RECLAMATION

Managing Water in the West

Green River Block Water Exchange Contract
Final Environmental Assessment

PRO-EA-16-020

Upper Colorado Region
Provo Area Office
Provo, Utah

U.S. Department of the Interior
Bureau of Reclamation
Provo Area Office
Provo, Utah

January 2019

Mission Statements

The Department of the Interior conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Green River Block Water Exchange Contract Final Environmental Assessment

Upper Colorado Region
Provo Area Office
Provo, Utah

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U.S. Department of the Interior
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FINDING OF NO SIGNIFICANT IMPACT

Environmental Assessment Green River Block Water Exchange Contract
Utah and Colorado

EA-16-020

Recommended by: For

Peter Crookston
Environmental Group Chief

2/13/2019
Date

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2/13/2019
Date

Approved by:

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13 FEB 2019
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I. Introduction

In compliance with the National Environmental Policy Act of 1969, as amended (NEPA), the Bureau of Reclamation, Provo Area Office has conducted an Environmental Assessment (EA; attached) to determine the potential effects to the human and natural environment of executing a water exchange contract (Proposed Action) with the State of Utah (State). If approved, the State (or a third party to the State) would be able to divert water from the Green River up to their adjudicated right and Reclamation in turn would receive compensation.

Reclamation received a letter dated January 5, 2016 from the State requesting two contracts for the use of its assigned water right (total of 158,890 acre-feet depletion). One contract represents 86,249 acre-feet depletion to be used for the Lake Powell Pipeline (LPP) proposed to be constructed by the State; the second contract, called the Green River Block (GRB) water exchange contract, represents the remaining amount of the assigned water right (72,641 acre-feet depletion) to be used for development along the Green River. The two contracts are separate and distinct, each covering different blocks of water to be developed under different circumstances and wholly independent of each other. One contract is not reliant on the other (i.e., if approved, the GRB water exchange contract would be executed and the corresponding water depleted regardless of the status of the proposed LPP contract, and vice versa). The GRB water exchange contract is the only contract action analyzed in the EA.

A public meeting was held on September 26, 2018 in Vernal, Utah to discuss the Draft EA. Approximately 15 individuals attended the meeting. A 50-day comment period began September 19, 2018 and ended November 2, 2018. Original comments received on the Draft EA are in Appendix C of the Final EA. Responses to those comments are included in Appendix D of the Final EA.

II. Alternatives

The EA analyzed two alternatives: the No Action and the Proposed Action.

No Action

Under the No Action Alternative, Reclamation and the State would not enter into an exchange contract. The State would remain free to develop their apportioned water right under the 1996 Assignment without the stability of Flaming Gorge (FG) stored water being released for this exchange. The State may run into shortages in years of drought, especially during the latter part of the summer when tributary flows can be significantly reduced.

Proposed Action

The Proposed Action consists of an exchange that would allow Reclamation to meet Endangered Species Act (ESA) Upper Colorado River Recovery Program (Recovery Program) goals in the Green River, continue to operate FG Dam within the parameters of the 2006 Flaming Gorge Record of Decision (FGROD), and provide the State with a reliable water supply for development of the 1996 Assignment.

If the water exchange contract is implemented, the State would forebear the depletion of a portion of the Green River and tributary flows to which it is entitled under Article XV(b) of the Upper Colorado River Basin Compact which expressly recognizes each compacting state's rights and powers to regulate within its boundaries the appropriation, use, and control of water apportioned and available to the states by the Colorado River and Upper Colorado River Basin Compacts. This forborne Compact Entitlement Water would contribute to meeting the ESA Recovery Program Requirements in Reaches 1 and 2, thereby assisting Reclamation in its obligation under the FGROD. In exchange, the State would be authorized to deplete an equal amount of Colorado River Storage Project (CRSP) water from FG releases throughout the year as water is needed for the Green River Block portion of the assigned water right. On an annual basis, the Compact Entitlement Water left in the river and used to meet ESA requirements would equal the FG project releases used for depletion by the State under the Green River Block portion of the assigned water right. The State would not make calls for releases from FG storage; rather, it would use the CRSP water as it is released in accordance with the flexibility in Reclamation's operations under the FGROD. The State and Reclamation acknowledge that the implementation of the exchange would remain subject to Reclamation's Section 7 ESA Recovery Program requirements and obligations under the FGROD.

Using the GRB portion of the assigned water right, the State may deplete up to 72,641 acre-feet annually of the direct flows of the Green River and its tributaries (part of the water it would have been available to deplete under its Compact Entitlement Water), which instead it would forebear and designate to meet ESA Recovery Program Requirements in Reaches 1 and 2. At present, 13,684 acre-feet of the 72,641 acre-feet has been developed. This water would not be available for exchange of Project water until such time that a water right change application is filed on these developed portions.

Additional releases may be necessary to meet target flows in Reach 2 as a result of depletions under the Proposed Action. Should Reach 2 target flows not be able to be met through FG operations, the State would coordinate with the Recovery Program and the USFWS as outlined in part 1(c) of the draft water exchange contract (Appendix B). Actions other than the depletion of 72,641 acre-feet of water continue to be subject to Section 10 consultation under the ESA in addition to the State's participation in the Recovery Program.

The purpose of the Proposed Action is to facilitate a water exchange between the State and Reclamation to provide the State with a more reliable water supply to develop their assigned water right. The Proposed Action fulfills the need for action by resolving a long-standing disagreement between the State and Reclamation over use of the water right.

Environmental commitments that are integral to the Proposed Action are as follows:

1. Additional Analyses - If the Proposed Action were to change significantly from that described in this EA because of additional or new information, or if other spoil, or work areas beyond those outlined in this analysis are required outside the defined Project construction area, additional environmental analyses may be necessary.

2. Cultural Resources - The Proposed Action is a water exchange contract action. There would be no ground disturbance or construction associated with the action so there would

be little potential for inadvertent discoveries. Nonetheless, if any surface or subsurface cultural resources are discovered within the proposed Project area, Reclamation's Provo Area Office archaeologist will be notified. The archaeologist will assess the resource and recommendations for how to proceed.

3. Human Remains - The Proposed Action is a water exchange contract action. There would be no ground disturbance or construction associated with the action so there would be little potential for inadvertent discoveries. Nonetheless, any person who knows or has reason to know that he/she has inadvertently discovered possible human remains on Federal land, he/she must provide immediate telephone notification of the discovery to Reclamation's Provo Area archaeologist. The area will be protected until the proper authorities are able to assess the situation onsite. This action will promptly be followed by written confirmation to the responsible Federal agency official, with respect to Federal lands. The Utah or Colorado SHPO and interested Native American Tribal representatives will be promptly notified. Consultation will begin immediately. This requirement is prescribed under the Native American Graves Protection and Repatriation Act (43 CFR Part 10); and the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470).

4. Paleontological Resources - The Proposed Action is a water exchange contract action. There would be no ground disturbance or construction associated with the action so there would be little potential for inadvertent discoveries. Nonetheless, should vertebrate fossils be found within the proposed Project APE, the area would be monitored until a qualified paleontologist could assess the find.

III. Summary of Impacts

A total of 15 resources were analyzed based on a No Action alternative (GRB water exchange contract is not executed), Proposed Action alternative (GRB water exchange contract is executed and the full depletion of 72,641 acre-feet is modeled), and Cumulative Effects (Proposed Action alternative plus reasonably foreseeable actions as defined in 40 Code of Federal Regulations (CFR) 1508.7 and 43 CFR 46.30). Hydrology of the Green River is the driver of effects to the other 14 resources. Hydrology was analyzed using observed hydrologic data from 1906-2015. Model results were estimated for years 2018-2060. See the Hydrologic Technical Appendix of the EA for the full hydrologic analysis. Differences between the No Action and Proposed Action were so negligible as to be discounted in almost all measures. Small differences were predicted during the months of July-September during drier hydrologic conditions, which occur approximately 30 percent of the time. Individual analyses conducted for each of the other 14 resources were largely based on the hydrologic modeling. A no effect or similar determination was made for each resource as summarized below.

1. Hydrology – Generally, hydrology of the Green River would not be affected in moderate to wet years (< 70 percent exceedance). There could be up to 300 cfs difference in dry years (> 70 percent exceedance) between the No Action and Proposed Action. However,

in all scenarios, hydrology under the Proposed Action falls within the analysis in the FGFEIS and the operational parameters established in the FGROD.

2. Recreation – No effect to recreation could be identified outside of what was analyzed in the FGFEIS.
3. Wetlands, Riparian, Noxious Weeds, and Vegetation – There would be minimal to no change in these resources under the Proposed Action.
4. Fish and Wildlife Resources – No effect on fish and wildlife resources would be expected as a result of the Proposed Action.
5. Threatened and Endangered Species – A "no effect" determination was made for all species identified in the U.S. Fish and Wildlife Service's Information, Planning, and Conservation (IPaC) report and included in the EA.
6. Sensitive Species – There would be no or minimal effects to sensitive fish species.
7. Socioeconomics – Impacts to socioeconomics would not be significant, as described in the EA.
8. Water Rights – The proposed water exchange contract is for an existing water right. No new water rights would be acquired as part of the Proposed Action.
9. Cultural Resources – There would be no additional impact to cultural resources not analyzed in the FGFEIS. The Utah and Colorado State Historic Preservation Offices concurred with Reclamation's determination.
10. Paleontology – There would be no additional impact to paleontological resources not analyzed in the FGFEIS.
11. Floodplains – There would be no changes in flood frequency or duration under the Proposed Action, and no earth disturbance is contemplated within the floodplain.
12. Geology and Soils – No effects to geology and soils could be identified that were not already analyzed in the FGFEIS.
13. Indian Trust Assets – Reserved water rights held by the Ute Tribe of the Uintah and Ouray Reservation were identified as an important Indian Trust Asset during the NEPA process. The Proposed Action would not affect senior water rights, including the Ute Tribe's 1860 and 1861 priority date water rights.
14. Environmental Justice – There are no environmental justice implications from the proposed contract.
15. Hydropower Generation and Marketing – Effects to hydropower would be negligible.

IV. Finding of No Significant Impact

Based on a review of the Final EA and its supporting documents, implementing the Proposed Action will not significantly affect the quality of the human or natural environment, individually or cumulatively with other actions in the area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27. Consequently, an Environmental Impact Statement is not required for this Proposed Action.

V. Decision

The Proposed Action, to execute a water exchange contract, will not significantly affect the human or natural environment as summarized above. Furthermore, the Proposed Action meets the purpose and need of the Project, to facilitate the development of the State's water right while resolving a long-standing disagreement between Reclamation and the State regarding use of that

water right. The No Action alternative does not meet the purpose or need for the Project. Based on the lack of significant effects to the human environment and because the No Action alternative does not meet the purpose and need of the Project, it is Reclamation's decision, therefore, to implement the Proposed Action as described in the attached EA and outlined in the draft water exchange contract (Appendix B of the EA).

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Executive Summary

This Environmental Assessment (EA) was prepared to examine the impacts or effects to the quality of the human environment as a result of the Bureau of Reclamation (Reclamation) entering into a water exchange contract with the State of Utah (State). If approved, the State (or a third party to the State) would be able to divert water from the Green River up to their adjudicated right and Reclamation in turn would receive compensation.

This EA evaluates the potential effects of the Proposed Action in order to determine whether it would cause significant impacts to the human or natural environment, as defined by the National Environmental Policy Act (NEPA) of 1969. If the analysis within the EA shows no significant impacts then a Finding of No Significant Impact (FONSI) will be issued by Reclamation. Otherwise, an Environmental Impact Statement (EIS) will be necessary prior to implementation of the Proposed Action.

In 1958, Reclamation filed a Utah Application to Appropriate No. A30414 (Water Right No. 41-2963) to appropriate water from the Green River for storage in Flaming Gorge (FG) Reservoir for Colorado River Storage Project (CRSP) purposes, and for the purposes of the Central Utah Project (CUP) including irrigation, municipal, domestic and industrial uses in the Uintah and Duchesne basins. The beneficial water uses listed on this appropriation included 500,000 acre-feet (AF) to be released annually as a part of the water supply for the CUP. It is important to note that the consumptive uses of this appropriation included the support of the Ultimate Phase Units (Upalco, Uintah Units). After 1958, Reclamation segregated 52,500 AF for multiple purposes, leaving 447,500 AF with the United States.

Subsequently, the State notified Reclamation that state law did not allow Reclamation to hold an undeveloped water right for more than 50 years. In 1996, Reclamation assigned (1996 Assignment) the remaining 447,500 AF of the water right to the Utah Board of Water Resources (Board). The 1996 Assignment provided the Board an opportunity to develop a portion of the Ultimate Phase Right before it lapsed in 2009.

From 1996 to 2000 the Board segregated portions of the assigned water and allowed irrigation companies, public water suppliers, and several miscellaneous water users to enter into contracts with the State to develop portions of the 1996 Assignment. The portions of the 1996 Assignment acquired by water users and public water suppliers through contract with the Board are collectively referred to as the Green River Block (GRB) because it is expected that this water would be

predominately developed along the Green River and its tributaries between FG and Lake Powell.

Reclamation received a letter dated January 5, 2016 from the State requesting two contracts for the use of its assigned water right (total of 158,890 AF depletion). One contract represents 86,249 AF depletion to be used for the Lake Powell Pipeline proposed to be constructed by the State; the second contract, called the GRB water exchange contract, represents the remaining amount of the assigned water right (72,641 AF depletion) to be used for development along the Green River. The two contracts are separate and distinct, each covering different blocks of water to be developed under different circumstances and wholly independent of each other. One contract is not reliant on the other (i.e., if approved, the GRB water exchange contract would be executed and the corresponding water depleted regardless of the status of the proposed LPP contract, and vice versa). The GRB water exchange contract is the only contract action analyzed in this EA.

For the GRB water exchange contract, the State would forebear the depletion of a portion of the Green River and tributary flows to which it is entitled, and instead allow these natural flows to which they are entitled under Article XV(b) of the Upper Colorado River Basin Compact (which expressly recognizes each compacting state's rights and powers to regulate within its boundaries the appropriation, use, and control of water apportioned and available to the states by the Colorado River and Upper Colorado River Basin Compacts) to contribute to meeting the Endangered Species Act (ESA) Recovery Program requirements in Reaches 1 and 2 of the Green River, thereby assisting Reclamation in its obligation under the 2006 Flaming Gorge Record of Decision (FGROD). In exchange, the State would be authorized to deplete an equal amount of CRSP project water from FG releases throughout the year as water is needed for the State's water right. On an annual basis, the direct flows that would be left in the river and used to meet ESA requirements would equal the FG project releases used for depletion by the State. The State would not make calls for releases from FG storage; rather, it would use the CRSP project water as it is released in accordance with the flexibility in Reclamation's operations under the FGROD. The State and Reclamation acknowledge that the implementation of the exchange would remain subject to Reclamation's Section 7 ESA Recovery Program requirements and obligations under the FGROD. Operational requirements remain consistent between the FGEIS and the water exchange contract analyzed in this EA. This provides the basis of comparative analysis to determine the impacts related solely to execution of the water exchange contract.

The purpose of the GRB water exchange contract is to facilitate a water exchange of 72,641 AF of depletions annually under the 1996 Assignment. The GRB water exchange contract would allow Reclamation to continue to meet ESA Recovery Program goals in the Green River, maintain operations of FG dam within the parameters of the FGROD, and provide the State with a reliable water supply for development of the 1996 Assignment. This contract is needed to resolve a long

standing disagreement between Reclamation and the State regarding use of the water right assigned in 1996.

A total of 14 resources were analyzed based on a No Action alternative (GRB water exchange contract is not executed), Proposed Action alternative (GRB water exchange contract is executed and the full depletion of 72,641 AF is modeled), and Cumulative Effects (Proposed Action alternative plus reasonably foreseeable actions as defined in 40 Code of Federal Regulations (CFR) 1508.7 and 43 CFR 46.30). Hydrology of the Green River is the driver of effects to the other 13 resources. This resource was analyzed using observed hydrologic data from 1906-2015. Model results were estimated for years 2018-2060. See the Hydrologic Technical Appendix of the EA for the full hydrologic analysis. Differences between the No Action and Proposed Action were so negligible as to be discounted in almost all measures. Small differences were predicted during the months of July-September during drier hydrologic conditions, which occur approximately 30 percent of the time. Individual analyses conducted for each of the other 13 resources were largely based on the hydrologic modeling. A no effect or similar determination was made for each resource.

A public meeting was held on September 26, 2018 in Vernal, Utah to discuss the Draft EA. Approximately 15 individuals attended the meeting. A 30-day comment period began September 19, 2018 and ended December 2, 2018. Original comments received on the Draft EA are in Appendix C. Responses to those comments are included in Appendix D.

Chapter 1 Introduction

This Environmental Assessment (EA) was prepared to examine the impacts or effects to the quality of the human environment as a result of the Bureau of Reclamation (Reclamation) entering into an exchange contract (Exchange Contract) with the State of Utah (State). If approved, the State (or a third party to the State) would be able to divert water from the Green River up to their adjudicated right and Reclamation in turn would receive compensation.

This EA evaluates the potential effects of the Proposed Action in order to determine whether it would cause significant impacts to the human or natural environment, as defined by the National Environmental Policy Act (NEPA) of 1969. If the analysis within the EA shows no significant impacts then a Finding of No Significant Impact (FONSI) will be issued by Reclamation. Otherwise, an Environmental Impact Statement will be necessary prior to implementation of the Proposed Action.

1.1 How to Read this Document

Chapter 1 provides an introduction to this EA. It describes the background information leading to the Proposed Action; purpose of and need for the Proposed Action; scoping, public involvement, and consultation; related projects, and more.

Chapter 2 describes the No Action and Proposed Action Alternatives.

Chapter 3 lists environmental resources, their baseline, and how they could be potentially affected by the No Action and Proposed Action Alternatives. Cumulative effects are identified by resource.

Chapter 4 provides the environmental commitments related to implementation of the Proposed Action.

Chapter 5 lists the individuals who prepared a portion of this EA.

Chapter 6 lists the literature cited in this EA.

Chapter 7 contains the appendices of this EA, including the hydrology modeling technical report, figures, etc.

1.2 Abbreviations

Abbreviations	Meaning
AF	Acre-Feet
APE	Area of Potential Effects
BA	Biological Assessment
Basin Study	2012 Colorado River Basin Water Supply and Demand Study
BMP	Best Management Practice
BO	Biological Opinion
Board	Utah Board of Water Resources
BON	Basis of Negotiation
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CRSP	Colorado River Storage Project
CRSP Act	Colorado River Storage Project Act
CRSS	Colorado River Simulation System
CUP	Central Utah Project
CUPCA	Central Utah Project Completion Act
DNF	Direct Natural Flow
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act

Abbreviations	Meaning
FERC	Federal Energy Regulation Commission
FG	Flaming Gorge
FGFEIS	Operation of Flaming Gorge Dam Final Environmental Impact Statement 2005
FGROD	2006 Record of Decision on Operation of Flaming Gorge Dam FEIS
FONSI	Finding of No Significant Impact
GRB	Green River Block
IPaC	Information, Planning, and Conservation
ISM	Index Sequential Method
ITA	Indian Trust Asset
LPP	Lake Powell Pipeline
LTSP	Larval Trigger Study Plan
NEPA	National Environmental Policy Act
O&M	Operation and Maintenance
Reclamation	U.S. Bureau of Reclamation
Recovery Program	Upper Colorado River Endangered Fish Recovery Program
River Office	Dinosaur National Monument River Office
ROD	Record of Decision
State	State of Utah
UDWR	Utah Division of Wildlife Resources
UCRC	Upper Colorado River Commission
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
YOY	Young of Year

1.3 Background

The Bureau of Reclamation was created as a result of the Reclamation Act of 1902, during the presidency of Theodore Roosevelt. Reclamation's objective was to develop water projects that would store and transport water to the arid lands of the Western United States. The Colorado River Storage Project Act of April 11, 1956 (CRSP Act) authorized construction of the Colorado River Storage Project (CRSP) which allowed for comprehensive development of the water resources of the Upper Basin states (Colorado, New Mexico, Utah, and Wyoming). The CRSP Act authorized construction, and operation and maintenance (O&M) of facilities for the purposes of: regulating the flow of the Colorado River; storage of water for beneficial consumptive use; making it possible for the states of the Upper Basin to utilize their apportionments under the Colorado River Compact and the Upper Colorado River Basin Compact (collectively Compacts); reclamation of arid and semiarid land; the control of floods; and the generation of hydroelectric

power. The Flaming Gorge (FG) Unit, authorized by the CRSP Act (70 Stat. 105), is one of four initial storage units in the CRSP.

The FG Unit was built on the Green River in the State of Utah. The FG Unit impounds FG Reservoir, which lies within the States of Utah and Wyoming. FG Dam is located on the upper main-stem of the Green River in northeastern Utah, about 200 miles east of Salt Lake City. Below FG, the Green River supports populations of four endangered native fishes. The Upper Colorado River Endangered Fish Recovery Program (Recovery Program) was established in 1988 under an agreement signed by Reclamation and the states of Colorado, Utah and Wyoming, to recover the listed species of the Upper Colorado River to the point of de-listing, while allowing for the continued operation and development of the water resources of the Upper Colorado River Basin. Operation of FG Dam influences downstream flow and temperature regimes, the ecology of the Green River, and recovery of the native fishes. Downstream of FG Dam, the Green River is joined by the Yampa, White and Duchesne Rivers, and portions of each have been designated as critical habitat under provisions of the Endangered Species Act (ESA) of 1973. Reclamation's obligations for the recovery of the endangered fish in the Green River implementing ESA provisions were established in the 2006 Record of Decision (FGROD) on the 2005 Operation of Flaming Gorge Dam Final Environmental Impact Statement (FGFEIS), which includes operation of Flaming Gorge and participation in the Flaming Gorge Working Group.

In addition to the four initial units of the CRSP, the CRSP Act and subsequent legislation authorized the construction of 16 participating projects, including the Central Utah Project (CUP). Because of its size and complexity, Reclamation divided the CUP into six units to be built in two phases. The "Initial Phase" of the CUP included four units, of which 3 have been fully constructed, with the remaining unit nearing completion. The "Ultimate Phase" of the CUP consisted of the Uintah and Ute Units, with only the Uintah Unit being partially developed. Congress de-authorized further expenditure on the undeveloped portion of the Ultimate Phase in 1992 under the Central Utah Project Completion Act (CUPCA) (Pub. L. 102-575).

In 1958, consistent with the Compacts and CRSP Act, Reclamation filed a Utah Application to Appropriate No. A30414 (Water Right No. 41-2963) to appropriate water from the Green River for storage in FG for CRSP purposes, and for the purposes of the Central Utah Project including irrigation, municipal, domestic and industrial uses in the Uintah and Duchesne basins. The beneficial water uses listed on this appropriation included 500,000 acre-feet (AF) to be released annually as a part of the water supply for the CUP. It is important to note that the consumptive uses of this appropriation included the support of the Ultimate Phase Units.

In 1969, Reclamation segregated 40,000 AF of irrigation from Water Right No. 41-2963 and moved it to Red Fleet Reservoir, Jensen Unit of the CUP. Once the Ultimate Phase Units were de-funded under CUPCA, portions of the remaining right (Ultimate Phase Right) were allocated as follows: 1) 12,000 AF was transferred to Daggett County for the Dutch John Federal Property Disposition and Assistance Act (PL 105-326); 2) 500 AF was set aside for recreational purposes on Forest Service lands surrounding FG; and 3) 447,500 AF remained with the United States.

Subsequently, the State notified Reclamation that state law did not allow Reclamation to hold an undeveloped water right for more than 50 years. In 1996, Reclamation assigned (1996 Assignment) the remaining 447,500 AF of the water right to the Utah Board of Water Resources (Board). The 1996 Assignment provided the Board an opportunity to develop a portion of the Ultimate Phase Right before it lapsed in 2009.

From 1996 to 2000 the Board segregated portions of the assigned water and allowed irrigation companies, public water suppliers, and several miscellaneous water users to enter into contracts with the State to develop portions of the 1996 Assignment. These contractors were allowed to develop their portion of the 1996 Assignment until 2009 after which the undeveloped portion of the right would revert to the Board. Exceptions to this requirement were made for public water suppliers. The portions of the 1996 Assignment acquired by water users and public water suppliers through contract with the Board are collectively referred to as the Green River Block (GRB) because it is expected that this water would be predominately developed along the Green River and its tributaries between FG and Lake Powell.

Table 1-1
Owners of Portions of the Green River Block of the 1996 Assignment

Owner	Diversion Limit (AF)	Depletion Limit (AF)	Developed
Uintah Water Conservancy District	51,800	25,176	No
Duchesne Water Conservancy District	47,600	31,160	No
Other Public Water Suppliers	5,176	2,621	No
Private Water Users	22,450	13,684	Yes

Total	**127,026**	**72,641**	

The remaining portion of the 1996 Assignment currently held by the Board has a diversion limit of 320,474 AF and a depletion limit of 86,249 AF. This portion is being reserved by the State to be used by the Lake Powell Pipeline Project (LPP) which would divert water from Lake Powell and deliver it through a pipeline to Washington and Kane counties in southwestern Utah. This portion of the 1996 Assignment is referred to as the LPP Block.

Reclamation and the State propose entering into an exchange contract for the GRB that would allow Reclamation to: meet ESA Recovery Program goals in the Green River, continue to operate FG dam within the parameters of the FGROD, and provide the State with a reliable water supply for development of the 1996 Assignment.

1.4 Purpose of and Need for Proposed Action

Reclamation received a letter dated January 5, 2016 from the State requesting two contracts for the use of its assigned water right (total of 158,890 AF depletion). One contract represents 86,249 AF depletion to be used for the LPP proposed to be constructed by the State; the second contract, called the Green River Block, or simply GRB, represents the remaining amount of the assigned water right (72,641 AF depletion) to be used for development along the Green River. The purpose of the Exchange Contract is to facilitate a water exchange of 72,641 AF of depletions annually under the 1996 Assignment, which was previously included as part of a CRSP participating project water right. This contract is needed to resolve a long standing disagreement between Reclamation and the State regarding use of the water right assigned in 1996.

1.5 Scoping, Public Involvement, and Consultation

Scoping, as defined in 40 CFR §1501.7, is "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." Scoping includes all types of information-gathering activities and can occur throughout the NEPA process. The Proposed Action was presented to the public and interested agencies as outlined below.

1.5.1 U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) was contacted to obtain an Information for Planning and Conservation (IPaC) report. These species are listed and described in section 3.3.5 of this EA. Multiple conference calls were held to discuss the potential effects of the Proposed Action on threatened and endangered species, particularly the four Colorado River endangered fish. Following those

discussions and the analysis found in section 3.3.5 of this EA, Reclamation made a "no effect" determination for each of the species listed in the IPaC report.

1.5.2 Native American Coordination

Reclamation conducted Native American consultation through the public involvement process. Tribal consultation letters for the Draft EA were sent in September 2018 to the Apache Tribe of Oklahoma, the Eastern Shoshone Tribe of the Wind River Reservation, the Fort Belknap Indian Community of the Fort Belknap Reservation of Montana, the Hopi Tribe of Arizona, the Kaibab Band of Paiute Indians of the Kaibab Indian Reservation, the Las Vegas Tribe of Paiute Indians of the Las Vegas Indian Colony, the Moapa Band of Paiute Indians of the Moapa River Indian Reservation, the Navajo Nation of Arizona, New Mexico, and Utah, the Northwestern Band of Shoshone Nation of Utah, the Paiute Indian Tribe of Utah, the Pueblo of Laguna, the Pueblo of Nambe, the Pueblo of Zia, the Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho, the Southern Ute Indian Tribe, the Ute Indian Tribe of the Uintah & Ouray Reservation, the Ute Mountain Ute Tribe, and the Zuni Tribe of the Zuni Reservation.

In compliance with 36 CFR 800.4, Reclamation sent consultation letters with a determination of No Adverse Effect to Historic Properties for the Project to the above tribes on June 8, 2018. All primary consultation was conducted in compliance with 36 CFR 800.2 (c)(2) on a government-to-government basis but letters were followed by phone calls to tribal cultural specialists in October 2018. Through this effort, each tribe was given a reasonable opportunity to identify any concerns about historic properties; to advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance; to express their views on the effects of the Proposed Action; and to participate in the resolution of Project effects.

Reclamation received several responses from tribes about the project. The Hopi Tribe of Arizona sent a letter in June of 2018 stating that they concur with Reclamation's determination of No Adverse Effect to Historic Properties. Reclamation received a letter response from the Southern Ute Indian Tribe on July 13, 2018 that stated that they concur with Reclamation's determination of No Adverse Effect to Historic Properties for the Project. Reclamation received an emailed letter on October 8, 2018 from the Tribal Historic Preservation Officer for the Eastern Shoshone Tribe of the Wind River Reservation that stated that they concur with the determination of No Adverse Effect. The cultural specialist for the Kaibab Band of Paiute Indians of the Kaibab Indian Reservation sent an email on October 4, 2018 in which he deferred to other tribes for comment on the Project. Government-to-government meetings are ongoing with the Ute Indian Tribe of the Uintah and Ouray Reservation about the Project. No other tribes have responded to EA or Section 106 consultation to date.

1.5.3 Public Meeting and Comment Period

A public meeting was held on September 26, 2018 in Vernal, Utah to discuss the Draft EA. Approximately 15 individuals attended the meeting. A 30-day comment period began September 19, 2018 and ended December 2, 2018. Original comments received on the Draft EA are in Appendix C. Responses to those comments are included in Appendix D.

1.5.4 Utah and Colorado State Historic Preservation Offices

A determination of No Adverse Effect to Historic Properties for the Proposed Action was submitted to the Utah and Colorado State Historic Preservation Offices (SHPOs) on June 7, 2018. The Utah SHPO concurred with Reclamation's determination of No Adverse Effect to Historic Properties in a letter dated June 11, 2018. The Colorado SHPO concurred with Reclamation's determination in a letter dated July 19, 2018.

1.6 Permits and Authorizations

Implementation of the Proposed Action may require a number of authorizations or permits from state and Federal agencies. Reclamation would be responsible for obtaining all permits and authorizations required for the Project, which is entering into an exchange contract with the State. The State would be responsible to obtain all permits and authorizations required for development of the assigned water right. Potential authorizations or permits may include those listed in Table 1-2.

Table 1-2
Permits and Authorizations

Agency/Department	Purpose
Bureau of Reclamation	Reclamation obtained an approved Basis of Negotiation (BON) in order to negotiate the exchange contract with the State.

1.7 Related Projects and Documents

1.7.1 Lake Powell Pipeline

The Federal Energy Regulation Commission (FERC) is the lead agency in preparing an EIS for the Lake Powell Pipeline project. The project would bring water to residents in southern Utah by building a 139 miles long, 69-inch diameter

pipeline from Lake Powell to Kane and Washington counties, Utah. Water delivered by the project will be based on the established water right.

1.7.2 Operation of FG Dam FEIS (2005) and ROD (2006)

The FGFEIS was completed in 2005 and a ROD was signed in 2006. Under the Action Alternative, FG Dam was to be operated with the goal of achieving the 2000 Flow and Temperature Recommendations (Muth et al. 2000; Flow Recommendations), while maintaining and continuing all authorized purposes of FG Dam and Reservoir. The Flow Recommendations prescribed high spring flows along the Green River, mimicking pre-dam flows.

1.7.3 Larval Trigger Study Plan (2012; LTSP)

The LTSP was developed as part of the Recovery Program's efforts to recover endangered Colorado River fish, particularly the razorback sucker (*Xyrauchen texanus*). Increased releases from FG are timed with the presence of larvae (thus, larval trigger) in the Green River. The additional flows increase the entrainment of larvae in Stewart Lake, (near Jensen, Utah) and other backwater wetlands on the Green River. Stewart Lake acts as a wild nursery for raising razorback sucker, which are released back into the Green River in September or October.

1.8 Scope of Analysis

The purpose of this EA is to determine whether or not Reclamation should enter into a contract with the State to exchange high spring tributary flows for water released from FG Dam, and to monetize that release of water. That determination includes consideration of whether there would be significant impacts to the human or natural environment. In order to enter into a contract, an EA must be completed and a FONSI issued. Analysis in the EA includes impacts from depletions of water along the Green River, from FG Dam down to, but not including, Lake Powell.

Analysis of the reservoir basin was not included because modeling results showed drawdowns were within the operational flexibility permitted and analyzed in the FGFEIS (Table 4-29). However, new data or information leading to a different current baseline for resources below the dam (i.e. recreation visitation numbers, new federally listed species, etc.) is incorporated and will be analyzed.

Chapter 2 Alternatives

2.1 Introduction

This chapter describes the features of the No Action and Proposed Action Alternatives and presents a comparative analysis. It includes a description of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between each alternative.

2.2 No Action

Under the No Action Alternative, Reclamation and the State would not enter into an exchange contract. The State would remain free to develop their apportioned water right under the 1996 Assignment without the stability of FG stored water being released for this exchange. The State may run into shortages in years of drought, especially during the latter part of the summer when tributary flows can be significantly reduced.

2.3 Proposed Action

The Proposed Action is the preferred alternative. The Proposed Action consists of an exchange that would allow Reclamation to meet ESA Recovery Program goals in the Green River, continue to operate FG dam within the parameters of the FGROD, and provide the State with a reliable water supply for development of the 1996 Assignment.

For this exchange, the State would forebear the depletion of a portion of the Green River and tributary flows to which it is entitled under Article XV(b) of the Upper Colorado River Basin Compact which expressly recognizes each compacting state's rights and powers to regulate within its boundaries the appropriation, use, and control of water apportioned and available to the states by the Colorado River and Upper Colorado River Basin Compacts. This forborne Compact Entitlement Water would contribute to meeting the ESA Recovery Program Requirements in Reaches 1 and 2, thereby assisting Reclamation in its obligation under the FGROD. In exchange, the State would be authorized to deplete an equal amount of CRSP project water from FG releases throughout the year as water is needed for the Green River Block portion of the assigned water right. On an annual basis, the Compact Entitlement Water left in the river and used to meet ESA requirements would equal the FG project releases used for depletion by the State under the Green River Block portion of the assigned water right. The State would not make calls for releases from FG storage; rather, it

would use the CRSP project water as it is released in accordance with the flexibility in Reclamation's operations under the FGROD. The State and Reclamation acknowledge that the implementation of the exchange would remain subject to Reclamation's Section 7 ESA Recovery Program requirements and obligations under the FGROD.

Using the Green River Block portion of the assigned water right, the State may deplete up to 72,641 AF annually of the direct flows of the Green River and its tributaries (part of the water it would have been available to deplete under its Compact Entitlement Water), which instead it would forebear and designate to meet ESA Recovery Program Requirements in Reaches 1 and 2. At present, 13,684 AF of the 72,641 AF has been developed. This water would not be available for exchange of Project water until such time that a water right change application is filed on these developed portions.

Additional releases may be necessary to meet target flows in Reach 2 as a result of depletions under the Proposed Action. Should Reach 2 target flows not be able to be met through FG operations, the State would coordinate with the Recovery Program and the USFWS as outlined in part 1(c) of the draft water exchange contract (Appendix B). Actions other than the depletion of 72,641 AF of water continue to be subject to Section 10 consultation under the ESA in addition to the State's participation in the Recovery Program.

The Proposed Action would benefit both Reclamation and the State in multiple ways. First, the State would secure a more reliable water supply for development of its apportioned water right under the 1996 Assignment. The State would not need to build a storage facility on the Green River to obtain a more reliable supply of water. The State would be in compliance with the provisions of the 1996 Assignment. Reclamation would also benefit from the proposed exchange contract through allowing Reclamation to continue to meet ESA Recovery Program goals in the Green River, and in part, by monetizing the exchange of water on a per AF basis. Additionally, Reclamation and the State, through the proposed contract, establish common ground on the management of the Green River, particularly with regard to the 1996 Assignment.

Chapter 3 Affected Environment and Environmental Consequences

3.1 Introduction

This chapter describes the environment that could be affected by the Proposed Action. These impacts are discussed under the following resource issues: hydrology; recreation; wetlands, riparian, noxious weeds and vegetation; fish and wildlife resources; threatened and endangered species; sensitive species; socioeconomics; water rights; cultural resources; paleontology, floodplains; geology and soils; Indian Trust Assets (ITAs); environmental justice; wilderness, and wild and scenic rivers; system operations; health, safety, air quality and noise; and access and transportation. The present condition or characteristics of each resource are discussed first, followed by a discussion of the predicted impacts caused by the Proposed Action. The environmental effects are summarized in Section 3-7.

3.2 Resources Considered and Eliminated from Further Analysis

The following resources were considered but eliminated from further analysis, because they did not occur in the Project area or because their effect is so minor (negligible) that it was discounted.

Table 3-1
Resources Eliminated from Further Analysis

Resource	Rationale for Elimination from Further Analysis
Wilderness, and Wild and Scenic Rivers	Although some areas along the Green River have been recommended, no designated Wilderness (Act of 1964) or Wild and Scenic Rivers (Act of 1968) occur in the project area; therefore, there would be no impact to these resources from the Proposed Action.
System Operations	No change in operations is being considered in this EA. Reclamation would continue to operate FG within the limits set by the FGROD. Therefore, there would be no impact to system operations.
Health, Safety, Air Quality, and Noise	The Proposed Action does not include construction or ground-disturbing actions; consequently, there would

Resource	Rationale for Elimination from Further Analysis
	be no impact to air quality or noise. FG would continue to provide flood control downstream in the Green River, protecting the health and safety of residents living downstream. Therefore, no impact would be anticipated on health and safety due to the Proposed Action.
Access and Transportation	The Proposed Action does not propose flows that would alter water levels in the Green River beyond what is expected based on current management of FG. Access to and across the Green River would remain the same, as would transportation. Therefore, the Proposed Action would have no impact on Access and Transportation.

3.3 Affected Environment and Environmental Consequences

This chapter describes the affected environment (baseline conditions) and environmental consequences (impacts as a result of the Proposed Action) on the quality of the human environment that could be impacted by construction and operation of the Proposed Action, as described in Chapter 2. The human environment is defined in this study as all of the environmental resources, including social and economic conditions occurring in the impact area of influence.

3.3.1 Hydrology

3.3.1.1 Overview

Through coordination with the State, Reclamation conducted several hydrologic modeling runs using Reclamation's long-term planning model, Colorado River Simulation System (CRSS). The results of these model runs are being used to determine potential impacts on the hydrology of the Colorado River System from development of the GRB Ultimate Phase depletions. These depletions and diversions were covered in the FGFEIS, and are being analyzed for the purpose of signing Contract No. 17-WC-46-655 for Exchange of Water-Green River Block between the United States of America and the State.

The hydrologic modeling provides projections of potential future Colorado River System conditions (e.g., reservoir elevations, reservoir releases, river flows) under the No Action Alternative for comparison with conditions under the Proposed Action Alternative. Due to uncertainties associated with future inflows into the system, multiple simulations were performed for each alternative to quantify the

uncertainties in future conditions, and the modeling results are typically expressed in probabilistic terms.

In 2000, the Recovery Program issued the Flow Recommendations (Muth et al. 2000). The Flow Recommendations provide the basis for the proposed action described and analyzed in the FGFEIS. The FGROD implements the Action Alternative, that FG Dam was to be operated, to the extent possible, with the goal of achieving the 2000 Flow and Temperature Recommendations (Muth et al. 2000; Flow Recommendations), while maintaining and continuing all authorized purposes of FG Dam and Reservoir. Table 2.1 in the FGFEIS summarizes the Flow Recommendations and can be found in Appendix A of the Hydrology Modeling Technical Report. The FGROD directs Reclamation to operate to achieve, to the extent possible, the Flow Recommendations as described in the FGFEIS.

The Flow Recommendations divide the Green River below FG Dam into three river reaches. Reach 1 begins directly below the dam and extends to the confluence with the Yampa River (65 river miles). Reach 2 begins at the Yampa River confluence and continues to the White River confluence (99 river miles). Reach 3 is between the White River and Colorado River confluences (246 river miles) (Muth et. al 2000).

3.3.1.2 Methodology

Three scenarios were compared in this analysis for each set of hydrology: (1) Upper Basin depletions held constant at 2018 (No Action Scenario); (2) Upper Basin depletions held constant at 2018 levels *plus* GRB depletions (GRB Depletion Scenario); and (3) Upper Basin depletions held constant at 2018 levels and GRB depletions *plus* reasonably foreseeable depletions held constant at 2060 levels (Full Depletion Scenario). In this context, a reasonably foreseeable future depletion is one which has state legislation, or a tribal resolution or federal Indian water settlement, or a FONSI or ROD. See the full technical hydrology report (Appendix A) for further discussion and for specific CRSS model depletion nodes.

This modeling assumption is different than standard CRSS model runs that are used in a long-term basin-wide planning context (e.g., the 2012 Colorado River Basin Water Supply and Demand Study (Basin Study)). CRSS runs performed in a basin-wide planning context typically project that future Upper Basin depletions increase throughout the entire model run period. The model runs presented in this report analyze the difference between diverting water out of the Green River directly below FG Dam and not diverting the water. In this analysis, the State's total depletions in the GRB Depletion and No Action Scenarios differ by the volume of water being diverted below FG Dam. This modeling approach isolates the impact of diverting water out of the Green River under the GRB Depletion Scenario as compared against the No Action Scenario and Full Depletion Scenario.

3.3.1.2.1 Future Depletion Scenarios

No Action Scenario
Under the No Action Scenario, GRB depletions were assumed to be zero for the entire model run (2018-2060). Depletion data for all other locations in CRSS were the Upper Colorado River Commission (UCRC) 2007 depletion schedule and held steady at 2018 levels.

GRB Depletion Scenario
Under the GRB Depletion Scenario, the GRB maximum annual depletion is 58,957 AF. It was assumed that the GRB depletion location would occur directly below FG Dam during the agricultural growing season from July through the end of September. The 2006 FGROD operations remained consistent throughout each alternative. Reclamation made a commitment in the FGROD to maintain Reach 1 and 2 flow target levels as measured by the U.S. Geological Survey (USGS) stream gage on the Green River at Greendale (Reach 1) and the Green River at Jensen, Utah (Reach 2). The GRB depletion maintains FGROD operations and no change to operations outside operations outlined in the FGROD are made under the GRB alternative. Releases from FG Dam maintain Reach 1 and 2 flow thresholds.

Full Depletion Scenario
Under the Full Depletion Scenario, all assumptions from the GRB Depletion Scenario are maintained, with the addition of reasonably foreseeable depletions held constant at 2060 levels with all other depletions held constant at 2018 depletion levels.

3.3.1.2.2 Future Inflow Hydrology Scenarios

3.3.1.2.2.1 Historic Hydrology - Direct Natural Flow (DNF)

The future hydrology used as input to the model consisted of samples taken from the historic record of natural flow in the river system over the 110-year period from 1906 through 2015 from 29 individual inflow points (or nodes) on the Colorado River System. Natural flow is the observed flow adjusted for the effects of diversions and the operation of reservoirs upstream of the streamgage. This natural flow record was developed by Reclamation and is used extensively in their hydrologic modeling and Environmental Impact Statements. In this inflow scenario, the existing historical record of natural flows was used to create a number of different future hydrologic sequences using a resampling technique known as the Index Sequential Method (ISM). The ISM provides the basis for quantification of the uncertainty and an assessment of the risk with respect to future inflows and is based upon the best available measured data. This inflow

dataset and methodology was used as the primary inflow scenario in the 2007 Shortage EIS and one of the inflow scenarios used in the Basin Study.

Concerns over a changing climate have been prominent in environmental and water resources. The DNF hydrology set contains multiple period of drought, including the decades of drought that occurred in the1930s, 1950s, 1970s and 2000 up to 2015. In order to determine the impacts of continued drought, the trace with the lowest elevation has been isolated and its results have been included. Trace 63 begins with the initial conditions and then historic year 1979 is the first hydrologic year of that trace. This trace moves through the wet years in the 1980s, but ends with the drought in 2000-2015. It is the period of operations from 2000-2015 that have the greatest impact on elevation. The impact trends of implementing the exchange agreement are seen in the worst-case scenario. The illustrations in the drought trace 63 should be considered one representation of potential possibilities of future hydrology and it is statistically unlikely that trace 63 will happen.

3.3.1.2.1.4 Comparing Scenarios

For comparison purposes, the GRB Depletion Scenario and Full Depletion Scenario are compared to the No Action Scenario designated as basecase in the following graphs. The comparisons are made using the DNF future inflow scenarios. The following variables were evaluated:

- FG pool elevation on April 31st
- FG elevation ≤ 5,980 ft
- FG Release and Jensen Flows (January-February)
- FG Release and Jensen Flows (March)
- FG Release (April)
- FG Release and Jensen Flows (July-September)
- FG Release and Jensen Flows (October-December)
- Jensen Flows (April-July)
- Jensen Maximum Annual Flow (April-July)
- Jensen Sustained 14-Day Duration Flows (April-July)
- Jensen Flows (August-September)

3.3.1.3 No Action

Under the No Action Alternative, Reclamation and the State would not enter into an exchange contract. The State would remain free to develop their apportioned water right under the 1996 Assignment without the stability of FG stored water being released for this exchange. There would be no effect to current hydrology of the Green River associated with the proposed contract action.

3.3.1.4 Proposed Action

The Proposed Action would have minimal impacts on hydrology, with potential effects occurring mostly in moderately dry to dry years (> 70 percent exceedance). The model isolates the impacts of the GRB Depletion Scenario against future depletions on the Green River. The modeling shows impacts of the GRB depletion are insignificant as compared against both the No Action and the Full Depletion Scenarios.

Comparing results from various key parameters provides an understanding of the difference between the scenarios. The difference between the No Action and implementation of the Proposed Action results in a maximum 6 foot drop in the reservoir elevation, an overall indicator of storage impacts. This is also true when using trace 63 for model predictions. The difference when using trace 63 is that the 6 foot drop would occur around 70 percent exceedance instead of 100 percent. This is within normal operating procedures analyzed in the FGFEIS and implemented in the FGROD. The 6 foot drop does not represent a new operating elevation, simply a variation in reservoir elevations under the GRB Depletion Scenario.

FG operations are divided between spring and base flows with transition months to accommodate forecast uncertainty and spring inflow volume in March and April. Flows are measured at the release point directly below the dam (Reach 1) and at the stream gage located on the Green River at Jensen, Utah (Reach 2). The flows at Jensen incorporate tributary inflows from the Yampa River. Releases from FG in the No Action and GRB depletion scenarios are almost identical. The addition of Full Depletion Scenario causes a decrease in FG elevation that in turn decreases base flow releases to increase elevation where flexibility exists in FG operations.

March is a transition month where FG releases can be dramatically higher or lower than the base flow period from August-February to achieve the May 1 elevation drawdown level as evidenced during the low exceedance probabilities (higher percentiles) for releases from FG and subsequent Jensen flows. Releases above power plant capacity (4,600 cfs) occur 4 percent of the time in all scenarios. FG releases and Jensen flows are nearly identical between the No Action and GRB depletion scenarios. This is also true in trace 63. Base flows would occur approximately 15 percent more often using trace 63.

Spring peak releases during the month of April are nearly identical under all scenarios). Again, this holds true for trace 63 as well.

Jensen flows for the April-July period incorporate the largely unregulated nature of the Yampa River with a daily disaggregation algorithm that provides a significant range of flows on the Yampa. Jensen flows are below 5,000 cfs approximately 45 percent of the time. Jensen flows in the Proposed Action Alternative are higher approximately 5 percent of the time when FG releases are

increased in July to maintain Reach 2 flows, and are higher than the No Action Alternative.

The FGROD entails, to the extent possible, meeting a daily maximum of 18,600 cfs 50 percent of the time in Reach 2 at Jensen. The No Action Alternative along with the GRB depletion scenario have similar results for the maximum daily flow at Jensen. Both scenarios indicate that meeting the daily maximum flow at Jensen at or above 18,600 cfs 50 percent of the time is not achievable under historic hydrology used in this modeling scenario. Differences between this analysis and the analysis outlined in the FGFEIS are responsible for the result regarding achievability of annual peak flows at Jensen, Utah. The FGFEIS historic record ended in 1996, while this hydrologic record continues through 2015. The extended record includes the lowest hydrologic period on record that beginning in the year 2000. Additionally, the modeling ruleset makes assumptions regarding use of bypass and operational constraints in order to determine necessary steps needed to meet target flows. These modeling results provide information to Reclamation that will be used to operate to meet the 18,600 cfs annual peak target at Jensen, Utah at least 50 percent of the time.

FGROD commitments also include flows at Jensen to meet or exceed 18,600 cfs for a duration of 14 days at least 40 percent of the time. Modeling results in Appendix A illustrate the probability of meeting 18,600 cfs for a consecutive 14-day period, which is a stricter standard than the FGROD that requires 18,600 cfs for a cumulative total of 14 days at least 40 percent of the time during the spring release period. Based on the conservative estimate, the modeling indicates that Jensen flows would remain at or above 18,600 cfs for a consecutive 14-day period approximately 25 percent of the time under all three scenarios. No difference exists between the No Action and Proposed Action Alternatives.

FG Dam is operated to meet Reach 2 targets by incorporating the Yampa River flows and accounting for the GRB depletions total volume averaged daily over the July through September period. Releases from FG under the GRB depletion scenario are higher than the No Action Alternative 30 percent of the time, but remain within the operational parameters analyzed in the FGFEIS and set in the FGROD. The GRB depletion scenario is higher to maintain Reach 2 flows and compensate for higher depletion rates below FG Dam.

The results of FG releases on Reach 2 flows are calculated from the likelihood of wet year flows extending into July with the total flows at Jensen approximately 26,000 cfs at the highest levels. Targeting the impacts of releases from FG to flows at Jensen during lower base flows using Jensen flows for August through September indicates that Yampa flows provide a significant portion of Reach 2 flows with the flows under the No Action and GRB Depletion Scenarios being similar until approximately 65 percent exceedance level, or 35 percent of the time, when the GRB depletion increases releases above the No Action. This would change to 55 percent exceedance, or 45 percent of the time, when using trace 63

for model predictions. The No Action scenario has lower flows than the GRB depletion scenario when the minimum flow release target from FG Reservoir has essentially been altered to compensate for the depletion scenario during drier hydrology.

The GRB depletion ends on September 30, and the remaining months of the year are used to increase reservoir storage within the FGROD base flow requirements. FG releases are maintained at minimum 800 cfs levels approximately 10 percent more time than the No Action Alternative, and are at minimum releases for 25 percent of the time. The GRB depletion scenario maintains slightly lower releases as compared against the No Action, but converges with the No Action Alternative beyond the 45th percentile during October-December.

The impact to Reach 2 Jensen flows for the GRB depletion during October through December is negligible, with the addition of Yampa River flows assisting overall flows at Jensen.

3.3.1.5 Cumulative Effects

Cumulatively, there would not be a significant impact to hydrology based on the analysis performed in this EA. The Full Depletion Scenario, which includes reasonably foreseeable depletions, increases the maximum difference in elevation at FG Reservoir to 30 feet when compared to the No Action Alternative, at 100 percent exceedance, yet still within the FGFEIS range that extends to elevation 5980 feet. This remains true using trace 63 for model predictions. It is important to remember that this is the worst case scenario—water is assumed to be taken below FG Dam in the projected driest year.

The impacts of incorporating full depletion development on the Green River are greater than impacts from the GRB depletions, however the projected range of reservoir elevations is still within that analyzed in the FGFEIS. These impacts are seen throughout the graphical results comparing the GRB depletion scenario and incorporating the official UCRC 2060 reasonably foreseeable depletions on the Green River.

The Full Depletion Scenario extends the minimum base flow duration at the Jensen stream gage approximately 10 percent both in the dry and average flow ranges. The historic record includes some high precipitation months in January and February that are seen in the Jensen flows reaching above 4,500 cfs < 0.01 percent of the time.

The Full Depletion Scenario extends minimum releases in March approximately 10 percent of the time during the drier portion of average flows. Continued lower release levels, albeit not minimum releases, occur an additional 50 percent of the time to increase reservoir storage under the Full Depletion Scenario. The Full Depletion Scenario continues to release slightly less in the month of April and minimum releases are extended an additional 10 percent of the time.

Jensen flows in the GRB Depletion Scenario and the Full Depletion Scenario are higher approximately 5 percent of the time when FG releases are increased in July to maintain Reach 2 flows, and are higher than the No Action Scenario.

