollution acts. Parks and Recreation also has management authority, in cooperation with the Division of Wildlife Resources, for the River Enhancement Program. This program is for "rivers or streams that are impacted by high density populations or that are prone to flooding." Parks and Recreation is directed by statute to provide for recreation, flood control, water conservation and wildlife habitat along eligible rivers and streams.⁽⁹³⁾

Any activity affecting the bed or banks of a natural stream requires written approval from the State Engineer, Division of Water Rights. The banks of a natural stream include the sides of the channel and the area adjoining a natural stream, normally vegetated with woody plants that provide stability to the banks. (The absence of vegetation due to activities such as grazing, construction, fires, flooding, etc. is not natural. The stream bank in these cases shall include an adjoining area which would be present in an undisturbed section of the stream.⁽⁹⁴⁾

Lessees of mineral leases granted by the DFFSL must consult with these agencies on mineral related issues on sovereign lands. Permits that might be needed by a lessee are for drilling, mining, activities that create potential boating hazards, and water diversion. The DFFSL has not in the past reviewed sovereign lands to determine whether a lessee will be able to fully develop the mineral lease. Some lessees have questioned whether the

state can grant a lease and at the same time enforce regulations which prohibit its development. However, mineral lessees must obtain a Stream Alteration Permit from Water Rights. The mineral lease does not assure the issuance of such a permit from Water Rights.

The DFFSL is participating on a Recreational Dredging Committee with representatives from Water Rights, Oil Gas and Mining, and Wildlife. A representative from Parks and Recreation will be added to this committee. Federal representatives on the committee are from the Forest Service, BLM, and USFWS. The committee's purpose is to address the number of applications for permits to divert water for recreational mining. The Green and Colorado River are among the waterways closed to recreational dredging because of concerns with endangered fishes and because significant stretches are in sovereign land ownership. However, parties interested in mining on these rivers can still apply for leases and permits through DFFSL pursuant to the mineral leasing plan.

SITLA manages lands adjacent to sovereign lands in eastern Utah. The mission of SITLA is to manage resources on state trust lands to generate the greatest revenues for Utah's schools and other beneficiaries. Its management perspective therefore differs from the DFFSL. Because of this difference in perspective, the State Legislature approved the creation of the two agencies from the Division of State and Lands and Forestry in 1994.

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