The FGROD directs, to the extent possible, meeting a daily maximum of 18,600 cfs 50 percent of the time. The No Action and Full Depletion Scenarios have similar results for the maximum daily flow at Jensen. Under all three depletion scenarios analyzed in this EA, meeting the daily maximum flow at Jensen at or above 18,600 cfs 50 percent of the time is not achievable under historic hydrology used in this modeling scenario.

FGROD commitments also include flows at Jensen to meet or exceed 18,600 cfs for a duration of 14 days at least 40 percent of the time. Modeling results in Appendix A illustrate the probability of meeting 18,600 cfs for a consecutive 14-day period, which is a stricter standard than the FGROD that requires 18,600 cfs for a cumulative total of 14 days at least 40 percent of the time during the spring release period. The Full Depletion Scenario indicates slightly lower probabilities of meeting this target caused by the increased depletions in the system.

FG Dam is operated to meet Reach 2 targets by incorporating the Yampa River flows and accounting for the GRB depletions total volume averaged daily over the July through September period. Under the Full Depletion Scenario, releases from FG are higher than the No Action Alternative about 35 percent of the time. The Full Depletion Scenario is higher to maintain Reach 2 flows and compensate for higher depletion rates below FG Dam.

The results of FG releases on Reach 2 flows are calculated from the likelihood of wet year flows extending into July with the total flows at Jensen approximately 26,000 cfs at the highest levels. Targeting the impacts of releases from FG to flows at Jensen during lower base flows using flows for August through September. The Full Depletion Scenario remains lower than the No Action to increase reservoir storage 30 percent of the time during drier hydrology, at which time FG releases increase the Full Depletion Scenario above the basecase. The No Action Scenario has lower flows for the Full Depletion Scenario when the minimum flow release target from FG Reservoir has essentially been altered to compensate for the depletion scenarios during drier hydrology.

The GRB depletion ends on September 30, and the remaining months of the year are used to increase reservoir storage within the FGROD base flow requirements. The base flows during the October through December time frame are evaluated for Jensen flows. FG releases are maintained at minimum 800 cfs levels approximately 10 percent more time than the GRB Depletion Scenario and are at minimum releases an increased 35 percent of the time. Releases are lower than the GRB Depletion Scenario during the entire October through December period.

The impact to Reach 2 Jensen flows for the Full Depletion Scenario during October through December is minimal as shown in Figure 15, with the addition of Yampa River flows assisting overall flows at Jensen. The Full Depletion Scenario maintains approximately 250 cfs lower flows at Jensen 80 percent of the time.

3.3.2 Recreation

Reclamation constructed and currently operates FG Dam. FG Reservoir and the Green River for approximately 12 miles downstream of the dam comprise the Flaming Gorge National Recreation Area (FGNRA) which is managed by the Ashley National Forest, USDA Forest Service (USFS). Providing recreation experiences is one of the primary objectives of the FGNRA. After exiting the FGNRA, the Green River flows across U.S. Bureau of Land Management (BLM) and State of Utah lands for approximately 18 miles before entering the USFWS managed Browns Park National Wildlife Refuge along the Utah/Colorado border 30 miles downstream of the dam. Immediately downstream of the refuge, approximately 47 miles downstream of the dam, lies Dinosaur National Monument (NM) managed by the U.S. National Park Service (NPS). The upper portion of Dinosaur NM, upstream of the confluence with the Yampa River, is the end of Reach 1 of the study area.

The recreation analysis conducted during the summer of 2001 by Aukerman and Schuster for the 2005 FGFEIS addressed impacts to both FG Reservoir and the Green River downstream of FG Dam. Despite the series of Federal and State managed public lands along the river downstream of the dam, the analysis focused upon recreation effects within Reach 1 and specifically within the FGNRA because that is where the majority of the potentially impacted water based recreation occurred. Visitation at the reservoir far surpasses that of the river, representing from 87 to 96 percent of the combined total depending on the hydrologic condition. Power boating/waterskiing and boat fishing on the reservoir are the dominant activities accounting for 80 to 90 percent of the combined total visitation and nearly 95 percent of visitation on the reservoir. Shoreline fishing/trail use, scenic floating, and private boat fishing account for most of the visitation on the river. These three activities, while significant on the river given they reflect from 82 to 87 percent of river visitation, account for, at most, about 11 percent of the combined total visitation. Boat camping and swimming are relatively minor activities across all conditions.

Relatively little of the river oriented recreation activity within the region (mainly scenic floating via raft/kayak, shoreline and boat based fishing, and camping) initiates within the 35-mile stretch of the river between the FGNRA and Dinosaur NM. In Dinosaur NM, water-based recreation is dominated by rafting activities. Rafting within the monument is managed via a permit system that covers both the Green and Yampa Rivers. If flow conditions deteriorated on the Green River to the point of adversely impacting rafting activity, there exists the possibility of shifting activity to the Yampa River. While NPS constrains the total number of

permits for both commercial and private rafting parties across both rivers to 600 a year, and the number of launches from either river to 4 per day, there still exists the potential for rafting substitution between the rivers. In addition, the majority of commercial and private rafting trips are scheduled well ahead of time. Commercial rafting operations are popular and early reservations are often required since space on these trips tends to fill up quickly. Private rafting permits are limited to one per person annually and must be obtained via a lottery system months prior to the actual trip date.

Changes in water-based recreation activity within Reaches 2 and 3 based on the FGFEIS alternatives were also assumed to be relatively minor either due to low levels of recreation use or the overriding effect of the combined flows from the numerous tributaries (e.g., Yampa, Duchesne, White, etc.) as compared to dam releases. Given all of the above, the decision was made to focus the recreation visitation and value analysis on water-based effects primarily within the FGNRA.

The Green River portion of the FGNRA is located entirely within Daggett County Utah, found in the northeast corner of the state. The southernmost portions of the reservoir are also found within Daggett County. This part of the reservoir is relatively narrow given the water is impounded via a series of canyons. The reservoir widens as one travels northward out of the canyons and toward the Utah/Wyoming border. The Wyoming portion of the reservoir, located entirely within Sweetwater County, is relatively wide and extends northward for many miles before narrowing at the confluence of the Green and Blacks Fork Rivers. Potentially affected recreation facilities within the FGNRA along both the Green River and FG Reservoir include the following:

Green River:

1. Boat ramps at the FG Dam spillway and at the Little Hole recreation complex
2. Little Hole National Recreation Trail (from the spillway of FG Dam to the Little Hole recreation complex)
3. Fishing pier at the Little Hole recreation complex
4. 18 riverside campgrounds (7 are on BLM lands outside FGNRA)

FG Reservoir:

1. 11 boat ramps (4 associated with marinas)
2. 3 marinas
3. 3 boat based campgrounds
4. 4 swimming beaches
5. 1 Fishing Pier/Visitor Dock at Dam Point
6. Cut Through - Horseshoe Canyon Bypass (not evaluated within the recreation analysis since it has only minor impacts on recreation use)

While the Green River recreation analysis emphasizes impacts within the upper portion of Reach 1, primarily within FGNRA, consideration is also given to recreation facilities downstream, all the way to the confluence with the Colorado River. After passing out of Reach 1 within Dinosaur NM, the Green River flows across private lands, State of Utah lands, Federal lands (BLM, USFWS including Ouray National Wildlife Refuge), and Ute Indian tribal lands within Reach 2. Very few recreational facilities are found in this reach. Reach 3 of the Green River starts at the confluence with the White River and ends at the Colorado River. This long stretch of river includes Ute Indian tribal lands (including Desolation Canyon), State of Utah lands (including Green River State Park), Federal lands (BLM, NPS including Canyonlands National Park), and private lands. Numerous recreational facilities are located within Reach 3. The following represents a list of recreational facilities found along the Green River downstream of FGNRA within Reaches 1, 2, and 3.

Green River – Reach 1 (downstream of FGNRA):

BLM:
1. Three boat ramps (Indian Crossing, Bridge Hollow, and Swallow Canyon)
2. Twenty campgrounds - Six of these are administered by the USFS for BLM

State of Utah:
3. One boat ramp (Bridge Port Camp)
4. Five campgrounds (Gorge Creek, Little Davenport, Bridge Port, Elm Grove, and Burned Tree)

USFWS (Browns Park NWR):
5. Two boat ramps (Swinging Bridge, Crook)
6. Two campgrounds (Swinging Bridge, Crook)
7. Fishing Pier

NPS (Dinosaur NM): (Note: Facilities located downstream of the Yampa are technically Reach 2 (e.g., Split Mountain))
8. Three boat ramps (Lodore, Deerlodge, and Split Mountain)
9. Five riverside campgrounds (Lodore, Deerlodge, Echo Park, Split Mountain, and Green River)
10. One riverside picnic area (Split Mountain)

Green River – Reach 2 (Yampa River to White River):

USFWS (Ouray NWR):
1. One boat launch site

Green River – Reach 3 (White River to Colorado River):

BLM:

1. Five boat ramps/launch sites (Sand Wash, Swasey's Beach ramp, Nefertiti, Butler Rapid, and Mineral Bottom)
2. One riverside campground (Swasey's Beach)

State of Utah (Green River State Park):
3. One boat ramp
4. One campground

Private:
5. One boat launch site (Ruby Ranch)

NPS (Canyonlands N.P.):
6. Eight campsites

Reclamation attempted to obtain more recent data for this recreation analysis. According to email communication with the Vernal UDWR Aquatics Staff, 2018 creel data for the Green River is still in the process of being analyzed and is not yet ready for distribution. A request for the most up-to-date Green River visitation/permit data was submitted to the Dinosaur National Monument River Office (River Office) in December 2018. The River Office responded that they would try to retrieve the data but that some had been lost with the new conversion of the website recreation.gov. To date, no data has been received from the River Office.

3.3.2.1 No Action

The No Action Alternative would have no effect on the recreation activities mentioned above. FG Dam would continue to operate within the sideboards of the FGROD and recreation activities within the study area would continue according to historical practice based on interactions within the FG Working Group.

3.3.2.2 Proposed Action

Recreation facilities and activities identified in Section 3.3.2 are assumed to be unaffected by the Proposed Action given their historical use across a wide range of flow conditions. Given the degree of planning and financial commitment required for rafting trips, there exists a fairly strong incentive to take trips even when flow conditions are less than ideal. To substantiate this discussion, attempts were made to model the impact of average monthly flows on rafting visitation within Dinosaur NM (see Flaming Gorge FEIS Recreation Visitation and Valuation Analysis Technical Appendix section 3.1.1.1.2). Separate models were estimated for commercial and private rafting activity. These models either resulted in insignificant flow variables (commercial model) or significant flow variables with relatively minor impacts on rafting activity (private model). As a result, the assumption was made that rafting activity within Dinosaur NM would not vary substantially with the fluctuations in Green River flows associated with

the FGFEIS alternatives. Green River flows under the Proposed Action would continue within the sideboards of the FGROD.

3.3.2.3 Cumulative Effects

Cumulatively, there would not be a significant impact to recreation associated with the Proposed Action based on the analysis performed in the FGFEIS and within this EA, specifically section 3.3.1 Hydrology. Recreation opportunities within the study area are directly tied to the hydrology of the Green River. The hydrologic modeling conducted within this EA shows the Full Depletion Scenario would maintain approximately 250 cfs lower flows at Jensen 80 percent of the time. These reduced flows would still meet the minimum flows of 800 cfs at the Greendale and Jensen stream gages as required in the FGROD and would therefore have a negligible effect upon recreation activities within the study area. Flaming Gorge Dam would continue to operate within the sideboards of the FGROD.

The BLM (Vernal Field Office) and USFS have initiated several resource and river management plans along the Green River over the past 25 years. All of these efforts appear to have had either a negligible or positive effect on water-based recreation on or along the river. None of the plans appear to have impacted recreation within the study area in any significant way. As a result, the cumulative effects of the Proposed Action, in conjunction with these past actions would be insignificant.

3.3.3 Wetlands, Riparian, Noxious Weeds, and Vegetation

Plant communities found along the Green River and that are influenced by river flows are known as riparian, floodplain and riverine types. Some of these plant communities are considered wetlands, which are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered by shallow water, and support vegetation and soils adapted to these hydrologic conditions. Non-wetland areas are known as uplands. Wetland areas are protected by the Clean Water Act (CWA). Any activities affecting wetlands or Waters of the United States must receive approval from the U.S. Army Corps of Engineers (USACE) via issuance of a CWA section 404 permit.

Riverine wetlands occur within a stream channel that typically support herbaceous plant species. The riparian area represents a transition zone between water and upland, while floodplains are those areas associated with surface waters, such as rivers, that experience periodic flooding and function as flood water storage. Both riparian areas and floodplains may be considered wetland or upland depending on site conditions that include elevation distance above groundwater table, distance from surface water (i.e., wetlands, rivers, and lakes) and soil types. All plant communities immediately associated with the Green River can support

both native and non-native plant species, and some species can represent noxious weeds.

Because much of the Western United States is arid, riparian areas provide the moisture and nutrients that support more diverse plant species composition than adjacent upland areas. Riparian areas also support a greater diversity of wildlife, providing habitat for 75-80 percent of Utah's wildlife species. Riparian wetland areas are important for their role in water quality improvement, flood control, recreation, and ground water recharge and discharge.

The Green River's riparian areas change character as the river alternately meanders through bedrock-confined canyons and broad valleys. Narrow canyon reaches such as Red Canyon, Lodore, Whirlpool, and lower Labyrinth Canyon provide only limited opportunities for plant species establishment. Wider, unconfined river reaches of Browns Park, Island Park, and Ouray historically were composed of expansive and highly productive riparian plant communities. Intermediate to the above reach types are the confined alluvial reaches such as Echo Park, Grays, Desolation, and Stillwater Canyons. These areas, while still confined within a limited valley width, historically also allowed complex riparian development. Where canyons are narrow, the opportunity for floodplain development beyond the riparian area is extremely limited.

Fremont cottonwood (*Populus fremontii*) is the dominant tree species along the wide alluvial sections of the Green River, while box elder (*Acer negundo*) is the dominant tree of the canyon reaches. Both species are flood-dependent. Successful establishment of cottonwood communities depends on spring peak flows and associated overbank flooding to provide seed dispersal. A third native woody species, sandbar willow (*Salix exigua*), is the dominant shrub species within all three river reaches.

Tamarisk (*Tamarix ramosissima*) presence represents a fourth, dominant, woody plant species that, along with the three species above, strongly influence river channel width and complexity. It is a non-native invasive species that contributes to channel narrowing, simplification and stabilization, resulting in the displacement of native riparian vegetation with an accompanying reduction in plant and animal species diversity. However, this is not in contrast to the three native woody species, which also have this capability on regulated rivers. But tamarisk is proficient at this ability. During periods of low or high flow that coincides with late summer through fall, it rapidly colonize moist soils and, once established, can tolerate a range of environmental conditions.

Russian olive (*Elaeagnus angustifolia*) is another invasive plant of concern along alluvial reaches of the Green River. Relative to willow and cottonwood, it is drought and shade tolerant at both the seedling and adult stages. Russian olive does not depend on spring flooding and disturbed soils for establishment. Due to these characteristics, it can become the dominant climax community and prevent

establishment of native vegetation, especially cottonwoods (Shafroth et al. 1995). Although it is considered a noxious invasive species, the following sections will focus on effects from tamarisk.

3.3.3.1 No Action

The No Action Alternative would have no effect on wetlands, riparian, noxious weeds, and existing vegetation. Existing conditions would continue.

3.3.3.2 Proposed Action

The Proposed Action Alternative would have little to no effect on existing conditions. Wetlands require water either through inundation or groundwater, along with wetland-dependent plant species and suitable soils to persist. For this action, only water input is being considered as potentially affecting wetlands. The hydrologic modeling (section 3.3.1) predicted virtually no differences between the No Action and Proposed Action during high flow periods that would influence adjacent wetlands. Therefore, wetland hydric condition would not be altered, resulting in no effect to wetland areas from proposed hydrologic conditions.

Riparian areas would be affected by implementing the Proposed Action, but primarily in Reach 1. Only small increases (< 300 cfs) during the months of July through September, in dry years, were predicted by the hydrologic modeling. This could have a minimal positive effect for recruitment of tamarisk. Conversely, with no change to flow, tamarisk plants are likely to recruit anyway. This is primarily due to existing and future dam operation, which produce discharges that may not be of sufficient enough scouring flow to remove recruiting tamarisk from the banks.

Slightly lower flows (< 250 cfs difference) would potentially occur in the months of October through December. This again would likely be inconsequential for riparian areas as many affected plant species will enter dormancy during this period. Seed dispersal does not occur during dormancy, so plant species recruitment would not occur.

Consequently, noxious and invasive plant species occur in the Project area and are likely to continue recruiting. However, as previously discussed, the hydrologic modeling predicted there would be nearly no differences during spring high flow scouring events compared to existing dam operation, and only minor differences in river levels (< 300 cfs) in late summer through winter. Therefore, there would be no effect to noxious and invasive plant species.

3.3.3.3 Cumulative Effects

The cumulative effects analysis includes the Proposed Action Alternative with other reasonably foreseeable actions. Wetlands require substantial water either through inundation or through groundwater input to persist. The hydrologic

modeling (section 3.3.1) predicted virtually no differences comparing the No Action and Proposed Action alternatives during high flow periods that would connect the Green River to adjacent wetlands. Therefore, there would be no cumulative effect to wetlands.

Noxious and invasive plant species occur in the Project area. Although previously discussed for both wetland and riparian resources, the hydrologic modeling predicted there would nearly no differences during spring high flows (scouring events) and only minor differences in river levels (< 300 cfs) in late summer through winter. However, recent research by Scott and Friedman (2018) has indicated that, if summer-fall flows are increased, it will favor recruitment by tamarisk as this is when this species releases seed, which are dispersed via wind and stream. Comparatively, the three dominant native woody species seeds are primarily wind dispersed in spring.

Tamarisk recruitment and establishment is expected to outcompete native woody species if summer through fall with increased flow compared to current seasonal flows. It could result in channel narrowing, which would also produce a potential for increasing floodplain area as a narrowing channel will cause the Green River to have more frequent greater-than-bankfull flow events. In a larger context, the potential for these effects is greatest in Reach 1, with declining potential through Reaches 2 and 3 as the Yampa River flow, and other tributaries, influences are more similar to an unregulated river than the Green River in Reach 1.

Furthermore, channel narrowing may be inevitable based on the past, current and future dam operation. Perkins et al. (2016) reviewed and further analyzed studies by others, concluding:

> *"Although it appears that flow regulation may have influenced the timing and extent of invasion by many of these non-native species, because of their life history traits, these species are likely to continue to invade and persist to some degree in riparian settings regionally, regardless of the degree of flow regulation."*

This conclusion also considers noxious invasive herbaceous plant species as well as those woody species already discussed.

But more importantly, based on the hydrologic models, there is no clear indication that increased peak flows will occur during summer through fall in any future year(s) or during a consecutive series of years. Specifically, probable discharges measured at the Flaming Gorge Reservoir and the Jensen stream gage will be similar for the No Action, Proposed Alternative and Cumulative Effects analysis 70% of the time from August through September. This supports the conclusion that Perkins et al. (2016) makes, but from a hydrologic perspective. In other words, tamarisk and other noxious, invasive weed species have been established in all three river reaches during normal historic dam operation. With seasonally

important (in this context) flow probability expected to remain the same 70% of the time, past conditions would likely continue to produce similar effects into the future. Which means channel narrowing and floodplain formation will continue. Therefore, it is expected that the proposed action would produce no cumulative effects.

3.3.4 Fish and Wildlife Resources

3.3.4.1 Fish Species

Historically, the Green River in the area of FG was an unregulated, turbid, temperate stream that exhibited wide fluctuations in flow (Muth et al. 2000). Flows ranged from a few hundred cfs to over 68,000 cfs. Water temperature ranged from near freezing to greater than 70° F (21° C) annually. The river supported 12 native fish species: humpback chub (*Gila cypha*), bonytail (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), mountain whitefish (*Prosopium williamsoni*), mountain sucker (*Catostomus platyrhynchus*), mottled sculpin (*Cottus bairdi*), Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), flannelmouth sucker (*Catostomus latipinnis*), bluehead sucker (*Catostomus discobolus*), roundtail chub (*Gila robusta*), and speckled dace (*Rhinichthys osculus*).

Four fish species, including mountain whitefish, mountain sucker, mottled sculpin, and Colorado River cutthroat trout, were likely only part-time residents in the FG area, preferring cooler water temperatures that were found farther upstream. The river warming that occurred naturally would have completely precluded their presence by the time the Green River reached its confluence with the Yampa River. From that confluence downstream, the remaining eight warm water species (humpback chub, bonytail, Colorado pikeminnow, razorback sucker, flannelmouth sucker, bluehead sucker, roundtail chub, and speckled dace) comprised the entire fish community. These eight species were historically found throughout the Green River and the lower reaches of its tributaries: the Yampa, White, Duchesne, Price, and San Rafael rivers.

Impacts to the four endangered fishes (razorback sucker, bonytail, humpback chub, and Colorado pikeminnow) are addressed in Section 3.3.5 of this EA. The mountain sucker and Colorado River cutthroat trout are not protected under the ESA, but are species of concern in Colorado. The flannelmouth sucker, bluehead sucker, and roundtail chub are state sensitive species in Utah. These five species are included in the discussion of state sensitive species in Section 3.3.6 of this EA.

Earliest impacts to the Green River system came in two forms: alterations of the physical environment (channelization, diking, and pollution) and the introduction of nonnative species. The first major diversion structure placed in the main channel of the Green River was at Tusher Wash, near the town of Green River, Utah, in 1906 (Cavalli 2000). Tusher Wash Dam remained the only significant

barrier to warm water fish movement and the most significant form of river regulation on the Green River until the construction of FG Dam in 1962.

By the early 1900s, nonnative fish populations—in particular, channel catfish (*Ictalurus punctatus*)—had become established in the main stem Colorado River. Since that time, a total of 25 nonnative species representing 9 families has been introduced into the Green River and its tributaries. Nonnative fishes now dominate the fish community of the entire Colorado River System and are believed to contribute to reductions in the distribution and abundance of native species through competition and predation (Carlson and Muth 1989).

Common nonnative fishes that occur along the reaches of the Green River are trout (rainbow (*Oncorhynchus mykiss*), brown (*Salmo trutta*), and others), common carp, channel catfish, smallmouth bass, and a group of minnows (red shiner (*Cyprinella lutrensis*), fathead minnow (*Pimephales promelas*), sand shiner (*Notropis stramineus*), and redside shiner (*Richardsonius balteatus*)).

The first known nonnative trout introduced to the Green River tailwater were 18,900 catchable-sized rainbow trout stocked in 1963, and brown trout were first stocked in 1965. Initial plants of Yellowstone and Snake River cutthroat trout occurred in 1967 and 1971, respectively, and brook trout were first stocked in the tailwater in 1970.

Common carp (introduced to Green River in late 19th century; Nico et al. 2018) prefer sheltered areas with an abundance of aquatic vegetation in warm water lakes, reservoirs, and rivers. The adults are opportunistic feeders that are able to utilize any available food source (Sigler 1958). Carp typically spawn in flooded vegetation during the months of May and June in temperate climates. Carp are tolerant of a wide range of temperatures, but production is highly correlated with the number of days greater than 20 °C (68 ºF) (Backiel and Stegman 1968).

Channel catfish (introduced in the late 19th century; Fuller and Neilson 2018) prefer warmer water with a diversity of water velocities, depths, and structural features that provide cover and feeding areas. Channel catfish spawn in late spring and early summer (generally late May through mid-July) when temperatures reach about 21 °C (70 ºF) (Pflieger 1975). The optimal temperature range for adult channel catfish growth is 26 to 29 °C (79–84 ºF) (Chen 1976), and growth is poor at temperatures less than 21 °C (70 ºF) (Andrews and Stickney 1972).

Smallmouth bass (introduced around 1912-1914; Fuller et al. 2018) occur in the reservoir as well as the Green River and become more abundant farther downstream. These fish are not native to the Green River and pose a threat to endangered fish species. They prey on native species, especially young. They also compete with native fishes for food and cover. Smallmouth bass inhabit streams and rivers with gradients ranging from 1.2 to 7.6 meters (4–25 feet) per

mile (Funk and Pflieger 1975). The gradient through Lodore Canyon averages 4.6 meters (15.3 feet) per mile.

There are several minnows that occur within the reservoir and Green River that can attain an adult size of 2.5 cm (1 inch) in their first year and attain maximum sizes of only 5 to 7.5 cm (2 to 3 inches) throughout the course of their 2- to 3-year life span. They are all capable of spawning numerous times in a single spawning season, and each species has the potential to become extremely abundant given specific conditions and limited predation. The redside shiner prefers cool water and is found in a variety of habitats. Red shiner, fathead minnow, and sand shiner all prefer warmer water and low velocity habitats and are tolerant of high turbidities. They are commonly found in those habitats used by the young of native fish species.

3.3.4.1.1 No Action

The effect of the No Action Alternative would be similar to existing conditions, as the State would remain free to develop their assigned water right using accretion flows. FG Dam would continue to operate consistent with the FGROD.

3.3.4.1.2 Proposed Action

The Proposed Action Alternative would have no effect on the non-listed fish populations occurring in the Green River below the FG dam. The nonnative fishes are well adapted opportunists and the native fishes are even better adapted to typical riverine conditions, including variable flows. Brown trout, although non-native, are an important sport fish in the Green River. The Proposed Action would not significantly alter the flows during spawning events. An estimated 250 cfs reduction of flows could occur during the driest (> 70% exceedance) winter months, but the minimum flow requirements would still be met and the ambient temperatures and timing would be conducive to trout survival. Additionally, trout could potentially benefit from the slightly increased flows during the driest (> 70% exceedance) summer months. Reduced flows during winter could be beneficial for brown trout, especially fry, due to less energy expenditure (Cunjak and Power 1986). The potential for slight deviation from No Action flows would not be significant enough for the Proposed Action to cause any effects to the non-listed fishes.

3.3.4.1.3 Cumulative Effects

After reviewing the current status of the Green River fishery, the environmental baseline for the action area, the effects of the Proposed Action, and the cumulative effects, the Project would not reduce the reproduction, numbers, or distribution of the Green River fishes or reduce their habitat.

The Proposed Action plus reasonably foreseeable actions would not result in any direct or indirect impacts to the fish community. There would be no impact to the fish habitat within the Green River as the riverine habitat is not only capable of persisting with variable flows, but relies on them to maintain a healthy river ecosystem.

3.3.4.2 Terrestrial Species

The Green River provides free water and supports a variety of riparian vegetation used as foraging, breeding, and/or migratory habitat for a variety of terrestrial species. The riparian vegetation also supplies food and cover for insects emerging from the river, as well as its own invertebrate populations and their terrestrial predators. These insect and invertebrate populations, in turn, provide food for numerous terrestrial species. The drier habitat around the riparian and wetland areas adds to the diversity of terrestrial species.

Many species of amphibians and reptiles inhabit the river corridor. Most of these animals use both upland and riparian sites. The river is a source of abundant invertebrate food for these species. Cliff faces above the river provide escape and resting habitat for reptiles. The zone of fluctuating water level is an important foraging area for reptiles and amphibians.

The Green River provides various types of habitats that support numerous species of smaller mammals including; beaver (*Castor Canadensis*), ringtail (*Bassariscus astutus*), northern river otter (*Lutra canadensis*), raccoons (*Procyon lotor*), and muskrats (*Ondatra zibethicus*). Along the river there are adjacent stands of cottonwoods (*Populus* sp.), willows (*Salix* sp.), squawbrush (*Rhus trilobata*), and tamarisk (*Tamarix* sp.) that provides cover for cottontails (*Sylvilagus audubonii*), bobcats (*Felis rufus*), and porcupines (*Erethizon dorsatum*).

Several species of game mammals, including mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis nelsoni*), moose (*Alces alces*), pronghorn (*Antilocapra americana*), and bighorn sheep (*Ovis canadensis*), occur along the Green River corridor above and below FG Dam (BLM, 1990; Schnurr, 1992). All of these species use riparian habitats as foraging and watering areas but are not restricted to riparian areas at any time of the year. Mule deer, elk, and pronghorn range widely throughout this portion of Utah and Colorado but move toward the river in the fall and use the river valley as wintering range. Mule deer occur along the river throughout the year and are the most abundant game mammal in the area.

3.3.4.2.1 No Action

Under the No Action Alternative, there would be no new effects to terrestrial species. FG operations would maintain river flows within the operational parameters that were established in the FGFEIS. Under this alternative, existing conditions would continue.

3.3.4.2.2 Proposed Action

The hydrologic models (Patno 2018) show that flows at the Jensen streamgage and releases from FG would not deviate considerably from the current seasonal releases and flows in the No Action Alternative which were established by the FGFEIS. On the Green River, terrestrial species would be more likely to be affected by higher than average flows or flooding events that could reduce foraging and habitat resources than flows that stay within the main channel of the river. The highest flows in the Green River are in the spring months. Terrestrial species populations would not be expected to change because they would still have access to, or the extent of, the cover, food, water, and habitat resources available to them that currently exist. Terrestrial species using the riparian areas of the river are mobile and would move in response to river flow fluctuations.

The hydrologic model (Patno 2018, Figure 8 (a)) predicted that FG releases would remain within the same range as current levels under the Proposed Action. The Proposed Action does not include a change in operations of FG Dam as outlined in the FGROD; therefore, there would be no new effect to terrestrial species. Under the Proposed Action, flows from April to July may slightly increase during extremely dry years (Patno 2018, Fig. 8.b.). Late summer flows (Patno 2018, Figs. 11-13) could increase by about 300 cfs above 70 percent exceedance and are still very low compared to normal spring flows. At these flows, the difference in 300 cfs at the Jensen streamgage is less than 0.13 meters (5 inches) in height. Therefore, the Proposed Action Alternative should result in no considerable change to high Green River flows and no new effects to terrestrial species. The project would have no adverse effects on terrestrial species.

3.3.4.2.3 Cumulative Effects

On the Green River, effects to terrestrial species could be caused by higher than average flows or flooding events that could reduce available foraging or habitat resources that exists along the banks of the river. The hydrologic model (Patno 2018) shows that the GRB plus reasonably foreseeable depletions would typically result in slightly lower Green River flows than those under the No Action or Proposed Action Alternatives. As with the Proposed Action, April to July flows may slightly increase during extremely dry years (Patno 2018, Fig. 8.b.) and late summer flows (Patno 2018, Figs. 11-13) could increase by about 300-400 cfs during very dry years. However, these flows are still very low compared to spring flows. The difference in flow at the Jensen streamgage is less than five inches in height. Stream flows under the reasonably foreseeable depletion scenario are still within the parameters of the No Action Alternative (FGROD) and would have no new impacts on terrestrial species.

3.3.4.3 Avian Species

The Green River provides important breeding, nesting, migration, and wintering habitat for numerous waterfowl, shorebirds, and water bird species (Aldrich, 1992). Hawks, falcons, and many species of songbirds are also commonly found

using the river. Bald eagles (*Haliaeetus leucocephalus*) winter along the Green River.

Waterfowl species that commonly breed along the Green River corridor include Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), common merganser (*Mergus merganser*), gadwall (*Anus strepera*), green-winged teal (*Anus crecca*), and redhead (*Anthya americana*). In addition to these species, American widgeon (*Anus americana*), common goldeneye (*Bucephala clangula*), and American coot (*Fulica americana*) are common during migration or winter. Waterfowl use large eddies and riparian communities associated with them as nesting and brood habitat. They use ice-free areas of the river during the winter.

The shorebirds and water birds commonly using the Green River and associated wetlands include the pied-billed grebe (*Podilymbus podiceps*), eared grebe (*Podiceps nigricollis*), western grebe (*Aechmophorus occidentalis*), Clark's grebes (*Aechmorphorus clarkia*), double-crested cormorant (*Phalacrocorax auritus*), great blue heron, snowy egret (*Egretta thula*), black-crowned night-heron (*Nycticorax nycticorax*), white-faced ibis (*Plegadis chihi*), American bittern (*Botaurus lentiginosus*), mallard, gadwall, northern pintail (*Anus acuta*), redhead, common merganser, ruddy duck (*Oxyura jamaicensis*), American widgeon, Virginia rail (*Rallus limicola*), black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), Wilson's phalarope (*Phalaropus tricolor*), Forster's tern (*Sterna forsteri*), black tern (*Chlidonias niger*), greater yellowlegs (*Tringa melanoleuca*), lesser yellowlegs (*Tringa flavipes*), willet (*Catoptrophorus semipalmatus*), killdeer, and all three species of teal.

Species occupying the shrublands, grasslands, and riparian habitats near the river include the northern harrier (*Circus cyaneus*), burrowing owl (*Athene cunicularia*), ring-necked pheasant (*Phasianus colchicus*), Say's phoebe (*Sayornis saya*), western kingbird *(Tyrannus verticalis*) eastern kingbirds (*Tyrannus tyrannus*), horned lark (*Eremophila alpestris*), loggerhead shrike (*Lanius ludovicianus*), sage thrasher (*Oreoscoptes montanus*) (uncommon), vesper sparrow (*Pooecetes gramineus*), lark sparrow (*Chondestes grammacus*), and sage sparrow *(Amphispiza belli*), lazuli bunting (*Passerina amoena*), mourning dove (*Zenaida macroura*), yellow-billed cuckoo (*Coccyzus americanus*), Lewis's woodpecker (*Melanerpes lewis*), downy woodpecker (*Picoides pubescens*), hairy woodpecker (*Picoides villosus*), northern flicker (*Colaptes auratus*), black-capped chickadee (*Poecile atricapillus*), house wren (*Troglodytes aedon*), warbling vireo (*Vireo gilvus*), yellow warbler (*Dendroica petechia*), yellow-breasted chat (*Iicteria virens*), spotted towhee (*Pipilo maculatus*), northern oriole (*Icterus galbula*), marsh wren (*Cistothorus palustris*), and the yellow-headed blackbird (*Xanthocephalus xanthocephalis*).

Canada geese are particularly susceptible to changes in flow on the Green River (Holden, 1992; Aldrich, 1992). Islands and sandbars with low vegetation (e.g., grasses and forbs) are important nesting habitat for this species, and Browns Park

is the most important nesting area for Canada geese in the area (Schnurr, 1992). Most nesting occurs from March 15 to May 15. Great blue heron (*Ardea herodias*), spotted sandpiper (*Actitis macularia*), and killdeer (*Charadrius vociferous*) forage along shoreline and riparian habitats during the breeding season (Bogan et al., 1983). The great blue heron uses large trees (e.g., cottonwood) as nesting and roosting sites along the river. Killdeer and spotted sandpiper nest on the ground above the water line.

3.3.4.3.1 No Action

Under the No Action Alternative, there would be no new effects to avian species. FG operations would maintain river flows within the operational parameters that were established in the FGFEIS. Under this alternative, existing conditions would continue.

3.3.4.3.2 Proposed Action

The hydrologic models (Patno 2018) show that flows at the Jensen streamgage and releases from FG would not deviate considerably from the current seasonal releases and flows in the No Action Alternative which were established by the FGFEIS. On the Green River, terrestrial species would be more likely to be affected by higher than average flows or flooding events that could loss of foraging and habitat resources than flows that stay within the main channel of the river. The highest flows in the Green River are in the spring months. Terrestrial species populations would not be expected to change because they would still have access to, or the extent of, the cover, food, water, and habitat resources available to them that currently exist. Avian species populations would not be expected to change because they would still have access to, or the extent of, the foraging, breeding, nesting, and other habitat resources available to them currently.

The hydrologic model (Patno 2018, Figure 8 (a)) predicted that FG releases would remain within the same range as current levels under the Proposed Action. The Proposed Action does not include a change in operations of FG Dam as outlined in the FGROD; therefore, there would be no new effect to avian species. Under the Proposed Action, flows from April to July may slightly increase during extremely dry years (Patno 2018, Fig. 8.b.). Late summer flows (Patno 2018, Figs. 11-13) could increase by about 300 cfs above 70 percent exceedance and are still very low compared to normal spring flows. At these flows, the difference in 300 cfs at the Jensen streamgage is less than 0.13 meters (5 inches) in height. Therefore, the Proposed Action Alternative should result in no considerable change to high Green River flows and no new effects to avian species. The project would have no adverse effects on avian species.

3.3.4.3.3 Cumulative Effects

On the Green River, effects to avian species could be caused by higher than average flows or flooding events that could impact nesting opportunities and potentially reduce available foraging or habitat resources that exists along the banks of the river. The hydrologic model (Patno 2018) shows that the GRB plus reasonably foreseeable depletions would typically result in slightly lower Green River flows than those under the No Action or Proposed Action Alternatives. As with the Proposed Action, April to July flows may slightly increase during extremely dry years (Patno 2018, Fig. 8.b.) and late summer flows (Patno 2018, Figs. 11-13) could increase by about 300-400 cfs during very dry years. However, these flows are still very low compared to spring flows. The difference in flow at the Jensen streamgage is less than 0.13 meters (5 inches) in height. Stream flows under the reasonably foreseeable depletion scenario are still within the parameters of the No Action Alternative (FGROD) and would have no new impacts on avian species.

3.3.5 Threatened and Endangered Species

The USFWS IPaC report listed three mammals, five birds, five fish, and eight plants as protected or proposed to be protected under the ESA (see Table 3-2).

Table 3-2
Species List from USFWS IPaC Report

Species	Scientific Name	Listing Status	Designated Critical Habitat in Action Area	Occurrence in Action Area
Black-footed Ferret	*Mustela nigripes*	Experimental Population, Non-Essential	None Designated	Does not occur in the Project area.
Canada Lynx	*Lynx canadensis*	Threatened	None within Action Area	Does not occur in the Project area.
North American Wolverine	*Gulo gulo luscus*	Proposed Threatened	None Designated	Does not occur in the Project area.
California Condor	*Gymnogyps californianus*	Endangered	None within Action Area	Does not occur in the Project area.
California Condor	*Gymnogyps californianus*	Experimental Population, Non-Essential	None Designated	Does not occur in the Project area.
Gunnison Sage-grouse	*Centrocercus minimus*	Threatened	None within the Action Area	Does not occur in the Project area.
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened	Action Area Overlaps Designated Critical Habitat	May occur in the Project area.
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered	None within the Action Area	May occur in the Project area.
Yellow-billed Cuckoo	*Coccyzus americanus*	Threatened	Action Area Overlaps Proposed Critical Habitat	Occurs in the Project area.
Greenback Cutthroat Trout	*Oncorhynchus clarki stomias*	Threatened	None Designated	Does not occur in the Project area.
Bonytail	*Gila elegans*	Endangered	Action Area Overlaps Designated Critical Habitat	Occurs in the Project area.
Colorado Pikeminnow	*Ptychocheilus lucius*	Endangered	Action Area Overlaps Designated Critical Habitat	Occurs in the Project area.
Humpback Chub	*Gila cypha*	Endangered	Action Area Overlaps Designated Critical Habitat	Occurs in the Project area.
Razorback Sucker	*Xyrauchen texanus*	Endangered	Action Area Overlaps Designated Critical Habitat	Occurs in the Project area.
Barneby Reed-mustard	*Schoenocrambe barnebyi*	Endangered	None Designated	Does not occur in the Project area.
Clay Reed-mustard	*Schoenocrambe argillacea*	Threatened	None Designated	Does not occur in the Project area.
Jones Cycladenia	*Cycladenia humilis var. jonesii*	Threatened	None Designated	Does not occur in the Project area.
Navajo Sedge	*Carex specuicola*	Threatened	None within Action Area	Does not occur in the Project area.
Pariette Cactus	*Sclerocactus brevispinus*	Threatened	None Designated	Does not occur in the Project area.
Shrubby Reed-mustard	*Schoenocrambe suffrutescens*	Endangered	None Designated	Does not occur in the Project area.
Uinta Basin Hookless Cactus	*Sclerocactus wetlandicus*	Threatened	None Designated	Does not occur in the Project area.
Ute Ladies'-tresses	*Sprianthes diluvialis*	Threatened	None Designated	May occur in the Project area.

3.3.5.1 Mammals

Three mammals were listed in the IPaC Report: black-footed ferret, Canada lynx, and North American wolverine. Reclamation determined the Proposed Action would have no effect on these three species, as described in the following sections.

Black-footed Ferret

The black-footed ferret is a medium-sized member of the Mustelidae family typically weighing 0.6 to 1.1 kg (1.4 to 2.5 lb) and measuring 48 to 61 cm (19 to 24 inches) in total length. Black-footed ferrets prey primarily on prairie dogs and use their burrows for shelter and denning (Henderson et al. 1969, Hillman and Linder 1973, Forrest et al. 1985, Biggins 2006). Though the black-footed ferret may occur in upland areas near the action area, its habitat does not occur in the action area. Therefore, the Proposed Action would have no effect on the black-footed ferret.

Canada Lynx

The Canada lynx is a medium-sized cat with long legs, large, well-furred paws, long tufts on the ears, and a short, black-tipped tail. Lynx habitat can generally be described as moist boreal forests that have cold, snowy winters and a high-density snowshoe hare prey base. The predominant vegetation of boreal forest is conifer trees, primarily species of spruce (*Picea* spp.) and fir (*Abies* spp.). This habitat does not occur in the action area. Therefore, the Proposed Action would have no effect on the Canada lynx.

North American Wolverine

The North American wolverine is the largest terrestrial member of the family Mustelidae, with adult males weighing 12 to 18 kg (26 to 40 lb) and adult females weighing 8 to 12 kg (17 to 26 lb) (Banci 1994). Wolverines do not appear to specialize on specific vegetation or geological habitat aspects, but instead select areas that are cold and receive enough winter precipitation to reliably maintain deep persistent snow late into the warm season (Copeland et al. 2010). The requirement of cold, snowy conditions means that, in the southern portion of the species range where ambient temperatures are warmest, wolverine distribution is restricted to high elevations. This habitat does not occur in the action area. Therefore, the Proposed Action would have no effect on the North American wolverine.

3.3.5.2 Birds

Five species of birds were included in the IPaC Report: California condor, Gunnison sage-grouse, Mexican spotted owl, southwestern willow flycatcher, and yellow-billed cuckoo. A no effect determination was made for each of these species based on either a lack of suitable habitat or no measurable change to vegetation along the Green River.

California Condor

The California condor is the largest bird in North America. They are huge and unmistakable. Nest sites are located in cavities in cliffs, in large rock outcrops, or in large trees. Foraging occurs mostly in grasslands, including potreros within chaparral areas, or in oak savannahs. The California condor is classified as experimental, non-essential population in Utah. In 2014, a nesting pair of California condors hatched a chick in Zion National Park in southwestern Utah.

The Green River does not support the type of habitat necessary for California condors. Therefore, the Proposed Action would have no effect on the California condor.

Gunnison Sage-grouse

The Gunnison sage-grouse is an upland game bird in the Galliformes family. Its current range includes southwestern Colorado and a small portion of southeast Utah. The Gunnison sage-grouse is a sagebrush (*Artemisia* spp.) obligate, requiring access to large tracts of sagebrush year-round. This habitat does not occur in the action area. Therefore, the Proposed Action would have no effect on the Gunnison sage-grouse.

Mexican Spotted Owl

Spotted owls are residents of old-growth or mature forests that possess complex structural components (uneven aged stands, high canopy closure, multi-storied levels, high tree density). Canyons with riparian or conifer communities are also important components. The Green River does not support old-growth forests. The Green River does wind through canyons, especially in Reach 3, which could provide nesting or roosting habitat. However, riparian communities are uncommon in stretches with steep canyon walls. Further, the riparian communities are unlikely to be affected by the Proposed Action (see Section 3.3.3 of this EA). Therefore, the Proposed Action would have no effect on the Mexican spotted owl or its designated critical habitat.

Southwestern Willow Flycatcher

The Southwestern willow flycatcher is a small passerine, usually less than 6 inches in length, including the tail. For nesting, it requires dense riparian habitats that may include cottonwood/willow and tamarisk vegetation with microclimatic conditions dictated by the local surroundings. Saturated soils, standing water, or nearby streams, pools, or ciénegas are a component of nesting habitat that also influences the microclimate and density vegetation component. Habitat not suitable for nesting may be used for migration and foraging. Riparian habitats along the Green River would not be expected to dramatically change under the Proposed Action. Therefore, the Proposed Action would have no effect on the Southwestern willow flycatcher.

Yellow-billed Cuckoo

Yellow-billed cuckoos use wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes. In the Midwest, cuckoos can be found in shrublands of mixed willow and dogwood, and in dense stands of small trees such as American elm. In the central and eastern U.S., the yellow-billed cuckoo nests in oaks, beech, hawthorn, and ash. In the West, nests are often placed in willows along streams and rivers, with nearby cottonwoods serving as foraging sites. Yellow-billed cuckoo are known to use habitat along the Green River, and the proposed critical habitat overlaps the action

area. However, because there would be no measurable change to vegetation along the Green River, the Proposed Action would have no effect on the yellow-billed cuckoo.

3.3.5.3 Fish

Five fishes were listed on the IPaC Report (Colorado pikeminnow, humpback chub, razorback sucker, bonytail, greenback cutthroat trout [*Oncorhynchus clarki stomias*]). However, the only known greenback cutthroat trout population found in Utah occurs in a 1.2 mile stretch of Beaver Creek, east of the La Sal mountains. Because all known populations occur outside the Action Area, they have been removed from consideration for the Project. A "no effect" determination was made for the other four federally-listed fish species.

The four listed fish species are adapted to a hydrologic cycle characterized by large spring peaks of snowmelt runoff and low, relatively stable base flows (U.S. Fish and Wildlife Service 2002b). High spring flows maintain channel and habitat diversity, flush sediments from spawning areas, rejuvenate food production, form gravel and cobble deposits used for spawning, and rejuvenate backwater nursery habitats (U.S. Fish and Wildlife Service 2002b).

Colorado Pikeminnow

This large, predatory fish is widely distributed throughout the Upper Colorado River Basin. Recent estimates of abundance suggest the population in the Green River subbasin has been in decline for the past decade (Bestgen et al. 2018). However, results should be interpreted with caution based on the high amount of uncertainty with the limited sample size. Adult habitat requirements include deep, low velocity runs, pools, eddies, and seasonally flooded lowland habitats maintained by high spring flows. Pikeminnow display fidelity to natal spawning areas, of which there are few in the Green River subbasin; one is located on the lower Yampa River, and one is located on the Green River in Gray Canyon. Pikeminnow migrate to those spawning areas during the spring, coinciding with the descending limb of the hydrograph as river temperatures warm in excess of 62 ºF (18 ºC). Spawning occurs after spring runoff at water temperatures typically between 64 and 73 ºF (18 and 23 ºC); however, there are accounts of spawning at cooler temperatures [61 ºF (16 ºC)] (Bestgen et al. 1998).

The largest, most productive and most robust population of Colorado pikeminnow occurs in the mainstem Green River (combining the lower Green River, Desolation/Gray Canyon, and middle Green River populations). Colorado pikeminnow spawn in two principal sites: Gray Canyon in the lower Green River, and the lower Yampa River (U.S. Fish and Wildlife Service 2002b). Bestgen et al. (2018) recognized that the mechanism driving frequency and strength of recruitment events was likely the strength of age-0 Colorado pikeminnow production in backwater nursery habitats. Researchers are particularly concerned with what appears to be very weak age-0 representation in the Middle Green reach (1994 through 2008) and in the lower Colorado River (2001 through 2008).

Bestgen and Hill (2016) reviewed fall densities of age-0 Colorado pikeminnow collected in the middle and lower Green River that date back to 1979. They compared those densities to August and September base flows and discovered that declines in summer base flow magnitude were correlated with declining densities of age-0 Colorado pikeminnow in both reaches.

Throughout most of the year, juvenile, subadult, and adult Colorado pikeminnow use relatively deep, low-velocity eddies, pools, and runs that occur in near-shore areas of main river channels (multiple references in U.S. Fish and Wildlife Service 2002b). In spring, however, adults use floodplain habitats, flooded tributary mouths, flooded side canyons, and eddies that are available only during high flows (multiple references in U.S. Fish and Wildlife Service 2002b). Newly hatched larval fish drift downstream to backwaters in sandy, alluvial regions, where they remain through most of their first year of life (multiple references in U.S. Fish and Wildlife Service 2002b). Because of their mobility and environmental tolerances, adult Colorado pikeminnow are more widely distributed than other life stages.

Humpback Chub

The humpback chub was first included in the List of Endangered Species issued by the Office of Endangered Species on March 11, 1967 and received protection as endangered under the Endangered Species Act of 1973. Critical habitat was designated on March 21, 1994, and included stretches of the Yampa, Colorado, and Green Rivers in the Upper Colorado River Basin. The canyon-bound reaches of the Green River between its confluence with the Yampa and Colorado Rivers (Reaches 2 and 3) were designated. Threats to the species include streamflow regulation, habitat modification, predation by nonnative fish species, parasitism, hybridization with other native chubs, and pesticides and pollutants (U.S. Fish and Wildlife Service 2002c). This species is highly adapted to life in canyon environments. Adult habitat includes deep pools and shoreline eddies in the warmer portions of the main channel.

Specific physical spawning requirements are less understood for this species than other native Colorado River fishes. Humpback chub do not display spawning migrations and appear to complete their life cycle within the confines of relatively short stretches of canyon bound river. Drift of humpback chub larvae is less extensive than for Colorado pikeminnow. Spawning coincides with the spring runoff and typically occurs very soon after the peak when main channel temperatures warm in excess of 17 °C (62 ºF) (Chart and Lentsch 1999; Tyus and Karp, 1989; Valdez and Clemmer, 1982). The majority of spawning occurs when temperatures range from 16 to 22 ºC (61 to 72 ºF) (U.S. Fish and Wildlife Service 2002c). Unlike larvae of other Colorado River fishes (e.g., Colorado pikeminnow and razorback sucker), larval humpback chub show no evidence of long-distance drift (Robinson et al. 1998). Young occupy warm, low velocity shoreline habitats

but appear less specific in their nursery habitat selection than pikeminnow (Chart and Lentsch 1999).

Unlike Colorado pikeminnow and razorback sucker, humpback chub show high site fidelity for canyon-bound reaches of mainstem rivers. Past captures of adults were associated with large boulders and steep cliffs. Reproductive habitat is not defined because although humpback chub are believed to broadcast eggs over mid-channel cobble and gravel bars, spawning in the wild has not been observed for this species. It is believed that upon emergence from spawning gravels, humpback chub larvae remain in the vicinity of bottom surfaces near spawning areas. As larval fish mature, backwaters, eddies, and runs were reported as common capture locations for YOY humpback chub.

In the upper basin, the four extant populations vary widely in the length of occupied habitat and densities of Humpback Chub, ranging from approximately 25 to 400 fish per stream mile. Both the Black Rocks and Westwater Canyon populations declined in the early 2000s, but have apparently stabilized over the past decade. The other two extant upper basin populations, Desolation and Gray canyons and Cataract Canyon, persist but the lack of available monitoring data are not sufficient to make claims of changes over time (U.S. Fish and Wildlife Service 2018a). Uncertainty remains surrounding current population trajectories of Humpback Chub, densities of nonnative predators in the upper basin, and risk associated with future conditions throughout the basin (U.S. Fish and Wildlife Service 2017). However, the humpback chub is not in danger of extinction throughout all of its range but is likely to become so in the foreseeable future and justifies the downlisting to threatened status (U.S. Fish and Wildlife Service 2018a).

Razorback Sucker

The razorback sucker was federally listed as endangered on October 23, 1991, with critical habitat designated March 21, 1994. The entire Green River from its confluence with the Yampa River downstream to its confluence with the Colorado River (Reaches 2 and 3) was included in this designation. There is no critical habitat in Reach 1. Threats to the species include streamflow regulation, habitat modification, predation by nonnative fish species, and pesticides and pollutants (U.S. Fish and Wildlife Service 2002d). It is found in warm water reaches of the Green River and the lower portions of its major tributaries. It occurs primarily in the low gradient reaches between the confluences of the Yampa and Duchesne Rivers in Reach 2. Adult habitat includes runs, pools, eddies, and seasonally flooded lowlands. Spawning occurs in April through June, as the river rises to its spring peak (McAda and Wydoski 1980, Tyus 1987, Modde and Wick 1997, Muth et al. 1998). In recent years, spawning has occurred when average daily flows ranged between 2,754 and 22,000 cfs and temperatures ranged between 8 C (46 °F) and 19 °C (67 ºF). Razorback suckers spawn over coarse cobbles, and their eggs hatch in 6.5-12.5 days, dependent on water temperatures. Larval razorbacks are then transported downstream into off-channel nursery

environments (tributary mouths, backwaters, and inundated flood plains) where quiet, warm water is found (Mueller 1995, Paulin et al. 1989).

Declines in the abundance and distribution of razorback suckers in the Upper Colorado River Basin have been noted for decades (Wiltzius 1978). Although there continues to be evidence of successful reproduction, the Green River population of wild razorback suckers continues to decline due to lack of sufficient recruitment (Bestgen et al. 2002). One recent success regarding the rearing of razorback sucker in the wild includes the LTSP, which began in 2012. Flows from FG are timed with the occurrence of razorback sucker larvae in the Green River, typically between late May and late June, depending on water temperatures. Flows are increased to allow larvae to be entrained in Stewart Lake, a floodplain wetland near Jensen, Utah. Once larvae are entrained to the maximum extent possible, gates to Stewart Lake are closed to maintain water levels. Most of the large predatory fishes are excluded from entering the lake because of a fish screen. YOY are released back into the Green River in September or October, depending on the water year. In October 2016, approximately 2000 YOY razorback sucker, including 800 fish that received passive integrated transponder (PIT) tags, were released back into the Green River (Utah Division of Wildlife Resources 2016; UDWR). A total of 81 YOY Colorado pikeminnow were also released from Stewart Lake in 2016. The USFWS's 5-year status review of razorback sucker completed in 2012 reported that 85% of the downlisting recovery factor criteria) have been addressed to varying degrees and the USFWS proposes to downlist the species to threatened status (U.S. Fish and Wildlife Service 2002c, 2012, 2018b).

Similar to Colorado pikeminnow, razorback sucker use a variety of habitats throughout their life cycle. Outside of the spawning season, adult razorback suckers occupy a variety of shoreline and main channel habitats including slow runs, shallow to deep pools, backwaters, eddies, and other relatively slow velocity areas associated with sand substrates (U.S. Fish and Wildlife Service 2002d). In spring and winter adult razorback sucker require deeper, low-velocity habitat, but are known to occupy shallow sandbars in summer (McAda and Wydoski 1980 in Zelasko et al. 2009). Off-channel habitats are much warmer than the mainstem river and razorback suckers presumably move to these areas for spawning and other activities, such as, feeding, resting, or sexual maturation. Spawning occurs in a variety of environments, but likely, near-shore environments containing coarse gravel and sand substrates free of silt are preferred (Tyus 1998).

Off channel and floodplain habitat is also important to young razorback sucker. After hatching, razorback sucker larvae drift downstream to low-velocity floodplain or backwater nursery habitat. The absence of seasonally flooded riverine habitats is believed to be a limiting factor in the successful recruitment of razorback suckers in their native environment. Starvation of larval razorback suckers due to low zooplankton densities in the main channel and loss of

floodplain habitats which provide adequate zooplankton densities for larvae food is one of the most important factors limiting recruitment.

Bonytail

The bonytail was listed as endangered under a final rule published on April 23, 1980. Critical habitat was designated on March 21, 1994, and includes Reaches 2 and 3 of the Green River. Threats to the species include streamflow regulation, habitat modification, predation by nonnative fish species, hybridization, and pesticides and pollutants (U.S. Fish and Wildlife Service 2002a).

Life history requirements of the bonytail are poorly understood; it is considered adapted to main stem rivers where it has been observed in pools and eddies. As do other closely related fish species, bonytail probably spawn in the spring in rivers over rocky substrates. It has also been hypothesized that flooded bottomlands may provide important areas for growth and conditioning, particularly for the early life stages (U.S. Fish and Wildlife Service 2002a).

Bonytail are now rarely found in the Green and Upper Colorado River sub-basins and are the rarest of all the endangered fish species in the Colorado River Basin. In fact, no wild, self-sustaining populations are known to exist upstream of Lake Powell. Natural reproduction of bonytail was last documented in the Green River in 1959, 1960, and 1961 (U.S. Fish and Wildlife Service 2002a). However, the middle Green River is currently part of the stocking program area (along with the Yampa River in Dinosaur National Monument). The first reproduction by stocked bonytail was confirmed in floodplain habitats in the Green River in 2015 and again in 2016 (Bestgen et al. 2017).

While bonytail are closely related to humpback chub, their habitat usage may be slightly different. Bonytail are observed in pools and eddies in mainstem rivers, but recent information collected by the Recovery Program suggests that floodplain habitats may be more important to the survival and recovery of the bonytail than originally thought. Recent hypotheses surmise that flooded bottomlands may provide important bonytail nursery habitat. Since the species can spawn in both lotic and lentic environments, researchers hypothesize that off-channel or oxbow habitats may be important for survival, spawning, and recruitment (Mueller 2006). During 2015-16, a total of 28 and 5 YOY bonytails were collected from Stewart Lake and Johnson Bottom, respectively (Bestgen et al. 2017). Both areas are managed floodplain wetlands occurring within Reach 2 of the Green River.

3.3.5.3.1 No Action

The effect of the No Action Alternative would be similar to existing conditions, as the State would remain free to develop their assigned water right using accretion flows. FG Dam would continue to operate consistent with the FGROD.

If the State's actions were to cause adverse effects on the endangered fishes, mitigation would be required through the State's participation in the Recovery Program.

3.3.5.3.2 Proposed Action

The Proposed Action would have no effect on Colorado pikeminnow, razorback sucker, bonytail, or humpback chub or their critical habitat. During the winter months in the driest years, the Proposed Action would slightly reduce (approximately 250 cfs) the amount of water available to the four listed fishes but still maintain the minimum of 800 cfs. Operation of FG Reservoir would continue consistent with the FGROD and flow and temperature recommendations (Muth et al. 2000). The reduced flows would not significantly affect (directly nor indirectly) important factors such as water quality, predation, and spawning and rearing habitats. The modification of flow regimes, water temperatures, sediment levels, and other habitat conditions caused by water depletions has previously contributed to the establishment of nonnative fishes. However, the flows expected from the Proposed Action would not impact the endangered fishes through interspecific or exploitative competition as a result.

Although reducing flows throughout the Green River would typically result in numerous undesirable effects, in this case the effects of the Proposed Action on listed fish species would be negligible, for the majority of time based on model predictions. Any increased flows proposed during August – September would result in a positive effect on the endangered fishes as greater flows and river fluctuations are conditions these riverine fishes are well adapted to. Management of FG Dam would remain consistent with the FGROD. Spring releases would still be planned to assist in the recovery effort. Floodplain habitats such as Stewart Lake would remain fully functional, and Reclamation would continue to support recovery efforts by managing the flows from FG Dam.

The additional summer flows potentially created under the Proposed Action could provide benefit to the endangered fishes. Bestgen and Hill (2016) compared Colorado pikeminnow densities to August and September base flows and discovered that declines in summer base flow magnitude were correlated with declining densities of age-0 pikeminnow. Reduced survival of Colorado pikeminnow in 2011-2013 may have occurred as a result of high flows during a wet year and low flows during the following dry years (Bestgen et al. 2018). The other endangered fishes share similar rearing requirements and the potentially increased flows during August – September could benefit YOY by helping replenish and maintain backwaters. These additional flows would occur in lower water years and could benefit these habitats that may lack sufficient water under the No Action Alternative.

3.3.5.3.3 Cumulative Effects

After reviewing the current status of the Green River fishery, the environmental baseline for the action area, the effects of the Proposed Action, and the cumulative effects, the Project would not reduce the reproduction, numbers, or distribution of the endangered fishes or reduce their habitat. Future federal actions that are unrelated to the Proposed Action are not considered in this section because they require consultation pursuant to section 7 of the ESA.

The Full Depletion Scenario maintains approximately 250 cfs lower flows for Flaming Gorge 80 percent of the time during the time of greatest potential impact (October – December). This additional reduction of flows would be negligible due to the minimum required flows and cold-water biology of the endangered fishes. The Proposed Action plus reasonably foreseeable actions would not result in any direct or indirect impacts to the fish community. There would be no impact to the endangered fish habitat within the Green River.

3.3.5.4 Plants

Eight threatened or endangered plants were included in the IPaC report: Barneby reed-mustard, clay reed-mustard, Jones cycladenia, Navajo sedge, Pariette cactus, shrubby reed-mustard, Uinta Basin hookless cactus, and Ute ladies'-tresses.

Barneby Reed-mustard

The Barneby reed-mustard is a small sparsely leaved, herbaceous plant with light purple flowers and darker purple veins on each of the petals. These plants are usually up to 23 cm (9 inches) tall, with exceptional plants reaching 38 cm (15 inches) in height. The stems are woody and have smaller green, half-inch long leaves alternating up the stem about half way from the base of the plant. Populations of Barneby reed-mustard occur in Emery and Wayne counties, Utah. Populations have been known to occur on the Moenkopi Formation, Kaibab Limestone and on the Carmel Formation. This species is found growing on coarse soils derived from cobble and gravel river terrace deposits, or rocky surfaces at 1460 to 1980 meters (4,800 to 6,500 feet) in elevation. Barneby reed-mustard can be found growing with other desert shrubland plants including shadscale (*Atriplex confertifolia*), Indian ricegrass (*Oryzopsis hymenoides*) and pygmy sagebrush (*Artemisia pygmaea*). This habitat does not occur within the action area. Therefore, the Proposed Action would have no effect on the Barneby reed-mustard.

Clay Reed-mustard

The clay reed-mustard is a perennial herbaceous plant, with sparsely leafed stems 15 to 30 cm (6 to 12 inches) tall arising from a woody root crown. The leaves are very narrow with a smooth margin, 10 to 35 mm (0.4 to 1.4 inches) long and, usually, less than 2 mm (0.1 inch) wide. The clay reed-mustard grows on clay soils rich in gypsum, overlain with sandstone talus, that are derived from a mixture of shales and sandstones from the zone of contact between the Uinta and Green River geologic formations. The species most commonly occurs on steep

north-facing slopes. This habitat does not occur in the action area. Therefore, the Proposed Action would have no effect on the clay reed-mustard.

Jones Cycladenia

Jones cycladenia is a long-lived herbaceous perennial in the Dogbane family (Apocynaceae). The caulescent herb is 4 to 6 inches tall, and both glabrous and glaucous. It occurs between 1,340 to 1,830 meters (4,390 to 6,000 feet) elevation in plant communities of mixed desertscrub, juniper (*Juniperus* spp.), or wild buckwheat-Mormon tea (*Ephedra viridis*). It is found on gypsiferous, saline soils of Cutler, Summerville, and Chinle Formations. At the time of listing under the ESA, Jones cycladenia was found in Emery, Grand, and Garfield Counties in Utah and known historically from a fourth indeterminate site named Pipe Spring, in the vicinity of Mohave County, Arizona, and Kane County, Utah. This habitat does not occur within the action area. Therefore, the Proposed Action would have no effect on the Jones cycladenia.

Navajo Sedge

The Navajo sedge is a slender, perennial forb that is between 25 to 46 cm (10 and 18 inches) tall. The stem is triangular, and the leaves are pale green. Leaves are between 13 to 20 cm (5 and 8 inches) long, and are clustered near the plant's base. Occurs in hanging gardens within the Great Basin Conifer Woodland. The seep-spring pockets along the Navajo Sandstone Formation bedrock provide this habitat. Hanging gardens can occur from nearly inaccessible sheer cliff daces to accessible alcoves. Precipitation in the areas that the sedge has been found is approximately 19 cm (7.6 inches) a year. Other vegetation found by the sedge are monkey flowers (*Mimulus eastwoodiae*), hellebornie (*Epipactis gigantae*), sand bluestem (*Andropogon hallii*), thistles (*Cirsium* spp.), foxtail barley (*Hordeum jubatum*), and the common reed (*Phragmites communis*). There are currently only two known populations of the sedge. One in the Inscription House Ruin area, and the second in the Toenleshushe Canyon. Neither overlaps the action area. Therefore, the Proposed Action would have no effect on the Navajo sedge.

Pariette Cactus

The Pariette cactus is a barrel-shaped cactus that ranges from 2.5 to 8 cm (1.0 to 3.1 inches) tall. The Pariette cactus is a morphologically unique *Sclerocactus*, with flowering adults that are much smaller than either *S. glaucus* or *S. wetlandicus*. It grows on fine soils in clay badlands derived from the Uinta formation. Habitat of the Pariette cactus is sparsely vegetated desert shrubland dominated by *Atriplex*, *Chrysothamnus*, and *Tetradymia* species. This habitat does not occur within the action area. Therefore, the Proposed Action would have no effect on the Pariette cactus.

Shrubby Reed-mustard

The shrubby reed-mustard is a perennial herb in the mustard family (Brassicaceae). The clumped stems are 10 to 30 cm (4 to 12 inches) tall arising from a branching woody root crown. Shrubby reed-mustard occurs along semi-

barren, white-shale layers of the Evacuation Creek member of the Green River Formation in the Uinta Basin of eastern Utah. The habitat of this plant is disjunct knolls and benches resembling small extremely dry desert islands surrounded by mixed desert shrub and pinyon-juniper woodland. This habitat does not occur within the action area. Therefore, the Proposed Action would have no effect on the shrubby reed-mustard.

Uinta Basin Hookless Cactus

Uinta Basin hookless cactus is a barrel-shaped cactus that ranges from 4 to 18 cm (1.5 to 7 inches) tall, with exceptional plants up to 30 cm (12 inches) tall. Uinta Basin hookless cactus is generally found on coarse soils derived from cobble and gravel river and stream terrace deposits, or rocky surfaces on mesa slopes at 1,350 to 1,900 meters (4,400 to 6,200 feet) in elevation. Associated desert shrubland vegetation includes shadscale, James' galleta (*Hilaria jamesii*), black sagebrush (*Artemisia nova*), and indian ricegrass. This habitat does not occur in the action area. Therefore, the Proposed Action would have no effect on the Uinta Basin hookless cactus.

Ute Ladies'-tresses

Ute ladies'-tresses is a perennial herb with erect, glandular-pubescent stems 13 to 61 cm (5 to 24 inches) tall arising from tuberous-thickened roots. The inflorescence is a sparsely pubescent 3 to 15 cm (1 to 6 inches) long spike of numerous small white or ivory-colored flowers arranged in a gradual spiral. The species occurs in Colorado, Idaho, Montana, Nebraska, Nevada, Utah, Washington, and Wyoming. When Ute ladies'-tresses was listed in 1992 it was known primarily from moist meadows associated with perennial stream terraces, floodplains, and oxbows at elevations between 1310 to 2090 meters (4300 to 6850 feet). Surveys since 1992 have expanded the number of vegetation and hydrology types occupied by Ute ladies'-tresses to include seasonally flooded river terraces, sub-irrigated or spring-fed abandoned stream channels and valleys, and lakeshores. They have also been discovered along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside barrow pits, reservoirs, and other human-modified wetlands. One population was documented in Dinosaur National Monument in the early 1990s. It is unknown whether this population has persisted. As discussed in section 3.3.3 and 3.3.11, it is unlikely that there would be a change in flooding/inundation patterns under the Proposed Action Alternative. Wetlands and riparian areas would not be affected by the Proposed Action (section 3.3.3), which reduces the likelihood there would be an effect to Ute ladies'-tresses. Additionally, late summer flows when Ute ladies'-tresses bloom would only be minimally affected (< 300 cfs) in dry years, and no effect in average to wet hydrologic years. Therefore, the Proposed Action would have no effect on Ute ladies'-tresses.

Species	Scientific Name	Listing Status	Effect Determination
Black-footed Ferret	*Mustela nigripes*	Experimental Population, Non-Essential	No Effect

Species	Scientific Name	Listing Status	Effect Determination
Canada Lynx	*Lynx canadensis*	Threatened	No Effect
North American Wolverine	*Gulo gulo luscus*	Proposed Threatened	No Effect
California Condor	*Gymnogyps californianus*	Endangered	No Effect
California Condor	*Gymnogyps californianus*	Experimental Population, Non-Essential	No Effect
Gunnison Sage-grouse	*Centrocercus minimus*	Threatened	No Effect
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened	No Effect
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered	No Effect
Yellow-billed Cuckoo	*Coccyzus americanus*	Threatened	No Effect
Greenback Cutthroat Trout	*Oncorhynchus clarki stomias*	Threatened	No Effect
Bonytail	*Gila elegans*	Endangered	No Effect
Colorado Pikeminnow	*Ptychocheilus lucius*	Endangered	No Effect
Humpback Chub	*Gila cypha*	Endangered	No Effect
Razorback Sucker	*Xyrauchen texanus*	Endangered	No Effect
Barneby Reed-mustard	*Schoenocrambe barnebyi*	Endangered	No Effect
Clay Reed-mustard	*Schoenocrambe argillacea*	Threatened	No Effect
Jones Cycladenia	*Cycladenia humilis var. jonesii*	Threatened	No Effect
Navajo Sedge	*Carex specuicola*	Threatened	No Effect
Pariette Cactus	*Sclerocactus brevispinus*	Threatened	No Effect
Shrubby Reed-mustard	*Schoenocrambe suffrutescens*	Endangered	No Effect
Uinta Basin Hookless Cactus	*Sclerocactus wetlandicus*	Threatened	No Effect
Ute Ladies'-tresses	*Sprianthes diluvialis*	Threatened	No Effect

3.3.6 Sensitive Species

3.3.6.1 Fish

The flannelmouth sucker, bluehead sucker, roundtail chub, mountain sucker, and Colorado River cutthroat trout are not protected under the ESA. However, they are species of concern in Colorado and Utah and therefore are covered in this section of the EA.

Flannelmouth sucker

Flannelmouth suckers are widespread in warm water reaches of larger river channels. Adults typically occupy pools and deeper runs, eddies, and shorelines

and spawn in the spring prior to peak flows. Young flannelmouth suckers occupy low velocity shorelines or other seasonally flooded low velocity habitats.

Bluehead sucker

Bluehead suckers are also widespread. They occur in a wider range of water temperatures, including cooler habitats than those occupied by flannelmouth sucker. The bluehead sucker is more of a fast water fish, occupying riffles or shallow runs over rocky substrates. It spawns in the spring at slightly warmer temperatures than flannelmouth suckers. Young bluehead suckers also occupy low velocity shorelines or seasonally flooded areas.

Roundtail chub

Roundtail chubs are less abundant in the Green River main stem than the native suckers but are more abundant in the smaller tributaries and in the upper reaches of the Green, White, and Colorado Rivers. Roundtail chubs are also commonly collected in the Yampa River, including its lower, canyon-bound portions (Haines and Modde, 2002). Adult habitat includes riffles, runs, pools, eddies, backwaters, and areas that provide a diversity of flows. Roundtail chubs spawn during the spring peak, typically on the descending limb as temperatures range between 17 to 21 °C (62 and 70 °F) (Chart and Lentsch, 1999). Young roundtail chubs occupy low velocity shoreline habitats.

Mountain sucker

Mountain suckers are widespread throughout much of their range. Adults prefer lotic waters but can also be found in lentic waters. They can be found in a range of waterbody sizes from small streams to large rivers and lakes. The preferred water temperatures for mountain suckers during summer range from about 10 to 28 °C (50 to 82 °F) and tolerated temperatures in the winter can nearly reach 0 °C (32 °F) (Smith 1966).

Colorado River cutthroat trout

The Colorado River cutthroat trout has bright red sides, sometimes with tints of crimson, orange, and gold on the belly (Spahr 1991). Its current range is limited to some headwater streams of the Green and upper Colorado rivers in Colorado, Utah, and Wyoming.

3.3.6.1.1 No Action

The effect of the No Action Alternative would be similar to existing conditions, as the State would remain free to develop their assigned water right using natural flows. FG Dam would continue to operate consistent with the FGROD and there would be no effect on the sensitive fish species occurring within the Green River.

3.3.6.1.2 Proposed Action

The Proposed Action Alternative would have no effect on the sensitive fish species occurring in the Green River below the FG Dam. The sensitive fish species are well adapted for riverine conditions and rely on a range of flows to maintain in-stream habitats. The potential for slight deviation from No Action flows would not be significant enough for the Proposed Action to cause any effects to the sensitive fishes.

3.3.6.1.3 Cumulative Effects

After reviewing the current status of the Green River fishery, the environmental baseline for the action area, the effects of the Proposed Action, and the cumulative effects, the Project would not reduce the reproduction, numbers, or distribution of the Green River sensitive fishes or reduce their habitat.

The Proposed Action with other reasonably foreseeable actions would not result in any direct or indirect impacts to the fish community. There would be no impact to the fish habitat within the Green River as the riverine habitat is not only capable of persisting with variable flows, but relies on them to maintain a healthy river ecosystem. Fishes and fish habitat in the tributaries of the Green River would incur minimal carryover and not be impacted.

3.3.7 Socioeconomics

Socioeconomic analysis is a tool used to estimate the impacts (positive or negative) of a project in terms of output (spending), value added (income), and measurable changes to the local economy. Economic impacts are most often measured by direct and indirect impacts. Direct impacts are often expressed by using metrics such as income and employment and are measured by construction activities, changes in local employment due to the proposed action, variations in agriculture or manufacturing output, and long-term deviations to the operation and maintain costs of a project. Indirect impacts occur when surrounding individuals and businesses are affected by the project action. Examples of this would include increased or decreased demand for food and beverages, lodging, fuel, health services, recreation, and the supply of materials.

3.3.7.1 No Action

Under the No Action Alternative, Reclamation and the State would not enter into an exchange contract. The State would remain free to develop their assigned water right using accretion flows. All operations would fall within the sideboards presented in the FGFEIS. For additional information, please see the FGFEIS Socioeconomics Technical Analysis.

3.3.7.2 Proposed Action

The FGFEIS Appendix 8, Socioeconomics Technical Analysis, provided a regional economic analysis to measure changes in total economic activity within

the area surrounding FG (including below the reservoir) to measure the potential effects of the activities allowed under the Action Alternatives of reservoir operation. The areas studied for potential effect were the potential changes in costs of agricultural production due to flooding on irrigated acreage, differences in recreational expenditures based on changes in reservoir water levels and river flows, and the changes to the costs of electricity due to changes in timing and production of hydropower with the fluctuation and releases from FG Dam. Due to the minor changes in agricultural production and hydropower, these topics were deemed insignificant and were dropped from the study, leaving recreation as the only variable for further analysis. End water use and distribution are not being evaluated as part of this analysis, as the State already has the right to deplete the previously stated amounts of water.

The modeling performed for Section 3.3.1 (above) demonstrates that the Proposed Action would have minimal impacts on hydrology, and would not bring the reservoir below the minimum power pool elevation. As the analysis for Recreation in Section 3.3.2 (above) also declares the effects of the Proposed Action to be insignificant, it is highly unlikely that the Proposed Action would have any real effect on the socioeconomic situation in the area.

Although the Green River flows through the Uintah and Ouray Indian Reservation, no negative effects have been identified to the native population as a result of the Proposed Action.

3.3.7.3 Cumulative Effects

As the cumulative effects to both hydrology and recreation for the Proposed Action have been estimated to be minimal, the impacts to the socioeconomic situation in the area would likely also create very little effect.

3.3.8 Water Rights

Reclamation filed a Utah Application to Appropriate No. A30414 (Water Right No. 41-2963) in 1958 to appropriate water from the Green River for storage in FG for CRSP purposes, and for the purposes of the Central Utah Project. The beneficial water uses listed on the appropriation included 500,000 AF to be released annually as a part of the water supply for the CUP, which included consumptive uses to support the Ultimate Phase Units.

Reclamation has segregated out portions of Water Right No. 41-2963 for various purposes between 1969 and 1996. They were allocated as follows: 40,000 AF moved to Red Feet Reservoir, 12,000 AF to Daggett County for Dutch John, and 500 AF for recreational purposes on Forest Service land surrounding FG. The remaining 447,500 AF of the water right was assigned to the Utah Board of Water Resources in 1996 to allow the State a way for the water to be developed for the benefit of its water users.

From 1996 to 2000 the Board segregated portions of the assigned water and allowed irrigation companies, public water suppliers, and several miscellaneous water users to enter into contracts with the State to develop portions of the 1996 Assignment. These contractors were allowed to develop their portion of the 1996 Assignment until 2009 after which the undeveloped portion of the right would revert to the Board. Exceptions to this requirement were made for public water suppliers. The portions of the 1996 Assignment acquired by water users and public water suppliers through contract with the Board are collectively referred to as the GRB because it is expected that this water would be predominately developed along the Green River and its tributaries between FG and Lake Powell.

Table 3-2
Owners of Portions of the Green River Block of the 1996 Assignment

Owner	Diversion Limit (AF)	Depletion Limit (AF)	Developed
Uintah Water Conservancy District	51,800	25,176	No
Duchesne Water Conservancy District	47,600	31,160	No
Other Public Water Suppliers	5,176	2,621	No
Private Water Users	22,450	13,684	Yes
Total	**127,026**	**72,641**	

The Ute Indian Tribe of the Uintah and Ouray Reservation hold an 1860 water right that is addressed in the Indian Trust Assets section of the EA (section 3.3.13).

3.3.8.1 No Action

Under the No Action Alternative, Reclamation and the State would not enter into an exchange contract. The State would remain free to develop their apportioned water right under the 1996 Assignment without the stability of FG stored water being released for this exchange.

3.3.8.2 Proposed Action

The Proposed Action Alternative would initiate an exchange contract with the State Board of Water Resources for use of their assigned water right. This contract would be used for the development along the Green River for the remaining assigned depletions of 58,957 AF (72,641 AF less the 13,684 AF already segregated under private water users). The purpose of the Exchange

Contract is to exchange the water right depletions under the 1996 Assignment, which was previously included as part of a CRSP participating project water right. This contract is needed to resolve a long standing disagreement between Reclamation and the State regarding use of the water right assigned in 1996.

Reclamation and the State would both benefit in multiple ways from the proposed action. First, the State would secure a more reliable water supply for development of its apportioned water right under the 1996 Assignment. The State would not need to build a storage facility on the Green River to obtain a more reliable supply of water. The State would be in compliance with the contract in the 1996 Assignment. Reclamation would also benefit from the proposed exchange contract through allowing Reclamation to continue to meet ESA Recovery Program goals in the Green River, and in part, by monetizing the exchange of water on a per AF basis. Additionally, Reclamation, and the State, through the proposed contract, establish common ground on the management of the Green River, particularly with regard to the 1996 Assignment.

3.3.8.3 Cumulative Effects

Cumulatively, there would not be a significant impact to water rights based on the analysis performed in this EA. Under the No Action Alternative the State would be able to develop the water right that was assigned to them in 1996, but would not be able to rely on the exchange of water between the Yampa and FG reservoir.

Utah receives substantial benefits from FG Operations including the regulation of the river flows and the ability to continue developing Utah water under the Compact, subject to the State's commitment under the Recovery Program. Reclamation further considers water in FG is stored for the purposes of the CRSP Act for the benefit of all Upper Basin states and when released, this water is being delivered to Lake Powell as part of the operation of the CRSP system. Direct flows of non-CRSP (non-project) water entering the main-stem of the Green River downstream of FG from tributaries are available to the State for diversion, subject to the State meeting its commitments under the Recovery Program. Reclamation operates FG according to the 2006 ROD wherein Reclamation committed to attempt to meet flow recommendations in certain reaches to assist in the recovery of endangered fishes.

Reclamation and the State believe a contract provides an opportunity to find some common ground on the management of the Green River, especially with regard to the 1996 Assignment.

3.3.9 Cultural Resources

Cultural resources are defined as physical or other expressions of human activity or occupation. Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, mandates that Reclamation consider the potential effects of a proposed Federal undertaking on historic properties. Historic properties are a

subset of cultural resources that include sites, districts, buildings, structures, or objects that are at least 50 years in age and are included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). Such resources include culturally significant landscapes, prehistoric and historic archaeological sites as well as isolated artifacts or features, traditional cultural properties, Native American and other sacred places, and artifacts and documents of cultural and historic significance. Historic properties also meet one or more of the four NRHP criteria for evaluation (36 C.F.R. 60). The potential effects of the described alternatives on historic properties are the primary focus of this analysis.

In accordance with 36 CFR 800.4, the significance criteria applied to evaluate cultural resources are defined in 36 CFR 60.4 as follows:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

1. that are associated with events that have made a significant contribution to the broad patterns of our history; or
2. that are associated with the lives of persons significant in our past; or
3. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
4. that have yielded, or may be likely to yield, information important in prehistory or history.

In compliance with the regulations specified in Section 106 of the NHPA (36 CFR 800.16), the affected environment for cultural resources is identified as the area of potential effects (APE). The APE is defined as the geographic area within which federal actions may directly or indirectly cause alterations in the character or use of historic properties. The APE for a proposed action includes the area that could be physically affected by any of the proposed Project alternatives. For this Proposed Action, the point of diversion for the developed water rights would be on the Green River just below FG Dam, so the APE includes the Green River channel and floodplain from FG Dam south to its confluence with the Colorado River.

Reclamation completed the FGFEIS in 2005 to assess the effects of new guidelines for dam operations that were proposed to improve ecological conditions for endemic Green River fishes while also maintaining other important uses of the dam (e.g., power generation, delivering water). The FGFEIS included extensive background research to identify and assess the impacts of the proposed action on historic properties. This research included the completion of an ethnographic study (Rhodenbaugh and Newton 2001) and a Class I review of sites in the area and potential Project effects (Cater et al. 2001). In addition, four sites

along the Green River in Daggett County, Utah were tested and documentation was submitted to the Utah Department of State History (Utah SHPO, UDSH (Reclamation 2005).Site testing with an associated report and analyses were also completed for six sites in Browns Park National Wildlife Refuge in Colorado (Pfertsh 2003). Several NRHP eligible historic and prehistoric sites are located along the Green River channel and flood plain within the Project APE.

In the FGFEIS, Reclamation determined that the proposed dam operations would have no adverse effect on sites along stretches of the Green River between FG Dam and the Colorado River. Reclamation consulted with the Utah and Colorado SHPOs about the proposed action. The Utah SHPO concurred that there would be no adverse or no effect on the stretches in Utah (Reclamation 2005). The Colorado SHPO sent a letter to Reclamation on March 28, 2003, that recommended that Reclamation and the U.S. Fish and Wildlife Service consult further on two of the NRHP eligible historic properties within the APE (Reclamation 2005).

3.3.9.1 No Action

Under the No Action Alternative, there would be no new effects to cultural resources. FG operations would maintain river flows would within the operational parameters that were established in the FGFEIS. Under this alternative, conditions similar to existing conditions would continue.

3.3.9.2 Proposed Action

The hydrologic models (Patno 2018) show that flows at the Jensen streamgage and releases from FG would do not deviate considerably from the current seasonal releases and flows in the No Action Alternative which were established by the FGFEIS. On the Green River, cultural sites would be more likely to be affected by higher than average flows or flooding events that could cause increased erosion than flows that stay within the main channel of the river. The highest flows in the Green River are in the spring.

The hydrologic model (Patno 2018, Figure 8 (a)) predicted that FG releases would remain within the same range as current levels under the Proposed Action. The model predicted that Jensen flows between April-July would be below 25,000 cfs 98 percent of the time and below 10,000 cfs about 75 percent of the time. In the FGFEIS, sites that could be inundated at 10,000 cfs in Reach 1 (FG Dam to the Yampa River), and sites that are inundated at 25,000 cfs in Reach 2 (Yampa River to the White River) were considered within the FGFEIS APE. Model results under the GRB depletion scenario suggest that flows between the FG Dam and the White River would very infrequently reach these levels even during peak flows. Additionally, the model predicted that Jensen flows would almost exactly follow the baseline flows of the No Action Alternative that has been implemented for the last 12 years under the FGFEIS and FGROD. Under the FGFEIS and FGROD, if Reclamation meets flow targets in Reaches 1 and 2, then it is assumed that targets for Reach 3 (White River confluence to the Colorado River) are met. The Proposed Action does not include a change in operations of FG Dam as

outlined in the FGROD; therefore, there would be no effect to cultural resources in Reach 3. Under the Proposed Action, flows from April to July may slightly increase during extremely dry years (Patno 2018, Fig. 8.b.). Late summer flows (Patno 2018, Figs. 11-13) could increase by about 300 cfs above 70 percent exceedance and are still very low compared to normal spring flows. At these flows, the difference in 300 cfs at the Jensen streamgage is less than 0.13 meters (five inches) in height. Therefore, the Action Alternative should result in no considerable change to high Green River flows and no new effects to cultural resources. The Project would have no adverse effects on cultural resources.

In compliance with 36 CFR 800.4 (d)(1), Reclamation sent a determination of No Adverse Effect to Historic Properties for the Project to the Utah and Colorado SHPOs on June 7, 2018 and to tribes that may attach religious or cultural significance to historic properties on June 8, 2018. No cultural resource report was completed as the river flows projected for the Proposed Action do not substantially change from existing conditions. The Utah SHPO concurred with Reclamation's determination of No Adverse Effect to Historic Properties for the project in a letter dated June 11, 2018. The Colorado SHPO concurred with Reclamation's determination in a letter dated July 19, 2018. The Southern Ute Indian Tribe concurred with Reclamation's determination of No Adverse Effect to Historic Properties in a letter dated July 13, 2018. The Hopi Tribe of Arizona concurred with Reclamation's determination in June of 2018. Reclamation received an emailed letter on October 8, 2018 from the Tribal Historic Preservation Officer for the Eastern Shoshone Tribe of the Wind River Reservation that stated that they concur with the determination of No Adverse Effect. The cultural specialist for the Kaibab Band of Paiute Indians of the Kaibab Indian Reservation sent an email on October 4, 2018 in which he deferred to other tribes for comment on the Project. Reclamation has received no comments about cultural resource concerns on the Proposed Action from any other tribes to date.

3.3.9.3 Cumulative Effects

On the Green River, effects to cultural sites could be caused by higher than average flows or flooding events that could increase bank erosion. The hydrologic model (Patno 2018) shows that the GRB plus other reasonably foreseeable depletions would typically result in slightly lower Green River flows than those under the No Action or Proposed Action Alternatives. As with the Proposed Action, April to July flows may slightly increase during extremely dry years (Patno 2018, Fig. 8.b.) and late summer flows (Patno 2018, Figs. 11-13) could increase by about 300-400 cfs during very dry years. However, these flows are still very low compared to spring flows. The difference in 300 to 400 cfs at the Jensen stream gage is less than 0.13 meters (five inches) in height. Stream flows under the reasonably foreseeable depletion scenario are still within the parameters of the No Action Alternative (FGROD) and would have no new impacts on cultural sites.

3.3.10 Paleontology

Paleontologists from the Utah Geological Survey assessed the geological formations and known paleontological localities on the Green River downstream of the dam for the FGFEIS (DeBlieux et al. 2002, Reclamation 2005). Most of the exposed geologic units along the Green River contain fossils but the geologic deposits within the Proposed Action APE are primarily unconsolidated river-deposited sands and gravels that are unlikely to contain fossils. No significant fossil sites had been identified along the Green River within Dinosaur National Monument (DNM) in 2002 (Reclamation 2005). In areas where the Green River runs through exposed bedrock, the primary impact that would be expected is the polishing of invertebrate fossils (DeBlieux et al. 2002).

3.3.10.1 No Action

Under the No Action Alternative, there would be no new effects to paleontological resources. Although river levels fluctuate seasonally, operation of FG Dam would maintain river flows within the operational parameters that were established in the FGFEIS and FGROD. Under this alternative, existing conditions would continue.

3.3.10.2 Proposed Action

Under the Action Alternative, fluctuating river flows would not be expected to have an adverse effect on paleontological resources on the Green River. The hydrologic models (Patno 2018) showed that Jensen streamgage flows and releases from FG dam closely track the current seasonal releases and flows in the No Action Alternative which were established by the FGROD. For the Green River, there would be no effect that could be isolated from the Action Alternative, when compared to the No Action Alternative.

3.3.10.3 Cumulative Effects

The hydrologic model (Patno 2018) showed that Green River flows under the GRB plus other reasonably foreseeable depletion scenario would still be within the parameters of the No Action Alternative. Seasonal variations within these levels would have no new effects on paleontological resources.

3.3.11 Floodplains

Hydrologic modeling—discussed in [section 3.3.1]—was performed to evaluate the potential impacts of the State developing their water right via exchange contract with Reclamation. The statistical results of the hydrologic model were used to approximate impacts to floodplains that are likely to occur as a result of the proposed action being implemented. The impacts of the proposed action plus other reasonably foreseeable future depletions were also evaluated. It is important to note that, due to the uncertainty of the results of the No Action Alternative, the hydrologic model, and therefore, the discussion of impacts to floodplains,

evaluates impacts of the proposed action and proposed action plus foreseeable depletions versus the *current conditions*, *not* versus an alternative method of developing the water right.

3.3.11.1 No Action

Under the No Action Alternative, Reclamation and the State would not enter into an exchange contract. The State would remain free to develop their apportioned water right under the 1996 Assignment without the stability of FG stored water being released for this exchange.

3.3.11.2 Proposed Action

The Proposed Action Alternative would have no significant impacts on floodplains. The full range of river flows/elevations currently experienced would also be experienced under the proposed action. Floodplain-impacting high flows would be virtually unchanged in flowrate/elevation and frequency.

At base flows, the proposed action would have almost no impact on Green River water levels at the Greendale or Jensen streamgages and all river elevations would remain within the current normal operational range. On average, the river would be less than 0.06 meters (0.2 feet) lower than where it would without the State developing their water right. The most significant difference would likely come in the June to September timeframe when, at times the water surface could be up to 0.15 meters (0.5 feet) higher as additional water is released to supplement the generally low summertime river flows. It is anticipated that the proposed action would not have an impact on the ability to pattern releases to produce no more than a 0.1-meter-per-day (0.33 feet) stage change at the Jensen streamgage.

3.3.11.3 Cumulative Effects

The Proposed Action Alternative plus other reasonably foreseeable future depletions would have no significant impacts on floodplains. The full range of river flows/elevations currently experienced would also be experienced under the proposed action plus future depletions scenario.

Floodplain-impacting spring runoff high flows would be virtually unchanged in flowrate/elevation and frequency.

At base flows, the river would, generally, be slightly lower than current normal levels, but remain within the normal operational range. The river at the Greendale streamgage could at times be up to 0.21 meters (0.7 feet) lower—or up to 0.15 meters (0.5 feet) higher (in summer)—than with existing depletions. The river at Jensen could at times have similar impacts—up to 0.12 meters (0.4 feet) lower or 0.15 meters (0.5 feet) higher. It is anticipated that the proposed action would not have an impact on the ability to pattern releases to produce no more than a 0.1-meter-per-day (0.33 feet) stage change at the Jensen streamgage.

3.3.12 Geology and Soils

Since the construction of FG Dam, reduction of the source area and sediment load for downstream reaches of the Green River have occurred by trapping the incoming sediment load in the reservoir. Flow frequency and sediment transport conditions downstream from FG Dam have not changed back to pre-reservoir conditions because of the current baseline operation of FG Dam began with the FGROD in 2006. In the FGROD, releases from FG Dam were patterned so that the peak flows, durations, and base flows and temperatures, described in the 2000 Flow and Temperature Recommendations (Muth et al. 2000) would be achieved to the extent possible for Reaches 1, and 2 of the Green River. The FGROD represented a change from conditions established after construction of the dam in 1962.

Conditions below the dam were affected by operations at the dam beginning in 2006 with the release of higher flows out of the dam, up to 8,600 cfs, during the snowmelt runoff season. The increase in flows after 2006 were lower than pre-dam seasonal runoff flows. Predicted effects of the FGROD were outlined in the FGFEIS. The effects of the action were exhibited in the geomorphology of the river system directly downstream of the dam.

3.3.12.1 No Action

Under the No Action Alternative, there would be no effect to geologic and soil resources in the Green River. The effect of the No Action Alternative would be similar to existing conditions, as the State would remain free to develop their assigned water right using natural flows.

3.3.12.2 Proposed Action

The geology through Reaches 1, 2, and 3 downstream of FG Dam would not be affected by implementing the Proposed Action Alternative. As outlined in the FGFEIS within Reach 1, channel narrowing in Lodore Canyon has been associated with decreased sediment loading and decreased flow magnitude following completion of FG Dam. Some anticipated changes have occurred in Reach 1 following implementation of the FGROD in 2006. Channel areas have experienced some widening upon implementation of the FGROD as predicted. Under the Proposed Action Alternative, no additional changes would occur from what was outlined in the FGFEIS.

Within Reach 2, no changes would occur from what is outlined in the FGFEIS. As described in the FGFEIS, channel narrowing following initiation of water storage at FG Dam has been documented. In Reach 2, the average annual sediment loading was slightly increased following implementation of the FGROD. The FGROD targeted flood plain habitats in Reach 2 by increasing the frequency of bankfull discharges during runoff season. The FGROD within the

Green River channel and flood plain in Reach 2 predicted local channel changes including width, depth, and pattern flow. Under the Proposed Action Alternative, no changes would occur from what is outlined in the FGFEIS.

Former flood plains in portions of Reach 3 are no longer connected to the main channel of the Green River. With vegetation encroachment on natural levees and a diminished frequency of overbank flooding under post-dam flow conditions, only extremely rare, high magnitude flows can reach these areas. As described in the FGFEIS, changes in flow frequency and sediment transport in Reach 3 under the FGROD were expected to be similar to those described for Reach 2. The modified frequency of high flows attributable to the FGROD were not likely to result in a reconnection between the Green River channel and its flood plain in Reach 3. Under the Proposed Action Alternative, no changes would occur from what is outlined in the FGFEIS.

3.3.12.3 Cumulative Effects

Hydrologic effects to the Green River would be minimal when taking into account reasonably foreseeable actions (see section 3.3.1). Slightly lower flows a little more often would decrease erosion and sediment transport. Cumulative impacts to soil resources would be minimally different from impacts associated with the Proposed Action.

3.3.13 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian tribes or individuals. The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or Indian individuals by treaties, statutes, and executive orders. The Department of the Interior's policy is to recognize and fulfill its legal obligations to identify, protect, and conserve the trust resources of federally recognized Indian tribes and tribal members, and to consult with tribes on a government-to-government basis whenever plans or actions affect tribal trust resources, trust assets, or tribal safety (see Departmental Manual, 512 DM 2). Under this policy, as well as Reclamation's ITA policy, Reclamation is committed to carrying out its activities in a manner which avoids adverse impacts to ITAs when possible, and to mitigate or compensate for such impacts when it cannot. All impacts to ITAs, even those considered nonsignificant, must be discussed in the trust analyses in NEPA compliance documents and appropriate compensation or mitigation must be implemented.

Trust assets may include lands, minerals, hunting and fishing rights, traditional gathering grounds, and water rights. Impacts to ITAs are evaluated by assessing how the action affects the use and quality of ITAs. Any action that adversely affects the use, value, quality or enjoyment of an ITA is considered to have an adverse impact to the resources.

The Uintah and Ouray Reservation was established by the executive orders of October 3, 1861 and January 5, 1882, and by Acts of Congress approved May 27, 1902 and June 19, 1902. The reservation reaches from the Utah/Colorado border west to the Wasatch Mountain Range and consists of approximately 4.5 million acres with lands in Carbon, Duchesne, Grand, Uintah, and Utah counties, Utah. The Ute Indian Tribe of the Uintah and Ouray Reservation has approximately 2,970 members of whom over half reside on the reservation (Ute Indian Tribe 2018). The Tribe consists of three bands: the Uintah, the Uncompahgre, and Whiteriver bands. A portion of the Green River passes through the reservation lands in Uintah County and adjacent to reservation lands in Grand County. ITAs of concern for this action include the rights to fish, hunt, and gather, water rights as well as land and mineral rights, which are important trust assets for the Ute Indian Tribe (Reclamation 2005).

Tribal fishing rights, water rights, and oil and gas resources are three ITAs that have been identified within the proposed Project area (Reclamation 2005). The species of fish most commonly harvested by tribal members is channel catfish, a nonnative sport fish. Channel catfish are extremely abundant in the Green River, especially from the Yampa River confluence to the Colorado River.

Reclamation (2005) determined that the FG operations as proposed in the FGFEIS would be unlikely to affect tribal fishing rights, wildlife, or vegetation along the Green River and therefore would not affect tribal hunting and gathering rights (p. 193). Inundation within peak runoff periods that are within the parameters of current FG operations could affect oil and gas operations and access to agricultural lands currently. Reclamation concluded the flows proposed in the FGFEIS would not be substantially different between the Action and the No Action Alternatives so there would not be any adverse effects to ITAs (Reclamation 2005; p. 193).

Inquiries about ITA concerns were included in cultural consultation for the Project that was sent out to tribes on June 8, 2018 and in the Tribal Consultation letters for the Draft EA, sent out in September of 2018. Only the Ute Indian Tribe of the Uintah and Ouray Reservation replied with comments pertaining to ITAs. Their comments and Reclamation's responses can be viewed in Appendix B. No other ITA concerns have been identified by tribes throughout the consultation process to date.

3.13.1 No Action

Under the No Action Alternative, there would be no new effects to ITAs. River levels fluctuate seasonally but FG operations would maintain river flows within the operational parameters that were established in the FGFEIS. Under this alternative, existing conditions would continue.

3.13.2 Proposed Action

Under the Action Alternative, river flows would not be expected to have an adverse impact on ITAs. The hydrologic modeling (Patno 2018) showed that the Jensen flows and releases from FG Dam would be very similar to the current seasonal releases and flows in the No Action Alternative which were established by the FGFEIS and FGROD. Target high and low flows in the Green River under the Action Alternative would not exceed current flows.

The United States recognizes reserved water rights associated with the Uintah and Ouray Reservation and has been working with the Ute Tribe and the State of Utah for the past several decades to develop a Compact to quantify these rights. Once this Compact is signed, it is anticipated that the Ute Tribe will have a water right with a priority date of 1861 to the natural flows in the Green River. The hydrology analyses for both the FGFEIS and this EA assumed the eventual signing of the Compact (that volume of water was included as a reasonably foreseeable depletion) and show that the operation of FG Dam would not interfere with the exercise of these senior Green River water rights.

Furthermore, development of the State water right along the Green River would not affect the ability of the Ute Tribe of the Uintah and Ouray Reservation to develop their reserved water rights as they hold senior water rights along the river and Reclamation must comply with applicable water law including the doctrine of prior appropriation.

3.13.3 Cumulative Effects

The development and operation of oil and gas wells associated with tribal mineral rights, development of water rights, tribal fishing access, and hunting and gathering are expected to continue within the Project APE. No present or reasonably foreseeable actions are expected to result in adverse cumulative impacts to ITAs. There would be no adverse cumulative impacts to ITAs from Implementation of the Action Alternative.

3.3.14 Environmental Justice

Executive Order 12898, established Environmental Justice as a Federal agency priority to ensure that minority and low-income groups or Indian Tribes are not disproportionately affected by Federal actions. The Green River runs through and adjacent to counties in Utah and Colorado with minority and low-income groups. The Green River also runs through the Uintah and Ouray Reservation of the Ute Indian Tribe.

3.3.14.1 No Action

Under the No Action Alternative, Reclamation and the State would not enter into an exchange contract. The State would remain free to develop their apportioned water right under the 1996 Assignment without the stability of FG stored water

being released for this exchange. This would not impact minority and low-income groups or Indian Tribes.

3.3.14.2 Proposed Action

Implementation of the Proposed Action would not disproportionately (unequally) affect any low-income or minority communities within the Project area. The proposed Project would not involve any construction, population relocation, health hazards, hazardous waste, property takings, or substantial economic impacts. This action would, therefore, have no adverse human health or environmental effects on minority and low-income populations.

3.3.14.3 Cumulative Effects

The cumulative effects of the Proposed Action and other reasonably foreseeable actions would not disproportionately (unequally) affect any low-income or minority communities within the Project area. The proposed Project would not involve major facility construction, population relocation, health hazards, hazardous waste, property takings, or substantial economic impacts. This action would, therefore, have no adverse human health or environmental effects on minority and low-income populations.

3.3.15 Hydropower Generation and Marketing

The three generating units have a total capacity of about 152 MW. Hydropower generation rises and falls instantaneously with the load (or demand)—a pattern called load following. The amount of load on the system is determined by how many electrical devices are using power. By comparison, coal- and nuclear-based resources are less efficient and have a relatively slow response time; consequently, they generally are not used for load following. At a hydropower facility, minimum and maximum water release levels determine the minimum and maximum power generation capability. Ramping is the change in the water release from the reservoir to meet the electrical load. Both scheduled and unscheduled ramping are crucial in load following, ancillary services, emergency situations, and variations in realtime (what actually happens compared to what was scheduled) operations. North American Electric Reliability Council (NERC) and Western Electricity Coordinating Council operating criteria require Western and Reclamation to meet scheduled load changes by ramping the generators up or down beginning at 10 minutes before the hour and ending at 10 minutes after the hour.

As a control area operator, Western regulates the transmission system within a prescribed geographic area. Western is required to react to moment-by-moment changes in electrical demand within this area. Regulation means that “automatic generation control” will be used to adjust the power output of hydroelectric generators within a prescribed area in response to changes in the generation and

transmission system to maintain the scheduled level of generation in accordance with prescribed NERC criteria.

3.3.15.1 No Action

Under the No Action Alternative, there would be no new effect to hydropower. FG operations would maintain river flows and hydropower generation within the operational parameters that were established in the FGFEIS. Under this alternative, existing conditions would continue.

3.3.15.2 Proposed Action

The hydrologic models (Patno 2018) show that releases from FG would not deviate considerably from the current releases in the No Action Alternative which were established in the FGFEIS. The release patterns fall within the operational parameters established under the FGFEIS. The elevation decreases six feet, which is within the annual elevation fluctuations normally seen at FG. Releases increase during the July-September period to mitigate for the depletions during this time and meet the Reach 2 targets. These are high electrical demand months and provides a benefit to power resources. The mass balance decrease in releases during the October-December period occurs during lower electrical demand months, which also benefits hydropower.

3.3.15.3 Cumulative Effects

The cumulative effects of the Proposed Action Alternative with other reasonably foreseeable actions would have similar impacts as the Proposed Action Alternative. The hydrologic models (Patno 2018) show that releases from FG would not deviate from the operational constraints or impacts analyzed within the operational parameters established under the FGFEIS. The elevation decreases 30 feet, which is greater than elevation changes over an annual hydrologic cycle, but still within the elevations analyzed in the FGFEIS. The elevation decrease would impact energy efficiency associated with the head available, but those impacts would likely be small.

The release patterns with the reasonably foreseeable actions are similar to the Proposed Action Alternative with increased percentages of time July through September releases would be greater than the No Action with consistent decreases in releases during the January-February and October-December time frame. The timing differences with implementing the Proposed Action would benefit hydropower during the high electrical demand summer months.

3.4 Summary of Environmental Effects

Table 3-3 summarizes environmental effects under the No Action and the Proposed Action Alternatives.

Table 3-3
Summary of Environmental Effects

Project Resource	No Action	Proposed Action	Cumulative Effects
Hydrology	No Effect	No Effect	No Effect
Recreation	No Effect	No Effect	No Effect
Wetland, Riparian and Vegetation	No Effect	No Effect	No Effect
Fish and Wildlife Resources	No Effect	No Effect	No Effect
Threatened and Endangered Species	No Effect	No Effect	No Effect
Sensitive Species	No Effect	No Effect	No Effect
Socioeconomics	No Effect	No Effect	No Effect
Water Rights	No Effect	No Effect	No Effect
Cultural Resources	No Adverse Effect	No Adverse Effect	No Adverse Effect
Paleontology	No Effect	No Effect	No Effect
Floodplains	No Effect	No Effect	No Effect
Geology and Soils	No Effect	No Effect	No Effect
Indian Trust Assets	No Effect	No Effect	No Effect
Environmental Justice	No Effect	No Effect	No Effect
Hydropower Generation and Marketing	No Effect	No Effect	No Effect

Chapter 4 Environmental Commitments

Environmental Commitments have been developed to lessen the potential adverse effects of the Proposed Action.

4.1 Environmental Commitments

The following environmental commitments will be implemented as an integral part of the Proposed Action.

1. Additional Analyses - If the Proposed Action were to change significantly from that described in this EA because of additional or new information, additional environmental analyses may be necessary.

2. Cultural Resources - The Proposed Action is a water exchange contract action. There would be no ground disturbance or construction associated with the action so there would be little potential for inadvertent discoveries. Nonetheless, if any surface or subsurface cultural resources are discovered within the proposed Project area, Reclamation's Provo Area Office archaeologist will be notified. The archaeologist will assess the resource and recommendations for how to proceed.

3. The Proposed Action is a water exchange contract action. There would be no ground disturbance or construction associated with the action so there would be little potential for inadvertent discoveries. Nonetheless, any person who knows or has reason to know that he/she has inadvertently discovered possible human remains on Federal land, he/she must provide immediate telephone notification of the discovery to Reclamation's Provo Area archaeologist. The area will be protected until the proper authorities are able to assess the situation onsite. This action will promptly be followed by written confirmation to the responsible Federal agency official, with respect to Federal lands. The Utah or Colorado SHPO and interested Native American Tribal representatives will be promptly notified. Consultation will begin immediately. This requirement is prescribed under the Native American Graves Protection and Repatriation Act (43 CFR Part 10); and the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470).

4. Paleontological Resources – The Proposed Action is a water exchange contract action. There would be no ground disturbance or construction associated with the action so there would be little potential for inadvertent

discoveries. Nonetheless, should vertebrate fossils be found within the proposed Project APE, the area would be monitored until a qualified paleontologist could assess the find.

Chapter 5 Preparers

The following is a list of preparers who participated in the development of the EA. They include environmental summary preparers, Reclamation team members, and Federal, State and District members.

Table 6-1
Reclamation Team Members

Name	Title	Resource
Mr. Jared Baxter	Fish and Wildlife Biologist	Vegetation, Wildlife, ESA
Mr. Rick Baxter	Water, Environmental, and Lands Division Manager	Project Oversight
Mr. Scott Blake	Recreation Planner	Recreation
Mr. Peter Crookston	Environmental Group Chief	NEPA Oversight
Mr. Preston Feltrop	Fish and Wildlife Biologist	Fish
Mr. Jeff Hearty	Economist	Socioeconomics
Ms. Linda Morrey	Secretary	Document Compliance
Ms. Rachel Musil	Civil Engineer	Water Rights
Mr. Dave Nielson	Geologist	Geology and Soils
Ms. Heather Patno	Hydraulic Engineer	Hydrology
Mr. Justin Record	Civil Engineer	Water Rights
Ms. Carley Smith	Archaeologist	Archaeology, Paleontology, ITAs
Mr. David Snyder	Recreation Planner	Recreation

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Chapter 7 Appendices

Appendix A Hydrology Modeling Technical Report

Green River Evaluation and Analysis Team Hydrologic Modeling Methodology

December 2018
Heather E. Patno

Overview

Through coordination with the State of Utah Division of Water Resources (State), the Bureau of Reclamation (Reclamation) conducted several hydrologic modeling runs using Reclamation's long-term planning model, Colorado River Simulation System (CRSS). The results of these model runs are being used to determine potential impacts on the hydrology of the Colorado River System from development of the Green River Block of the Ultimate Phase depletions (GRB). These depletions and diversions were covered in the Operation of Flaming Gorge Dam Final Environmental Impact Statement published in September 2005 (FEIS), and are being analyzed for the purpose of signing Water Exchange Contract No. 17-WC-46-655 for exchange of Green River Block water between the United States of America and the State of Utah.

This report presents the results of two sets of hydrologic modeling runs. The modeling runs present modeling results comparing the GRB depletion against the no action alterative using historic natural flow hydrology.

Two different assumptions regarding reasonably foreseeable depletions are analyzed for each hydrologic run. The no action and GRB scenarios assume that all future Upper Basin depletions *except* for the GRB are modeled as constant at the 2018 depletion levels for the entire model run (GRB Depletion Scenario). The GRB plus reasonably foreseeable (Full Depletion Scenario) holds all future Upper Basin depletions *except* for the GRB and other future depletions assumed to the reasonably foreseeable as constant at the 2018 depletions levels, while the GRB and all reasonably foreseeable depletions are held constant at the 2060 levels. In this context, a reasonably foreseeable future depletion is one which has state legislation, or a tribal resolution or federal Indian water settlement, or a federal finding of no significant impact (FONSI) or record of decision (ROD). See the Discussion section of this document for further discussion and for specific CRSS model depletion nodes.

This modeling assumption is different than standard CRSS model runs that are used in a long-term basin-wide planning context (e.g., the 2012 Colorado River Basin Water Supply and Demand Study (Basin Study[1])). CRSS runs performed in a basin-wide planning context typically project that future Upper Basin depletions increase throughout the entire model run period. The model runs presented in this report analyze the difference between diverting water out of the Green River directly below Flaming Gorge

[1] Colorado River Basin Water Supply and Demand Study Final Study Report available at: http://www.usbr.gov/lc/region/programs/crbstudy/finalreport/index.html

Dam (FG) and not diverting the water. In this analysis, the State's total depletions in the GRB and basecase differ by the volume of water being diverted below Flaming Gorge Dam. This modeling approach isolates the impact of diverting water out of the Green River and the impact of the GRB as compared against reasonably foreseeable depletions.

Three scenarios were compared in this analysis for each set of hydrology: (1) Upper Basin depletions held constant at 2018 (No Action Scenario) and (2) Upper Basin depletions held constant at 2018 levels *except* GRB (GRB depletion scenario); and (3) Upper Basin depletions held constant at 2018 levels *except* GRB and reasonably foreseeable depletions (Full Depletion Scenario).

The first section of this report presents an overview of the data. Next, the general methodology and technical assumptions of CRSS are reviewed, followed by the technical assumptions specific to this study and model runs. The modeling results are then presented with an analysis of the differences between the action and no action alternatives. A discussion section concludes the report.

Data

The Green River Block total depletion amount is 72,641 acre-feet (af) of the total Ultimate Phase depletion amount of 158,890 af. The State of Utah has perfected water rights in the amount of 13,684 af for private water users along the Green River. These water rights are included in all three scenarios, and the total future depletion for the Green River amounts to 58,957 af of water remaining under the 72,641 af.

In this study, three future depletion scenarios were modeled: (1) basecase with no Green River diversion; (2) basecase with GRB of 58,957 per year; and (3) Green River Block depletions of 58,957 per year with constant 2060 reasonably foreseeable depletions. For all scenarios, it was assumed that Upper Basin depletions without state legislation, or a tribal resolution or federal Indian water settlement, or a federal finding of no significant impact (FONSI) or record of decision (ROD) remained constant at the 2018 depletion levels currently in CRSS. The GRB depletion includes Reaches 1 and 2 of the Green River. The reasonably foreseeable depletions assumed those depletions for the State of Utah on the Green, White and Yampa River tributaries, and included Ute Indian Compact and Upalco. See the discussion section for further details and for specific CRSS model depletion nodes held constant at the 2060 levels. Note that the 2018 depletions levels modeled are based upon the Upper Basin depletion schedules in CRSS and not the observed (or computed) depletions reported in the 2018 Consumptive Uses and Losses report[2] which was not available at the time of this analysis or the writing of this report and will later be prepared by Reclamation.

For each depletion scenario (no action, GRB depletion and full depletion), one future inflow hydrology scenario was modeled. The inflow scenario uses data from the observed streamflow record (1906-2015).

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[2] Colorado River System Consumptive Uses and Losses Reports available at: http://www.usbr.gov/uc/library/envdocs/reports/crs/crsul.html

Future Depletion Scenarios

1. No Action Scenario

Under the no action scenario, GRB depletions for this scenario were assumed to be zero for the entire model run (2018-2060). Depletion data for all other locations in CRSS were the Upper Colorado River Commission 2007 depletion schedule held steady at 2018 levels.

2. GRB Scenario

Under the GRB scenario, it was assumed that the GRB depletion location would occur directly below Flaming Gorge Dam during the agricultural growing season from July through the end of September. The 2006 Flaming Gorge Record of Decision (FGROD) operations remained consistent throughout each alternative. Reclamation made a commitment in the FGROD to maintain Reach 1 and 2 flow target levels as measured by the USGS streamgage on the Green River at Greendale (Reach 1) and the Green River at Jensen, Utah (Reach 2). The GRB depletion maintains FGROD operations and no change to operations are made under the GRB scenario. Flaming Gorge Dam releases maintain Reach 1 and 2 flow thresholds. The two depletion schedules differ based on the assumed future water available in the Green River Basin. In both depletion schedules the GRB maximum annual depletion is 58,957 acre-feet. In this modeling, the Green, Yampa and White depletions that are reasonably foreseeable are lower than those modeled in the 2012 Basin Study. This is because for the purposes of this analysis all depletions were held constant at 2018 depletion levels.

3. GRB and Full Depletion Scenario

Under the GRB and Full Depletion Scenario, all assumptions from the GRB scenario are maintained with the addition of reasonably foreseeable depletions held constant at 2060 levels with all other depletions held constant at 2018 depletion levels. In this modeling, the Green, Yampa and White depletions that are reasonably foreseeable are lower than those modeled in the 2012 Basin Study but represent the largest potential future depletions on the Green River system. Table 1 contains the 2018 and 2060 levels of each of the Upper Basin States modeled in CRSS. Colorado, New Mexico and Wyoming depletions were held constant at 2018 levels under all scenarios. Table 2 below contains the Reasonably Foreseeable Depletions with both 2018 and 2060 levels. The difference between total State of Utah depletions at 2060 levels and the Reasonably Foreseeable levels is 60 thousand acre-feet (kaf), which represents the depletions that do not meet the strict criteria to be included in the cumulative analysis. The additional depletions are also below Reach 2 and therefore not included in the geographical boundaries of this analysis.

State	Depletion (kAF/yr)	
	2018	2060
Colorado	2,833	2,955
New Mexico	594	642
Utah	945	1,163
Wyoming	609	763

Table 1. CRSS state depletion totals. This modeling assumed 2018 levels for Colorado, New Mexico and Wyoming depletions in both the GRB Scenario and the Full Depletion Scenario in order to isolate the impacts of signing the exchange contract with the State of Utah.

	Depletions (kAF/yr)	
Reasonable Forseeable Future Depletions and Diversion Nodes in CRSS for UP modeling	2018	2060
40 UPALCO, UINTA, BONNEVILLE, UTES.UPALCO PROJECT AG	9.94	10.4
40 UPALCO, UINTA, BONNEVILLE, UTES.UPALCO REPLACEMENT M&I	0	0
40 UPALCO, UINTA, BONNEVILLE, UTES.UINTA PROJECT	0	0
40 UPALCO, UINTA, BONNEVILLE, UTES.NEW INDIAN USES - UTE INDIAN COMPACT	16	40
41 UINTAH BASIN WQIP.UINTAH BASIN WQIP - USDA	0.9	0.9
48 USES BETWEEN GREENDALE AND OURAY.INDIAN USES SINCE 1965	6	6
48 USES BETWEEN GREENDALE AND OURAY.NON INDIAN USES SINCE 1965	1.8	1.9
48 USES BETWEEN GREENDALE AND OURAY.JENSEN AREA AG	2.7	2.8
49 MANDI USES BETWEEN GREENDALE AND OURAY.ADDITIONAL JENSEN UNIT	0.9	0.95
50 UTAH AGRICULTURAL USES.UTAH AG (ALSO IN RW)	0.43	0.43
50 UTAH AGRICULTURAL USES.NORTHERN UTE (FROM KBE)	14.4	31
53 AGRICULTURAL USES ABOVE GREEN RIVER, UT.UTE INDIANS COMPACT (GREEN RIVER)	31.2	63
	84.27	157.38

Table 2. Reasonably Foreseeable Future Depletions Nodes in CRSS for the Ultimate Phase Modeling at 2018 and 2060 levels.

Future Inflow Hydrology Scenarios

1. Historic Hydrology - Direct Natural Flow (DNF)

The future hydrology used as input to the model in this scenario consisted of samples taken from the historic record of natural flow in the river system over the 110-year period from 1906 through 2015 from 29 individual inflow points (or nodes) on the Colorado River System. Natural flow is the observed flow adjusted for the effects of diversions and the operation of reservoirs upstream of the flow gage. This natural flow record[3] was developed by Reclamation and is used extensively in their hydrologic modeling and Environmental Impact Statements (EIS). In this inflow scenario, the existing historical record of natural flows was used to create a number of different future hydrologic sequences using a resampling technique known as the Index Sequential Method (ISM[4]). The ISM provides the basis for quantification of the uncertainty and an assessment of the

[3] Colorado River Basin Natural Flow and Salt Data, available at: http://www.usbr.gov/lc/region/g4000/NaturalFlow/

[4] Index Sequential Method: Ouarda, T., Labadie, J.W., and Fontane, D.G. (1997), Index sequential hydrologic modeling for hydropower capacity estimation, *J. of the American Water Resources Association*, 33(6) 1337-1349; and Kendall, D.B. and Dracup, J.A. (1991), A comparison of index-sequential and AR(1) generated hydrologic sequences, *J. of Hydrology*, 122, 335-352.

risk with respect to future inflows and is based upon the best available measured data. This inflow dataset and methodology was used as the primary inflow scenario in the 2007 Shortage EIS and one of the inflow scenarios used in the 2012 Basin Study.

Methodology

Hydrologic modeling of the Colorado River system was conducted using Reclamation's long-term planning model, CRSS. The hydrologic modeling provides projections of potential future Colorado River system conditions (e.g., reservoir elevations, reservoir releases, river flows) under the No Action scenario for comparison with conditions under the GRB scenario. Due to uncertainties associated with future inflows into the system, multiple simulations were performed for each depletion scenario to quantify the uncertainties in future conditions, and the modeling results are typically expressed in probabilistic terms.

This document provides an overview of the hydrologic modeling and the framework within which the many simulations were undertaken.

In 2000, the Recovery Program issued Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam (Muth *et al.*, 2000; Flow Recommendations). The Flow Recommendations provide the basis for the proposed action described and analyzed in the FEIS. The ROD implements the proposed action by modifying the operations of Flaming Gorge Dam, to the extent possible, to assist in the recovery of endangered fishes and their critical habitat downstream from the dam and, at the same time, maintains and continues all authorized purposes of the Colorado River Storage Project (Reclamation 2006). Table 2.1 in the FEIS summarizes the Flow Recommendations and can be found in Appendix A.

The ROD directs Reclamation to operate to achieve, to the extent possible, the Flow Recommendations as described in the FEIS (Reclamation 2006). The Flow Recommendations divide the Green River below Flaming Gorge Dam into three river reaches. Reach 1 begins directly below the dam and extends to the confluence with the Yampa River. Reach 2 begins at the Yampa River confluence and continues to the White River confluence. Reach 3 is between the White River and Colorado River confluences (Muth et. al 2000). The Flow Recommendations and FGROD limit Reclamation's compliance responsibility to meeting flow targets at Reach 2 measured on the Green River at Jensen, Utah. This analysis looks at the impact of the GRB depletion scenario at Reach 2, according to the modeled information.

The ROD classifies annual hydrology into five hydrologic classifications dry (>90% exceedance); moderately dry (<70% and >90% exceedance); average (<30% and >70% exceedance); moderately wet (<10% and >30% exceedance); and wet (>10% exceedance).

Scenarios Modeled

A no action scenario, GRB scenario and full depletion scenario were modeled, as described above. The action scenario is the 58,957 acre-foot depletion scenario described above. The no action scenario is the August 2017 official CRSS run with the following two exceptions to the model assumptions (1) the 2007 Upper Colorado River Commission (UCRC) depletion schedule was used, and (2) all Upper Basin depletions were held constant at 2018 levels *except* those identified as reasonably foreseeable, which are held at 2060 levels in the Full Depletion scenario.

Period of Analysis

Hydrologic modeling extends from 2018 through 2060.

Model Description

Future Colorado River system conditions under the action and no action alternatives were simulated using CRSS. The model framework of CRSS is a commercial river modeling software called Riverware[5]; a generalized river basin modeling software package developed by the University of Colorado through a cooperative arrangement with Reclamation and the Tennessee Valley Authority. CRSS was originally developed by Reclamation in the early 1970s and was implemented in Riverware in 1996.

CRSS simulates the operation of the major reservoirs on the Colorado River on a monthly time-step and provides information regarding the projected future state of the system in terms of output variables including the amount of water in storage, reservoir elevations, releases from the dams, the amount of water flowing at various points throughout the system, and the diversions to and return flows from the water users throughout the system. The simulation uses a mass balance (or water budget) approach to account for water entering the system, water leaving the system (e.g., from consumptive use of water, trans-basin diversions, evaporation), and water moving through the system (i.e., either stored in reservoirs or flowing in river reaches). The model was used to project the future conditions of the Colorado River system on a monthly time-step for the period 2018 through 2060.

The input data for the model includes monthly future inflows, various physical process parameters such as the evaporation rates for each reservoir, initial reservoir conditions on January 1, 2018, and the future diversion and depletion schedules for entities in the Basin States and for Mexico. These future schedules were based on demand and depletion projections prepared and submitted by the Basin States based on the official 2007 Upper Colorado River Commission future depletions. In this analysis, except for reasonably foreseeable depletions, future Upper Basin depletions from the 2007 UCRC schedule was assumed constant at 2018 levels; this assumption results in depletions significantly lower than the future depletion projections used in long term planning studies such as the Basin Study, which assumed that Upper Basin depletions will grow through 2060. Depletions

[5] Riverware: A generalized tool for complex reservoir system modeling, Edith A. Zagona, Terrance J. Fulp, Richard Shane, Timothy Magee, and H. Morgan Goranflo, Published in the Journal of the American Water Resources Association, August 2001.

(or water use) are defined here as diversions from the river less return flow credits, where applicable.

The rules of operation of the Colorado River mainstream reservoirs including Flaming Gorge are also provided as input to the model. These sets of operating rules describe how water is released and delivered under various hydrologic conditions.

The Flaming Gorge ROD outlines spring and base flow recommendations that Reclamation is obligated to meet in Reaches 1 and 2. The spring peak flow recommendations are measured during April-July or until the cessation of the spring peak release and base flows are measured from the cessation of the spring peak releases or August through February of the next year. March and April are transition months to meet a variable May 1 elevation target for dam safety purposes.

Reach 1 releases from Flaming Gorge are calculated based on the Reach 2 requirements that include Yampa River flows. Reach 2 model results are measured at Jensen, Utah. The model utilizes a k-NN daily disaggregation method for the Yampa River April-July largely unregulated flows to determine frequency of meeting spring peak timing, magnitude and duration daily. Yampa River flows during the base flow period use the monthly flow and calculate a daily average for the entire month from that value.

Flaming Gorge powerplant capacity release is 4,600 cubic feet per second (cfs). Two hollow jet valves or bypass tubes each with a capacity of 2,000 cfs can be utilized for a total release from Flaming Gorge of 8,600 cfs. Flaming Gorge does have a gated spillway that can be used in a hydrologic emergency, which has been shown to be unnecessary in the current modeling.

General model assumptions:

- January 2018 initial conditions for all modeled reservoirs
    - Flaming Gorge 6,028.38 ft
- Run duration: 2018-2060
- Index sequential method used for the Direct Natural Flow period of record (1906-2015): 110 simulations.

Modifications to CRSS

Modifications were made to the official version of CRSS to model the GRB depletion for this analysis. The base flow release calculation during July-September for Reaches 1 and 2 included an average depletion divided into daily releases for the time period, and all minimum release thresholds were met.

Results

Each alternative (no action, GRB and full depletion scenarios) was modeled using the DNF future inflow scenarios, resulting in three model runs. For comparison purposes, the two action scenarios are compared to the no action alternative designated as basecase.

The comparisons are made using the DNF future inflow scenarios. The following variables were evaluated:

- Flaming Gorge pool elevation on April 31st
- Flaming Gorge elevation ≤ 5,980 ft
- Flaming Gorge Release and Jensen Flows (January-February)
- Flaming Gorge Release and Jensen Flows (March)
- Flaming Gorge Release (April)
- Flaming Gorge Release and Jensen Flows (July-September)
- Flaming Gorge Release and Jensen Flows (October-December)
- Jensen Flows (April-July)
- Jensen Maximum Annual Flow (April-July)
- Jensen Sustained 14-Day Duration Flows (April-July)
- Jensen Flows (August-September)

Post-processing and Interpretation Procedures

CRSS generates data on a monthly time-step for over 300 points (or nodes) on the Colorado River system. Furthermore, using the ISM on the natural flow record, the model generated 110 possible outcomes for each node for each month of the model run. Flaming Gorge data is further disaggregated to a daily hydrograph for Flaming Gorge releases and flows at Jensen, Utah below the confluence of the Green and Yampa Rivers. These very large data sets generated for each alternative can be visualized as three-dimensional data "cubes" with the axes of time, space (or node) and trace (or outcome for each future hydrology). The data were aggregated to reduce the volume of data and to facilitate comparison of the alternatives.

For aggregation of data, simple techniques were employed. For example, Flaming Gorge pool elevations were evaluated on an annual basis (i.e., end of April) to show long-term lake elevation trends and compliance with the May 1 elevation target as opposed to short-term fluctuations. Standard statistical techniques were used to analyze the 110 possible outcomes for a fixed time or particular temporal span. Statistics were generated for the percent exceedance over certain time periods at critical river threshold levels. Inverse cumulative density probabilities were determined by simply ranking the outcomes for all 110 possible outcomes over each temporal scale (from lowest to highest) and determining the probability of being at or above that value. For example, 110 Flaming Gorge release values were generated for January 1, 2018, one for each natural flow inflow trace. These 110 values were compiled with all daily Flaming Gorge release values for the January 1-December 31 time period. These statistics are then used to determine the probability of Flaming Gorge elevations or releases and Jensen flows being at certain thresholds throughout the run period (each separate scenario result contains 56,760 individual points of data for a CDF that contains every month of all 110 runs throughout the 2018-2060 period, 577,060 individual points for the daily data during the April-July period).

Concerns over a changing climate have been prominent in environmental and water resources. The DNF hydrology set contains multiple period of drought, including the decades of drought that occurred in the1930s, 1950s, 1970s and 2000 up to 2015. In order to determine the impacts of continued drought, the trace with the lowest elevation has

been isolated and its results have been included. Trace 63 begins with the initial conditions and then historic year 1979 is the first hydrologic year of that trace. This trace moves through the wet years in the 1980s, but ends with the drought in 2000-2015. It is the period of operations between 2000-2015 that have the greatest impact on elevation. The impact trends of implementing the exchange agreement are seen in the worst-case scenario. The illustrations in the drought trace 63 should be considered one representation of potential possibilities of future hydrology and it is statistically unlikely that trace 63 will happen.

Direct Natural Flow Results

Figures1 and 2 show the differences in Flaming Gorge pool elevation in April between the action scenarios and the no action scenario at all probability percentiles. April was chosen because the 2006 FEIS identified this month as the reservoir elevation target to meet that varies depending upon percent exceedance of forecasted inflow. The difference between the no action and implementation of the GRB depletion results in a maximum six foot drop in the reservoir. The addition of Full Depletion scenario into the future increase the maximum difference in elevation to 30 feet, yet still within the FEIS range that extends to elevation 5980 feet as analyzed in the FEIS.

Figure 1 illustrates impacts that are seen throughout the graphical results comparing the impact between implementing the Green River Block depletion and incorporating the official UCRC 2060 depletions on the Green River. The impacts of incorporating full depletion development on the Green River are greater than impacts from the 58,957 acre-feet depletion.

Figures 3 and 4shows the probability of Flaming Gorge pool elevation being below 5,980 ft (minimum elevation in FEIS) in April. Under all scenarios, the modeling showed no traces (out of 110 traces) below minimum power pool (5,890 ft).

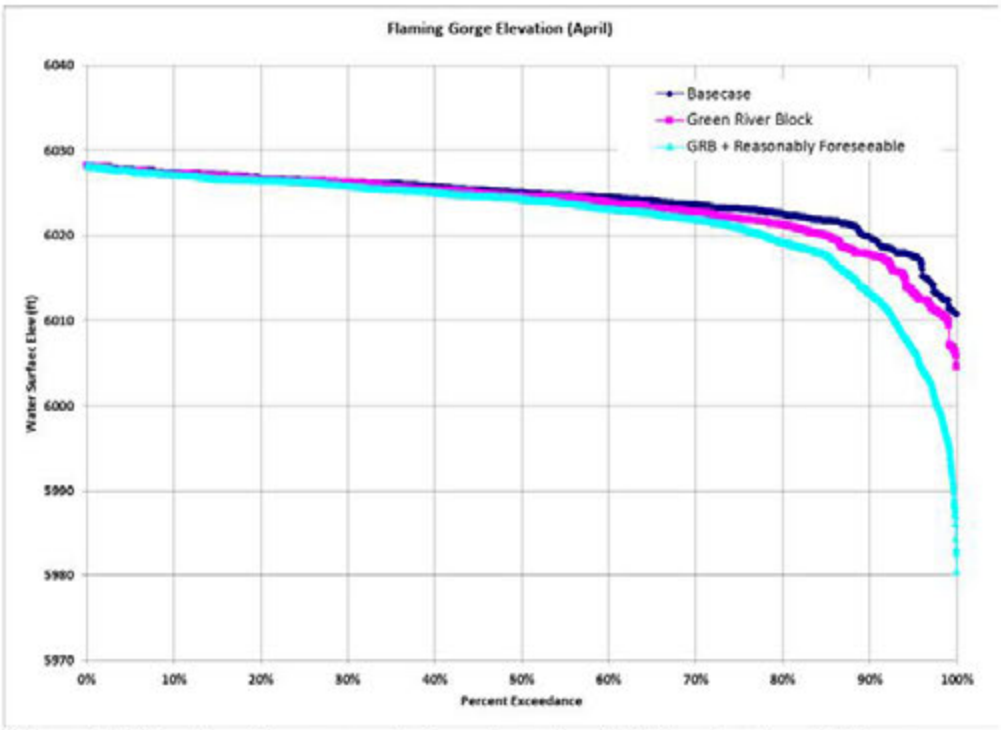


Figure 1. Flaming Gorge pool elevation, April. Direct natural flow inflows, 59kaf Green River maximum depletion. Illustrates the probability of Flaming Gorge pool elevation being below 5,980 ft (minimum elevation in FEIS) in April. Under all scenarios, the modeling showed no traces (out of 110 traces) below minimum power pool (5,890 ft).

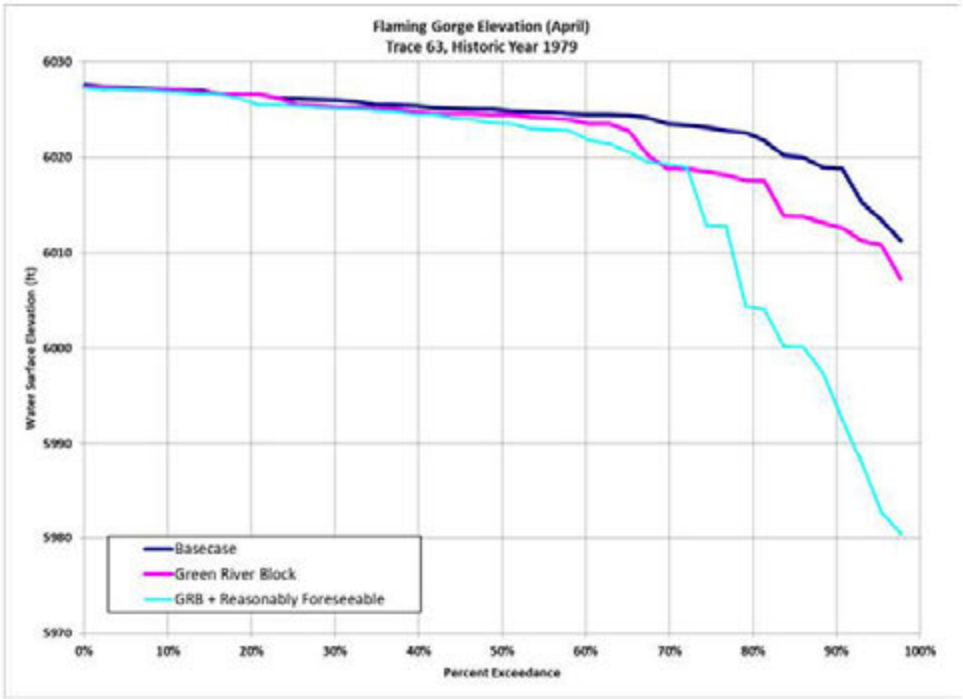


Figure 2. Flaming Gorge pool elevation, April. Direct natural flow inflows, 59kaf Green River maximum depletion, trace 63. Illustrates the probability of Flaming Gorge pool elevation being below 5,980 ft (minimum elevation in FGFEIS) in April. Under all scenarios, the modeling showed no traces (out of 110 traces) below minimum power pool (5,890 ft).

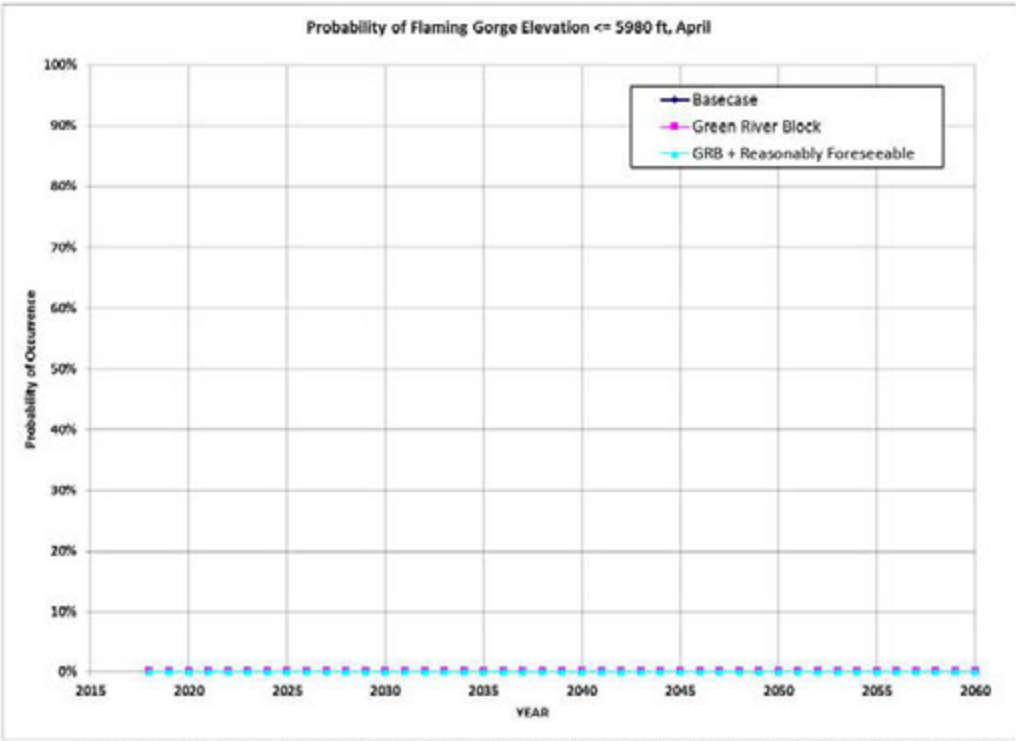


Figure 3. Probability of Flaming Gorge pool elevation below 5,980 feet (minimum elevation in FEIS) in April. Direct natural flow inflows, 59kaf Green River maximum depletion. Illustrates the probability of Flaming Gorge pool elevation being below 5,980 ft (minimum elevation in FGFEIS) in April. Under all scenarios, the modeling showed no traces (out of 110 traces) below minimum power pool (5,890 ft).

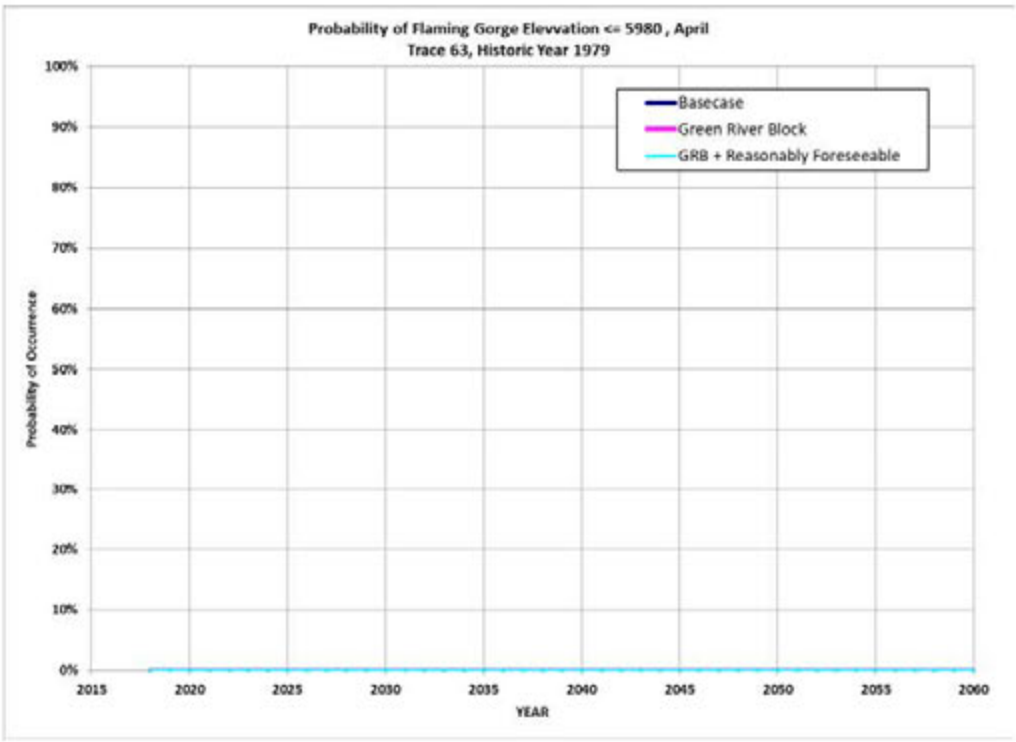


Figure 4. Probability of Flaming Gorge pool elevation below 5,980 feet (minimum elevation in FEIS) in April. Direct natural flow inflows, 59kaf Green River maximum depletion. Illustrates the probability of Flaming Gorge pool elevation being below 5,980 ft (minimum elevation in FGFEIS) in April. Under all scenarios, the modeling showed no traces (out of 110 traces) below minimum power pool (5,890 ft).

Figures 5-8 present Flaming Gorge and Jensen releases during the January and February base flow period. Releases from Flaming Gorge in the no action and GRB depletion scenarios are almost identical. The addition of full depletion scenario causes a decrease in Flaming Gorge elevation that in turn decreases base flow releases to increase elevation where flexibility exists in Flaming Gorge operations. Between both the 80 to 90 and 50 to 60 percent exceedance levels the full depletion scenario extends the minimum base flow duration at Jensen, Utah. The historic record includes some high precipitation months in January and February that are seen in the Jensen flows reaching above 4,500 cfs < 0.01 percent of the time.

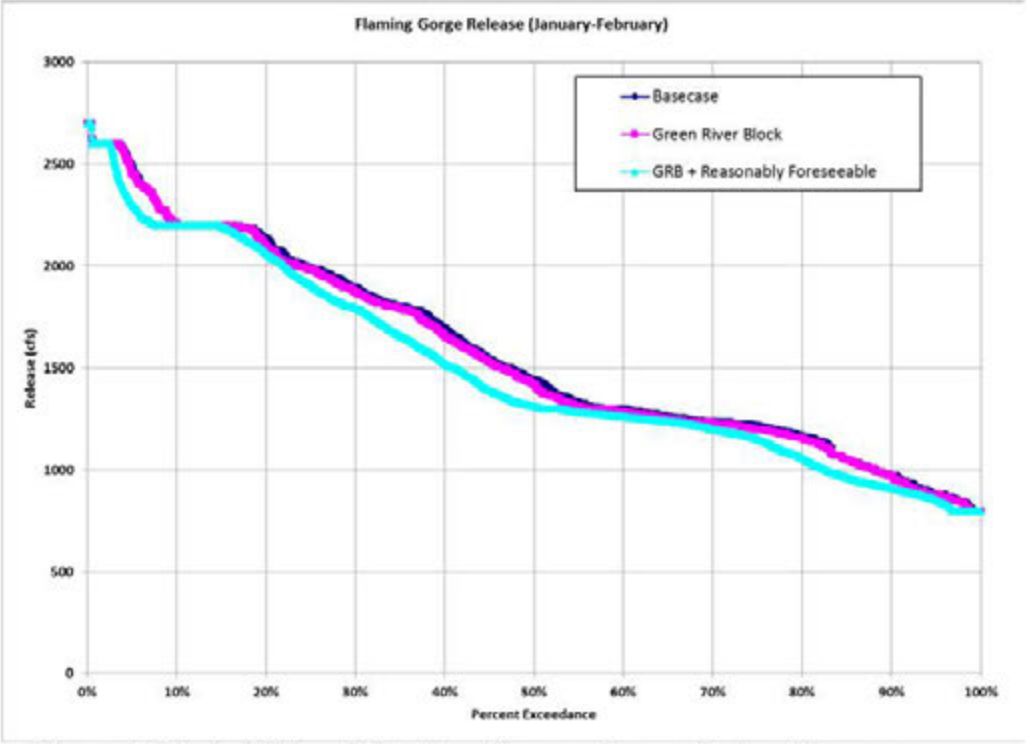


Figure 5. Probability of Flaming Gorge releases during January-February. Direct natural flow inflows, 59kaf Green River maximum depletion. Releases from Flaming Gorge in the no action and GRB depletion scenarios are almost identical. The addition of full depletion scenario causes a decrease in Flaming Gorge elevation that in turn decreases base flow releases to increase elevation where flexibility exists in Flaming Gorge operations.

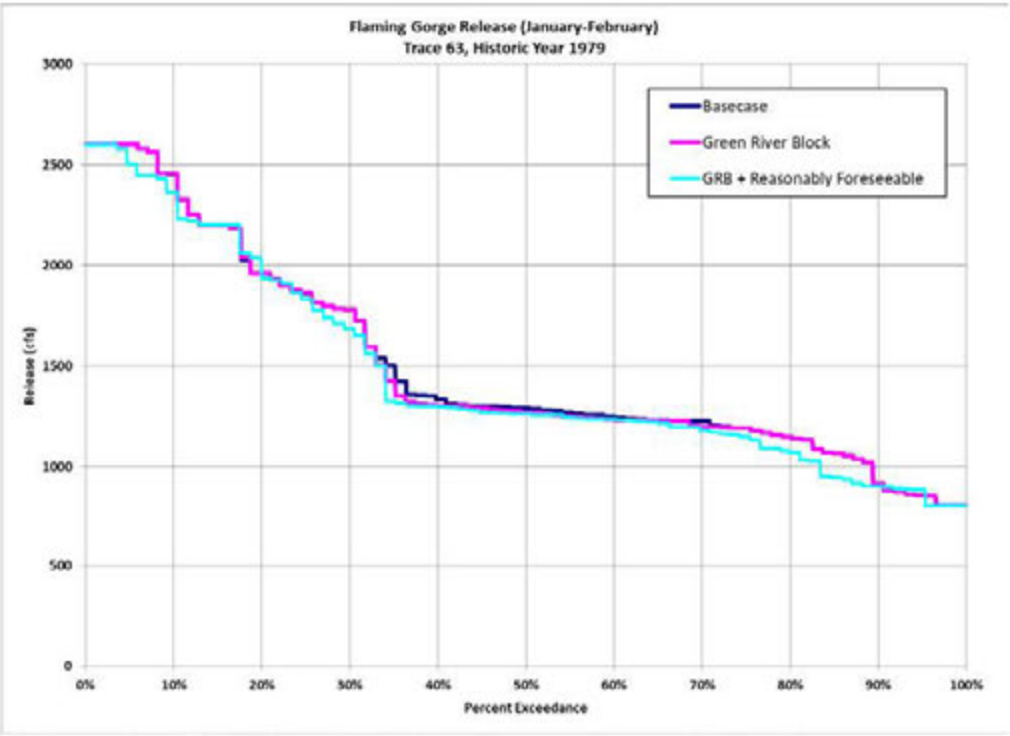


Figure 6. Probability of Flaming Gorge releases during January-February. Direct natural flow inflows, 59kaf Green River maximum depletion. Releases from Flaming Gorge in the no action and GRB depletion scenarios are almost identical. The addition of full depletion scenario causes a decrease in Flaming Gorge elevation that in turn decreases base flow releases to increase elevation where flexibility exists in Flaming Gorge operations.

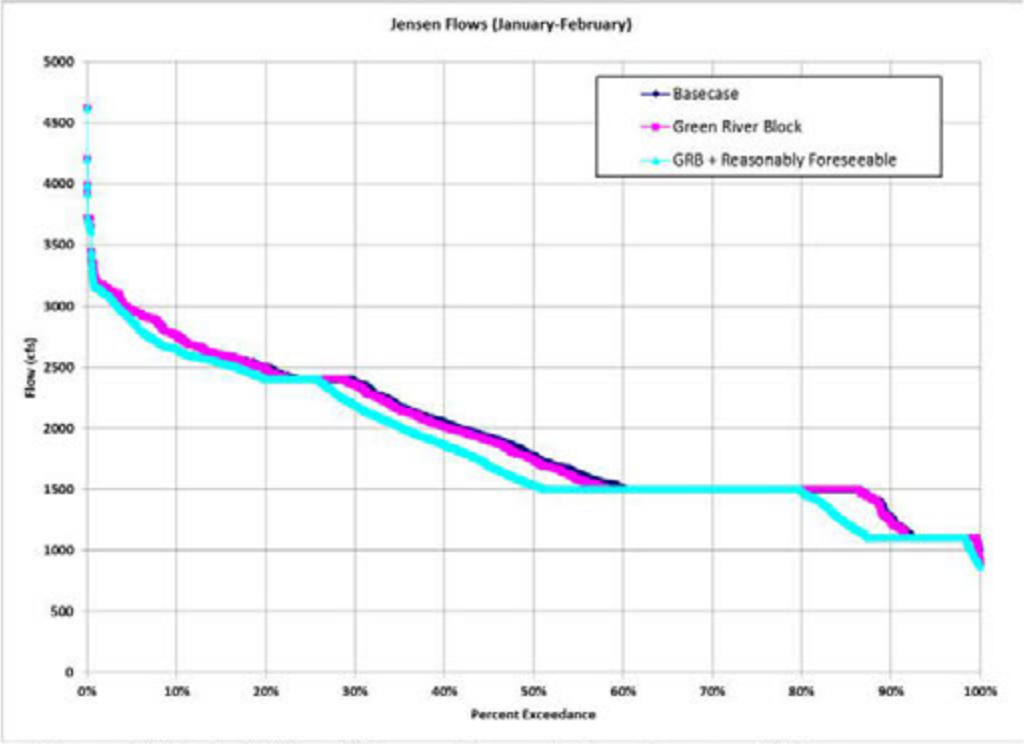


Figure 7. Probability of Jensen flows during January-February. Direct natural flow inflows, 59kaf Green River maximum depletion. Between both the 80 to 90 and 50 to 60 percent exceedance levels the full depletion scenario extends the minimum base flow duration at Jensen, Utah. The historic record includes some high precipitation months in January and February that are seen in the Jensen flows reaching above 4,500 cfs < 0.01 percent of the time.

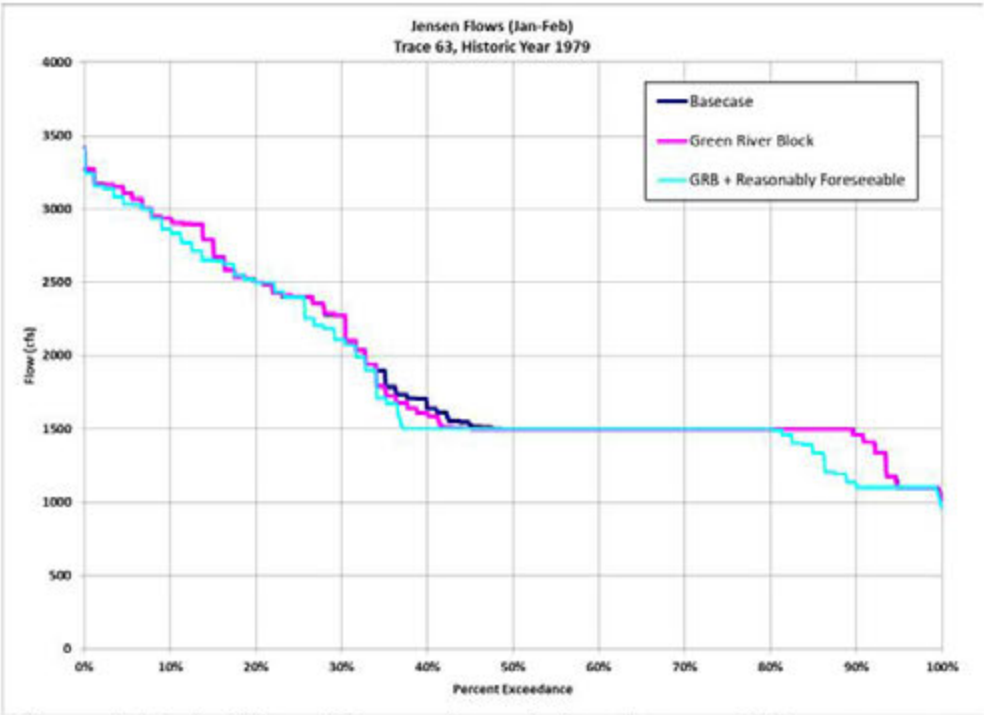


Figure 8. Probability of Jensen flows during January-February. Direct natural flow inflows, 59kaf Green River maximum depletion. Between both the 80 to 90 and 50 to 60 percent exceedance levels the full depletion scenario extends the minimum base flow duration at Jensen, Utah. The historic record includes some high precipitation months in January and February that are seen in the Jensen flows reaching above 4,500 cfs < 0.01 percent of the time.

March is a transition month where Flaming Gorge releases can be significantly higher or lower than the base flow period from August-February to achieve the May 1 elevation drawdown level as evidenced during the low exceedance probabilities (higher percentiles) for Flaming Gorge releases and subsequent Jensen flows in Figures 10-12. Releases above powerplant capacity (4,600 cfs) occur 4 percent of the time in all scenarios.

Figures 9-12 also present a similar story to the previous figures. Flaming Gorge and Jensen releases are nearly identical between the no action and GRB depletion scenarios, while the addition of the full depletion scenario extends minimum releases in March from 60 to 70 percent exceedance levels. Continued lower release levels, albeit not minimum releases, occur from 10 to 60 percent exceedance levels (50 percent of the time) to increase reservoir storage under the full depletion scenario.

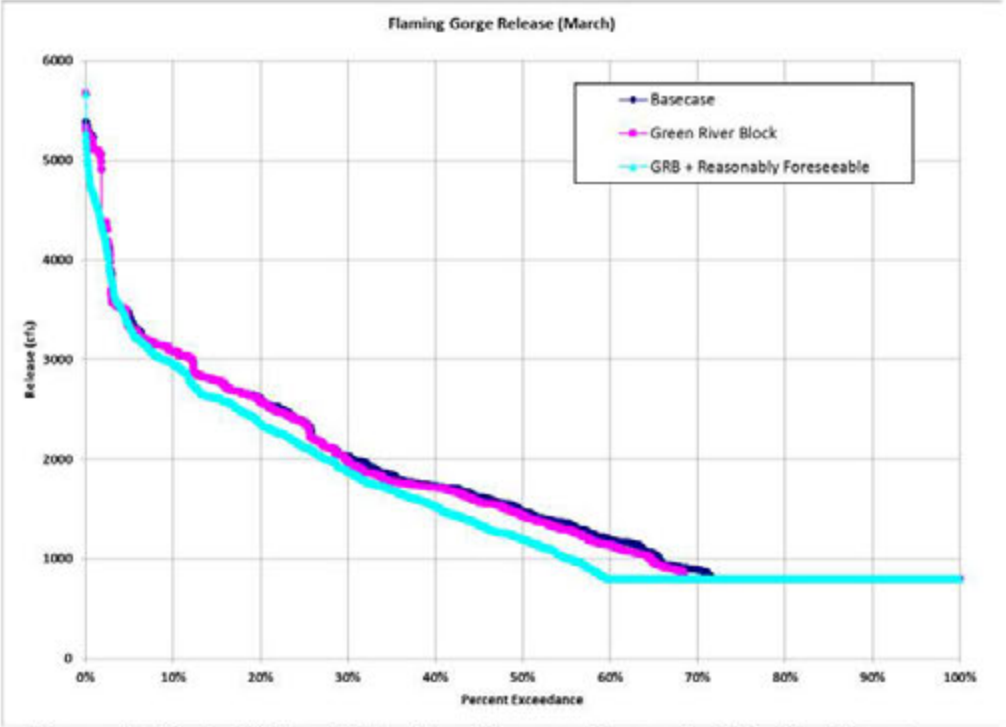


Figure 9. Probability of Flaming Gorge releases in March. Direct natural flow inflows, 59kaf Green River maximum depletion. March is a transition month where Flaming Gorge releases can be significantly higher or lower than the base flow period from August-February to achieve the May 1 elevation drawdown level as evidenced during the low exceedance probabilities (higher percentiles) for Flaming Gorge releases and subsequent Jensen flows in Figures 5 and 6. Releases above powerplant capacity (4,600 cfs) occur 4 percent of the time in all scenarios.

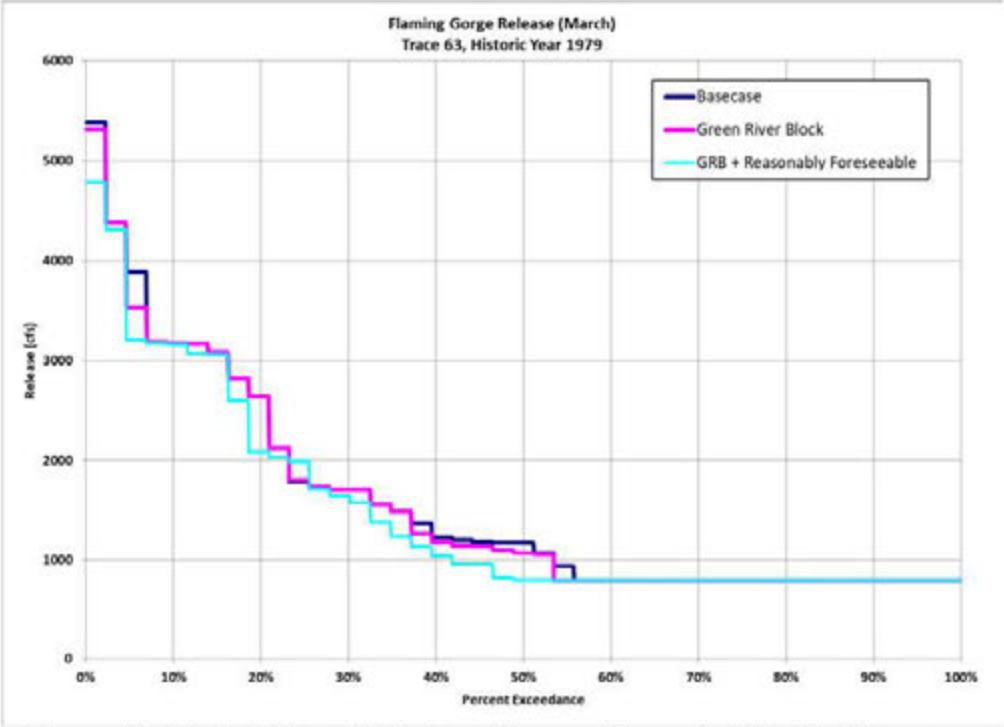


Figure 10. Probability of Flaming Gorge releases in March. Direct natural flow inflows, 59kaf Green River maximum depletion. March is a transition month where Flaming Gorge releases can be significantly higher or lower than the base flow period from August-February to achieve the May 1 elevation drawdown level as evidenced during the low exceedance probabilities (higher percentiles) for Flaming Gorge releases and subsequent Jensen flows in Figures 5 and 6. Releases above powerplant capacity (4,600 cfs) occur 4 percent of the time in all scenarios.

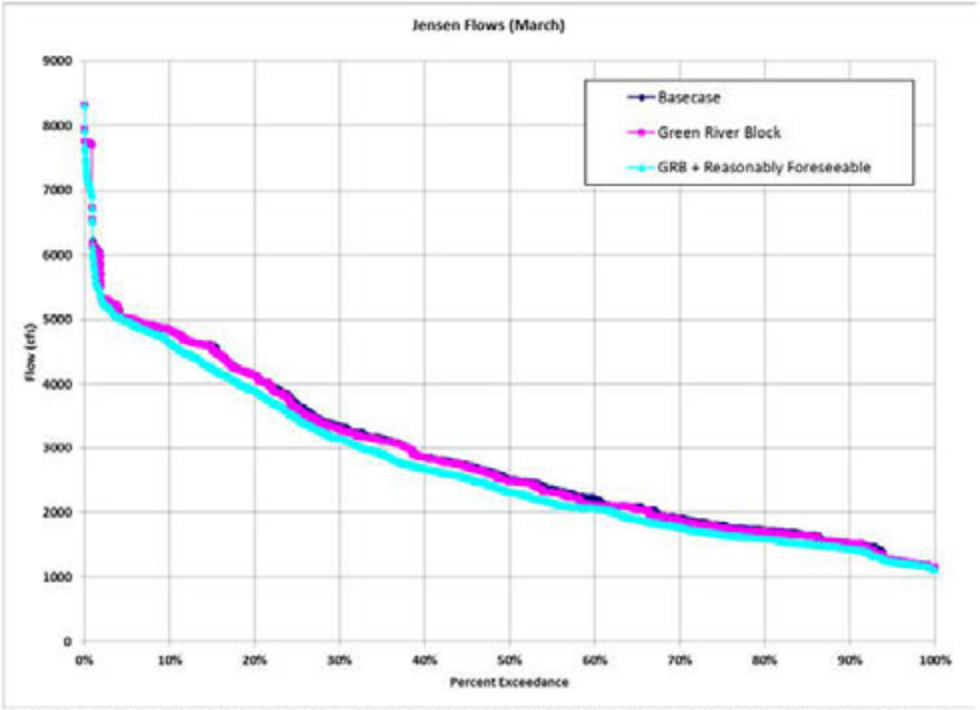


Figure 11. Probability of Jensen flows in March. Direct natural flow inflows, 59kaf Green River maximum depletion. March is a transition month where Flaming Gorge releases can be significantly higher or lower than the base flow period from August-February to achieve the May 1 elevation drawdown level as evidenced during the low exceedance probabilities (higher percentiles) for Flaming Gorge releases and subsequent Jensen flows in Figures 5 and 6. Releases above powerplant capacity (4,600 cfs) occur 4 percent of the time in all scenarios

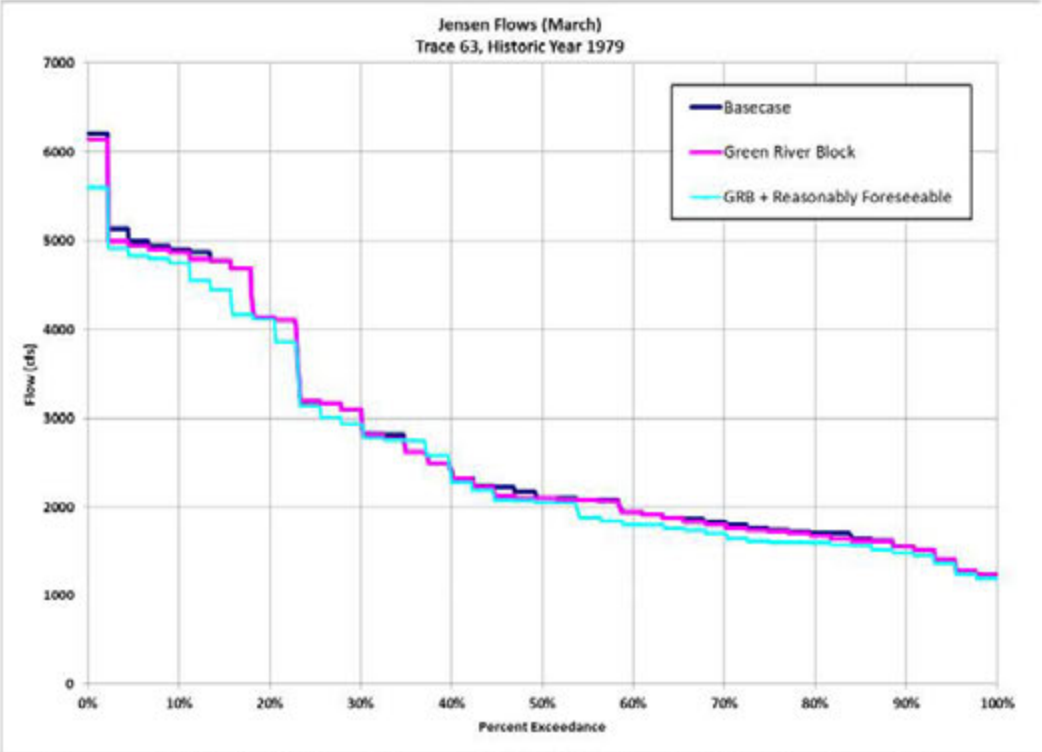


Figure 12. Probability of Jensen flows in March. Direct natural flow inflows, 59kaf Green River maximum depletion. March is a transition month where Flaming Gorge releases can be significantly higher or lower than the base flow period from August-February to achieve the May 1 elevation drawdown level as evidenced during the low exceedance probabilities (higher percentiles) for Flaming Gorge releases and subsequent Jensen flows in Figures 5 and 6. Releases above powerplant capacity (4,600 cfs) occur 4 percent of the time in all scenarios

Spring peak releases during the month of April are nearly identical under all scenarios. The full depletion scenario continues to release slightly less and minimum releases are extended an additional 10 percent of the time, as evidenced in Figure 13-14.

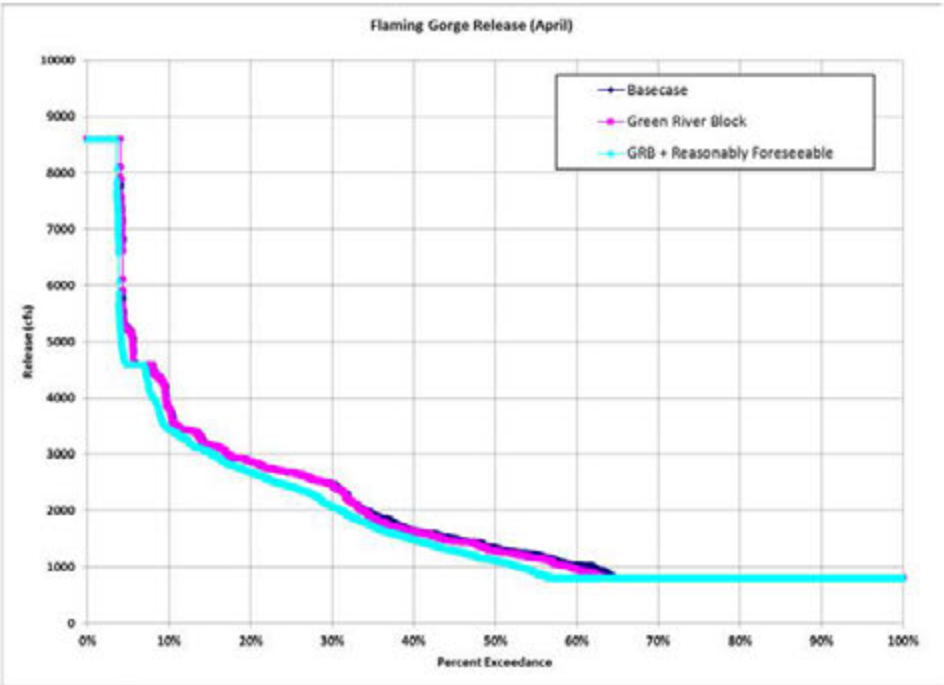


Figure 13. Probability of Flaming Gorge releases in April. Direct natural flow inflows, 59kaf Green River maximum depletion. Spring peak releases during the month of April are nearly identical under all scenarios. The full depletion scenario continues to release slightly less and minimum releases are extended an additional 10 percent of the time

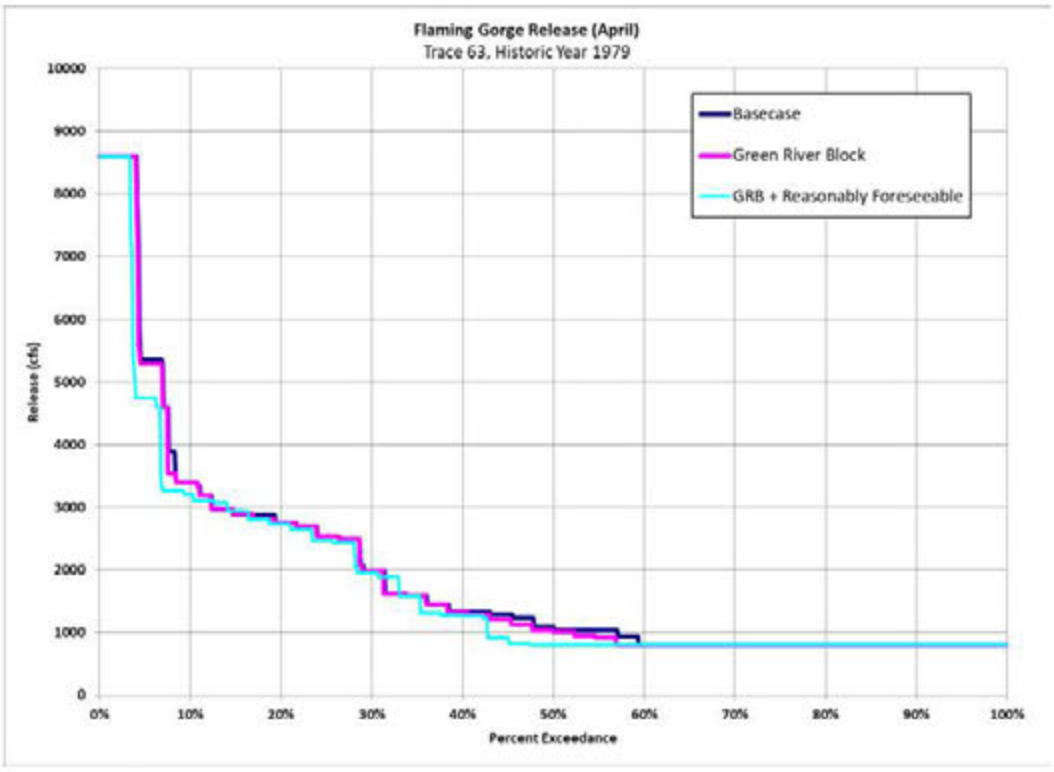
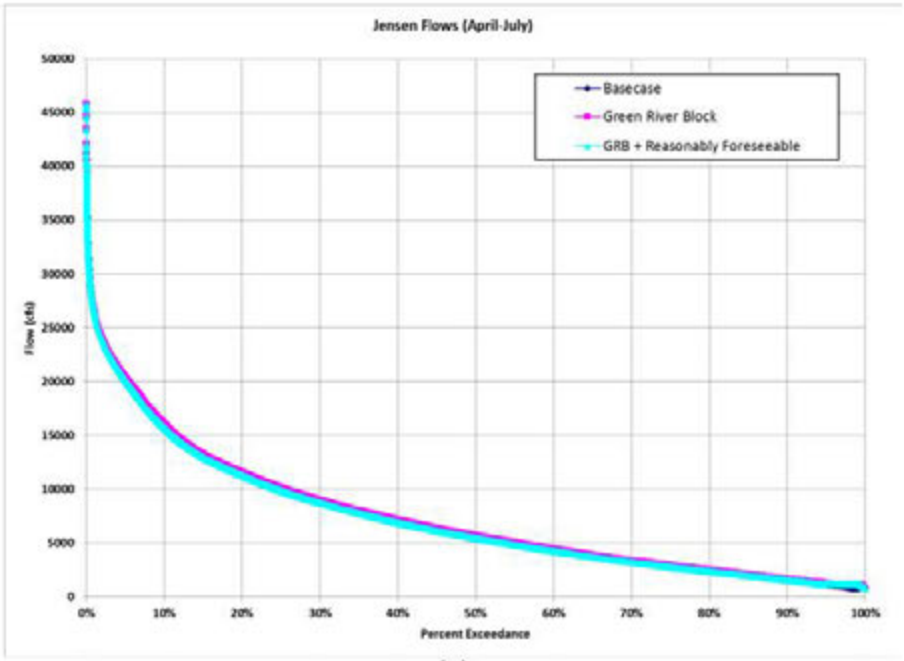
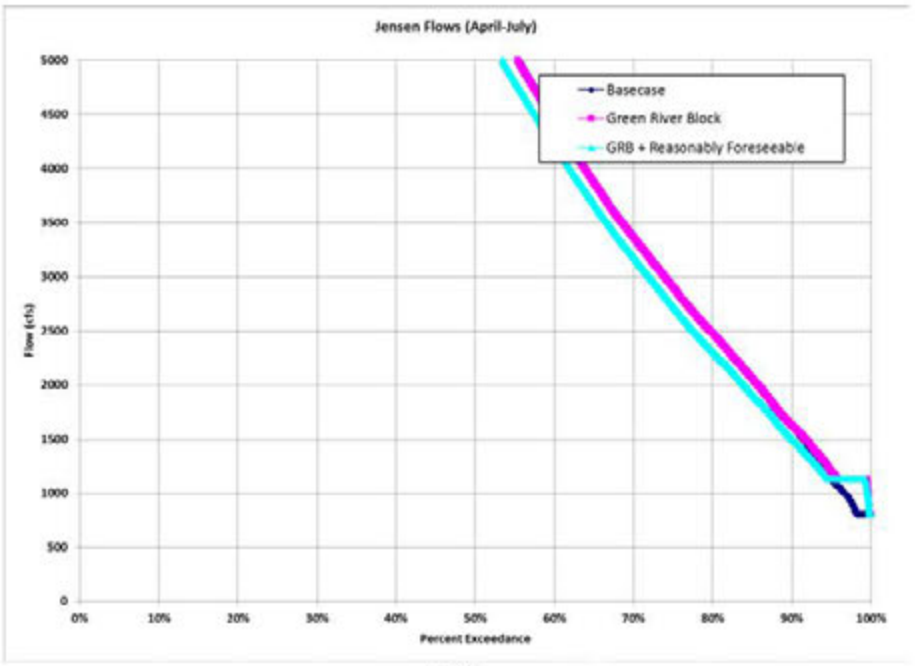


Figure 14. Probability of Flaming Gorge releases in April. Direct natural flow inflows, 59kaf Green River maximum depletion. Spring peak releases during the month of April are nearly identical under all scenarios. The full depletion scenario continues to release slightly less and minimum releases are extended an additional 10 percent of the time

Jensen flows for the April-July period are presented in Figure 15(a) and (b) and 16(a) and (b). The largely unregulated nature of the Yampa River and the daily disaggregation algorithm provide a significant range of flows on the Yampa that are illustrated in Figure 15(a) and 16(a). Jensen flows are below 5,000 cfs approximately 45 percent of the time, and Figure 15(b) and 16(b) focuses on those flows for increased optics. Jensen flows in the GRB scenario and the full depletion scenario are higher approximately 5 percent of the time when Flaming Gorge releases are increased in July to maintain Reach 2 flows, and are higher than the no action scenario. The slight decrease approximately 1 percent of the time can
be attributed to April flows that are outside the shift in timing for the GRB scenario releases.

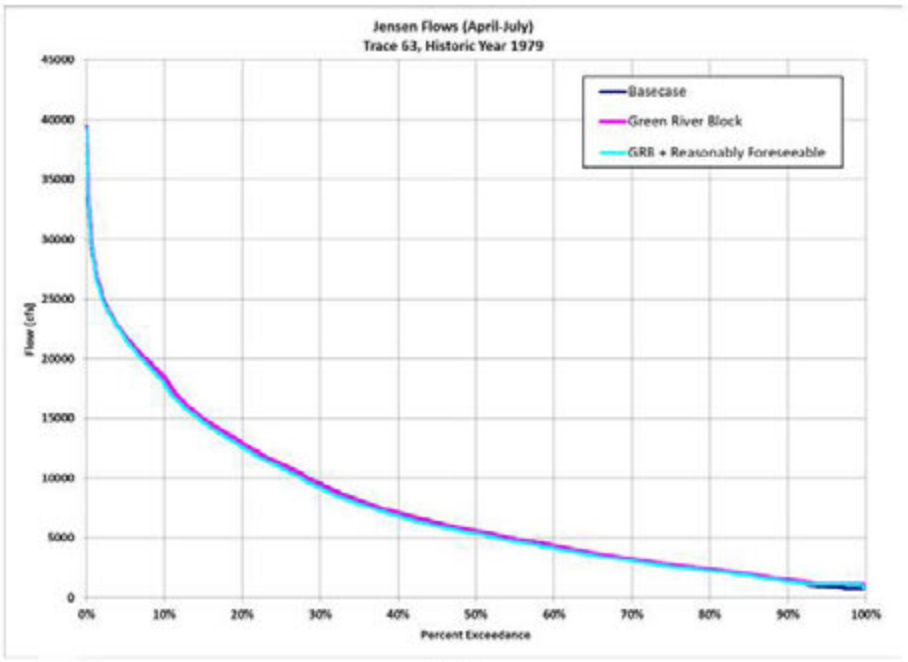


(a)

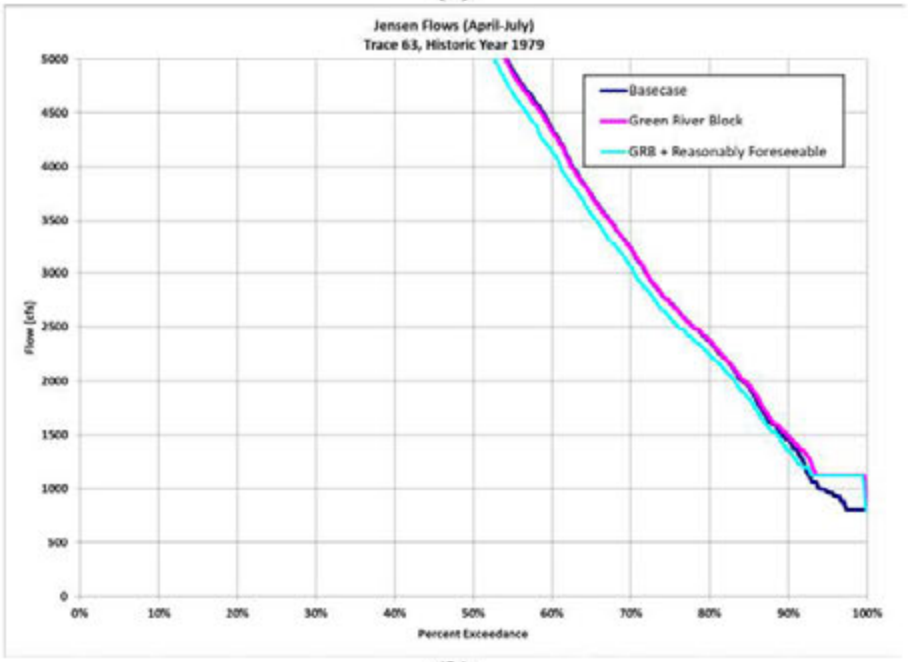


(b)

Figure 15. Probability of Jensen flows during April-July. Direct natural flow inflows, 59kaf Green River maximum depletion. The largely unregulated nature of the Yampa River and the daily disaggregation algorithm provide a significant range of flows on the Yampa that are illustrated in Figure 15(a). Jensen flows are below 5,000 cfs approximately 45 percent of the time, and Figure 15(b) focuses on those flows for increased optics. Jensen flows in the GRB scenario and the full depletion scenario are higher approximately 5 percent of the time when Flaming Gorge releases are increased in July to maintain Reach 2 flows, and are higher than the no action scenario. The slight decrease approximately 1 percent of the time can be attributed to April flows that are outside the shift in timing for the GRB scenario releases.



(a)



(b)

Figure 16. Probability of Jensen flows during April-July. Direct natural flow inflows, 59kaf Green River maximum depletion. The largely unregulated nature of the Yampa River and the daily disaggregation algorithm provide a significant range of flows on the Yampa that are illustrated in Figure 16(a). Jensen flows are below 5,000 cfs approximately 45 percent of the time, and Figure 16(b) focuses on those flows for increased optics. Jensen flows in the GRB

scenario and the full depletion scenario are higher approximately 5 percent of the time when Flaming Gorge releases are increased in July to maintain Reach 2 flows, and are higher than the no action scenario. The slight decrease approximately 1 percent of the time can be attributed to April flows that are outside the shift in timing for the GRB scenario releases.

The maximum daily flow at the Jensen gage is presented in Figures 17-20. The ROD requires meeting a daily maximum of 18,600 cfs 50 percent of the time, which is indicated by the horizontal black line on the graph. The no action along with the GRB and full depletion scenarios have similar results for the maximum daily flow at Jensen. All three scenarios indicate that meeting the daily maximum flow at Jensen at or above 18,600 cfs 50 percent of the time is not achievable under historic hydrology used in this modeling scenario. Differences between this analysis and the analysis outlined in the FGFEIS are responsible for the result regarding achievability of annual peak flows at Jensen, Utah. The FGFEIS historic record ended in 1996, while this hydrologic record continues through 2015. The extended record includes the lowest hydrologic period on record beginning in the year 2000. Additionally, the modeling ruleset makes assumptions regarding use of bypass and operational constraints in order to determine necessary steps needed to meet target flows. These modeling results provide information to Reclamation that will be used to operate to meet the 18,600 cfs annual peak target at Jensen, Utah at least 50 percent of the time.

Flaming Gorge ROD commitments also include flows at Jensen to meet or exceed 18,600 cfs for a duration of 14 days at least 40 percent of the time. Figure 10 illustrates the probability of meeting 18,600 cfs for a consecutive 14-day period, which is a stricter standard than the ROD that requires 18,600 cfs for a cumulative total of 14 days at least 40 percent of the time during the spring release period. Based on the conservative estimate, Figure 10 indicates that Jensen flows would remain at or above 18,600 cfs for a consecutive 14-day period approximately 25 percent of the time under all three scenarios. No difference exists between the no action and action alternatives, while the full depletion scenario indicates slightly lower releases caused by the increased depletions in the system.

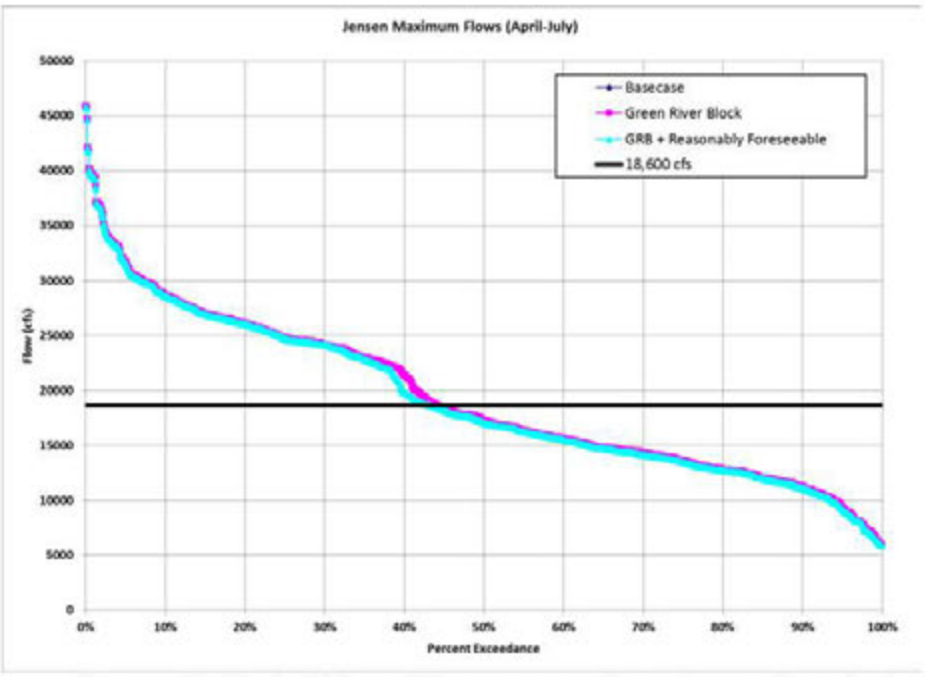


Figure 17. Probability of Jensen annual maximum flow during April-July. Direct natural flow inflows, 59kaf Green River maximum depletion.

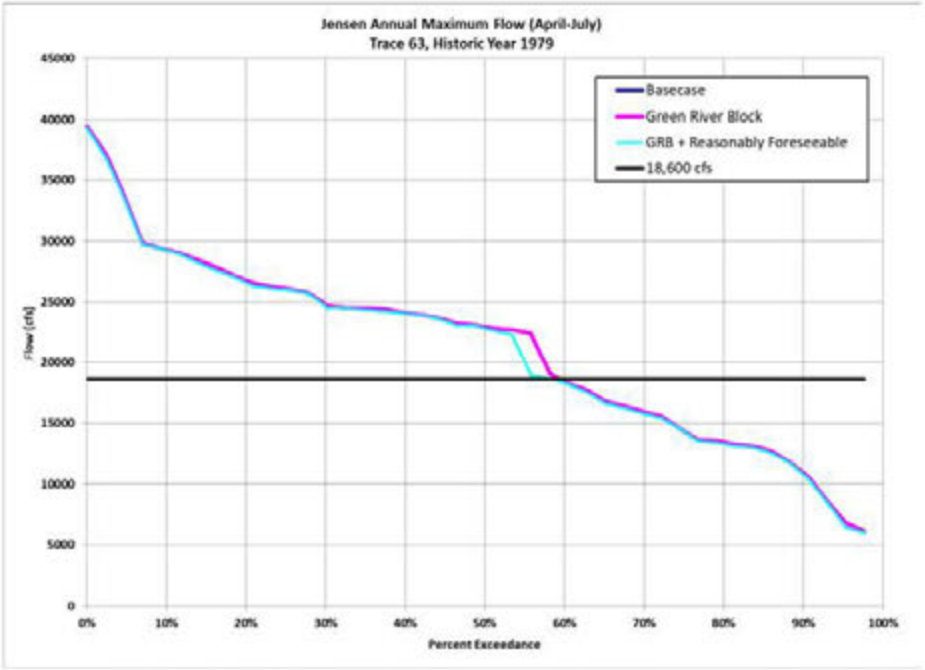


Figure 18. Probability of Jensen annual maximum flow during April-July. Direct natural flow inflows, 59kaf Green River maximum depletion.

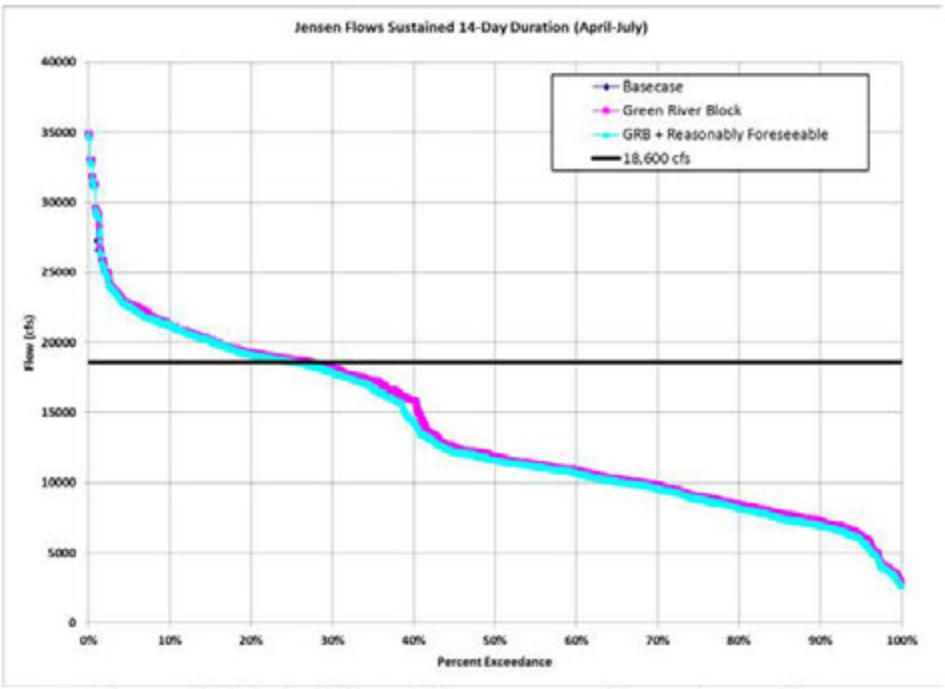


Figure 19. Probability of Jensen annual maximum flow sustained for 14 consecutive days during April-July. Direct natural flow inflows, 59kaf Green River maximum depletion.

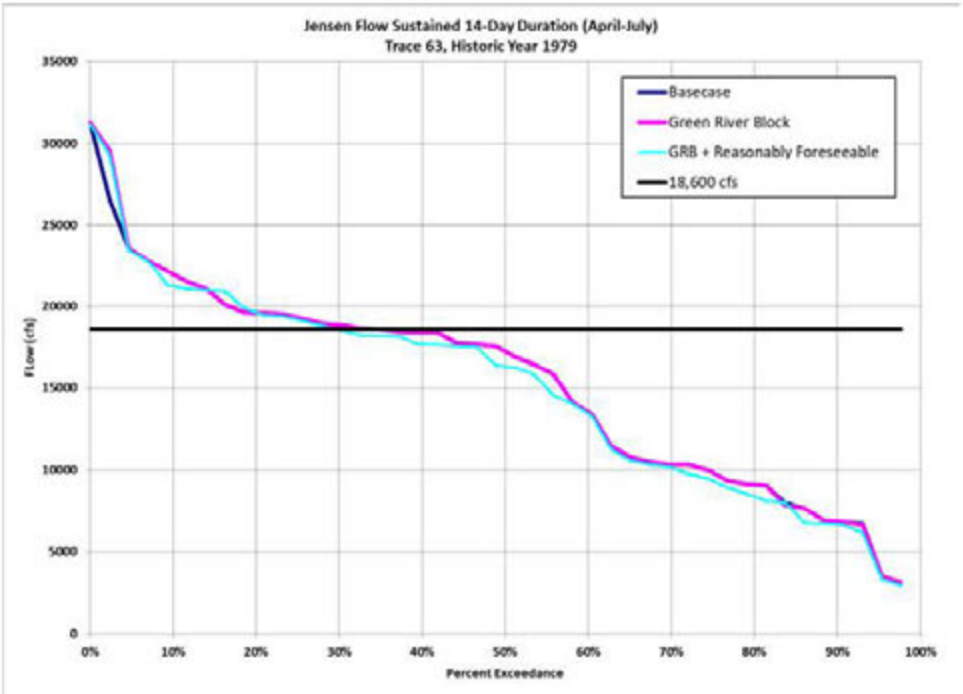


Figure 20. Probability of Jensen annual maximum flow sustained for 14 consecutive days during April-July. Direct natural flow inflows, 59kaf Green River maximum depletion.

Flaming Gorge Dam is operated to meet Reach 2 targets by incorporating the Yampa River flows and accounting for the GRB depletions total volume averaged daily over the July through September period. The results of the GRB depletion can be seen in Figures 21 and 22 where the full depletion scenario results in slightly lower flows around 50 percent of the time. The GRB depletions and total depletion releases from Flaming Gorge are similar above 65 percent exceedance, or 35 percent of the time, at higher releases than the no action scenario. The GRB depletion and full depletion scenarios are higher to maintain Reach 2 flows and compensate for higher depletion rates below Flaming Gorge Dam.

The results of Flaming Gorge releases on Reach 2 flows can be seen in Figures 19 and 20 on the Green River at Jensen. Figures 23-24 illustrates the likelihood of wet year flows extending into July with the total flows at Jensen approximately 26,000 cfs at the highest levels. Targeting the impacts of releases from Flaming Gorge to flows at Jensen during lower baseflows can be seen in Figures 25-26, which illustrates Jensen flows for August through September. The more granular view of Reach 2 flows during the August through September period indicates that Yampa flows provide a significant portion of Reach 2 flows with the no action and GRB scenario flows similar until approximately 65 percent exceedance level or 35 percent of the time, when the GRB scenario increases releases above the no action. The full depletion scenario remains lower than the base case to increase reservoir storage at less than 70 percent exceedance or 30 percent of the time, at which time Flaming Gorge releases increase the full depletion scenario above the base case. The no action scenario has lower flows than either GRB or full depletion scenarios when the minimum flow release target from Flaming Gorge Reservoir has essentially been altered to compensate for the depletion scenarios during drier hydrology.

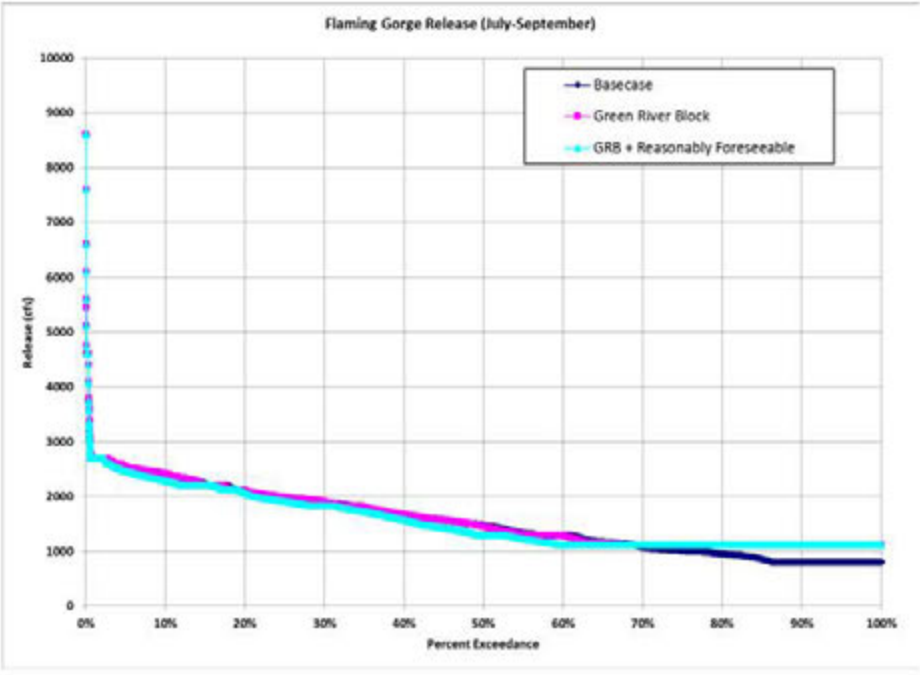


Figure 21. Probability of Flaming Gorge releases during July-September. Direct natural flow inflows, 59kaf Green River maximum depletion.

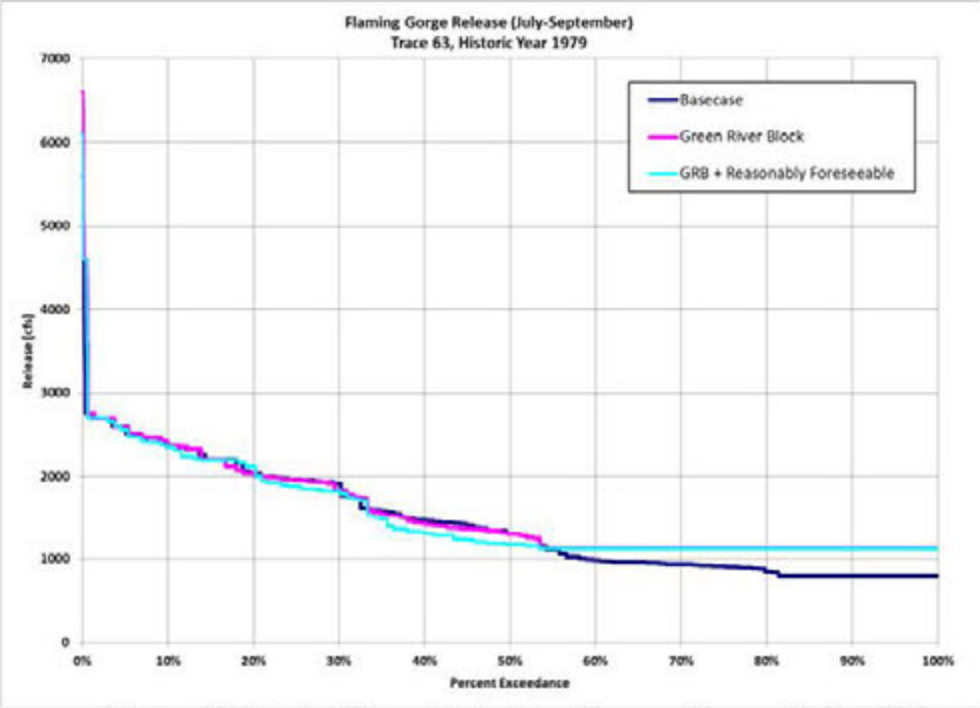


Figure 22. Probability of Flaming Gorge releases during July-September. Direct natural flow inflows, 59kaf Green River maximum depletion.

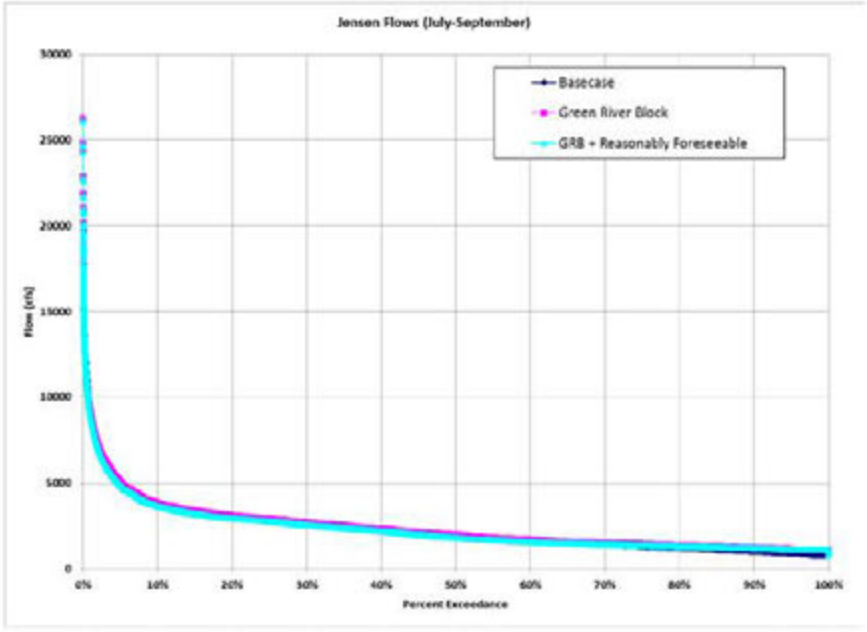


Figure 23. Probability of Jensen flows during July-September. Direct natural flow inflows, 59kaf Green River maximum depletion.

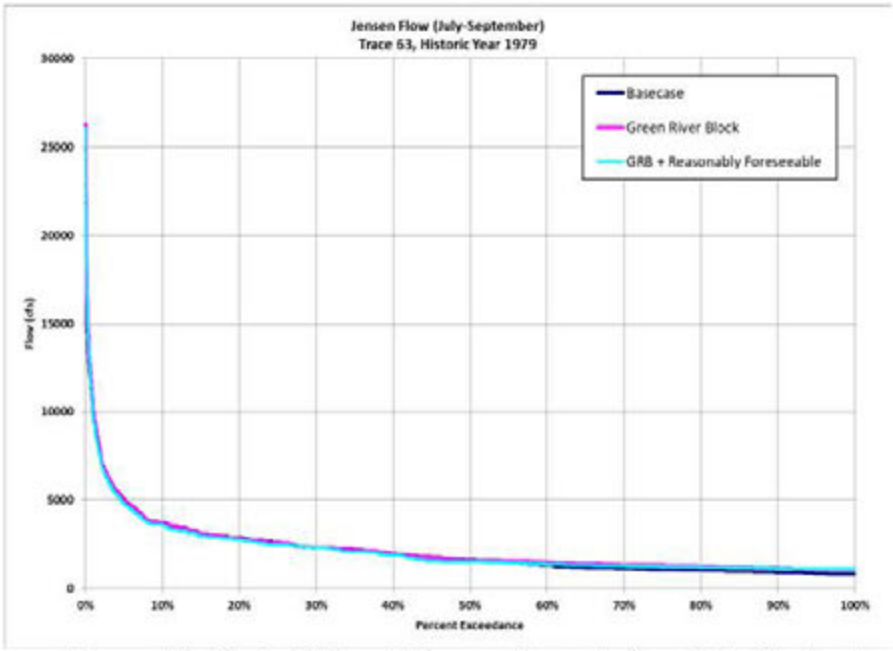


Figure 24. Probability of Jensen flows during July-September. Direct natural flow inflows, 59kaf Green River maximum depletion.

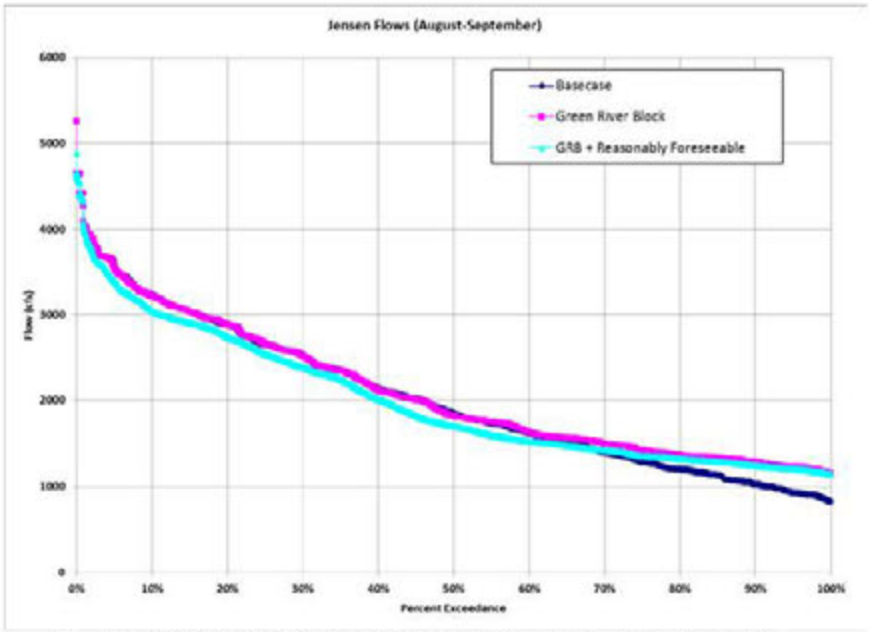


Figure 25. Probability of Jensen flows during August-September. Direct natural flow inflows, 59kaf Green River maximum depletion.

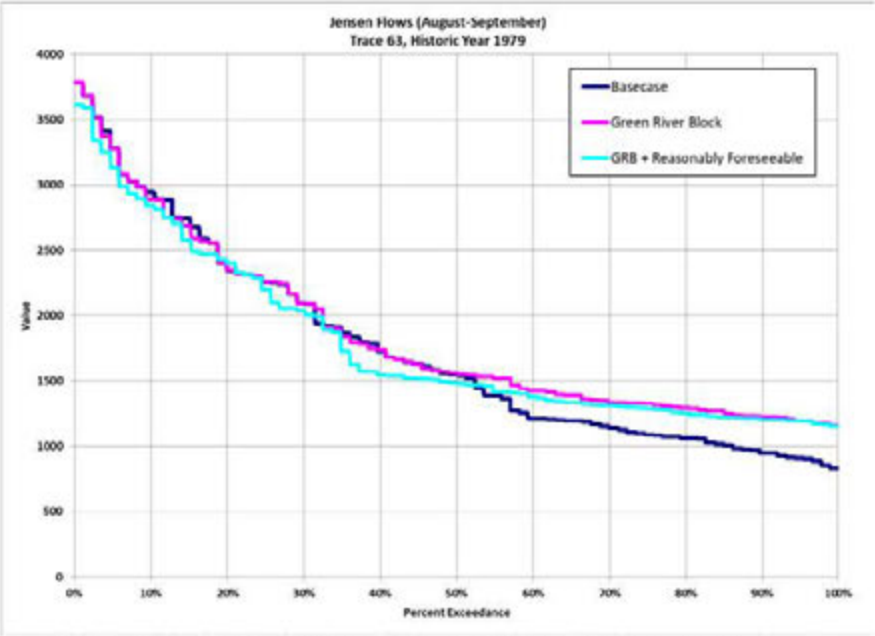


Figure 26. Probability of Jensen flows during August-September. Direct natural flow inflows, 59kaf Green River maximum depletion.

The GRB depletion ends on September 30, and the remaining months of the year are used to increase reservoir storage within the ROD base flow requirements. The base flows during the October through December time frame are evaluated in Figures 27 and 28 for Flaming Gorge releases and Figures 29-30 for Jensen flows. Flaming Gorge releases are maintained at minimum 800 cfs levels approximately 10 percent more time than the no action, and are at minimum releases for 25 percent of the time. The GRB depletion scenario maintains slightly lower releases as compared to the no action until 45 percent of the time after which releases converge with the no action scenario during October-December. The full depletion scenario increases the duration at minimum 800 cfs releases 20 percent of the time as compared against the no action, and releases are lower than the no action during the entire October through December period.

The impact to Reach 2 Jensen flows for the GRB depletion during October through December is negligible as shown in Figures 27 and 28, with the addition of Yampa River flows assisting overall flows at Jensen. The full depletion scenario maintains approximately 250 cfs lower flows at Jensen 80 percent of the time. This corresponds to 13-17 percent of the total flow volume seen at Jensen.

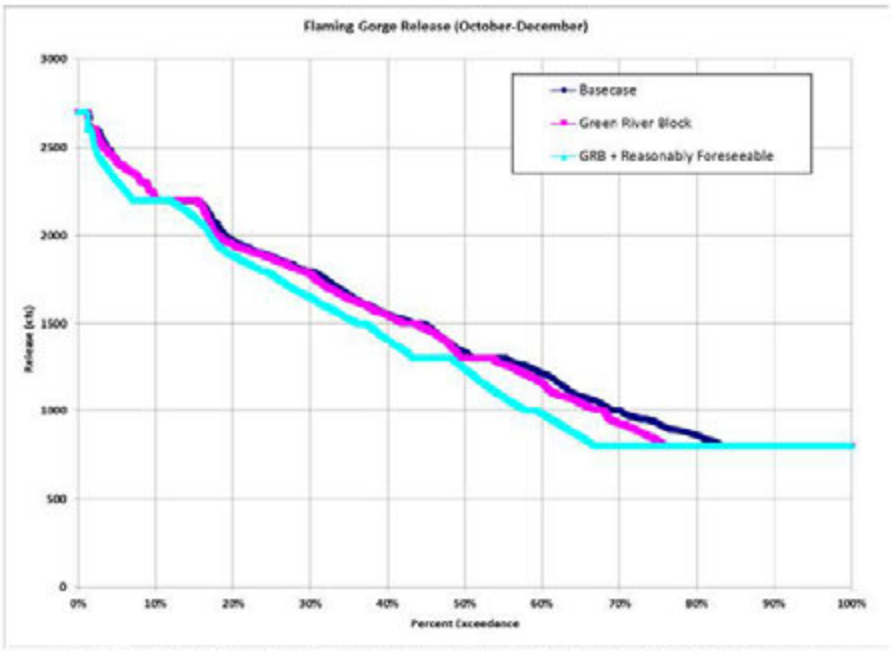


Figure 27. Probability of Flaming Gorge releases during October-December. Direct natural flow inflows, 59kaf Green River maximum depletion.

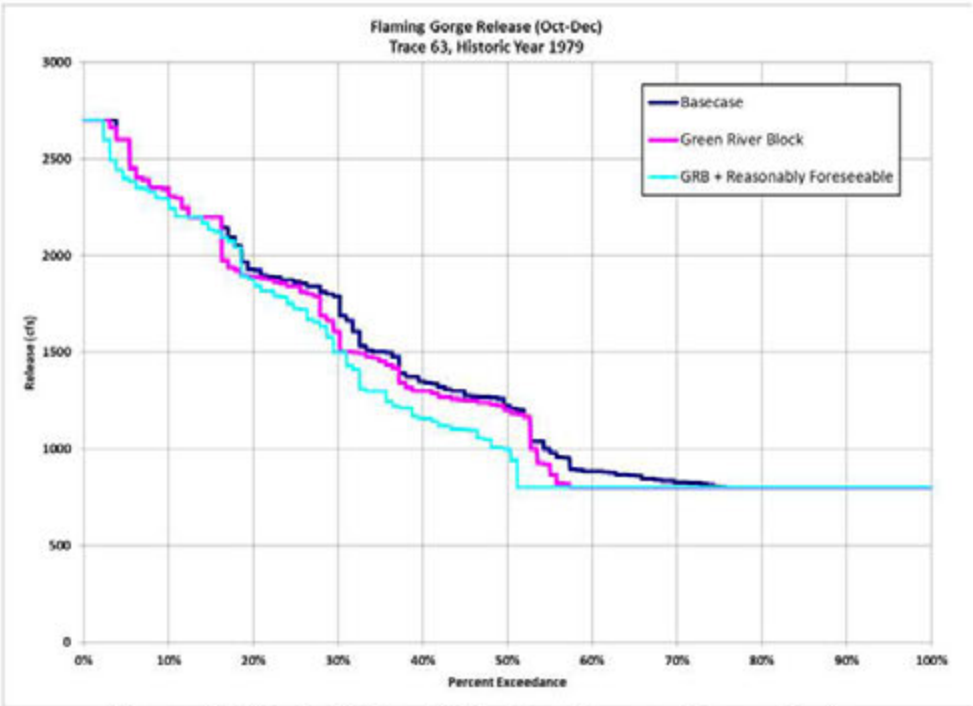


Figure 28. Probability of Flaming Gorge releases during October-December. Direct natural flow inflows, 59kaf Green River maximum depletion.

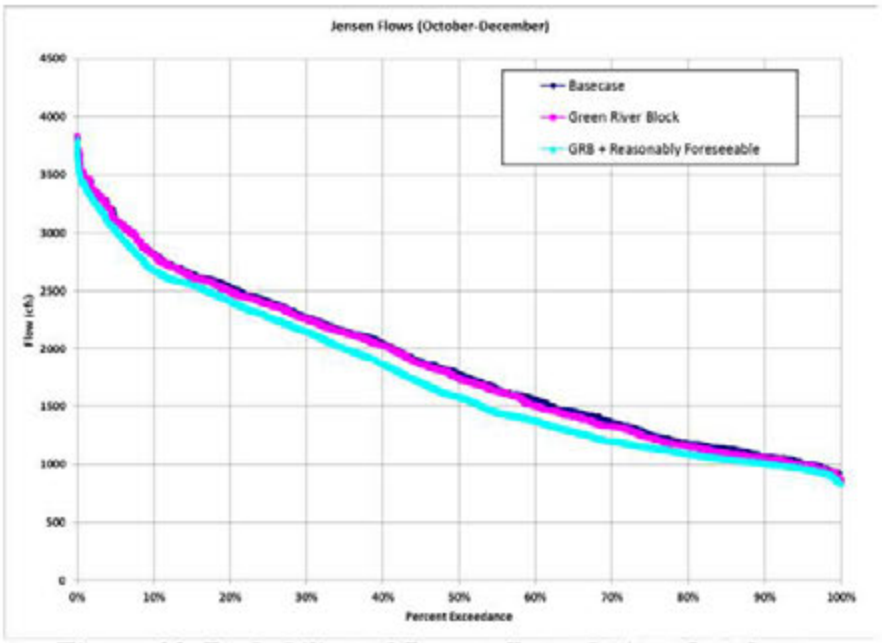


Figure 29. Probability of Jensen flows during October-December. Direct natural flow inflows, 59kaf Green River maximum depletion.

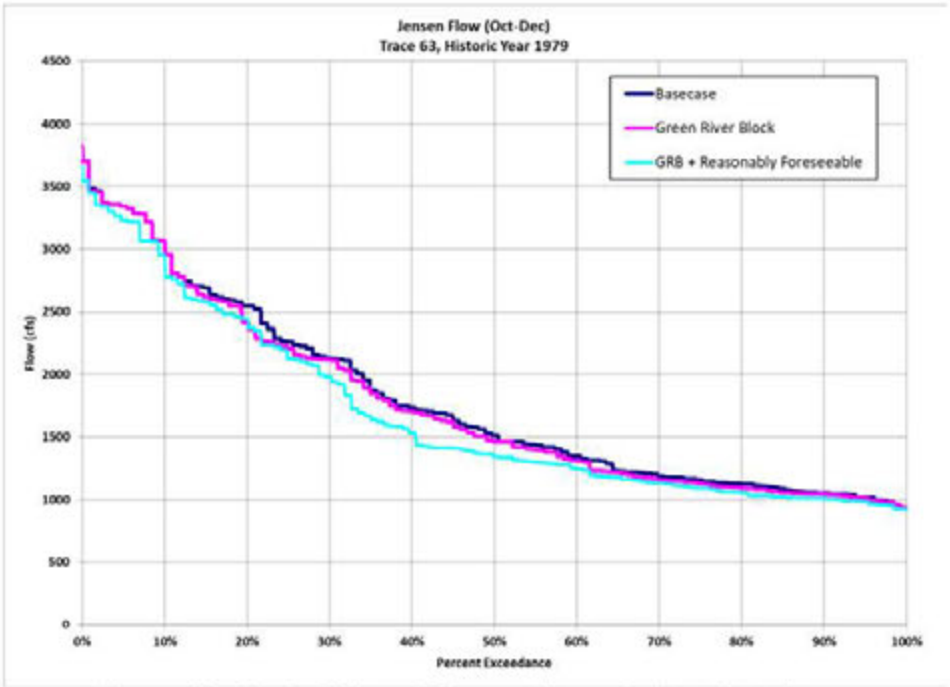


Figure 30. Probability of Jensen flows during October-December. Direct natural flow inflows, 59kaf Green River maximum depletion.

Discussion

The results from these hydrologic model runs should be interpreted with consideration to the model assumptions. Unique to this analysis is the model assumption that no new projects or depletions will occur in the Upper Basin. This model assumption adopts a rigorous definition of what reasonably foreseeable future depletions are in the Upper Basin and is consistent with Reclamation's NEPA guidelines. Under this approach, a reasonably foreseeable future depletion is one which has state legislation, or a tribal resolution or federal Indian water settlement, or a federal finding of no significant impact (FONSI) or record of decision (ROD). These are the criteria of certainty that a future depletion would occur at a particular time and place. This is a conservative approach to modeling the alternatives and takes the strictest approach to defining what is included and excluded for the cumulative impact analysis required by the Council on Environmental Quality's regulations 40 CFR 1508.7.[6]

It is recognized that the Upper Basin States plan to develop their compact allocated Colorado River water and, as such, it is highly unlikely that depletions will remain at the 2018 level in the future.

It should also be noted that the modeling effect of holding most Upper Basin depletions constant at 2018 levels results in depletions significantly lower than the future long-term depletion projections provided by the Upper Basin States which assume that Upper Basin depletions will grow through 2060. The current ROD at Flaming Gorge and its five hydrologic classifications has essentially turned the operations into a pass-through reservoir where the inflows equal the outflows during most years, except for extremely dry years when minimum releases decrease reservoir elevations. Lower depletions would result in higher reservoir elevations overall, but releases would essentially remain the same.

Note that these model results do not represent what the actual reservoir elevations or releases will be in any particular year. Model results should be interpreted based on the relative differences between the action and no action alternatives.

The results presented in this report are the product of statistical analysis performed on model results from the 110 (DNF) model traces.

[6] Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Appendix A

Flaming Gorge Final Environmental Impact Statement

Table 2.1: Recommended Magnitudes and Durations Based on Flows and Temperatures for Endangered Fishes in the Green River Downstream from Flaming Gorge Dam as Identified in the 2000 Flow and Temperature Recommendations

Table 2-1.—Recommended Magnitudes and Duration of Maximum Spring Peak and Summer-to-Winter Base Flows and Temperatures for Endangered Fishes in the Green River Downstream From Flaming Gorge Dam as Identified in the 2000 Flow and Temperature Recommendations

Location	Flow and Temperature Characteristics	Hydrologic Conditions and 2000 Flow and Temperature Recommendations[1]				
		Wet[2] (0–10% Exceedance)	Moderately Wet[3] (10–30% Exceedance)	Average[4] (30–70% Exceedance)	Moderately Dry[5] (70–90% Exceedance)	Dry[6] (90–100% Exceedance)
Reach 1 Flaming Gorge Dam to Yampa River	Maximum Spring Peak Flow	• 8,600 cfs (244 cubic meters per second [m^3/s])	• 4,600 cfs (130 m^3/s)	• 4,600 cfs (130 m^3/s)	• 4,600 cfs (130 m^3/s)	• 4,600 cfs (130 m^3/s)
	Peak flow duration is dependent upon the amount of unregulated inflows into the Green River and the flows needed to achieve the recommended flows in Reaches 2 and 3.					
	Summer-to-Winter Base Flow	1,800–2,700 cfs (50–60 m^3/s)	1,500–2,600 cfs (42–72 m^3/s)	800–2,200 cfs (23–62 m^3/s)	800–1,300 cfs (23–37 m^3/s)	800–1,000 cfs (23–28 m^3/s)
Above Yampa River Confluence	Water Temperature Target	• 64 degrees Fahrenheit (°F) (18 degrees Celsius [°C]) for 3-5 weeks from mid-August to March1	• 64 °F (18 °C) for 3-5 weeks from mid-August to March 1	• 64 °F (18 °C) for 3-5 weeks from mid-July to March 1	• 64 °F (18 °C) for 3-5 weeks from June to March 1	• 64 °F (18 °C) for 3-5 weeks from mid-June to March 1
Reach 2 Yampa River to White River	Maximum Spring Peak Flow	• 26,400 cfs (748 m^3/s)	• 20,300 cfs (575 m^3/s)	• 18,600 cfs[7] (527 m^3/s) • 8,300 cfs[8] (235 m^3/s)	• 8,300 cfs (235 m^3/s)	• 8,300 cfs (235 m^3/s)
	Peak Flow Duration	Flows greater than 22,700 cfs (643 m^3/s) should be maintained for 2 weeks or more, and flows 18,600 cfs (527 m^3/s) for 4 weeks or more.	Flows greater than 18,600 cfs (527 m^3/s) should be maintained for 2 weeks or more.	Flows greater than 18,600 cfs (527 m^3/s) should be maintained for 2 weeks in at least 1 of 4 average years.	Flows greater than 8,300 cfs (235 m^3/s) should be maintained for at least 1 week.	Flows greater than 8,300 cfs (235 m^3/s) should be maintained for 2 days or more except in extremely dry years (98% exceedance)
	Summer-to-Winter Base Flow	2,800–3,000 cfs (79–85 m^3/s)	2,400–2,800 cfs (69–79 m^3/s)	1,500–2,400 cfs (43–67 m^3/s)	1,100–1,500 cfs (31–43 m^3/s)	900–1,100 cfs (26–31 m^3/s)
Below Yampa River Confluence	Water Temperature Target	Green River should be no more than 9 °F (5 °C) colder than Yampa River during summer base flow period.	Green River should be no more than 9 °F (5 °C) colder than Yampa River during summer base flow period.	Green River should be no more than 9 °F (5 °C) colder than Yampa River during summer base flow period.	Green River should be no more than 9 °F (5 °C) colder than Yampa River during summer base flow period.	Green River should be no more than 9 °F (5 °C) colder than Yampa River during summer base flow period.
Reach 3 White River to Colorado River	Maximum Spring Peak Flow	• 39,000 cfs (1,104 m^3/s)	• 24,000 cfs (680 m^3/s)	• 22,000 cfs[9] (623 m^3/s)	• 8,300 cfs (235 m^3/s)	• 8,300 cfs (235 m^3/s)
	Peak Flow Duration	Flows greater than 24,000 cfs (680 m^3/s) should be maintained for 2 weeks or more, and flows 22,000 cfs (623 m^3/s) for 4 weeks or more.	Flows greater than 22,000 cfs (623 m^3/s) should be maintained for 2 weeks or more.	Flows greater than 22,000 cfs (623 m^3/s) should be maintained for 2 weeks in at least 1 of 4 average years.	Flows greater than 8,300 cfs (235 m^3/s) should be maintained for at least 1 week.	Flows greater than 8,300 cfs (235 m^3/s) should be maintained for 2 days or more except in extremely dry years (98% exceedance)
	Summer-to-Winter Base Flow	3,200–4,700 cfs (92–133 m^3/s)	2,700–4,700 cfs (76–133 m^3/s)	1,800–4,200 cfs (52–119 m^3/s)	1,500–3,400 cfs (42–95 m^3/s)	1,300-2,600 cfs (32–72 m^3/s)

Appendix B Draft Water Exchange Contract

UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

COLORADO RIVER STORAGE PROJECT
FLAMING GORGE STORAGE UNIT

CONTRACT FOR EXCHANGE OF WATER
GREEN RIVER BLOCK

BETWEEN THE UNITED STATES OF AMERICA
AND THE STATE OF UTAH

THIS CONTRACT, made this _____ day of _____, 20___, under the Act of June 17, 1902 (32 Stat. 388), and acts amendatory thereof and supplementary thereto, and particularly the Colorado River Storage Project (CRSP) Act of April 11, 1956 (43 U.S.C. § 620, et seq.) (CRSP Act), and the Reclamation Project Act of 1939, Section 14 (43 U.S.C. § 389), all collectively referred to as the Federal Reclamation Laws, is between the UNITED STATES OF AMERICA (United States), acting through the Bureau of Reclamation (Reclamation), represented by the Contracting Officer executing this Contract, and the STATE OF UTAH, acting through the Utah Board of Water Resources (Board).

RECITALS

a. The CRSP Act authorized construction and operation and maintenance (O&M) of facilities for the purposes of, among other things, making it possible for the states of the Colorado River Upper Basin, including the State of Utah, to utilize their apportionments of water under the 1922 Colorado River Compact and the 1948 Upper Colorado River Basin Compact (collectively Compacts).

b. The United States constructed the Flaming Gorge (FG) Unit, as an initial storage unit of the CRSP, as authorized by the CRSP Act. The FG Unit is located on the Green River in the State of Utah, and impounds Flaming Gorge Reservoir, which lies within the States of Utah and Wyoming. Flaming Gorge Dam is located on the upper mainstem of the Green River in northeastern Utah.

c. Below the FG Dam, the Green River supports populations of four endangered native fishes. The Upper Colorado River Endangered Fishes Recovery Program (Recovery Program) was established in 1988 under an agreement signed by Reclamation and the

states of Colorado, Utah, and Wyoming to recover the endangered fishes while allowing for continued water development in the Upper Basin. Operation of the FG Dam influences downstream flow and temperature regimes, the ecology of the Green River, and recovery of the native fishes. Downstream of the FG Dam, the Green River is joined by the Yampa, White, and Duchesne Rivers, and portions of each have been designated as critical habitat under provisions of the Endangered Species Act of 1973 (16 U.S.C. § 1531-1544) (ESA). Reclamation's current obligations for the recovery of the endangered fish in the Green River, through implementation of the ESA, were established in the 2006 Record of Decision (2006 ROD) on the Operation of Flaming Gorge Dam Final Environmental Impact Statement (FEIS).

d. Reclamation's commitment, as described in the 2006 ROD, is to manage FG Dam releases in Reach 1 (immediately below the dam) to meet Reach 2 flow targets, as measured with the United States Geological Survey (USGS) stream gauge on the Green River at Jensen, Utah. The assumption, based on the then projected hydrology and depletions in the 2006 ROD analysis, was that Reach 3 targets measured with the USGS stream gauge on the Green River at Green River, Utah, would be met once Reach 2 targets were met.

e. The CRSP Act authorized the construction of sixteen participating projects, including the Central Utah Project (CUP). Because of its size and complexity, Reclamation divided the CUP into six units to be built in two phases. The "Initial Phase" of the CUP included four units, of which three have been fully constructed, with the remaining unit nearing completion. The "Ultimate Phase" of the CUP consisted of the Uintah and Ute Units, with only the Uintah Unit being partially developed. In 1992, in the Central Utah Project Completion Act (CUPCA) (Pub. L. 102-575), Section 501(a)(3), Congress stated that there is no present intent to proceed with Ultimate Phase construction.

f. In 1996, Reclamation assigned the water right associated with the Ultimate Phase portion of the CUP, No. 41-3479 (A30414d) (as numbered by the Utah State Engineer), to the State of Utah, through the Board of Water Resources (Assigned Water Right). The Board desires to put the Assigned Water Right to beneficial use.

g. The March 12, 1996 Assignment agreement for the Assigned Water Right includes the provision "Upon release from Flaming Gorge Reservoir, said water right can be developed, diverted and perfected by the State of Utah as permitted by law. The State of Utah agrees that if it stores water in or benefits directly from the Colorado River Storage Project Facilities, the state of Utah will enter into a water service contract with the United States." (Assignment Provision) (Exhibit A).

h. This Contract is one of two contracts that will satisfy the Assignment Provision. The Board is requesting to enter into two separate contracts for the Assigned Water Right: this contract is for the depletion of 72,641 acre-feet (AF) of water and is intended for the

development along the Green River (Green River Block), and the remaining 86,249 AF will be addressed under a separate and distinct contract, and is intended to be used in the Lake Powell Pipeline Project.

i. The Board desires to develop the Assigned Water Right in a manner legally conforming to the Assignment Provision, and is willing to forbear the diversion of a portion of the natural flows to which the State is entitled under the Compacts, and allow these flows to contribute to meeting the ESA Recovery Program Requirements in Reaches 1 and 2. This will assist Reclamation in its obligations under the 2006 ROD, and in addition, the Reach 3 responsibilities of Recovery Program parties. The forgone diversions will assist the Recovery Program in meeting Reach 3 requirements. In exchange, the Board will deplete an equal amount of CRSP project water from releases from the FG Unit throughout the year. This Contract does not entitle the Board to call for releases from FG.

j. Under Section 14 of the Reclamation Project Act of 1939, (43 U.S.C. § 389), the Secretary is authorized to "enter into such contracts for exchange…of water [or] water rights…as in his judgment are necessary and in the interests of the United States."

k. The Secretary has determined that this exchange is in the interests of the United States because it supports both the Board's desire to develop its apportionment under the Compacts while improving Reclamation's ability to meet flow recommendations.

l. Under Utah Code Section 73-10-14 the Board is authorized to enter into contracts with Federal agencies "on behalf of the state for any purpose which relates to the development, conservation, protection and control of the water and power resources of the state." The Board authorized this Contract because it will allow Utah to develop its water allocation under the Compacts while improving Reclamation's ability to reach target flows for the endangered fishes.

NOW THEREFORE, in consideration of the mutual and dependent covenants herein contained, Reclamation and the Board agree as follows:

1. DEFINITIONS
For purposes of this Contract only, the following terms are given the definitions below:

a. Assigned Water Right: means an interest in Application to Appropriate number A30414d (as numbered by the Utah State Engineer) for the diversion of 447,500 acre-feet with 158,890 acre-feet of depletion or segregated portions of A30414d, and including change applications which have or will be filed based on A30414d or its segregated portions. The Board will require, as a condition of its approval for change applications it must

authorize, a Third-Party Contract with the Board that is consistent with the terms of this Contract.

b. Compact Entitlement Water: means the Utah apportionment of water under Article III of the Upper Colorado River Basin Compact ("Upper Basin Compact") and regulated by the State under Article XV(b) of the Upper Basin Compact which expressly recognizes each compacting state's rights and powers to regulate within its boundaries the appropriation, use, and control of water apportioned and available to the states by the Colorado River and Upper Colorado River Basin Compacts.

c. ESA Recovery Program Requirements: The FG 2006 ROD Commitment 10 requires coordination with the Recovery Program. A technical working group, consisting of biologists and hydrologists from Reclamation, the Western Area Power Administration, and the Fish and Wildlife Service, will annually propose to the existing Flaming Gorge Working Group an initial flow regime that implements, to the extent possible, the Flow and Temperature Recommendations. This process will concurrently fulfill informal consultation and coordination requirements of ESA for the action agencies.

d. Project Water: means all CRSP water released from the Flaming Gorge Unit.

e. Third-Party Contract: means any contract entered into between the Board and a third party for the beneficial use of the Assigned Water Right.

2. PURPOSE

The purpose of this Contract is to comply with the Assignment Provision and authorize the exchange of the Assigned Water Right for Project Water. Additionally, the purpose of this Contract is to support compliance with the 2006 ROD by both Reclamation and the Board.

3. OTHER AGREEMENTS AND OBLIGATIONS

a. This Contract will not alter, modify, or amend the duties, responsibilities, relationships, or conditions outlined in any agreements not specifically mentioned in this Contract.

b. This Contract does not alter, modify, or amend the Assigned Water Right's priority date, points of diversion or delivery, nature of or places of use, operations, or any other conditions not specifically mentioned in this Contract, nor does it result in any relinquishment of the Assigned Water Right.

c. Prior to the exercise of the exchange of the Assigned Water Right for Project Water, for Assigned Water Right portions owned by the Board, the Board will be responsible for filing any necessary water right change applications, obtaining approval from the Utah

State Engineer's Office, and providing copies of the application approval to the United States at no cost to the United States.

4. TERM

This Contract becomes effective upon execution of this Contract. The 50 year term begins in the year of execution of the first Third Party Contract, and will remain in effect for fifty (50) years, unless terminated under the provisions of this Contract. The Board may request renewal of this Contract by providing written request to the United States on or before two years prior to the date of expiration. The United States will provide the Board written notice of the renewal deadline at least sixty (60) days prior to the two year deadline. Failure of either Party to act will not result in automatic termination of this Contract or preclude the opportunity for the Parties to renew the Contract. Renewal shall be granted upon terms and conditions as may be mutually agreeable between the United States and the Board based upon Federal Reclamation laws and policy in effect at the time of renewal, and will include updated pricing, accounting, and contract term provisions.

5. TERMINATION

The terms and conditions of this Contract may be amended, or the Contract may be terminated on January 1 of any year, if the Board and the United States mutually agree in writing. It is the intent of the United States and the Board that this Contract remain in force for the full term of fifty (50) years, unless it is terminated or superseded by a mutually agreed upon contract.

6. EXCHANGE OF WATER

For this exchange, the Board will forbear the depletion of a portion of the Green River and tributary flows to which it is entitled, and instead allow that portion of the Compact Entitlement Water rights to contribute to meeting the ESA Recovery Program Requirements in Reaches 1 and 2. This will assist Reclamation in meeting its obligation under the 2006 ROD. In exchange, the Board is authorized to deplete an equal amount of Project Water from releases from the FG Unit throughout the year as water is needed for the Assigned Water Right. On an annual basis, the direct flows that will be left in the river and used to meet ESA requirements will equal the FG project releases used for depletion by the Board under the Assigned Water Right. The Board will not make calls for releases from FG Unit storage, rather, it will use the Project Water as it is released in accordance with the flexibility in Reclamation's operations under the 2006 ROD.

7. AMOUNT OF WATER TO BE EXCHANGED

a. The Board and the United States acknowledge that the implementation of the exchange contemplated in this Contract is consistent with and remains subject to Reclamation's Section 7 ESA Recovery Program requirements and obligations under the 2006 ROD.

b. Each water year, the Board may deplete up to 72,641 acre-feet, which is the amount of water that would have been available to deplete under part of its Compact Entitlement Water and Assigned Water Right, but which has instead been forborne and designated to meet ESA Recovery Program Requirements in Reaches 1 and 2.

c. As a condition of approval for a change application for a segregated portion of the Assigned Water Right, State Engineer policy requires a contract consistent with the Assignment Provision. Obtaining a Third-Party Contract consistent with the terms of this Contract, as provided in Article 10, satisfies the Assignment Provision.

d. At the time of contract execution, 13,684 AF of the 72,641 AF which is the subject of this Contract has been developed. This 13,684 AF of water will not be available for exchange of Project Water under this Contract until such time that a new water right change application is filed on these developed portions.

e. This Contract is intended only for the exchange of a portion of the Assigned Water Right for Project Water, and no other water right owned by the Board or any other person or entity. This Contract does not establish any precedent or right for other exchanges.

f. Additional releases from FG may be necessary to meet target flows in Reach 2 as a result of depletions under this Contract. In the unlikely event that target flows under the ESA Recovery Program Requirements are not met, the Board and Reclamation will continue to coordinate with the Recovery Program and the Fish and Wildlife Services to address meeting target flows.

8. RATE AND METHOD OF PAYMENT

a. The Board agrees to make annual payments to the United States as compensation for the benefits received under this Contract. The annual payment is based on the annual contract rate multiplied by the number of acre-feet depleted each year. The initial annual contract rate is $19.00 per acre-foot (Contract Rate). The Contract Rate for each acre-foot of exchange water depleted will be adjusted every 5 years by applying the estimated historical average of Reclamation's Construction Cost Index (CCI) of 2.05% annually. Calculation of indexing begins December 31, 2020, with the first Contract Rate adjustment occurring December 31, 2025. The 5 year adjustments of the Contract Rate through the contract term, as defined in Article 4, are listed in Exhibit B.

b. Each year, the Board will pay the United States a proportionate share of the annual operation and maintenance costs allocable to the consumptive use for the FG Unit. This

amount is equal to $3.37 per acre-foot (O&M Assessment). This will be assessed on the amount of annual depletions that occur under Third-Party Contracts.

c. The sum of the Contract Rate and the O&M Assessment, multiplied by the number of AF depleted by the Board each year, will be the amount of the "Annual Payment." The first Annual Payment will be due upon Article 10.c. notice of the Board's first Third-Party Contract and will be based on the amount of depletions estimated to occur in the first year under that and any contemporaneous Third-Party Contracts. Subsequent payments will be made in advance, on or before April 1 of each year, as long as this contract is in effect. The Board will provide Reclamation an estimate of annual depletions by January 31 of each year, based on the quantity of water under Third-Party Contracts, and the United States will bill the Board by March 1 of each year based upon such estimate, and the Board agrees to pay the United States within 30 days of receipt of said bill. If the actual amount of depletion in any year is different from the amount estimated for the Annual Payment, any adjustments will be made by Contracting Officer on the next annual billing.

d. The Board's payments made under this Contract will be credited to the Basin Fund, as required by Section 5 of the Colorado River Storage Project Act, 43 U.S.C. 620d.

9. MEASUREMENT AND ACCOUNTING

a. Water right applications will be filed with the Utah State Engineer in accordance with State Law for all diversions of water under A30414d. The Board agrees that applications it must authorize will:
   i. Establish the amount of water each water user is entitled to divert and deplete; and
   ii. Establish the points of diversion.

b. The Board agrees, by May 1, to provide to the Contracting Officer an annual verification that the water available in priority under the Assigned Water Right, as determined by the Utah Division of Water Rights, meets or exceeds the estimated annual depletions provided by the Board under Article 8(c).

c. The Board will provide annual reports to the Contracting Officer that document, on at least a monthly basis, the depletion of the exchange water by January 31 of the following calendar year.

d. The Board will hold the United States harmless for damage or claim of damage of any nature whatsoever, including property damage, personal injury or death arising out of or connected with the control, carriage, handling, use, disposal, or distribution of Project Water by the Board.

10. THIRD PARTY CONTRACTS

a. The Board will require, as a condition of its approval of the filing of any change applications it must authorize, a Third-Party Contract. These Third-Party Contracts will be between the Board and third-party contractors.
b. The Board will require in all Third-Party Contracts:
   i. That water users install metering devices on all exchange diversion points; and

   ii. That water users will provide to the Board annual reports of the AF quantity and beneficial uses of Project Water depleted.

c. The Board will provide the Contracting Officer a copy of each Third-Party Contract for the Assigned Water Right water within 30 days of execution.

d. Third-party contracts entered into by the Board for the Assigned Water Right do not create an additional obligation for the United States to satisfy obligations under those Third-Party Contracts beyond its water delivery obligation provided for under this exchange Contract.

11. ENVIRONMENTAL COMPLIANCE

Compliance with the provisions of the National Environmental Policy Act (NEPA), as amended, and the Endangered Species Act (ESA), as amended, is a prerequisite to executing this Contract. Compliance was addressed through [NEPA reference document number], completed [date].

12. SEVERABILITY

If any provisions of this Contract or the application thereof to any person or circumstances shall be invalid or unenforceable to any extent, the remainder of this Contract and the application of such provisions to other persons or circumstances shall not be affected thereby and may be enforced to the greatest extent permitted by law.

13. NOTICES

Any notice, demand, or request authorized or required by this Contract shall be deemed to have been given to the United States, Reclamation, and the Contracting Officer on behalf of the Board, when mailed, postage prepaid, or delivered to:

Regional Director
Upper Colorado Region
Bureau of Reclamation
125 South State Street
Room 8100
Salt Lake City, Utah, 84138-1102

and on behalf of the United States to the Board, when mailed, postage prepaid, or delivered to:

Director
Utah Division of Water Resources
1594 West North Temple
Salt Lake City, Utah 84116
Or
Utah Division of Water Resources
PO Box 146201
Salt Lake City, Utah 84114-6201

14. STANDARD PROVISIONS

The Standard Provisions applicable to this contract are listed below. The full text of these articles is attached as Exhibit C and is hereby made a part of this contract.

a. CHARGES FOR DELINQUENT PAYMENTS
b. GENERAL OBLIGATION – BENEFITS CONDITIONED UPON PAYMENT
c. CONTINGENT UPON APPROPRIATION OR ALLOTMENT OF FUNDS
d. OFFICIALS NOT TO BENEFIT
e. ASSIGNMENT LIMITED – SUCCESSORS AND ASSIGNS OBLIGATED
f. BOOKS, RECORDS, AND REPORTS
g. PROTECTION OF WATER AND AIR QUALITY
h. RULES, REGULATIONS AND DETERMINATIONS
i. EQUAL EMPLOYMENT OPPORTUNITY
j. COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS
k. CERTIFICATION OF NONSEGREGATED FACILITIES
l. MEDIUM FOR TRANSMITTING PAYMENTS
m. CONTRACT DRAFTING CONSIDERATIONS
n. CONSTRAINTS ON THE AVAILABILITY OF WATER

The United States and the Board agree, by their signatures below, to be bound to this contract beginning on the date written above.

UNITED STATES OF AMERICA

Approved:

_____
Regional Director
Bureau of Reclamation

_____
Office of the Regional Solicitor

CONTRACTOR

_____
State of Utah
Director, Utah Board of Water Resources

ASSIGNMENT OF WATER RIGHT NO. 41-3479 (A30414d)
FROM
THE UNITED STATES OF AMERICA
TO THE
STATE OF UTAH

THIS ASSIGNMENT, made this 12th day of ~~December 1995~~ March 1996, by THE UNITED STATES OF AMERICA, Department of Interior, Bureau of Reclamation, Assignor, herein styled the United States, to the STATE OF UTAH, Board of Water Resources, Assignee, herein styled the State of Utah,

WHEREAS, the United States planned and initiated construction of The Central Utah Project, a participating project of the Colorado River Storage Project, for the purpose, among others, to permit the State of Utah to more fully utilize its allocation of the waters of the Colorado River system, as set forth in the Colorado River Compact and the Upper Colorado River Basin Compact; and

WHEREAS, the United States has obtained various approved water right applications for the various Units and Phases of the Central Utah Project including the Ultimate Phase of the Central Utah Project, and

WHEREAS, the Congress of the United States enacted Public Law 102-575, the Central Utah Project Completion Act, which identifies features of the Central Utah Project for which construction is authorized to be completed, and

WHEREAS, Public Law 102-575 does not authorize the further expenditure of funds by the United States to plan or construct the Ultimate Phase of the Central Utah Project, and

WHEREAS, in recognition of Congress' actions in Public Law 102-575, the State of Utah in the normal course of evaluating the Bureau of Reclamation's water right associated with the Ultimate Phase of the Central Utah Project would consider it partially undeveloped and unperfected, and

WHEREAS, the State of Utah desires to obtain an assignment of that portion of the water right application associated with the Ultimate Phase for its own purposes.

NOW THEREFORE, it is mutually agreed as follows:

The United States, in consideration of the sum of one dollar and other good and valuable consideration, does hereby assign, set over and transfer unto the State of Utah, Board of Water Resources, Water Right No. 41-3479 (A30414d). A copy of said application is attached and made a part of this assignment. Said water right is the undeveloped and unperfected portion of Water Right No. 41-2963 (A30414) and pertains to the proposed uses for the Ultimate Phase of the Central Utah Project, also known as the Ute Indian Unit. The quantity of said undeveloped water right is up to 447,500 acre-feet annually.

Upon release from Flaming Gorge Reservoir, said water right can be developed, diverted and perfected by the State of Utah as permitted by law. The State of Utah agrees that if it stores water in or benefits directly from Colorado River Storage Project Facilities, the State of Utah will enter into a water service contract with the United States.

The United States reserves the right to continue to divert, store, and use water under Water Right No. 41-2963 (A30414). Water Right No. 41-2963 (A30414) allows for the diversion of up to 8000 ft^3/s and the storage of up to 4,000,000 acre-feet of water from the Green River.

Exhibit B

Annual Index	2.05%
5 Year Index	10.68%

	Calendar Year(s)	Rate	Contract Term Increment
December 31,	2018-2023	$ 19.00	0-5
	2024-2028	$ 21.03	6-10
	2029-2033	$ 23.27	11-15
	2034-2038	$ 25.76	16-20
	2039-2043	$ 28.51	21-25
	2044-2048	$ 31.56	26-30
	2049-2053	$ 34.93	31-35
	2054-2058	$ 38.66	36-40
	2059-2063	$ 42.78	41-45
	2064-2068	$ 47.35	46-50

EXHIBIT C

STANDARD PROVISIONS

The Contractor, as referred to in the following Standard Provisions, shall be the State of Utah, acting through the Utah Board of Water Resources (Board).

(a) CHARGES FOR DELINQUENT PAYMENTS

(1) The Contractor shall be subject to interest, administrative, and penalty charges on delinquent payments. If a payment is not received by the due date, the Contractor shall pay an interest charge on the delinquent payment for each day the payment is delinquent beyond the due date. If a payment becomes 60 days delinquent, the Contractor shall pay, in addition to the interest charge, an administrative charge to cover additional costs of billing and processing the delinquent payment. If a payment is delinquent 90 days or more, the Contractor shall pay, in addition to the interest and administrative charges, a penalty charge for each day the payment is delinquent beyond the due date, based on the remaining balance of the payment due at the rate of 6 percent per year. The Contractor shall also pay any fees incurred for debt collection services associated with a delinquent payment.
(2) The interest rate charged shall be the greater of either the rate prescribed quarterly in the Federal Register by the Department of the Treasury for application to overdue payments, or the interest rate of 0.5 percent per month. The interest rate charged will be determined as of the due date and remain fixed for the duration of the delinquent period.
(3) When a partial payment on a delinquent account is received, the amount received shall be applied first to the penalty charges, second to the administrative charges, third to the accrued interest, and finally to the overdue payment.

(b) GENERAL OBLIGATION—BENEFITS CONDITIONED UPON PAYMENT

(1) The obligation of the Contractor to pay the United States as provided in this contract is a general obligation of the Contractor notwithstanding the manner in which the obligation may be distributed among the Contractor's water users and notwithstanding the default of individual water users in their obligation to the Contractor.
(2) The payment of charges becoming due pursuant to this contract is a condition precedent to receiving benefits under this contract. The United States shall not make water available to the Contractor through CRSP project facilities during any period in which the Contractor is in arrears in the advance payment of water rates or any operation and maintenance charges due the United States. The Contractor shall not deliver water under the terms and conditions of this contract for lands or parties that are in arrears in the advance payment of water rates and operation and maintenance charges as levied or established by the Contractor.

(c) CONTINGENT ON APPROPRIATION OR ALLOTMENT OF FUNDS

The expenditure or advance of any money or the performance of any obligation of the United States under this Contract shall be contingent upon appropriation or allotment of funds. Absence of appropriation or allotment of funds shall not relieve the Contractor from any obligations under this Contract. No liability shall accrue to the United States in case funds are not appropriated or allotted.

(d) OFFICIALS NOT TO BENEFIT

No Member of or Delegate to the Congress, Resident Commissioner, or official of the Contractor shall benefit from this Contract other than as a water user or landowner in the same manner as other water users or landowners.

(e) ASSIGNMENT LIMITED—SUCCESSORS AND ASSIGNS OBLIGATED

The provisions of this Contract shall apply to and bind the successors and assigns of the parties hereto, but no assignment or transfer of this Contract or any right or interest therein by either party shall be valid until approved in writing by the other party.

(f) BOOKS, RECORDS, AND REPORTS

The Contractor shall establish and maintain accounts and other books and records pertaining to administration of the terms and conditions of this Contract. Subject to applicable Federal laws and regulations, each party to this Contract shall have the right during office hours to examine and make copies of the other party's books and records relating to matters covered by this Contract.

(g) PROTECTION OF WATER AND AIR QUALITY

(1) Project facilities used to make available and deliver water to the Contractor shall be operated and maintained in the most practical manner to maintain the quality of the water at the highest level possible as determined by the Contracting Officer: Provided, That the United States does not warrant the quality of the water delivered to the Contractor and is under no obligation to furnish or construct water treatment facilities to maintain or improve the quality of water delivered to the Contractor.

(2) The Contractor shall comply with all applicable water and air pollution laws and regulations of the United States and the State of Utah; and shall obtain all required permits or licenses from the appropriate Federal, State, or local authorities necessary for the delivery of water by the Contractor; and shall be responsible for compliance with all Federal, State, and local water quality standards applicable to surface and subsurface drainage and/or discharges generated through the use of Federal or Contractor facilities or Project water provided by the Contractor within the Contractor's Project Water Service Area.

(3) This article shall not affect or alter any legal obligations of the Secretary of the Interior to provide drainage or other discharge services.

(h) RULES, REGULATIONS, AND DETERMINATIONS

(1) The parties agree that the delivery of water or the use of Federal facilities pursuant to this contract is subject to Federal reclamation law, as amended and supplemented, and the rules and regulations promulgated by the Secretary of the Interior under Federal reclamation law.

(2) The Contracting Officer shall have the right to make determinations necessary to administer this contract that are consistent with its expressed and implied provisions, the laws of the United States [and the State(s) of Utah], and the rules and regulations promulgated by the Secretary of the Interior. Such determinations shall be made in consultation with the Contractor.

(i) EQUAL EMPLOYMENT OPPORTUNITY

(1) During the performance of this Contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, disability, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, disability, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, disability, or national origin.

(c) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the Contracting Officer, advising the labor union or workers' representative of the Contractor's commitments under section 202 of Executive Order 11246 of September 24, 1965, as amended (EO 11246), and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Contractor will comply with all provisions of EO 11246, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(e) The Contractor will furnish all information and reports required by EO 11246, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the Contracting Agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(f) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of such rules, regulations, or orders, this Contract may be canceled, terminated or suspended, in whole or in part, and the Contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in EO 11246, and such other sanctions may be imposed and remedies invoked as provided in EO 11246, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(g) The Contractor will include this clause (1), including all provisions of paragraphs (a) through (g), in every subcontract or purchase order unless exempted by the rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of EO 11246, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the Contractor may request that the United States enter into such litigation to protect the interests of the United States.

(2) The Contractor hereby agrees to incorporate, or cause to be incorporated, clause (1) as it appears above, including paragraphs numbered (a) through (g), into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 C.F.R., Chapter 60, which is paid for in whole or in part with funds obtained from the Federal Government or borrowed on the credit of the Federal Government pursuant to grant, contract, loan, insurance, or guarantee or undertaken pursuant to any Federal program involving such grant, contract, loan, insurance, or guarantee.

(3) The Contractor will be bound by clause (1) with respect to its own employment practices when it participates in federally assisted construction work: Provided, That if the Contractor so participating is a state or local government, clause (1) is not applicable to any agency, instrumentality, or subdivision of such government which does not participate in work on or under the contract.

(4) The Contractor will assist and cooperate actively with the Contracting Officer and the Secretary of Labor in obtaining the compliance of Contractors and subcontractors with this article, number 14, and the rules, regulations, and relevant orders of the Secretary of Labor; that it will furnish the Contracting Officer and the Secretary of Labor such information as they may require for the supervision of such compliance; and that it will otherwise assist the Contracting Officer in the discharge of his or her primary responsibility for securing compliance.

(5) The Contractor will refrain from entering into any contract or contract modification subject to EO 11246 with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts

pursuant to EO 11246 and will carry out such sanctions and penalties for violation of this article, number 14, as may be imposed upon contractors and subcontractors by the Contracting Officer or the Secretary of Labor pursuant to Part II, Subpart D, of EO 11246. In addition, the Contractor agrees that if it fails or refuses to comply with these undertakings, the Contracting Officer may take any or all of the following actions: cancel, terminate, or suspend, in whole or in part, this Contract; refrain from extending any further assistance to the Contractor under the program with respect to which its failure or refusal occurred until satisfactory assurance of future compliance has been received from the contractor; refer the case to the Department of Justice for appropriate legal proceedings.

(j) COMPLIANCE WITH CIVIL RIGHTS LAWS AND REGULATIONS

(1) The Contractor shall comply with Title VI of the Civil Rights Act of 1964 (Pub. L. 88-352; 42 U.S.C. § 2000d), the Rehabilitation Act of 1973 (Pub. L. 93-112, Title V, as amended; 29 U.S.C. § 791, et seq.), the Age Discrimination Act of 1975 (Pub. L. 94-135, Title III; 42 U.S.C. § 6101, et seq.), Title II of the Americans with Disabilities Act of 1990 (Pub. L. 101-336; 42 U.S.C. § 12131, et seq.), Title III of the Americans with Disabilities Act of 1990 (Pub. L. 101-336; 42 U.S.C. § 12181, et seq.), and any other applicable civil rights laws, and with the applicable implementing regulations and any guidelines imposed by the U.S. Department of the Interior and/or Bureau of Reclamation.

(2) These statutes prohibit any person in the United States from being excluded from participation in, being denied the benefits of, or being otherwise subjected to discrimination under any program or activity receiving financial assistance from the Bureau of Reclamation on the grounds of race, color, national origin, disability, or age. By executing this Contract, the Contractor agrees to immediately take any measures necessary to implement this obligation, including permitting officials of the United States to inspect premises, programs, and documents.

(3) The Contractor makes this agreement in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts, property discounts, or other Federal financial assistance extended after the date hereof to the Contractor by the Bureau of Reclamation, including installment payments after such date on account of arrangements for Federal financial assistance which were approved before such date. The Contractor recognizes and agrees that such Federal assistance will be extended in reliance on the representations and agreements made in this article and that the United States reserves the right to seek judicial enforcement thereof.

(4) Complaints of discrimination against the Contractor shall be investigated by the Contracting Officer's Office of Civil Rights.

(k) CERTIFICATION OF NONSEGREGATED FACILITIES

The Contractor hereby certifies that it does not maintain or provide for its employees any segregated facilities at any of its establishments and that it does not permit its employees to perform their services at any location under its control where segregated facilities are maintained. It certifies further that it will not maintain or provide for its employees any

segregated facilities at any of its establishments and that it will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this certification is a violation of the Equal Employment Opportunity clause in this Contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, disability, or otherwise. The Contractor further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Employment Opportunity clause; that it will retain such certifications in its files; and that it will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods):

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES

A Certification of Nonsegregated Facilities must be submitted prior to the award of a subcontract exceeding $10,000 which is not exempt from the provisions of the Equal Employment Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually). Note: The penalty for making false statements in offers is prescribed in 18 U.S.C. § 1001.

(l) MEDIUM FOR TRANSMITTING PAYMENTS

(1) All payments from the Contractor to the United States under this contract shall be by the medium requested by the United States on or before the date payment is due. The required method of payment may include checks, wire transfers, or other types of payment specified by the United States.1

(2) Upon execution of the contract, the Contractor shall furnish the Contracting Officer with the Contractor's taxpayer's identification number (TIN). The purpose for requiring the Contractor's TIN is for collecting and reporting any delinquent amounts arising out of the Contractor's relationship with the United States.

(m)CONTRACT DRAFTING CONSIDERATIONS

This Contract has been negotiated and reviewed by the parties hereto, each of whom is sophisticated in the matters to which this Contract pertains. Articles 1 through 14 of this Contract have been drafted, negotiated, and reviewed by the parties, and no one party shall be considered to have drafted the stated articles.

(n) CONSTRAINTS ON THE AVAILABILITY OF WATER

[1]This language may be modified to state Reclamation's selected method of payment.

(1) In its operation of the Project, the Contracting Officer will use all reasonable means to guard against a condition of shortage in the quantity of water to be made available to the Contractor pursuant to this Contract. In the event the Contracting Officer determines that a condition of shortage appears probable, the Contracting Officer will notify the Contractor of said determination as soon as practicable.

(2) If there is a condition of shortage because of inaccurate runoff forecasting or other similar operational errors affecting the Project; drought and other physical or natural causes beyond the control of the Contracting Officer; or actions taken by the Contracting Officer to meet current and future legal obligations, then no liability shall accrue against the United States or any of its officers, agents, or employees for any damage, direct or indirect, arising therefrom.

Appendix C Comments on Draft Environmental Assessment

Comments on draft Green River Block EA

Dave Speas, UCRO Environmental Resources

9/27/18

Page (electronic, not print)	location	Comment
12	1.5.1, second sentence	Replace "these species" with "The species listed in the IPaC report…"
14	1.8, first sentence, "high spring tributary flows"	Sec. 2.3 says just "tributary flows". Is the state exchanging depletions from only high spring peak flows from tributaries, or all depletions from tributaries, regardless of timing?
15	Second paragraph under 2.3, second to last sentence, "Contract Entitlement Water right"	Is it "Contract" or "Compact" Entitlement Water right?
19	3.3.1.2, first paragraph, number 3, "cumulative effects or full depletion scenario"	This is also referred to as the "reasonable and foreseeable alternative", which makes a total of three ways that this doc refers to this type of hydrologic simulation. This gets a little hard to follow after a while, suggest picking one of them to preserve readability. Whichever is used, I would suggest eliminating use of "alternative" which is also easily confused with the Proposed Action (preferred alternative). "Cumulative effects scenario" also is also a little problematic because it can get confused with the "cumulative effects analysis" as a NEPA term. Suggest "full depletion scenario" as it actually refers to a type of hydrologic simulation, not an alternative or the NEPA definition of cumulative effects. The "full depletion scenario" is (correctly) what appears in the cumulative effects section but as such, it's the results of a simulation, not an action alternative.
20	3.3.1.2.1.4, "the action alternatives are compared to the No Action Alternative"	This is an important section because it explains how the resource impacts are analyzed in relation to the No Action Alternative. There is really only one "alternative" being analyzed, that is the "preferred alternative" or the Proposed Action. It appears that the GRB <u>scenario</u> (not alternative) is used to look at the Proposed Action per se in relation to the No Action, and the full depletion <u>scenario</u> is used to evaluate Cumulative Effects. This distinction must be made much more clearly since there are two simulations or scenarios (NOT alternatives) used to evaluate the Proposed Action. Also numbering is off, this should be 3.3.1.2.2.2 (I think?)
23	First full paragraph from top, last sentence	Sentence is very hard to follow. Suggest "The GRB depletion scenario maintains slightly lower releases as compared against

		the No Action but converges with the No Action scenario beyond the 45th percentile during October-December"
21	3.3.1.4 and 3.3.1.5	It appears that the relevant portions of Appendix A have been parsed and moved to the corresponding Proposed Action and Cumulative Effects section of the EA. I would urge the preparers to make sure all relevant details in Appendix A make it into the main body of the EA so that the original context is preserved.
23	3.3.1.5	This section contains a lot of repeats from 3.3.1.4 and I think that is so because the GRB scenario and the full depletion scenario are both simulations of the same Proposed Action. Suggest restricting section 3.3.1.4 (Proposed Action) to the GRB-only scenario and using 3.3.1.5 to cover the full depletion (AKA cumulative effects) scenario.
23	3.3.1.5, second paragraph, second sentence	"These impacts are seen throughout the graphical results..." It would be a much easier document to read and understand if the figures in Heather Patno's report (in appendix) were brought forward into the main text of the EA so the descriptions could be better illustrated.
42	Colorado pikeminnow, second paragraph, first sentence.	This is not a true statement as Green River Colorado pikeminnow have been in severe decline since at least 2008. See Betgen et al. 2018 http://www.coloradoriverrecovery.org/documents-publications/technical-reports/rsch/Bestgen-pikeminnowAbd2011-2013March2018.pdf
42	Colorado pikeminnow, last paragraph, second sentence	Suggest deleting, repeat of previous paragraph
45	Razorback sucker, first paragraph at top, "Flows are increased to allow larvae to be entrained in Stewart Lake, a backwater near Jensen, Utah."	Stewart Lake is referred to as a floodplain wetland; backwaters are usually refer to in-channel features.
45	"Once larvae are entrained to the maximum extent possible, gates to Stewart Lake are closed to prevent predatory fishes from entering the lake."	Large-bodied predators are excluded by way of a screen, not the headgates. The gates get closed to regulate water level, usually to keep water and larvae from flowing out again. They open it periodically if there are short-term (hours) bumps in discharge, to entrain more fish
45	"including 800 that received pit tags"	PIT tags (acronym)
45	"The Service's 5-year status review of	Citation should probably be 2012 if it's the 5 year review from 2012?

	razorback sucker completed in 2012 reported that 85 percent of the downlisting recovery factor criteria (U.S. Fish and Wildlife Service 2002c)..."	
45	"Reproductive activities are believed to take place in off-channel habitats and tributaries because razorback sucker aggregations were reported in these areas."	Perhaps some spawning takes place in these areas, but most spawning occurs on cobble bars in the main channel. Suggest deleting as the next sentence is better.
46	3.3.5.3.2, second sentence about 100 cfs reduction	Under what hydrologic conditions would this happen?
47	Second full paragraph, "The additional flows potentially created under the Proposed Action could provide benefit to the endangered fishes."	But the elevated flows are there for the purposes of depletion, so it could be a wash. If the flows were protected, then certainly it would be beneficial, but they probably won't be because that's the purpose of the EA. Is there a brief way to resolve this?
47	Last paragraph, "The full depletion scenario maintains approximately 250 cfs lower flows at Jensen 80 percent of the time during the time of greatest potential impact (October – December)."	Greatest potential impact to flows, as opposed to fish I would assume? (fish would be most vulnerable during the spring peak and summer base flows).
83	"The impacts of incorporating full depletion development on the Green River are significantly greater than impacts from the 58,957 acre-feet depletion."	This statement as written could lead some to believe that the full depletion scenario is a "significant" departure from no action. It might be worthwhile to add "...however the projected range of reservoir elevations is still within that analyzed in the FEIS" to the end of the sentence (this appears a few sentences prior on page 8, but the connection to the "significantly greater" impact statement (left) is not specific).

88	“and Figure 8(b) focuses on those flows for increased optics. Jensen flows in the action alternative”	“increased optics” = “increased detail”?

UTAH RIVERS COUNCIL

October 17, 2018

Mr. Brent Rhees
Bureau of Reclamation
Upper Colorado Regional Office
125 South State Street, Room 8100.
Salt Lake City, UT 84138
greenriverblock@usbr.gov
801-524-3600

Re: Environmental Assessment for Green River Block Water Exchange Contract

Dear Mr. Rhees:

On behalf of the Utah Rivers Council ('URC') I respectfully submit the following comments in response to the Bureau of Reclamation's ('BOR') Environmental Assessment ('EA') for the Green River Block water exchange contract with the State of Utah ('State').

The BOR and the State are currently negotiating two separate contracts for the Green River Block ('GRB') and the Lake Powell Pipeline Block ('LPPB'), yet the EA states that the GRB is specifically related to the proposed Lake Powell Pipeline ('LPP'), sponsored by the Utah Board of Water Resources ('BWRe'). The proposed LPP is currently in the NEPA process with the Federal Energy Regulatory Commission ('FERC') and it appears the GRB contract would be followed by BOR's consideration of the LPPB contract with the State for the LPP water right.

Founded in 1995, the Utah Rivers Council ('URC') is a non-profit 501(c)(3) grassroots community-based organization that advocates for sound water policy and protection and conservation of Utah's rivers, streams, and clean water sources for today's citizens, future generations, and wildlife. The URC and our members are seriously concerned with the impacts water diversions and pipelines have on Utah's aquatic ecosystems as well as the fiscal impacts unnecessary water spending has on taxpayers.

The URC has a long history working to protect the Green and Colorado Rivers and their tributaries and we believe the proposed contract affects numerous stakeholders including the thousands of members of our organization, and many URC members in eastern Utah. These members are taxpayers, ratepayers, conservationists, fishermen, outfitters, guides and other recreationists and business leaders who have a vested interest in sustainable water management, fiscally conservative water spending, and the continued existence of aquatic ecosystems. Our experience in drafting and implementing statewide water policy, analyzing municipal water use data, studying water project economics, initiating water conservation programs and our ability to provide expertise on sustainable water policy have made our organization a leader in the conservation community in Utah.

After carefully studying the LPP for the last eight years our organization continues to have major concerns about the purpose and need for the LPP as well as the socioeconomic

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impacts the Pipeline will have on southwest Utah and the Lower Colorado River Basin. Additionally, our organization is seriously concerned with the impacts the LPP will have upon the fragile desert ecosystems in the region and imperiled species.

Moreover, the proposed GRB contract appears to be undertaken to advance the controversial LPP, not as a necessary aspect of the BOR's operations. We believe that the proposed GRB contract should not be approved for the purpose of accommodating the LPP, when the project has not yet been approved, and in fact such approval may take many years, if it happens.

The EA makes it abundantly clear that the proposed GRB contract has no purpose and need. Also concerning is that the BOR is treating the GRB contract as distinct and separate from the LPPB contract, but we fail to see how they are separate. The NEPA process is essentially being segmented by BOR through the initiation of separate NEPA processes for this proposed Green River Block exchange contract and for the proposed Lake Powell Pipeline Block exchange contract in Washington County. This creates the appearance that the GRB exchange contract is being advanced to avoid cumulative impact analysis for the LPP Block and LPP NEPA process under FERC. Since BOR has agreed to be a cooperating agency on the environmental analysis for the LPP with FERC, the cumulative impacts of the proposed GRB exchange contract and the proposed LPPB exchange contract should be considered together by BOR and FERC as part of the LPP NEPA process.

Our comments concern four general points:

I) **The EA ignores agency-documented risks from expected water supply shortage declarations and contains major inconsistencies between available water supplies in the Colorado River Basin and the water rights that Utah Division of Water Resources ('DWRe') holds on paper for the Lake Powell Pipeline and for the Green River Block.**

In the Green River Block EA, the BOR essentially pretends that we are living 50 years ago and that the Green and Colorado Rivers are a secure water source. This kind of wishful behavior is expected from the DWRe as the agency regularly ignores reality and tells federal and state decision-makers that Utah's Colorado River allocation is secure. According to a presentation by the DWRe to the Executive Water Finance Board on September 19, 2018, the state is guaranteed 1.4 million acre-feet ('MAF') of average annual reliable supply. This claim is misleading because the Colorado River Compact does not guarantee Utah 1.4 MAF of water from the Colorado River, it guarantees Utah a share or percentage of the water left for the Upper Basin States after water deliveries to the Lower Basin states and Mexico are provided.

Utah's share of the Upper Colorado River Basin's water is 23%, with Colorado receiving 51.75%, New Mexico receiving 11.25% and Wyoming receiving 14%. The DWRe incorrectly assumes the Colorado River's average annual flow is 15 MAF. According to the USGS, the agency that measures the river's flows, the river's average annual volume is 12.4 MAF, not 15 MAF.[i] That means the Upper Basin is left with approximately 3.4 MAF and

Utah's share would be approximately 800,000 acre feet or a little more than half as much water as the Division regularly claims to Utah Legislators.

According to the Utah Division of Water Rights ('DWRi'), Utah depletes approximately 1,007,500 acre-feet per year through existing diversions, primarily via the Central Utah Project that provides water to Utah's Wasatch Front. Utah has apparently over allocated it's share of Colorado River water and therefore Utah's water rights that are part of the Green River Block that aren't currently being put to use should be extinguished by the BOR.

The State of Utah is also currently working to settle significant federal water rights claims with two Native American tribes, the Northern Ute Tribe and Navajo Tribe and negotiations with these tribes are ongoing. Considering that the Ute Tribe is entitled to 105,000 acre feet per year, the BOR should wait to approve the proposed GRB contract until the proposed compact between Utah and the Ute Tribe has been ratified. Additionally, the Navajo Water Rights Settlement Act, sponsored by Senator Hatch, is currently working its way through Congress and the BOR should wait to see what happens with the bill before approving a major depletion of the river system via the GRB contract, since the two Tribes could theoretically deplete almost 200,000 acre feet per year from the Green and Colorado Rivers.

Moreover, even if we take the DWRe's 15 MAF claim at face value, the BOR is still ignoring the significant reductions in Green and Colorado River flows that are expected to occur as a function of climate change and warmer air temperatures. The BOR's EA for the GRB contract does not consider the impacts on the river as a function of climate change and warmer air temperatures. We find this baffling because the BOR is effectively ignoring its own stark projections contained within the Bureau's 2012 *Colorado River Basin Water Supply and Demand Study* as well as projections by Udall and Overpeck in their 2016 study titled *The twenty-first century Colorado River hot drought and implications for the future.* According to Udall and Overpeck, the Colorado River's flow will likely decrease by 20-30% by mid-century.

In stark contrast to the head-in-the-sand behavior of the Division, who is proposing a new $4 billion diversion of the river at Lake Powell, other water suppliers on the Colorado River are paying close attention to climate change projections and working hard to prepare their cities and states for a future where there is less water to go around in the Colorado River Basin. Using the long-term projections from the Bureau's 2012 *Colorado River Basin Water Supply and Demand Study*, the Southern Nevada Water Authority's ('SNWA') planning documents show they are expecting a 3.2 MAF per year deficit in Colorado River supply and demand by the year 2060.[ii] According to the SNWA's 2015 *Water Resources Plan*, the agency expects a wide range of impacts to follow including extended durations of low Lake Mead elevations and possible reductions in Colorado River resources.[iii]

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LAKE MEAD WATER LEVEL	NEVADA SHORTAGE	ARIZONA SHORTAGE
1,075 - 1,050 FT.	13,000 AFY	320,000 AFY
1,050 - 1,025 FT.	17,000 AFY	400,000 AFY
BELOW 1,025 FT.	20,000 AFY	480,000 AFY
	RECONSULTATION	

FIGURE 2.2 **Interim Guidelines Shortage**

Moreover, the BOR's most recent modeling released in August of 2018 indicates there is a 90% chance the Colorado River at Lake Mead will fall below 1,075 feet in elevation by December 2019, which will trigger a Tier 1 shortage. This shortage declaration will directly impact the SNWA as well as water suppliers in Arizona.[iv] The above table from the SNWA's plan shows the quantity of those shortages based on Lake Mead water elevations.

When the risks associated with Colorado River supply are not considered by the BOR it misinforms the discussion about whether the GRB contract and the LPPB contract will negatively impact the Green and Colorado Rivers and downstream water users. Surely BOR staff wouldn't be this reckless if one of their personal investments were this risky. Imagine if a contractor building your new house told you there is a 90% chance of the house collapsing by 2060, would you still pay them hundreds of thousands of dollars to build it regardless?

A more sincere effort by the BOR would have explained the reality that Utah may not have water for the GR Block and the LPP Block in the future after spending billions of dollars in taxpayer money on new infrastructure and indebting Utahns for several generations. Instead, the BOR painted a rosy picture of Colorado River water supply in the EA to advance Utah's ill-advised Lake Powell Pipeline proposal, which will initiate billions in new spending for the Pipeline. Is the BOR aware of its obligations to comply with federal laws like NEPA and of it's responsibly to manage the Colorado River responsibly for water users other than the State of Utah?

The arbitrary separation of the LPP Block and Green River Block exchange contacts appears to be a clever trick by Utah to sneak water away from Lower Colorado River Basin states. A combined depletion of 158,890 acre-feet per year will have significant impacts on the Colorado River water supply as a whole. That the BOR would ignore these impacts while facilitating a massive new depletion of the river system in the face of a pending shortage declaration, is astonishing. The BOR can't simply divide up the Colorado River watershed and say that the GRB and LPPB contracts have no relation to the forthcoming level 1 and 2 shortage declaration and this is a glaring omission of the EA.

We question why BOR is so eager to acquiesce to Utah's demands for an enormously controversial Pipeline, which has a flawed purpose and need and has not yet been approved by the federal government. The BOR has an obligation to the citizens of the United States, which includes 35 million residents across the Colorado River Basin who are very concerned about new proposed upstream diversions like the Lake Powell Pipeline. At

the very least, the BOR should conduct a full Environmental Impact Statement for the Green River Block exchange contract. Preferably, the BOR would reject the GRB exchange contract altogether.

II) **The stated purpose and need for the proposed Green River Block exchange contract is flawed.**

According to the EA the purpose and need for the GRB exchange contract is to facilitate a massive depletion of the Green River:

> *The purpose of the Exchange Contract is to facilitate a water exchange of 72,641 AF of depletions annually under the 1996 Assignment, which was previously included as part of a CRSP participating project water right. This contract is needed to resolve a long-standing disagreement between Reclamation and the State regarding use of the water right assigned in 1996.*[v]

This is like saying that the purpose and need of buying a new car is to have a car. A real and compelling purpose and need would be buying a new car because you need a method of transportation to get to work and there is no other viable method of transportation. A true purpose and need for a 72,641 acre foot depletion of the river would demonstrate the water is actually needed by some stakeholder, like a city that is on the verge of running out of water. Not only is the 72,641 acre feet of water from the GRB not needed by the State of Utah, neither is the 86,249 acre feet of water that would be depleted for the LPP Block.

Water supply needs in the LPP Project area have been drastically overstated, cannot be substantiated by data and a host of reasonable alternatives exist to provide additional water for southwestern Utah that have not been adequately considered by DWRe. The proposed GRB and LPPB exchange contracts aren't needed because reasonable alternatives exist for the LPP and the there is no purpose and need for the project.

The amount of water a community is using is the cornerstone of demonstrating future water needs and future spending required to serve these water needs. Accurately determining the amount of water used by a community is therefore vital to determining whether future spending is required. Exaggerating future or existing water use is no different than a government representative intentionally exaggerating the number of constituents needing services, or the amount of services an agency claims to deliver to said constituents.

In their official document submissions to FERC to receive federal permits for the proposed Pipeline, DWRe clearly indicated that Washington County residents are using far more water than the U.S. average or Utah average. On page 45 (3-5) of the April 2016 *Final Lake Powell Pipeline Water Needs Assessment* submitted by the Utah Division of Water Resources to FERC, Washington County residents used 325 gallons of municipal water per-person per day.[vi]

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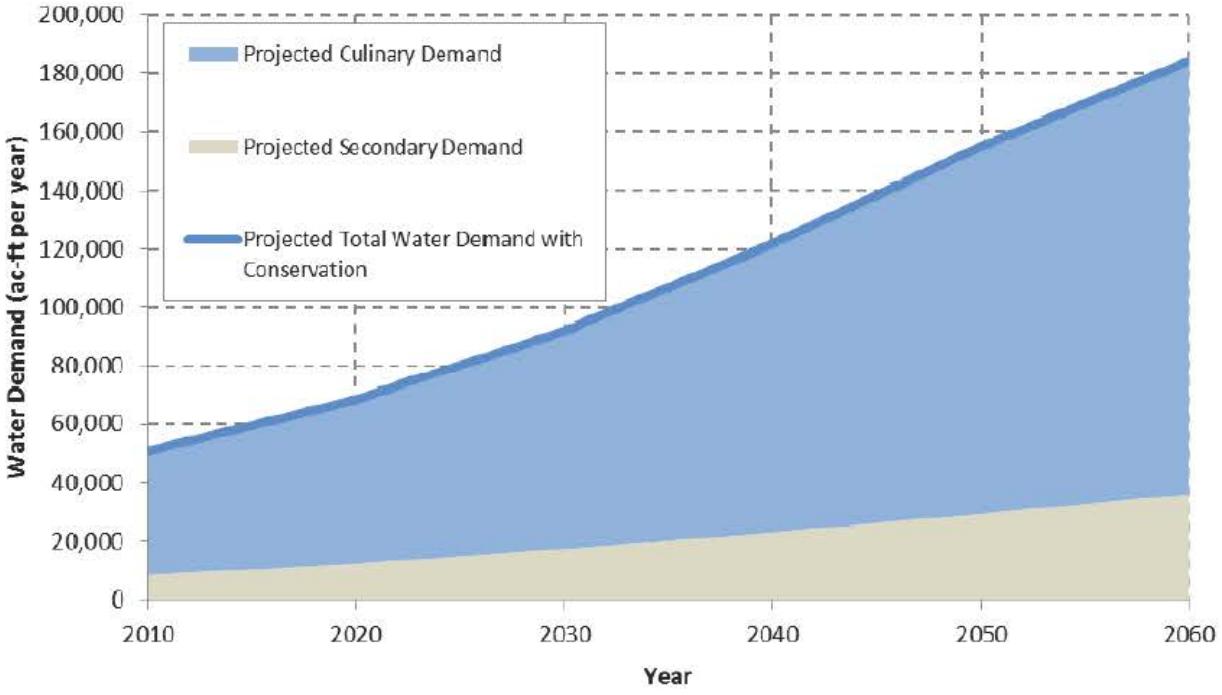
Table 3-3 WCWCD Total M&I Water Demand Forecast

Year	Population	Per Capita Use with Conservation (gpcd)	Total Projected Water Demand with Conservation (ac-ft/yr)
2010	138,530	325	50,380
2020	196,480	311	68,450
2030	279,270	295	92,220
2040	369,370	295	122,010
2050	468,990	295	154,940
2060	576,850	285	184,250
Source: DWRe 2014c			

The DWRe calculated future water needs using this water use figure of 325 from the year 2010, because they sought to demonstrate to FERC that Southwestern Utah needs the Lake Powell Pipeline. This can be plainly seen in the April 2016 *Final Lake Powell Pipeline Water Needs Assessment* which includes the following water demand chart showing the long term water 'needs' of Washington County, based on this water use figure of 325 gallons.[vii]

Figure 3-4 WCWCD Projected Demand



This water use figure of 325 has received immense criticism from other Colorado River stakeholders, the public and the media since it is more than twice the national average and significantly higher than the per person water use of most communities within the Colorado River Basin.

A comparison with the water use of other southwestern communities indicates the DWRe has drastically overstated future water demand to federal regulators. The DWRe claims that 149,873 AF of water will be needed to provide water for ~500,000 residents in Washington County by the year 2060. However, this is roughly twice the amount of water than is currently needed to serve over 600,000 people in Albuquerque, New Mexico.[viii]

City	Water Authority	Year	Water Usage (af)	Number of Users	GPCD
Albuquerque, NM	Albuquerque Bernalillo County Water Authority	2015	86,319	606,780	**127**
Phoenix, AZ	City of Phoenix	2014	298,500	1,500,000	**178**
Tucson, AZ	Tucson Water	2016	87,160	722,000	**117**
Las Vegas, NV	Las Vegas Valley Water District	2016	319,027	1,400,000	**203**
Washington County, UT	Washington County Water Conservancy District	2010	50,380	138,530	**325**
			Southwest Cities Average GPCD		**156.16**

It is hard to imagine the DWRe, and the BOR for that matter, are not aware of the water supply and demand of other southwest communities. The purpose and need for the proposed LPP and therefore the GRB and LPPB exchange contracts is flawed and as such should be eliminated from consideration. Or, they should both be considered as part of the LPP NEPA process to ensure detrimental environmental impacts on the Green and Colorado Rivers and downstream water users do not occur.

III) The EA represents a segmentation of NEPA and therefore violates federal law.

As stated above, the proposed GRB exchange contract has been arbitrarily separated from the LPPB exchange contract and has no real purpose outside the Lake Powell Pipeline, which is currently in the NEPA process with FERC. As a result, this proposed exchange contract represents a segmentation of NEPA and should be included as part of the LPP NEPA process so as to not violate federal law.

The scope of the EA for the proposed contract must include the consideration of the purpose and need for the project and connected and cumulative actions with potentially significant impacts, like the proposed Lake Powell Pipeline. Our organization questions why the proposed exchange contract is not part of the LPP NEPA process unless the BOR and the DWRe are trying to obtain approval for the GRB and LPPB contracts before the Draft EIS for the LPP is completed.

The LPP is the largest new proposed diversion of the Colorado River across seven states and is already generating enormous controversy across the Colorado River Basin. The Pipeline would pump 86,000 acre-feet of water out of the Colorado River at Lake Powell, over 2000 feet in elevation, across 140 miles of desert to Sand Hollow Reservoir in

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Washington County. The LPP will consist of a 69-inch diameter pipe and will require numerous pump stations, new roads, and transmission lines.

A full analysis of socioeconomic impacts for the proposed GRB exchange contract should be included as part of the NEPA process in order to address the cumulative impacts of the LPP on the Green and Colorado Rivers' recreation economy. The LPP license application lacks essential information about costs, economics and financial consideration and numerous questions still remain about the purported need for, environmental impacts of, economic feasibility of and taxpayer liability of the LPP and therefore the proposed exchange contract. Our organization maintains that the proposed exchange contract should be included in the LPP NEPA process with FERC in order to comply with NEPA, and to better serve the public interest.

Regulations implementing NEPA define "connected actions" as those that "are closely related and therefore should be discussed in the same impact statement." 40 C.F.R. § 1508.25(a)(1). Actions are connected if they "[a]re interdependent parts of a larger action and depend on the larger action for their justification." *Id.* § 1508.25(a)(1)(iii).[ix] Further, "[p]roposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement." *Id.* § 1502.4(a).

An agency must consider all "connected actions" in a single EIS. *Great Basin Mine Watch v. Hankins*, 456 F. 3d 955, 968-69 (9th Cir. 2006). *See also Kleppe v. Sierra Club*, 427 U.S. 390, 399 (1976) (a single environmental review document is required for distinct projects when there is a single proposal governing the projects); *Alpine Lakes Prot. Soc'y v. U.S. Forest Serv.*, 838 F. Supp. 478, 482 (D. Wash. 1993) ("In its use of the word 'shall,' 40 C.F.R. § 1508.25 makes mandatory the consideration of connected, cumulative, and similar actions by an agency when determining the scope of an EIS."); *Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mgmt.*, 387 F.3d 989, 998 (9th Cir. 2004) ("[p]roposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement"); *Utahns for Better Transp. v. United States Dep't of Transp.*, 305 F.3d 1152, 1182 (10th Cir. 2002), modified in part on other grounds, 319 F.3d 1207 (2003). The "purpose of this requirement is to prevent an agency from dividing a project into multiple actions, each of which individually has an insignificant environmental impact, but which collectively have a substantial impact." *Great Basin Mine Watch*, 456 F. 3d at 969 (quotation marks omitted).

The Tenth Circuit utilizes an "independent utility test in which it concludes that projects that have independent utility are not connected actions under 40 C.F.R. § 1508.25(a)(1)(iii)." *Citizens' Comm. to Save Our Canyons v. U.S. Forest Serv.*, 297 F.3d 1012, 1029 (10th Cir. 2002) (citations & quotations omitted). Where projects are interdependent, they must be reviewed together. *Id.* at 1028; *see also Thomas v. Peterson*, 753 F.2d 754, 75859 (9th Cir. 1985) (finding agency must analyze road construction project and timber sales together because "[i]t is clear that the timber sales cannot proceed without the road, and the road would not be built but for the contemplated timber sales."). The Ninth Circuit has required the Forest Service to prepare a single EIS for multiple post-

fire timber sales that were planned in response to the same fire and located in the same watershed. -*Blue Mountains Biodiversity Project v. Blackwood*, 161 F.3d 1208, 121415 (9th Cir. 1998).-

The BOR appears to be violating federal law as a function of segmenting the LPP NEPA process in two ways: 1) through the separate NEPA process for the Green River Block exchange contract, and 2) through the separate NEPA process for the LPP Block exchange contract. Neither the GRB nor the LPPB have any purpose outside the proposed LPP, a project that has not been approved. The proposed GRB exchange contract EA should be included as part of the LPP NEPA process so as not to be a violation of federal law.

IV) **The exchange contract would result in a total of 158,890 acre-foot depletion of the Green and Colorado River system and would have numerous connected and cumulative impacts and as such requires a full Environmental Impact Statement.**

As stated above, the proposed GRB and LPPB depletions would be disproportionally harmful to the natural environment of the over tapped Green and Colorado Rivers and will have numerous secondary and cumulative effects on downstream water users facing the high likelihood of shortage declaration in the coming years. As such a full Environmental Impact Statement is warranted for both proposed exchange contracts.

V. **The proposed contract includes no mechanism to prevent Utah from advancing new diversions of Green River tributaries they would be required to forebear.**

The BOR is proposing to exchange flaming Gorge Dam releases for Utah's Green River tributary diversion rights. According to the EA:

> *"For this exchange, the State would forebear the depletion of a portion of the Green River and tributary flows to which it is entitled..."* [x]

However, whereas the BOR controls the releases of water from Flaming Gorge Dam, the BOR has no such control or oversight on Green River tributaries within Utah and the BOR is effectively taking Utah for their word that they will not divert more water out of tributary rivers to the Green River. This is a classic example of the fox guarding the hen house. The EA fails to explain what tributary diversion rights Utah would forbear and how this would be verified by the BOR.

The State of Utah is currently poised to approve a new trans-basin diversion of 5,400 acre feet of water out of Gooseberry Creek on the headwaters of the Price River for a handful of farmers to grow more hay in northern Sanpete County. This proposal comes after the Army Corps of Engineers shot down federal approval for the proposed Narrows Dam in 2016 on the basis that BOR's FEIS for the project was inadequate and flawed in a number of

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ways.

The proposed trans-basin diversion would be destructive to Gooseberry Creek's sensitive riparian areas and aquatic environment, while posing a threat to the water supply for 25,000 Carbon County residents downstream. The diversion has been protested by numerous downstream stakeholders who argue there is no more water to divert out of the river. They include several canal and irrigation companies, municipalities, sportsmen groups, small businesses and others. Does the State of Utah intend to walk away from this 5,400 acre-feet per year depletion of a Green River tributary if the GRB contract is approved? If not, what tributary diversion rights is Utah exchanging with BOR?

The BOR should explain which tributaries to the Green River within Utah actually have remaining water to divert, and explain how the BOR and the public can be assured that these tributaries will not be diverted in the future. Nearly every tributary to the Green River is over allocated and over used. The Yampa River was dewatered twice this year and water users put a call on the river for the first time ever. As mentioned above the Price River is the center of a decades-old water war over a proposed trans-basin diversion backed by the DWRe. What water is there left for the DWRe to divert out of the tributaries of the Green River that they would forbear to comply with the terms of the proposed GRB exchange contract? The BOR needs to explain in a full EIS. Which diversion rights will no longer be developed by Utah and how will the BOR and the public be assured of this?

VI. Conclusion

In conclusion, the BOR should not approve the proposed GRB exchange contract because the contract and the BOR's EA for the contract are flawed in several ways. The EA ignores agency-documented risks from expected water supply shortage declarations and contains major inconsistencies between available water supplies in the Colorado River Basin and the water rights that the Utah Division of Water Resources holds on paper for the Lake Powell Pipeline and for the Green River Block. The EA represents a segmentation of NEPA and the GRB and LPPB contracts should be part of the LPP NEPA process currently underway with FERC.

Additionally, the purpose and need for the contract as stated in the EA is inadequate as the GRB contract has no purpose outside of the proposed Lake Powell Pipeline. Moreover, the GRB and LPPB exchange contracts would result in a total of 158,890 acre-foot depletion of the Green and Colorado River system and would have numerous connected and cumulative impacts and as such require a full Environmental Impact Statement. Our organization strongly urges the BOR to consider the cumulative effects of the proposed GRB contract alongside the proposed Lake Powell Pipeline that would create a cascade of disastrous impacts for the Green and Colorado Rivers. Finally, the proposed contract fails to describe how and where Utah will cease to advance new diversions of Green River tributaries.

We look forward to your decision and thank you for the opportunity to provide these comments.

Respectfully submitted this 17th day of October, 2018,

Nick Schou
Conservation Director
Utah Rivers Council
1055 East 2100 South, Suite 201
Salt Lake City, UT 84106
(801) 486-4776
nick@utahrivers.org

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[i] USGS. *Climatic Fluctuations, Drought and Flow in the Colorado River Basin.* Page 4.
[ii] Southern Nevada Water Authority. *2015 Water Resource Plan.* Chapter 2, page 14. https://www.snwa.com/ws/resource_plan.html
[iii] Southern Nevada Water Authority. *2015 Water Resource Plan.* Chapter 2, page 14. https://www.snwa.com/ws/resource_plan.html
[iv] Southern Nevada Water Authority. *2015 Water Resource Plan.* Chapter 2, page 12. https://www.snwa.com/ws/resource_plan.html
[v] Bureau of Reclamation. *Green River Block Water Exchange Contract Draft Environmental Assessment.* 9/2018 page 5
[vi] Utah Division of Water Resources. *Final Lake Powell Pipeline Water Needs Assessment*, April 2016, sec. 3.2.1, pg. 42
[vii] Utah Division of Water Resources. *Final Lake Powell Pipeline Water Needs Assessment*, April 2016, figure 4-6, pg. 45.

[viii] Amount of water users, 2nd bullet point (http://www.abcwua.org/Your_Water_Authority.aspx)

[ix] CEQ regulations provide three definitions of connected actions, of which the "interdependent parts" definition is one. The three definitions are to be read disjunctively. *See Blue Ocean Pres. Soc. v. Watkins*, 754 F. Supp. 1450, 1457 (D. Haw. 1991) ("The case law interpretations of the regulation have been consistent with this, having treated the separate subsections as sufficient conditions, not necessary conditions.").
[x] Bureau of Reclamation. *Green River Block Water Exchange Contract Draft Environmental Assessment.* 9/2018 page 9

GreenRiverBlock, BOR-sha-PRO <greenriverblock@usbr.gov>

[EXTERNAL] Comments Green River Block Water Exchange

2 messages

tylercallantine@aol.com <tylercallantine@aol.com> Thu, Oct 18, 2018 at 10:20 AM
To: greenriverblock@usbr.gov

To Whom It May Concern,

I am writing to comment on the Green River Block Water Exchange Contract Draft Environmental Assessment PRO-EA-16-020 between the Bureau of Reclamation and the State of Utah. I have several concerns in this proposal.

1st Issue - Page 19 Section 3.3.2 Recreation
The recreation analysis was conducted in 2005 to address impacts at Flaming Gorge Reservoir and downstream of the dam along the Green River. My first concern here is the time frame and the growth that has occured with river use since 2005. The volume of river user groups has grown significantly since 2005 and particularly in the last 3 years. I feel that a more current and up to date analysis should be used to better reflect today's recreation numbers for the reservoir and the river corridor. My second concern with this section of the proposal is rafting in Dinosaur National Monument. In the proposal it states *"If flow conditions deteriorated on the Green River to the point of adversely impacting rafting activity, there exists the possibility of shifting activity to the Yampa River."* There is not truly a possibility of switching activity to the Yampa River. In theory that is true but due to demand of the both the Green River Gates of Lodore and the Yampa River switching permits would be near impossible. The other issue is the Yampa River flows are dictated by snow melt run off. Last summer 2018 the Yampa River was not boatable most of the summer season due to lack of water. With the increase of recreational river use the odds of even obtaining a Dinosaur National Monument permit let alone switching from the Green River to the Yampa River are one in 9000.
Once again I feel that the information and analysis utilized for the recreation portion of this plan is antiquated and out of date in comparison to the dramatic growth that has been seen in recreation along the Green River below Flaming Gorge Dam.

2nd Issue - Page 5 Section 1.4 Purpose and Need for Proposed Action
I understand the State of Utah is requesting the use of its assigned water right a total of 158,890 AF of depletion. My concerns are one that it does not describe what the development along the Green River will be and why this water is needed for that development. My second concern is for the Lake Powell Pipeline. To begin this water should stay in the Upper Basin for drought contingency, Flaming Gorge Reservoir has proven to be a substantial water storage facility in comparison to the lower basin storage reservoirs such as Lake Powell which has an extremely high rate of evaporation. The other issue is this water would be diverted to a region of Utah notorious for the highest levels of water waste in the United States. If Kane and Washington Counties were to implement and use wise water use practices yet still needed additional water sources then at that time it maybe viable to revisit the option of depleting water from Flaming Gorge Dam to Lake Powell for their use. At this time those counties need to address their misuse of the resources available to them and mitigate the water that is currently wasted.

Thank you for your time and consideration,
Tyler

Tyler Callantine
Vernal, Utah
801-499-9181
tylercallantine@aol.com
Owner and Operator
Dinosaur River Expeditions

GreenRiverBlock, BOR-sha-PRO <greenriverblock@usbr.gov> Thu, Oct 18, 2018 at 10:36 AM
To: tylercallantine@aol.com

The email serves as notification that your comments have been placed in the administrative record. Thanks!
[Quoted text hidden]

GreenRiverBlock, BOR-sha-PRO <greenriverblock@usbr.gov>

[EXTERNAL] comment for green river block

2 messages

Jennifer Cole <jen.cole306@yahoo.com> Thu, Oct 18, 2018 at 10:32 AM
To: "greenriverblock@usbr.gov" <greenriverblock@usbr.gov>

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Once again I feel that the information and analysis utilized for the recreation portion of this plan is antiquated and out of date in comparison to the dramatic growth that has been seen in recreation along the Green River below Flaming Gorge Dam.

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Thank you for your time and consideration,

Jen Callantine
Vernal, Utah

GreenRiverBlock, BOR-sha-PRO <greenriverblock@usbr.gov> Thu, Oct 18, 2018 at 10:37 AM
To: Jennifer Cole <jen.cole306@yahoo.com>

The email serves as notification that your comments have been placed in the administrative record. Thanks!
[Quoted text hidden]

Bill James, UDWR

Chapter 1—Scope of Analysis. Because increased releases from Flaming Gorge Dam (FGD) have the potential to draw Flaming Gorge Reservoir (FGR) down to a lower operating level, the scope of analysis should be expanded to include impacts to Flaming Gorge Reservoir. The assessment states that the analysis included the following:

- Flaming Gorge pool elevation on April 31st
- Flaming Gorge elevation $\leq$ 5,980 ft
- Flaming Gorge Release and Jensen Flows (January-February)
- Flaming Gorge Release and Jensen Flows (March)
- Flaming Gorge Release (April)
- Flaming Gorge Release and Jensen Flows (July-September)
- Flaming Gorge Release and Jensen Flows (October-December)
- Jensen Flows (April-July)
- Jensen Maximum Annual Flow (April-July)
- Jensen Sustained 14-Day Duration Flows (April-July)
- Jensen Flows (August-September)

But the variables having to do with FGR are never mentioned. If an analysis was conducted, its conduct and results should be made clear in the assessment.

Page 9, 2.2 – We feel additional information is needed for proper evaluation of the No Action alternative. The last sentence states that in drought years tributary flows can be significantly reduced. Tributaries have proven to be vital for bolstering upper basin native fish recruitment (e.g., Bottcher et al. 2013; https://doi.org/10.1080/02755947.2013.785993). We would like to see specific details on which tributaries will be most affected under this scenario, because tributary impacts could influence native fish recruitment. Surely this constitutes an important factor in the Bureau of Reclamation making a decision. Water delivery enabling attainment of species recovery goals under the Endangered Species Act seemingly would still need to occur under the No Action alternative, but the document is unclear on this point. Please clarify.

Page 10, second to last paragraph - more information is needed on how the state would coordinate with the Recovery Program and U.S. Fish and Wildlife Service, should Reach 2 flows not be met from FGR releases. What would be done and where would this water come from?

Page 13, Methodology - for a decision of this magnitude this analysis is extremely limited. Using 2018 release levels is a poor choice for a baseline because it was an exceptionally dry year, with drier hydrology. Also, using a single unrepresentative year to base this analysis on is much too simplistic and not revealing of the actual, typical hydrology. A much more comprehensive analysis should occur in which releases from a variety of years representing a broad spectrum of hydrologic conditions (dry-wet hydrologies) is included. We need to see representative sampling of observed flows, spread over more than one year. Furthermore, it is unclear how this model accounts for future climate change and lack of inflow given that a clear indication from a variety of climate models indicates that more precipitation will come in the form of rain, and not snowpack equivalent.

Page 14 -- 3.3.1.2.1.2 GRB Alternative -- if the diversion is immediately below FGD, how would the Reach 2 flows continue to be met? Because more water would be released from the dam during the irrigation season? If this is the case, the impacts to recreation on the Green River below the dam and in the reservoir were not adequately analyzed. Utah Division of Wildlife Resources (UDWR) just completed a creel survey on the Green River, A and B sections, and it shows usage and how dependent customer satisfaction is on flows. This creel survey data should be incorporated into the analysis, and is readily available from our Aquatics staff in the Vernal office.

Page 15 -- 3.3.1.4 Proposed Action -- Is the maximum 6-ft storage drop of the reservoir a new operating level? If annually there is anticipated to be higher releases during the irrigation season, how is the maximum drop only 6 ft? How can the No Action and GRB scenarios be similar unless base flow releases are significantly decreased to accommodate the increased releases during irrigation? Please be more specific. Decreased releases at certain times of year could be beneficial to the Flaming Gorge kokanee fishery, yet detrimental to angling on the Green River. It is difficult to provide valuable comments when the specific action is not clearly described in the assessment.

Page 16 -- It looks like part of the way the Bureau will meet the additional irrigation demands is to reduce the frequency of bypass flows? If this is the case, how can Larval Trigger Study Plan (LTSP) needs still be met? Also, UDWR would like to see spring flushing flows in more than 4% of years, although we clearly do not need them every year. Flushing flows move sediments and dislodge algae, increasing surfaces for bugs to adhere to and increasing overall productivity of the river. The sport fishery has responded very positively to the high flow releases we have received since 2011, in stark contrast to the sport fishery before 2011 during the decade between flushing flows. Does the Bureau's estimate of flows staying above 18,600 cfs at Jensen for 14 days or more in 25% of years rely heavily on Yampa River flows? Please specify, as contributions from the Yampa River appear to be overstated and should also be modeled in a comprehensive manner to account for future declines from predicted climate change.

Under Recreation 3.3.2, page 19, it states the analysis used data from the 2005 FGFEIS. There was no reference to when those data were originally collected, but obviously they were at least 13 years old. If the original data was from the 1991 U.S. Forest Service Use Capacity Survey, that would be of clear concern based on human population growth in Utah since that time. UDWR spent all spring and summer on the ramps at Little Hole and Indian Crossing for a creel survey and we observed how busy the tailrace has become. For example, just in our creel data from this year, the average number of users in A Section was 640 people (2 weekend days and 2 week days). In the 1991 Use Capacity Survey, it stated 474 people was the average for July. The Forest Service count data may even exceed ours. We also wonder about the comparison "visitation at the reservoir far surpasses that of the river" and "the river only contributes 11% of the total visitation to the NRA". Once again, where did these numbers come from? The only place we know that visitor counts occur is the river.

On page 20, there is no reference to the fishing pier/visitor dock at Dam Point, which is a big concern with lower reservoir levels. It would have to be moved or re-engineered. In the big

picture, these infrastructures and how they are adjusted might not be a huge issue, but the information in the document should be as accurate as possible.

Under 3.3.3 Wetlands, Riparian, Noxious Weeds and Vegetation -- there is discussion in regard to the impacts to riparian habitat below the dam, but was there an analysis of lower reservoir elevations and the impacts of non-native vegetation along the reservoir shoreline? It's likely that lower reservoir elevations would create an opportunity for pioneer species like tamarisk and Russian olive to flourish, creating massive non-native forests similar to those observed at lower basin reservoirs or even the Open Hills of FGR. This would be a huge seed source to deal with and could also have impacts to shoreline angler access, specifically north of the Boar's Tusk. For the river portion, the document mentions seed dispersal but not need for inundation to get cottonwood germination in the river reaches. Please discuss how many years we might expect to see cottonwood germination and establishment between the current situation and the Proposed Alternative.

Page 22 -- The assumption that rafting activities will likely not vary substantially given this scenario is likely faulty, especially since it appears the Bureau is using outdated use information/numbers for this analysis.

Under Fish and Wildlife Resources, page 25, would the Proposed Alternative increase or decrease fall/winter drawdown on the reservoir? Also, please discuss wetted width of the river as it relates to spawning habitat for rainbow trout in the spring and brown trout in the fall. With lower base flows, brown trout spawning and nursery habitat may be reduced. Brown trout are certainly one of the most important sportfish species in the river.

Page 33, Table 3-2 – fisheries managers generally no longer call these bonytail chub, preferring simply "bonytail."

Page 36, second paragraph - the dependence of native fish on hydrologic cycles is poorly represented and needs to be expanded greatly (e.g., Bestgen and Hill 2016).

Page 36, Colorado pikeminnow, second paragraph - the first sentence is incorrect using an outdated reference. Pikeminnow population status has changed significantly. See Bestgen, K.R., C.D. Walford, G.C. White, J.A. Hawkins, M.T. Jones, P.A. Webber, M. Breen, J.A. Skorupski Jr., J. Howard, K. Creighton, J. Logan, K. Battige, and F.B. Wright. 2018. **Population Status and Trends of Colorado pikeminnow in the Green River Sub-Basin, Utah and Colorado, 2000-2013.** Final Report of the Larval Fish Laboratory, Colorado State University to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Page 37, Humpback chub - this section needs to be updated with information from the recent PVA analysis conducted by the Recovery Program.

Page 39, first paragraph - the LTSP benefits numerous wetlands, not just Stewart Lake as mentioned: "Flows are increased to allow larvae to be entrained in Stewart Lake, a backwater near Jensen, Utah." Stewart Lake is not a backwater, more a wetland wildlife management area. Also wetland operations are misrepresented for the remainder of this paragraph and several

incorrect numbers are reported. A more comprehensive discussion on how FG flows are linked to wetlands and how those operations unfold is needed. See Speas, D., M. Breen, T. Jones, and B. Schelly. 2017. Wetlands White Paper: Updated floodplain wetland priorities for recovery of endangered fish in the Middle Green River. to accurately portray the details as well as Schelly et al. 2016 (referenced incorrectly here; see http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2016/hab/FR-165.pdf) to accurately report findings.

Page 40, second paragraph - more is known about bonytail than reflected here, see (Bestgen, K.R., R.C. Schelly, R.R. Staffeldt, M.J. Breen, D.E. Snyder & M.T. Jones. 2017. **First Reproduction by Stocked Bonytail in the Upper Colorado River Basin.** North American Journal of Fisheries Management, 37:2, 445-455, DOI: 10.1080/02755947.2017.1280571.). The last paragraph of this bonytail section makes several presumptions (e.g., "probably") without any actual references; riverine and reservoir habitats are not comparable as suggested.

Page 40, Proposed Action - Although only ~100 cfs in estimated losses under the proposed action it cannot be said that this will have no effect on these fish species: any loss of water will have an impact as their life cycles highly depend on annual hydrology for numerous reasons discussed in the previous pages. The same goes for nonnative fish interactions; several species would benefit from even minor losses (e.g., Bestgen and Hill 2016).

Page 41, second paragraph - "Any increased flows proposed during August - September would result in a positive effect on endangered fishes as greater flows and river fluctuations are conditions that these riverine fishes are well adapted to." This statement is taken completely out of context. Re-read Bestgen and Hill 2016 to better understand that there is a careful balance and specific flow ranges are necessary to benefit native fishes and disadvantage nonnative fishes.

Page 45, table at the top – prefer simply "bonytail."

Page 45, 3.3.6.1 Fish - Flannelmouth sucker, bluehead sucker and roundtail chub are poorly represented in detail here, and the detail is warranted given the State of Utah manages these species under a conservation agreement to preclude the need for federal listing. See the 2006 Range-wide conservation agreement and strategy for roundtail chub, bluehead sucker, and flannelmouth sucker for more details on these species and the 2016 Utah statewide monitoring summary for up-to-date population status.

Page 47, under 3.3.7.2 Proposed Action, the last sentence states "it is highly unlikely the proposed action would have any real effect on the socioeconomic situation in the area". It would be nice to see the information and analysis which led to such a conclusion. Based on what we have heard over the years, and captured in our creel/angler survey this year, it appears visitors are very sensitive to flows. Visitation is highly related to social and economic changes. We feel justified in disagreeing with these conclusions, as the Bureau has made them without supplying any basis or reasoning.

There appears to be no mention of impacts to power generation. This seems a significant oversight. Surely increasing water releases in the summer will decrease water releases in the winter when the Western Area Power Administration wants to double peak releases?

The Nature Conservancy
Protecting nature. Preserving life.™

November 1, 2018

Via Email to: greenriverblock@usbr.gov

Mr. Jared Baxter
U.S. Bureau of Reclamation, Provo Area Office
Provo, Utah

Re: Comments on Draft Environmental Assessment (EA) for the Green River Block (GRB) Exchange Contract

Dear Mr. Baxter:

Please accept these comments from The Nature Conservancy, an active participant in the Upper Colorado River Endangered Fish Recovery Program since its inception in 1988 and in the process that led to the Final Environmental Impact Statement and Record of Decision for re-operation of Flaming Gorge Dam and Reservoir to meet flow and temperature recommendations for endangered fish. The Conservancy takes no position regarding the conclusion by the U.S. Bureau of Reclamation (USBR) that no significant impacts were identified and that an Environmental Impact Statement is not required because it is not yet clear that the scenario analysis in the draft EA supports this conclusion We believe that the final EA's cumulative impacts analysis will be stronger if it addresses the following issues with disclosure, justification, and documentation.

1. The draft EA defines the 2018 level of depletions from the Green River and the rest of the Upper Colorado River Basin by reference to the depletion schedule adopted by the Upper Colorado River Commission (UCRC) in 2007 and holds this level of depletions steady without any increases for the no action scenario, while observed depletion levels as of 2018 were not used because the USBR Consumptive Uses and Losses (CUL) Report for 2018 was not available (Appendix A – Modeling Technical Report, pages 2-3). The UCRC schedule is expressed in 10-year intervals so that the depletion level for 2018 seems to have been interpolated between those in the UCRC schedule for 2010 and 2020. For more complete disclosure and better understanding of the flow impacts, the final EA should specify the interpolated level for 2018, by sector (e.g., municipal, agricultural), for the Green River in Utah, the rest of Utah in the Upper Basin, and the rest of the Upper Basin states. Prior to the release of the CUL Report for 2018, the final EA could tell us what a recent average of current depletions has been based on the CUL Reports through 2016 or 2017 for better context.

2. To simplify the analysis, the GRB of depletions are modeled for the draft EA as being taken out of the Green River during an irrigation season from July to September immediately below the Flaming Gorge Dam (Appendix A, page 3), and presumably immediately above

the Greendale gage. To better understand this simplifying assumption, the final EA should specify where these depletions may actually occur and whether they may actually be limited in duration to an irrigation season from July to September. This specification should be based on the water needs and plans of the expected GRB contractees.

3. To define reasonably foreseeable future depletions that are added to 2018 depletions and the GRB of depletions for a cumulative impact analysis, in one place (Appendix A, page 2), the draft EA excludes any future depletions without state legislation, a tribal resolution or federal Indian water settlement, or a federal finding of no significant impact (FONSI) or record of decision (ROD), and holds those future depletions at 2018 levels. In another place, the draft EA says that the modeling assumes that no new depletions will occur in the Upper Colorado River Basin (Appendix A, page 19). In another place, it indicates that some reasonably foreseeable new depletions were assumed for the cumulative analysis in the State of Utah on the Green, White and Yampa tributaries and included the Utah Indian Compact and Upalco [unit of the Central Utah Project] (Appendix A, page 2). In another place, it says holding most depletions, presumably including future ones, at 2018 levels results in significantly lower depletions than the increases projected through 2060 for the 2012 Basin Study (Appendix A, pages 4, 5) and the increases projected through 2060 by the Upper Basin states (Appendix A, page 20). In another place, the draft EA refers to an Attachment B that appears to specify the demand nodes in the USBR's Colorado River Simulation System (CRSS) for all reasonably foreseeable future depletions that are held constant at 2060 levels, but this Attachment B was not attached to Appendix A and was not well explained.

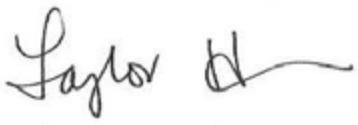
   These disclosures of the reasonably foreseeable future depletions for the cumulative analysis in the draft EA seem to conflict and are confusing. To clear them up, the final EA should include a straightforward table with a column that identifies recognizable projects for the future depletions that are considered reasonably foreseeable in each of the Upper Basin states and that will impact flows in the Green River below Flaming Gorge Dam, with another column that associates these new depletions with the increases by sector since 2018 in the UCRC's 2007 depletion schedule, with another column that specifies the state legislation, tribal resolution or federal Indian water settlement, or federal finding of no significant impact or record of decision that makes them reasonably foreseeable, and with a last column that names the CRSS demand node used to model each of these future depletions. Such a straightforward table could look like this:

Prospective Project/River Reach	Estimated New Depletion by 2060 (kaf/yr)/State	Project Plan or Authorization/Sector	CRSS Demand Node Used for Model Runs

   To put such a table in spatial context, the final EA should include a schematic with the named CRSS nodes overlaid on watersheds at the HUC-8 scale.

The Conservancy respectfully requests that the USBR provide the above disclosures in the final EA. In addition, so that we can evaluate the extent to which the flow targets are met for Reach 3 when they are met for Reach 2, we request that the USBR provide us with the CRSS modeling results for the no action, GRB, and reasonably foreseeable future depletion scenarios, at the Green River gage for Reach 3, formatted as flow duration curves comparable to those in Appendix A to the draft EA.

Sincerely,



Taylor Hawes, Director
Colorado River Program, The Nature Conservancy

cc: Robert Wigington, Patrick McCarthy, Edalin Koziol, Elizabeth Kitchens

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Mountain-Prairie Region

IN REPLY REFER TO:
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Bureau of Reclamation
Provo Area Office
Provo, Utah

November 01, 2018
Submitted via email to
greenriverblock@usbr.gov

RE: Draft Environmental Assessment (EA), Green River Block Exchange Contract

Thank you for the opportunity to review and comment on the *Green River Block Water Exchange Contract Draft Environmental Assessment*, dated September 2018. We very much appreciate Reclamation's efforts, working with the State of Utah, to identify means for further developing the Green River Block of water in Utah without unduly impacting river flows that are crucial for endangered fish recovery in the Green River basin. We offer the following comments on your draft document:

1. We suggest additional description be provided regarding how Reclamation intends to operate to meet these exchange contract commitments, beyond what's currently provided on the bottom of page 9 and top of page 10. It is not entirely clear *why* the modeling yields the results it does in the absence of additional description of the model operating rules.

    a. *For example*: Reclamation's modeling indicates a small increase in base flows under the Proposed Action in July-September (at least in drier years), with small decreases typical for the remainder of the base flow period. Is this the result of increasing Flaming Gorge releases from July through September to offset new depletions for the Green River Block during that period (in a manner that can't and won't precisely match the daily timing and quantity of those depletions, thus potentially resulting in net increases in river flow), and of decreasing releases during the October-December period to recover storage, while meeting the minimum base flow targets for Reach 2 during both periods? It would be helpful if the EA could clarify whether this explanation or some other modeling rules/assumptions produce the results shown.

2. From Page 10: "should Reach 2 target flows not be able to be met through FG operations, the State would coordinate with the Recovery Program and the USFWS." Is this language currently in proposed Contract 17-WC-40-655? If so, we have concerns that this commitment for the State to "coordinate with" the Program is weak, as it does not commit to making serious efforts to address shortfalls to endangered species flow targets.

We would like to discuss with Reclamation and the State of Utah options for strengthening this commitment.

3. On Page 14: Reclamation's modeling is based on the 1906 through 2015 hydrologic record, with no consideration of hydrologic changes or trends associated with warming temperatures. Is it realistic to assume that upper Colorado River basin hydrology in the future will look like that of the past, given recent research suggesting otherwise (e.g., USBR 2012; Udall and Overpeck 2017, McCabe et al. 2017; Xiao et al. 2018)? Reclamation may have information more specific to the Yampa and upper Green River subbasins that would help address this concern.

4. From Page 15: "Under the No Action Alternative … there would be no effect to the current hydrology of the Green River." We suggest adding to this sentence the words "*associated with the proposed contracting action.*" Clearly, Utah's development of their apportioned water right under the 1996 Assignment without replacement water from Flaming Gorge releases would affect the current hydrology of the Green River.

5. From Page 16: "Jensen flows for the April-July period incorporate the unregulated nature of the Yampa River …". We suggest changing "unregulated" to "largely unregulated", as some storage on the mainstem and tributaries (Stagecoach Reservoir, Catamount Reservoir, Elkhead Reservoir, Juniper Reservoir) does affect spring flows on the Yampa River, albeit to a much lesser extent than on other major upper Colorado Basin tributaries.

6. Much of the language contained within Section 3.3.1 (Hydrology) describes changes in Flaming Gorge releases and Green River discharge in relative qualitative terms such as: "insignificant", "nearly identical", "almost identical", "slightly lower", "negligible", etc. None of these terms provide *quantitative* descriptions of the change that allow the reader to understand the magnitude of the change. We suggest changing these terms to actually describe the quantitative change, refer to specific figures that show the change (in Appendix A), or reference some other table that allows the user to understand what these nebulous terms mean.

7. The EA states (pages 29 and 31) that "releases from FG would not deviate considerably from the current seasonal releases". Similarly, on page 20 of the hydrology appendix, it states that "releases would essentially remain the same". It is unclear how 58,957 AF of additional releases from FG to offset Green River consumptive can be considered "essentially the same as" current releases, as this equates to roughly 300 cfs of additional releases over a 100-day irrigation season. Related, the statement is made on page 11 that "no change in operations is being considered", which seems inconsistent with the EA analysis. Would it be more accurate to say "there would be no change in operations *outside of the parameters set by the FGROD*"?

8. Page 35 states: "The Southwestern willow flycatcher … for nesting … requires dense riparian habitats (cottonwood/willow and tamarisk vegetation)." This statement implies the flycatcher requires tamarisk vegetation to nest. We suggest modifying the wording to read something like "… requires dense riparian habitats which may include cottonwood, willow, and/or tamarisk vegetation".

9. We appreciate the presentation of modeling results for the Reach 2/Jensen gage location (including flow duration curves). We suggest that Reclamation also provide modeling results for Reach 3, including for the No Action, GRB, and Reasonably Foreseeable Depletion scenarios.

Appendix A Technical Report

Page 2: The first paragraph under 'Data' cites the figure of 58,997 acre-feet of remaining water under the 72,641 af total Green River Block depletion. We believe this figure is supposed to be 58,957 af.

Page 6: The third paragraph on this page references "spring base flow recommendations", when we believe you mean "spring peak flow recommendations".

Page 8: Figure 1 would benefit by adding a line labeling the minimum drawdown elevation from the 2005 EIS (5980'). The associated discussion (page 47) also references the "minimum power pool elevation", but that elevation is never specified (is it 5873 feet?).

If you have any questions regarding these comments, please contact me at (303) 236-4491. Thank you for this opportunity to provide comments.

Sincerely,

Brian S. Caruso, Ph.D., P.E.
Chief, Division of Water Resources
USFWS Region 6

Citations

McCabe G.J., D.M. Wolock, G.T. Pederson, C.A. Woodhouse, and S. McAfee. 2017. Evidence that recent warming is reducing Upper Colorado River flows. Earth Interactions 21(10):1–14.

Udall, B. and J. Overpeck. 2017. The 21st Century Colorado River hot drought and implications for the future. Water Resources Research. 53. 10.1002/2016WR019638.

U.S. Bureau of Reclamation (USBR). 2012a. Colorado River Basin Water Supply and Demand Study, Study Report. December.

Xiao, M., B. Udall and D.P. Lettenmaier. 2018. On the causes of declining Colorado River streamflows. Water Resources Research, https://doi.org/10.1029/2018WR023153.

November 2, 2018

Mr. Brent Rhees
Upper Colorado Regional Director
Bureau of Reclamation
125 South State Street, room 8100
Salt Lake City, Utah 84138

RE: Green River Block Water Exchange Contract Draft Environmental Assessment PRO-EA-16-020

Dear Director Rhees:

Conserve Southwest Utah (CSU) appreciates the opportunity to comment on this Draft Environmental Assessment (EA). CSU is a coalition of citizens advocating for conservation of the area's natural resources, public lands, water, air, and cultural resources. We advocate for Smart Growth principles that enable conservation of these resources for the benefit of present and future generations. CSU has been studying the diminishing flows and the over-allocation of the Colorado River. We have been commenting on the Lake Powell Pipeline (LPP) Project for over 10 years. CSU was nominated by the governor to be on a team of 40 water experts state-wide to come up with a 50-year water strategy.[1] It was a multi-year process, and the strategies were completed last year.

Joining this comment letter are Glen Canyon Institute, the Arizona Chapter of the Sierra Club, the Grand Canyon Wildlands Council, and the Wildlands Network. They are also concerned about the diminishing flows and over-allocation of the Colorado River and have been commenting on the Federal Energy Regulatory Commission's process for the Lake Powell Pipeline Project.[2]

We are concerned that the State of Utah's (Utah) request for 72,641 AFY of water from Flaming Gorge Reservoir to develop the Green River Block's (GRB) water rights will lead to another deficit in an already over-allocated Colorado River basin. The development of water for the GRB may require more damaging diversions on the Green River. In exchange, Utah would let BOR use 72,641 AFY for the endangered fishes in the Green River. However, Utah has not disclosed where this surplus undeveloped high water right of 72,641 AFY is located. Moreover, the water

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[1] https://envisionutah.org/projects/utah-water-strategy

[2] Conserve Southwest Utah formally Citizens for Dixie Future *et al.*, "Comments of the Lake Powell Pipeline Coalition on Scoping Document 1 and Pre-Application Document, and Additional Study Requests," eLibrary no. 20080707-5206 (Jul. 7, 2008); Citizens for Dixie's Future *et al.*, "Lake Powell Pipeline Coalition's Comments on Study Plans and Draft Study Reports," eLibrary no. 20110506-5125 (May 6, 2011); Citizens for Dixie's Future *et al.*, "Lake Powell Pipeline Coalition's Comments on Modified Draft Study Reports," eLibrary no. 20120323-5005 (Mar. 23, 2012);

that Utah wants to exchange may no longer be physically available. Therefore, the BOR cannot give Utah a 50-year service contract out of Flaming Gorge Reservoir for a paper water right that is not connected to a verifiable water supply. Furthermore, this exchange is a significant change of water use; water for the endangered fishes will be exchanged for water for development along the Green River, which is a very sensitive place for the endangered fishes. In the past, the priority for Green River management was to protect the flows for the endangered fishes; in contrast, this exchange is weighted toward development, which represents a dramatic shift in management of the Green River. This exchange needs to be carefully decided with reference to detailed information in an Environmental Impact Statement, not an EA.[3] This EA lacks sufficient detail and fails to provide a thorough explanation of how this exchange is going to work.

BOR NEPA guidelines, page 4-41:

> "*A NEPA review is required to identify the likely environmental consequences of a change in water use. The information gathered during the NEPA review, such as the potential impacts to an endangered species, must be considered in Reclamation's decision in approving the water use change. Environmental impacts are considered for both the immediate and long-term effects of a water use change.*"

This EA did not consider the impact to endangered fishes due to development of GRB's water rights. Specifically, it did not state where the proposed diversions would be located or what amount of water would be diverted.

Furthermore, the EA does not address Utah's diminishing water supply or the over-allocation of its water rights. For example, the BOR is not using hydrological modeling scenarios that reflect diminishing stream flows from a warming climate. This outdated approach puts our environment and the water supplies that we rely on at risk.

Our other concerns with this EA include:

1. BOR is not verifying Utah's Green River tributaries water supply of 72,641 AFY for the endangered fishes, which it wants to exchange for this 50-year service contract. However, the spring high flows of the Green River tributaries may already be diverted to the Central Utah Project.
2. It doesn't correctly describe the primary purpose or impact of allowing Utah to draw its Ultimate Phase CUP water right of 158,890 AFY depletion and about 300,000 AFY

[3] https://www.law.cornell.edu/cfr/text/40/1500.1: 40 CFR 1500.1 Purpose **(b)** NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. The information must be of high quality. Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA. Most important, NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail.

diversion from Flaming Gorge Reservoir. We suspect that amount of water that Utah wants to exchange for the endangered fishes is not actually available in the high water spring runoff of the Green River tributaries.

3. BOR is using a piecemeal approach by trying to approve signing a 50-year service contract for the GRB using a flawed EA before the Lake Powell Pipeline (LPP) Project Environmental Impact Statement (EIS) is approved. This concept of a water use exchange with BOR should be included in the Lake Powell Pipeline EIS. Both of BOR's proposed service contracts, the GRB and LPP Block are connected, because they both depend on water from Flaming Gorge Reservoir and both seek to exchange use of spring high water Green River tributary flows for the endangered fishes to complete their proposed actions.[4] Also, they are requested actions from the same entity, the Utah Board of Water Resources and are segregated from the same Ultimate Phase CUP Water Right No. 41-3479.
4. BOR is ignoring its own call to action to deal with the over-allocation of the Colorado River basin. "The Basin faces a wide range of plausible future long-term imbalance between supply and demand." This call to action is outlined in the *Colorado River Basin Water Supply and Demand Study.*[5]
5. A contract negotiation meeting for this exchange was held December 2017 in St. George. However, in this EA, the proposed Contract No.17-WC-46-655 draft provisions were not

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[4] 43 CFR § 1508.25 Scope. *Scope* consists of the range of actions, alternatives, and impacts to be considered in an environmental impact statement. The scope of an individual statement may depend on its relationships to other statements (§§ 1502.20 and 1508.28). To determine the scope of environmental impact statements, agencies shall consider 3 types of actions, 3 types of alternatives, and 3 types of impacts. They include:
(a) Actions (other than unconnected single actions) which may be:
(1) Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they: **(i)** automatically trigger other actions which may require environmental impact statements. **(ii)** Cannot or will not proceed unless other actions are taken previously or simultaneously. **(iii)** Are interdependent parts of a larger action and depend on the larger action for their justification. **(2)** Cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement. **(3)** Similar actions, which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography.

[5] Colorado River Basin Stakeholders *Moving Forward,* addressing challenges identified in the Colorado River Basin Water Supply and Demand Study, Phase 1 Report: Executive Summary, Bureau of Reclamation, May 2015. "The Basin faces a wide range of plausible future long-term imbalance between supply and demand. This imbalance computed as a 10-year running average, ranges from no imbalance to 6 million acre-feet (MAF) with a median of 3.2 MAF in 2060."[5] Compounding the problem is river flows at Lee Ferry during last 15 years have only been 12.5 -13 MAFY; lower than the estimated 15 MAFY used in decision making. These lower flows are not being considered by BOR, or Utah in forecasting water availability for the LPP and this omission is making the over allocation worse.

provided for public comment. CSU provides specific comments on the proposed contract below.

CSU's specific comments on the EA, with page numbers and quotes noted:

1.3 Background, page 5.

"*Reclamation and the State propose entering into an exchange contract for the GRB that would allow Reclamation to: meet ESA Recovery Program goals in the Green River, continue to operate FG dam within the parameters of the FGROD, and provide the State with a reliable water supply for development of the 1996 Assignment.*"

"*The remaining portion of the 1996 Assignment currently held by the Board has a diversion limit of 320,474 AF and a depletion limit of 86,249 AF. This portion is being reserved by the State to be used by the Lake Powell Pipeline Project (LPP) which would divert water from Lake Powell and deliver it through a pipeline to Washington and Kane counties in southwestern Utah. This portion of the 1996 Assignment is referred to as the LPP Block.*"

CSU comment:

As mentioned above, both 50-year service contracts requests for water from Flaming Gorge Reservoir should be carefully studied in the context of the Lake Powell Pipeline EIS. Utah's claim that it still has this large remaining water right of 72,641 AFY in the spring high water Green River tributaries needs to be verified, because water supplies are declining and Utah has over-allocated its water rights in this region. Utah provides no evidence in this EA to support the claim that they have this water. One possible reason why there is not much undeveloped high water in the Green River tributary flows is because it may all be going to the Central Utah Project.

Furthermore, the EA does not explain how 72,641 AFY of undeveloped Green River tributary flows below Flaming Gorge Reservoir will be left in the Green River tributaries for the endangered fishes. Will water be identified and measured in these Green River tributaries before it is released from Flaming Gorge Reservoir?

Additionally, Utah should disclose the source of the water supply it wants to exchange. This supply should remain physically available for the endangered fishes to assure that it stays in the system for the 50-year term of the service contract. Utah should also be required to show proof of this claim so it can be evaluated against claims of senior water right holders and the remaining water supply. A study of water supply availability in Green River tributaries needs to be included in the EIS.

Moreover, months ago, CSU sent a GRAMA records request to the Utah Division of Water Resources to ask for details on where these undeveloped high water Green River tributary flows are located. We were told that the information provided by the Utah Division of Water Rights records was inconsistent with the records of the Utah Division of Water Resources. We are still waiting to obtain this information.

1.4 Purpose of and Need for Proposed Action, page 5

"*Reclamation received a letter dated January 5, 2016, from the State requesting two contracts for the use of its assigned water right (total of 158,890 AF depletion). One contract represents 86,249 AF depletion to be used for the LPP proposed to be constructed by the State; the second contract, called the Green River Block, or simply GRB, represents the remaining amount of the assigned water right (72,641 AF depletion) to be used for development along the Green River. The purpose of the Exchange Contract is to facilitate a water exchange of 72,641 AF of depletions annually under the 1996 Assignment, which was previously included as part of a CRSP participating project water right. This contract is needed to resolve a long standing disagreement between Reclamation and the State regarding use of the water right assigned in 1996.*"

CSU Comment:

CSU is concerned that this exchange will further diminish an already over-allocated Colorado River, where existing deficits have not yet been addressed. It is well-documented by the BOR that there is more water allocated in the Colorado River than the river produces annually, even without considering a warming climate. The releases from Lake Powell continue to exceed inflows. This over-allocation has drained the reservoirs faster than anyone predicted.

This EA did not consider Utah's water right laws in its water use exchange concept.

The *Doctrine of Prior Appropriation* states the fundamental principle by which water rights are managed within the western states and Utah: "first in time, first in right." This doctrine is not used in allocations in the Colorado River Compact between the states, but it is the basis for Utah's water laws. This means that those holding a water right with the earliest priority date, and who have continued to make beneficial use of the water, have the right to water from a certain source before others with water rights having later priority dates. As water supplies decline, this principle will decide whose water supply gets shut off and who can continue to access the water. The GRB's 1958 water right 41-3479 is junior to many senior water right holders and is at high risk of being shut off. BOR is ignoring this risk. As Colorado River flows diminish over time, Utah's junior

priority GRB's water rights of 1958 will be subordinate to those of senior water rights holders.

Utah's water laws and water rights should be made part of this EA's decision-making process, but so far, they have not been considered. All of the Ultimate Phase CUP water rights have to show proof of beneficial use by 2020. This includes the GRB's water rights. Is BOR changing all the GRB's water rights proof of beneficial use dates past 2020 by ignoring this provision and including the water in a 50-year service contract? This gives Utah's water rights a senior position above all others. Furthermore, Utah's water law concerning instream flows may also have to be updated to accommodate this exchange, so that water can be left in a stream for the fishes and not developed. Thus far, this EA includes no discussion of how Utah's water rights laws will govern the exchange of water use in this 50-year service contract.

For instance, the priority date for all GRB water rights is 1958. This means that all water rights granted prior to 1958 have priority over the GRB's water rights. Also, the GRB's water rights are junior to: the Bonneville Unit of Central Utah Project, the Lower Basin states, and water for Mexico, as well as tribal water rights and other unsettled Federal Reserve Water Rights yet unresolved. All of these risks to this GRB's water rights need to be evaluated in an EIS.

We were told by BOR staff that the GRB's water right's 1958 priority dates would not change, and it would remain junior to the CUP. CSU is concerned that the BOR intends to give a service contract for 50 years for 72,641 AFY without considering the risks that the GRB's water rights could be shut off. This would happen if Utah's water rights laws are followed.

CSU does not understand how BOR's own goals would be met in this proposed exchange concept. It doesn't solve any of over-allocation of the Green River basin, and it is unclear whether sufficient water would remain available to protect the endangered fishes. The exchange also does not seem to appear in keeping to Utah's previous pledge to not issue water rights or do any change applications in this section of the Green River. In this 2009 proposed Green River Water Rights Policy Agreement, Utah had been tasked with providing legal protections for the endangered fish flows from Flaming Gorge Reservoir to Lake Powell under the *Recovery Implementation Program Recovery Action Plan* (RIPRAP).[6] Also, the Department of Interior recommends that each action be consistent with the goals of BOR.

[6] https://www.waterrights.utah.gov/meetinfo/m20090820/policy-upcorviMC09L.pdf and

"Interior's regulations at 43 CFR 46.420(a)(1) indicate that, in accordance with 40 CFR 1502.13, "purpose" and "need" may be described as distinct aspects defining the underlying situation that the agency is responding to. The "need" for action is the underlying problem the agency wants to fix or the opportunity to which the agency is responding with the action. The "purpose" is the goals or objectives that the agency is trying to achieve."

CSU does not think this proposed action meets the goals of BOR to try the solve the long-term imbalance between supply and demand. It certainly meets Utah's goals—but at what expense to the environment and the public good?

EA page 5. Purpose continues:

"This contract is needed to resolve a long standing disagreement between Reclamation and the State regarding use of the water right assigned in 1996."

CSU does not understand how this EA would solve the core issue that BOR faced in 2009: that the Green River was over-allocated. This Ultimate Phase CUP Water Right No. 41-3479 should have lapsed in 2009, as the state agreed to do. Rather than resolving the over-allocation of the Green River, this EA makes it worse.

In 2009, the BOR had a different position about the Ultimate Phase CUP Water Right No. 41-3479. BOR stated in their protest letter that this water right should have lapsed due to the over-allocation of senior water rights holders in this region. [7] The GRB is a portion of this same water right. This letter reads as follows:

Water Right No. 41-3479 is a segregated portion of the Flaming Gorge water right, Application to Appropriate No. A30414. This appropriation originally included both the storage of water in Flaming Gorge Reservoir and the beneficial use thereof for the "Ultimate Phase" of the Central Utah Project. After the "Ultimate Phase" was deauthorized, Reclamation assigned this portion of the appropriation to the Utah Board of Water Resources with the understanding that any portion of this water right not developed within 50 years of the original approval date (October 6, 2009) would lapse.

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[7] Letter from BOR to State Engineer Dec 17, 2009 see at:
https://www.waterrights.utah.gov/asp_apps/DOCDB/DocImageToPDF.asp?file=/docSys/v921/b921/B921002N.TIF;
https://www.waterrights.utah.gov/asp_apps/DOCDB/DocImageToPDF.asp?file=/docSys/v921/b921/B921002O.TIF

Reclamation is concerned that further extensions on the undeveloped portions of the Flaming Gorge appropriation could jeopardize the future of the Central Utah Project (CUP). To date, over $2 billion dollars have been spent to develop the CUP, which supplies agricultural, municipal, and industrial water to millions of Utah residents in the Uintah Basin, Heber Valley, and Wasatch Front corridor. The key right for the CUP, Water Right No. 43-3822, has a priority date of November 11, 1964. If all the senior undeveloped water rights in the Green River and San Juan River Basins are developed, Utah would exceed its portion of the Colorado River Compact and the Central Utah Project water rights would be adversely impacted.

The BOR protested the Ultimate Phase CUP Water Right No. 41-3479 extension of time, for proof of beneficial use, beyond the 50-year limit (October 6, 2009). For this reason, Utah made all these GRB water rights junior to the Central Utah Project All of GRB water rights holders also have to show proof of beneficial use by 2020. The BOR also mentioned in their protest letter that if all senior undeveloped water rights in Green River and San Juan are developed, Utah would exceed its portion of the Colorado River Compact. The BOR also protested every water right that was segregated from the Ultimate Phase Water Right No 41-3479, and Utah made them junior to the Central Utah Project.

This suggests these GRB water rights are not a valid water right to exchange with the BOR for a 50-year service contract. The BOR has changed its position for an unknown reason and now claims these water rights are a viable, permanent 72,641 AFY water right that can be used for an instream flow for the endangered fishes for 50 years. However, the BOR has not addressed the concern that this 1958 GRB's water rights are junior to senior water right holders and will be in jeopardy of being shut off as water supplies decline. The BOR should explain why they changed their position in this EA. Furthermore, BOR should conduct an analysis of the validity of Utah's GRB's water rights and the available projected water supply for this 50-year service contract before agreeing to this exchange with Utah.

Utah has about 1.369 Million Acre Feet per Year (MAFY) of depletions from tributary sources to the Upper Basin Colorado River to use, and the balance of water is supposed to go downstream to the Lower Basin states.

Utah estimates that 1,007,500 AFY are being depleted. This is water that is taken out of the watershed and does not return. If you use a natural flow at Lees Ferry of 15 MAFY, it leaves about 360,000 AFY left for Utah to use. But, if you have less water at Lees ferry

(as shown in Udall's 2017 study,[8] which identifies a 19% decrease since 2000), this reduces the availability of the GRB's water rights. Udall and colleagues also concluded in another study that the naturalized flow of the Colorado River has decreased about 15% over the last 100 years.[9]

Therefore, Utah may not have a remaining share to develop due to diminishing flows and the over-allocation of its Colorado River water rights. A validation process should be initiated to resolve Utah's over-allocation of its Colorado River water rights, which are currently in disarray, before the state allocates more water from its diminishing supplies.

For Example: The State's web site on the Upper Basin Water Rights lists 2.5 MAFY of approved depletions, but Utah is only supposed to deplete 1.369 MAFY.

> See https://www.waterrights.utah.gov/distinfo/colorado/WRPriorityDDview.asp, where new totals are indicated at the bottom of the page:
>
> - 6,450,413 acre feet diversion; and
> - 2,542,092 acre feet depletions.

Consequently, there are significantly more approved water right applications than Utah's allocation, which, if developed, could potentially exceed Utah's entitlement.[10]

Furthermore, in 2009, there was a proposed water rights policy agreement for the Green River. [11] The Nature Conservancy and Western Resource Advocates described the over-allocation of the Green River as follows:[12]

> *"As the DWR stated in the public meetings, the surface waters in the affected reaches of the Green River are in essence "fully appropriated" and generally not subject to additional appropriation. New groundwater appropriations are limited to "small . . . applications for 1 family, 1/4 acre of irrigation and up to 10 livestock units." DWR's existing policy is to deny any significant new applications to appropriate water from these reaches. Consequently, we believe that the large*

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[8] *The Twenty-First Century Colorado River hot drought and implications for the future.* See at: http://conserveswu.org/wp-content/uploads/Udall_et_al-2017-Water_Resources_Research.pdf.

[9] Mu. Xiao, Udall, Lettenmaier, On the causes of declining Colorado Stream Flows, 2018 see at: https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2018WR023153

[10] Water Right Issues in the Upper Colorado River Basin of Utah https://www.waterrights.utah.gov/meetinfo/m042005/summary.htm

[11] https://www.waterrights.utah.gov/meetinfo/m20090820/policy-upcorviMC09L.pdf

[12] https://www.waterrights.utah.gov/meetinfo/m20091014/20091201_WRA-TNC_comments_final.pdf

"approved" but not yet "perfected" water rights are a much greater challenge for DWR in protecting the recovery flows. The potential reduction in recovery flows resulting from the exemption of approved, but unperfected water rights, needs to be fully addressed by the proposed policy. Additionally, the proposed policy does not account for "approvals" upstream of Reaches 1 and 2. One way to address depletions by approved but unperfected water rights may be to provide for an additional and equivalent increase in releases from Flaming Gorge whenever the perfection of approved water rights will reduce the recovery flows, as discussed above."

CSU comment:

In a 2009 proposed Green River Water Rights Policy Agreement, Utah was tasked with providing legal protections for the endangered fish flows from Flaming Gorge Reservoir to Lake Powell under the *Recovery Implementation Program Recovery Action Plan* (RIPRAP). However, Utah now wants to allow many new diversions on the Green River for the GRB's water rights to be able to divert 72,641 AFY from the Green River. This seems to be conflict with this previous agreement. The GRB's water districts only have until 2020 to show proof of beneficial use. Therefore, there is no certainty that this water right will remain in place for the duration of a 50-year service contract. It is not clear how Utah's water laws and the requirement to put all waters to beneficial use may impact this water use exchange, which changes water use from development to an instream flows.

1.5 Scoping, page 6.

CSU comment:

Scoping was not done in a reasonable time period. BOR only held one scoping meeting on the EA in Vernal, Utah, and gave short notice for that meeting. Scoping is supposed to identify the issues to be addressed in the study, but the public was not given a meaningful chance to participate in a scoping process. The EA does not address the risk and uncertainty of the GRB water rights that Utah wants to exchange with BOR. CSU gave written comments to BOR on the proposed contract after the Open House in St George in December of 2017. However, this EA does not address any of the concerns expressed in our comments.

1.8 Scope of Analysis, page 8.

"The purpose of this EA is to determine whether or not Reclamation should enter into a contract with the State to exchange high spring tributary flows for water released from FG Dam, and to monetize that release of water. That determination includes consideration of

whether there would be significant impacts to the human or natural environment. In order to enter into a contract, an EA must be completed and a FONSI issued. Analysis in the EA includes impacts from depletions of water along the Green River, from FG Dam down to, but not including, Lake Powell".

CSU comment

An Environmental Assessment and Finding of No Significant Impact (40 CFR 1501.3 and 1508.9, 43 CFR 46.300-325 state that:

> *"An EA is a concise document prepared with input from various disciplines and interested parties that provides sufficient evidence and analysis for determining whether to prepare an EIS or a FONSI. This conclusion cannot be reached without having knowledge of what the issues are, as determined by appropriate Federal, tribal, State, local, and public entities, as well as the general public."*

CSU comment:

This EA did not provide sufficient evidence or information to make a decision possible. Therefore, BOR needs to do an EIS. There is nothing in the EA that describes where the Green River seasonal high water tributary flows of 72,641 AFY are located. This EA also does not indicate where all the GBR's possible water diversions along the Green River will be, or how they might impact the endangered fishes.

Chapter 2 Alternatives, page 9

2.1 Introduction,

> *"This chapter describes the features of the No Action and Proposed Action Alternatives and presents a comparative analysis. It includes a description of each alternative considered. This section also presents the alternatives in comparative form, defining the differences between each alternative."*

CSU comment:

An EA must include a discussion of alternatives, including the agency's preferred alternative.

40 C.F.R. section 1508.9(b). Under Reclamation's NEPA guidance, "[t]he responsible official has discretion to determine what (if any) action alternatives are appropriate." Reclamation's NEPA Handbook (Feb. 2012), p. 4-18. The record must include the official's rationale for how they exercised this discretion. Id. Thus, the official must explain how the alternatives considered were determined to be appropriate or feasible given the applicant's goals. See "CEQ Guidance regarding NEPA Regulations, " 48 Fed. Reg. 34263 (July 22, 1983), p. 9.

The EA identifies two alternatives: No Action and Proposed Action (defined as the "preferred alternative"). However, the EA does not provide adequate information to show that Reclamation's preferred alternative, i.e., the Proposed Action, is appropriate or feasible. More specifically, the EA does not include any inquiry into whether Utah has the water rights necessary to implement the Proposed Action for the 50-year term of the service contract. As discussed in these comments, BOR needs to reveal how it determined that Utah has the 72,641 AFY seasonal high Green River tributary flows to exchange with BOR to protect the endangered fishes. Also, the BOR needs to disclose how it made the decision that the GRB's 1958 junior water rights, which have to show proof of beneficial use by 2020, can be given a 50-year service contract for 72,641 AFY from Flaming Gorge Reservoir. As such, there is insufficient information in the record to show that the Proposed Action is appropriate or feasible. We again request that Reclamation provide information that demonstrates Utah has the water rights necessary to implement the Proposed Action.

1.2 Proposed Action, page 9

"For this exchange, the State would forebear the depletion of a portion of the Green River and tributary flows to which it is entitled, and instead allow these Compact Entitlement Water (the water under Article XV(b) of the Upper Colorado River Basin Compact which expressly recognizes each compacting state's rights and powers to regulate within its boundaries the appropriation, use, and control of water apportioned and available to the states by the Colorado River and Upper Colorado River Basin Compacts) rights to contribute to meeting the ESA Recovery Program Requirements in Reaches 1 and 2, thereby assisting Reclamation in its obligation under the FGROD. In exchange, the State would be authorized to deplete an equal amount of CRSP project water from FG releases throughout the year as water is needed for the State's Water Right. On an annual basis, the direct flows that would be left in the river and used to meet ESA requirements would equal the FG project releases used for depletion by the State under the Contract Entitlement Water right. The State would not make calls for releases from FG storage; rather, it would use the CRSP project water as it is"

continued on page 10,

"Each water year, the State may deplete up to 72,641 AF (part of the water it would have been available to deplete under its Compact Entitlement Water right), which instead it would forebear and designate to meet ESA Recovery Program Requirements in Reaches 1 and 2. At present, 13,684 AF of the 72,641 AF has been developed. This water would not be available for exchange of Project water until such time that a water right change application is filed on these developed portions."

CSU comment:

> *"On an annual basis, the direct flows that would be left in the river and used to meet ESA requirements would equal the FG project releases used for depletion by the State under the Contract Entitlement Water right"*
>
> *"For this exchange, the State would forebear the depletion of a portion of the Green River and tributary flows…"*

These statements from the EA are very confusing, because they do not explain how these direct high Green River tributary flows will be measured so an exact amount can be drawn from Flaming Gorge Reservoir. It also does not identify where the flows are that the Utah will forebear and give to the endangered fishes.

3.3.1.1. Hydrology, page 12, Overview

"Through coordination with the State, Reclamation conducted several hydrologic modeling runs using Reclamation's long-term planning model, Colorado River Simulation System (CRSS). The results of these model runs are being used to determine potential impacts on the hydrology of the Colorado River System from development of the GRB Ultimate Phase depletions. These depletions and diversions were covered in the FGFEIS, and are being analyzed for the purpose of signing Contract No. 17-WC-46-655 for Exchange of Water-Green River Block between the United States of America and the State."

"The hydrologic modeling provides projections of potential future Colorado River System conditions (e.g., reservoir elevations, reservoir releases, river flows) under the No Action Alternative scenario for comparison with conditions under the Proposed Action Alternative scenario. Due to uncertainties associated with future inflows into the system, multiple simulations were performed for each alternative to quantify the uncertainties in future conditions, and the modeling results are typically expressed in probabilistic terms."

CSU comment:

CSU questions BOR's exclusive use of CRSS, DNF models, and the Index Sequential Method (ISM) because these methods do not account for the impact of a warming climate. The models used in this EA only use the 100-year average of 15 MAFY at Lees Ferry. As mentioned above stream flows have continued to diminish. The BOR does have the option to use other available models that reflect diminishing flows, such as the Downscaled GCM projected scenarios results in the Basin Study, which use a mean annual flow of approximately 13.6 MAFY at Lees Ferry.

3.3.1.5 Cumulative Effects, page 17.

"Cumulatively, there would not be a significant impact to hydrology based on the analysis performed in this EA. The full depletion scenario, which includes reasonably foreseeable depletions, increases the maximum difference in elevation at FG Reservoir to 30 feet when compared to the No Action Alternative, at 100 percent exceedance, yet still within the FGFEIS range that extends to elevation 5,980 feet. It is important to remember that this is the worst case scenario—water is assumed to be taken below FG Dam in the projected driest year."

CSU comment:

The models do not consider a warming climate, which is likely to have a significant impact on the environment and the diminishing water supplies. As a result, these models do not accurately assess the cumulative effects of this action. These models do not reveal the full impact of the depletions, and they do not account for the projected diminishing future stream flows predicted by the BOR.

Specific CSU comments on the Contract No. 17-WC-46-655, Technical Draft 10-05-2017 include:

RECITALS

CONTRACT Page 3. RECITALS

CSU comment:

j. In this contract Recital, the BOR claims this action is in the best interest of the United States. However, based on our analysis, this contract is not in the best interest of the United States or other stakeholders, because it continues to over-allocate the diminishing flows of Colorado River.

CONTRACT Page 4., 4. TERM

The Contract remains in effect for 50 years.

CSU comment:

How can BOR guarantee GRB's 1958 junior water right for 50 years, when this water right has to show proof of beneficial use by 2020? This proposed contract also conflicts with Utah's water laws and Utah's 2009 Proposed Water Rights agreement on the Green River.

CONTRACT Page 5.

8. RATE AND METHOD OF PAYMENT

CSU comment:

How did BOR calculate this low annual rate of $19 per acre foot? This rate seems low compared to other BOR contracts. BOR should disclose how the rate was established and what other projects have been charged. Also, what are the costs of the CRSP used to determine the rate in this Contract? BOR should provide this information so the public can judge whether the rate is fair and whether it will be subsidized by the nation's taxpayers.

For instance, the Upper Gunnison River Water Conservancy District Contract No. 04-WC-40-010 was charged a much higher rate of $71.68 per acre foot than Utah's $19 AFY.

Excerpts from their Contract:

The first year per acre-foot rate of $71.66 will be charged for any approved third-party contract and is calculated from an amortization of the total debt service amount of $611,745.00, using the annuity due formula, a 40-year payment term, and an interest rate of 5.49 percent, which is the 2001 annual average rate for 20-year Treasury constant maturities.

This contract with Utah could also be an opportunity to add an escalation clause to the Contract. As the elevation of Flaming Gorge Reservoir decreases, the price per acre foot of water should increase. Pricing is a good tool for conservation.

CONTRACT, Page 14.

(n) CONSTRAINTS ON THE AVAILABILITY OF WATER

CSU comment:

This section should describe at what reservoir level Utah could not continue to draw water out of Flaming Gorge Reservoir.

This Contract should disclose how Utah's water laws and senior water rights holders may restrict water use to protect the endangered fishes.

WATER SUPPLY SHORTAGE

CSU comment:

There is nothing in the Contract that explains what will happen to 1958 Ultimate Phase GRB's water right in a shortage. A clause should be included in this Contract.

ADD –WATER CONSERVATION CLAUSE TO CONTRACT

CSU comment:

There is an opportunity to add a water conservation clause similar to the one included in this UTE Contract shown below. Cities receiving water would have to have a comprehensive Water Conservation Plan with firm targets. For example:

THE UTE MOUNTAIN UTE TRIBE, ANIMAS-LA PLATA PROJECT, [13] page 19

WATER CONSERVATION
"*Prior to the delivery of water provided from or conveyed through federally constructed or federally financed facilities pursuant to this contract, the Tribe shall develop a water conservation plan, which shall contain definite water conservation objectives, appropriate economically feasible water conservation measures, and time schedules for meeting those objectives.*"

In summary, this EA does not contain sufficient or accurate information to enable stakeholders to fully understand the proposed action's impact on the environment and make an informed decision. There is no certainty that there is 72,641 AFY physically available for the endangered fishes. This decision should be studied in an EIS.

This EA includes many unsubstantiated claims that need clarification. Where does Utah find 72,641 AFY currently in seasonal high flows of Green River Tributaries that is surplus and not being used by other senior water rights holders? The BOR must address the fact that Utah's share of the Colorado River has already declined and will continue to decline over this 50-year period. It should also consider the other obligations that have a higher priority date than this GRB's 1958 water right. The GRB' water rights are junior to the largest water user of Upper Basin Colorado River water, the Central Utah Project. Finally, given all the uncertainties of declining water supplies and over-allocation of water in the Colorado River system, Utah must also address the over-allocation of its Colorado River approved water rights before it allocates more water for the GRB.

In closing, the Bureau of Reclamation (BOR) is responsible for determining how much water is available in the Upper Basin for new projects to use. Therefore, the BOR should conduct a Hydrological Determination to prove that there is a sufficient water supply for the GRB and for the endangered fishes will be present in the Colorado River System for the duration of this 50-

[13] See at:https://www.usbr.gov/uc/wcao/pdfs/contractDocs/ALP_UMUT_DRAFT_Contract_11.2017.pdf

year service contract. Based on our analysis, declining stream flows and the over-allocation of Utah's remaining share of the Colorado River suggest that the GRB's water rights may already be restricted to senior water rights holders.

A comprehensive study, such as a Hydrological Determination, could determine whether Utah has a sufficient remaining Colorado River allocation to exchange for this 50-year service contract. BOR's service contract with Utah for water from Flaming Gorge Reservoir should occur only after the Lake Powell Pipeline EIS is completed. There should not be a separate EA for the GRB's exchange of water use.

Please don't hesitate to call or email me if you have questions about our comments.

Respectfully,

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November 2, 2018

Mr. Jared Baxter
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302 East 1860 South
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Sent via email to: greenriverblock@usbr.gov

Re: Comments on the Draft Environmental Assessment for the Green River Block Water Rights Exchange Contract

Dear Mr. Baxter,

Living Rivers & Colorado Riverkeeper submit the following comments for the Draft Environmental Assessment (DEA) of the Green River Block Water Exchange Contract. Thank you for the opportunity to participate in this public process. We also thank you for extending the comment period from October 18 to November 2.

INTRODUCTION

Living Rivers is a nonprofit organization based along the Colorado River in Moab, Utah. Moab is the county seat of Grand County and the western boundary of our county is the Green River. Living Rivers has approximately 1,200 members. Since its inception in 2000, Living Rivers has been engaged in advocating for responsible management of the Colorado River system. Living Rivers was designated as the official Colorado Riverkeeper in 2002 by the Waterkeeper Alliance, comprised of more than 350 on-the-water advocates who patrol and protect more than 100,000 miles of rivers, lakes and coastlines on 6 continents. Many Waterkeepers in the Western US depend on the scarce water resources of the Colorado River basin. Living Rivers' trustees, partners, and members live, work, recreate and rely on the waters of the Green and Colorado Rivers.

This DEA examines the impacts of a contract between the State of Utah and the Bureau of Reclamation (Reclamation) which outlines agreements on water released from Flaming Gorge Dam, operated by Reclamation, for use in Utah by Utah water rights holders. The Green River Block water rights, held by private and public water suppliers, mostly along the Green River in Utah, amount to 72,641 acre-feet (af). This water from Flaming Gorge is available for consumption to the counties of eastern Utah.

Incidentally, we recognize a controversy amongst stakeholders that releases from Flaming Gorge Dam, in the Upper Basin Division, and conveyed by pipeline to Washington County, Utah, which is in the Lower Basin, may not be an appropriate use under the 1922 Compact. When the time comes to for Reclamation to prepare the DEA for the Lake Powell Pipeline Contract of 86,000 acre-feet (annual), we would appreciate Reclamation's clarification on this matter, at that time.

From 2000 to 2005, Living Rivers, Colorado Riverkeeper and Center for Biological Diversity participated in the National Environmental Policy Act (NEPA) for an Environmental Impact Statement (EIS) process in regards to re-operations at Flaming Gorge Dam.[1] We participated fully in the NEPA process for the 2007 Interim Guidelines EIS.[2] In 2010, we provided comments on the Green River Pumping Project Environmental Assessment (EA).[3] Since 2012, we jointly participated in the EIS for Long Term Experimental Management Plan for operations at Glen Canyon Dam.[4] We also participated in the 2012 Water Supply and Demand Study (Basin Study), which was not a NEPA process, but was authorized by the 2009 SECURE Water Act.[5]

Joining this comment letter for the Green River Block DEA are the following groups: Green River Action Network, Upper Green River Network, Las Vegas Water Defender, Waterkeeper Alliance, Save The Colorado, Utah Chapter of the Sierra Club, Holiday River Expeditions, Colorado Outward Bound, Dinosaur River Expeditions, OARS, and One-Way River Works.

While we appreciate the attempt to tie the Green River Block water withdrawals to releases from Flaming Gorge Dam to protect critical habitat and maintain minimum flows in the Green River (Reaches 1, 2 & 3) we are concerned about the inadequate modeling of future hydrology in the DEA and the lack of a basin-wide comprehensive Environmental Impact Statement evaluating how future Drought Contingency Plans (DCP) will influence Flaming Gorge reservoir levels. Additionally, we question which specific water rights will be left in tributaries by the State of Utah in exchange for water out of Flaming Gorge Reservoir and how these will be accounted for. We also question the legal validity of these water rights, since the appropriate intention by Reclamation, in 2009, was to let them lapse (50-years after 1959).[6]

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[1] http://www.livingrivers.org/archives/article.cfm?NewsID=90

[2] http://www.livingrivers.org/archives/article.cfm?NewsID=766

[3] http://www.livingrivers.org/pdfs/LRletterGreenRiverPumpingProject.pdf

[4] http://www.riversimulator.org/Resources/NGO/LTEMP/LTEMPeisCommentsLivingRivers31Jan2012.pdf

[5] http://www.livingrivers.org/pdfs/LivingRiversCBDComments2013.pdf

[6] http://www.riversimulator.org/Resources/Pipelines/UltimatePhase/ExtensionRequestDuchesneWaterConservancyDistrict2009Reclamation.pdf

Moreover, the DCP for the Upper Basin Division explains that there is flexibility within the Record of Decision (ROD) for dam operations at Flaming Gorge, Aspinall Unit, and Navajo, to release water annually (up to 2 million acre-feet has been proposed) to maintain the safe generation of hydropower at Glen Canyon Dam to the expiration date of the DCPs in 2026. The emergency evacuation of water from reservoirs in the upper basin might work for one year, but it is uncertain it would work in subsequent years. We worry that the measures proposed in the Upper Basin DCP may empty the upper basin reservoirs, threaten critical habitat below, and eventually compromise the recovery programs for the endangered fish. This situation would also negatively alter water quality for human uses, such as the degradation of drinking water and irrigation water. Such actions resemble a quote from Aldo Leopold, "Girdling the old oak to squeeze one last crop out of the barnyard has the same finality as burning the furniture to keep warm."

Demand Management strategies for the Upper Basin Division DCPs are premature for implementation. For example, large-scale forbearance agreements have yet to be negotiated, as are the funding mechanisms. The uncertainties that surround DCP and the basin-wide impacts that will result make it premature and difficult to impossible to consider those impacts, as NEPA requires they must, in the DEA for the Green River Block Water Rights Exchange.[7]

Furthermore, it is not clear to us if the proposed action has been properly defined in the DEA. For example, the users of this water are not defined, the locations of the withdrawals are not defined, the amount that the users would divert at such locations has not been defined, and an accounting system to ensure that the State of Utah is leaving water in tributaries in exchange for water from Flaming Gorge as not been defined. Without having empirical information, it is difficult for the public to understand what the impacts might be to the ecosystems of the Green River and its tributaries, such as the Yampa River, the White River, the Duchesne River, the Price River, the San Rafael River, and finally the tributaries of Lake Powell which include the Dirty Devil River and the Escalante River. If the public can't assess the proposed action and its potential impacts properly, then we have to assume that neither can the US Fish and Wildlife Service, the Tribes or other cooperating agencies.

The heightened concern for us are the endangered and threatened fish in the lowermost section of Reach Three, starting at the vicinity of the San Rafael River mouth where the last diversion occurs. We understand the nursery habitat at lower Reach Three suffers from incidental water withdrawal by natural evaporation and evapotranspiration (ET), along with a much-slowed river current and a general shallowness in this particular reach. On our river trips in the summer, we have witnessed fish morality due to heat stress and low oxygen levels, especially for the flannelmouth sucker. We have witnessed juvenile fish being stranded in detached backwaters that heat in the sun and make for easy foraging by fish-eating predators. A release from Flaming Gorge dam to augment the flows and reduce river temperatures and reconnect backwaters in Reach

[7] http://www.livingrivers.org/pdfs/Press/ColoradoRiverLeadersToDiscussIdeaOfMandatoryWaterCutsAcrossState.pdf

Three would take many days to arrive; a delay of time that a suffering and vulnerable fish does not have. This situation is happening right now and we expect future water scarcity issues will make this situation only worse.

Consequently, we also worry about river navigation through the submerged sandbar sections of the Green River in lower Reach Three. For example, in the first week of July, in the low water year of 2012, and during a science trip in Canyonlands National Park, it was necessary to off load passengers from row boats and push them into deeper water—twelve times—and specifically the 40 river miles between Fort Bottom and the Confluence with the Colorado River.[8]

HISTORY

These water rights were originally held in Flaming Gorge Reservoir by Reclamation as part of the "Ultimate Phase" of the Central Utah Project. This water was originally intended to supply the Uintah Unit (partially completed) and the Ute Indian Unit (never completed) of the Central Utah Project. In 1992, Congress signed the Central Utah Project Completion Act which deauthorized the Ultimate Phase, compensated the Northern Ute Tribe for construction projects not completed by the United States, and encouraged the tribe to quantify their water rights. Thus far, a Ute Water Compact has not been ratified by all bands of the Ute Tribe.

Reclamation held the Ultimate Phase water rights until 1996, when it transferred those rights to the Utah Board of Water Resources who, instead of granting them to the Northern Ute Tribe as originally intended, opened these rights up for development in Utah. Some water has been put to use by private and public users along the Green River and, potentially, in the drainage of the Colorado River in Grand County and San Juan County. These rights are collectively referred to as the Green River Block. All of the undeveloped rights from the Ultimate Phase have transferred back to the Utah Board of Water Resources, and they are planning on using them to supply the Lake Powell Pipeline for consumptive use in Washington and Kane Counties. Incidentally, this water exchange to Kane and Washington counties are now junior in priority to the developed Central Utah Project.[9] The Utah Division of Water Rights has granted extensions of time to put the water to beneficial use to all the public water suppliers holding undeveloped Ultimate Phase water rights. According to Reclamation, all of the undeveloped Ultimate Phase water rights were supposed to lapse on October 6th, 2009. The majority of the rights being discussed in the Green River Block should have lapsed on that date; the exceptions are the ones already developed and being put to beneficial use by private users.

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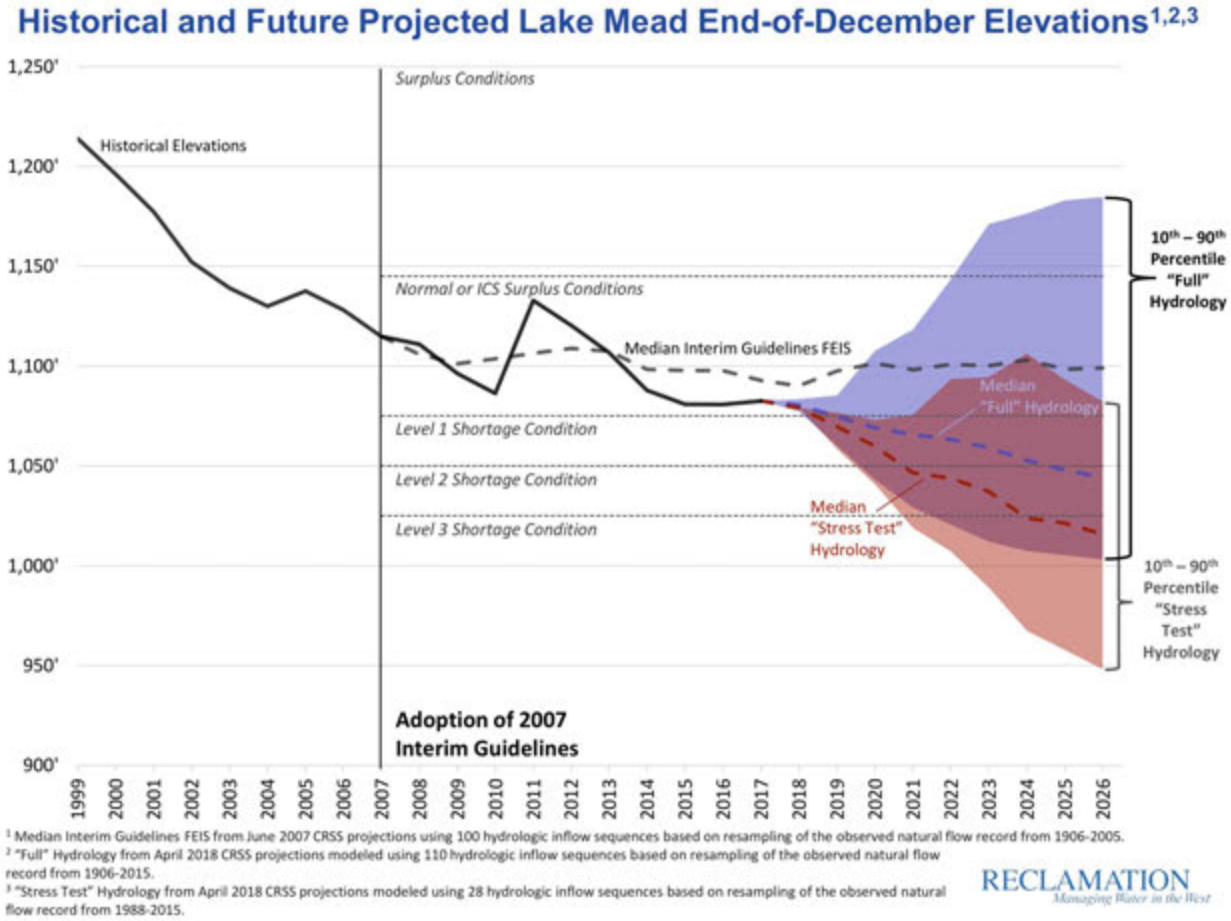
[8] Personal Communication with John Weisheit in Moab, Utah.

[9] http://www.riversimulator.org/Resources/Pipelines/FedAgreementWithUtah2011.pdf

1. THE DRAFT EA MUST ADDRESS CHANGING HYDROLOGY DUE TO CLIMATE CHANGE IN MODELING AND IN SECTION 3.3.1.5. CUMULATIVE EFFECTS

The DEA put forth by Reclamation uses quite complex modeling (Colorado River Simulation System, CRSS) to verify the existence of water in Flaming Gorge Reservoir for the water rights exchange. Given that, we are surprised that the model does not use the most current data available. The model needs to reflect the fact that our future inflow hydrology cannot be expected to mirror the first hundred years. We are in an era of unprecedented climate change, as acknowledged by Reclamation in the 2012 Colorado River Basin Supply and Demand Study.[10] The Colorado River Basin is in its nineteenth year of drought. Using hydrology from the last one hundred years (beginning in 1906) is inaccurate as a base for modeling future inflow hydrology, and it puts communities relying on the river at risk.

In the 2012 executive summary of the Colorado River Basin Supply and Demand Study, Reclamation claims, "climate change may put water users and resources relying on the



[10] https://www.usbr.gov/lc/region/programs/crbstudy.html

river at risk of prolonged water shortages in the future."[11] They go on to analyze current climate predictions and come up with a median expected decrease in Colorado River flow of about 9% by 2060.[12] This number is very low compared to other studies that suggest a conservative estimate could be closer to 20%,[13] but even at a 9% decrease in river flow, the Upper Basin will be required to finalize DCPs that involve such interconnected operations of reservoirs, including Flaming Gorge.

Lake Powell and Lake Mead are at risk of dropping to critically low levels before 2026 as seen by the graph (preceding page) entitled "Historical and Future Projected Lake Mead End-of-December Elevations" produced by Reclamation.[14] It is important to look at the "stress-test" hydrology based on flows from recent history (1988-2015) which many scientists think more accurately reflect our current state than "full hydrology" which includes an abnormally wet time early in the historical record. Stream flows are extremely likely to continue to decline throughout the century, causing all states to be required to use less water than was originally allocated by the Law of the River.

The 30-year average of unregulated flows into Lake Powell, which is used for the determinations of the Annual Operating Plan[15] for dam operations of the Colorado River Basin, will lower significantly in 2020. The current and last 30-year averages both include the pluvial that occurred during the 1980s (1971-2000 and 1981-2010). The time frame 1971-2000 averaged 12.6 million acre-feet per year (AFY). The more recent 30-year average (1981-2010) was 10.83 million acre-feet per year, a de-

The 30-year average in Annual Operating Plans

Lake Powell Unregulated Inflows	AOP Reference (hyperlinked above)	30-year average
1906 - 1968 (mean)	1970 AOP	No entry ??
1971-2000	2005 AOP	12.06
1971-2000	2010 AOP	12.04
1981-2010	2015 AOP	10.83
1981-2010	2018 AOP	10.83
1991 - 2020	To be determined	9.0 ??

[11] Bureau of Reclamation. 2017.Colorado River Basin Water Supply and Demand Study Executive Summary. p 26. https://www.usbr.gov/watersmart//bsp/docs/finalreport/ColoradoRiver/CRBS_Executive_-Summary_FINAL.pdf

[12] Bureau of Reclamation. 2017. Colorado River Basin Water Supply and Demand Study Executive Summary. p 7. https://www.usbr.gov/watersmart//bsp/docs/finalreport/ColoradoRiver/CRBS_Executive_-Summary_FINAL.pdf

[13] Udall, B. and J. Overpeck (2017), The twenty-first century Colorado River hot drought and implications for the future, Water Resource. Res., 53, 2404– 2418, doi:10.1002/2016WR019638.

[14] Bureau of Reclamation. http://www.riversimulator.org/Resources/States/ContingencyPlanning/Reclamation/MasterPresentationLBDCPandReclamationJune2018.pdf

[15] https://www.usbr.gov/uc/water/rsvrs/ops/aop/index.html

crease of 1.77 MAF.[16] The next 30-year average of unregulated flows into Lake Powell will decrease again because of the millennial drought, which was due in large part simply to increased temperatures in the basin.[17]

Live Storage Capacity of Colorado River Basin Reservoirs by % and by Decade

Water Year	Capacity%	Water Year	Capacity%	Water Year	Capacity%	Water Year	Capacity%
1980	90.3	**1990**	72.76	**2000**	85.1	**2010**	55.46
1981	82.07	**1991**	70.75	**2001**	77.87	**2011**	64.86
1982	89.49	**1992**	69.21	**2002**	63.54	**2012**	57.05
1983	97.74	**1993**	81.2	**2003**	57.13	**2013**	50.21
1984	95.03	**1994**	75.48	**2004**	50.03	**2014**	50.37
1985	91.98	**1995**	86.36	**2005**	58.59	**2015**	50.83
1986	92.14	**1996**	84.83	**2006**	56.21	**2016**	50.62
1987	90.98	**1997**	92.53	**2007**	53.88	**2017**	55.2
1988	87	**1998**	93.65	**2008**	57.12	**2018**	46.97
1989	80.38	**1999**	93.65	**2009**	57.38	**2019**	
Average	**89.65%**		**82.04%**		**61.69%**		**53.51%**
Notes:	Impacts to hydropower production may occur at capacities near or below 35%						
	Impacts of low capacity reservoirs include degradation to water quality						
	Lake Powell filled for the first time in 1980; filling of the reservoir began in 1963						

The Reclamation modeling for the 2007 Interim Guidelines has proven to be wrong.[18] Like this DEA, the 2007 modeling used CRSS and sampled the historical natural flow record (1906-2005). It is crucial that we stop using modeling that fails to play out in the real world, especially when we are living with the consequences right now. The seven basin states are currently preparing emergency Drought Contingency Planning (DCP) documents because the 2007 models failed to predict the situation we are in. If we had accurately predicted and planned for this scenario, we might be in better shape to deal with the consequences of the 19-year Millennial Drought. Notice in the graph (next page) the "risk assessed at the adoption of the 2007 Interim Guidelines" compared to the risk reassessed in 2018.

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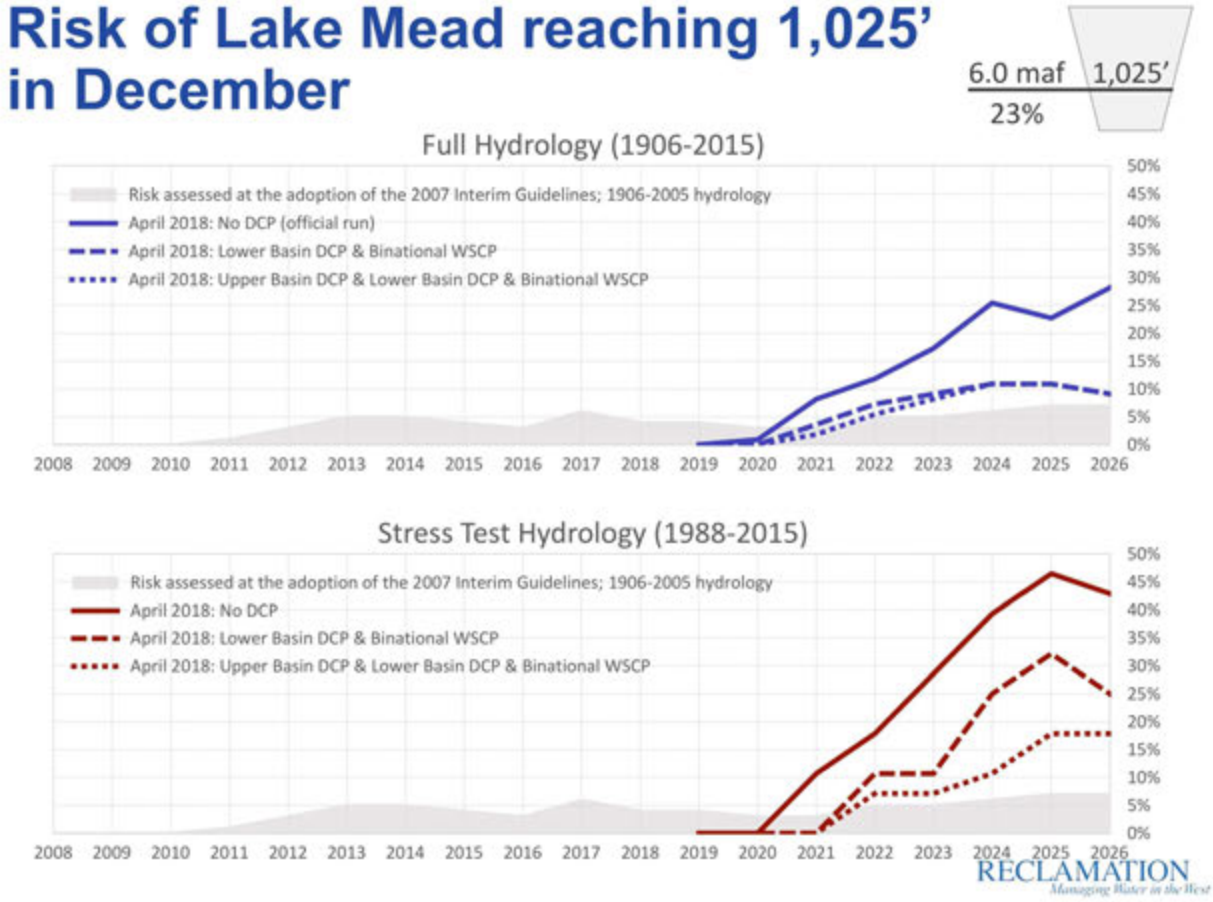
[16] Annual Operating Plans: https://www.usbr.gov/uc/water/rsvrs/ops/aop/index.html

[17] Xiao, M., Udall, B., Lettenmaier, P. (2018). On the causes of declining Colorado River streamflows. American Geophysical Union. p. 10-12, 39. doi: 10.1029/2018WR023153.

[18] CAP Press Release. Feb. 13 2008. "Lake Mead not going dry." Accessed at http://www.riversimulator.org/Resources/Press/LakeMeadDryCAPdozierFulp.pdf



In a 2007 letter to the Upper Colorado River Commission, Rick Gold (UC Regional Director) outlined what Reclamation believes to be a safe allowable annual release from Flaming Gorge Dam, which is 165,000 acre-feet. The letter says, "The analysis presumes that Wyoming, Utah, and Colorado will continue to develop their water supplies."[19] Was a contract for releases from Flaming Gorge for the Ute Tribe assumed in this modeling? Was the Green River Block also counted in modeling as a "future depletion?" Were climate change or DCPs accounted for in this analysis? Would Reclamation still claim there is 165,000 acre-feet available in Flaming Gorge for development? The DEA needs to address these questions.

Given the reality of diminishing Colorado River water, and the fact that Reclamation is acknowledging the changing hydrology in other situations, the DEA should include modeling that accurately reflects future climate models and does not rely on outdated numbers from the past century. The hydrologic situation due to climate change should be addressed in section 3.3.1.5. Cumulative Effects, of the DEA.

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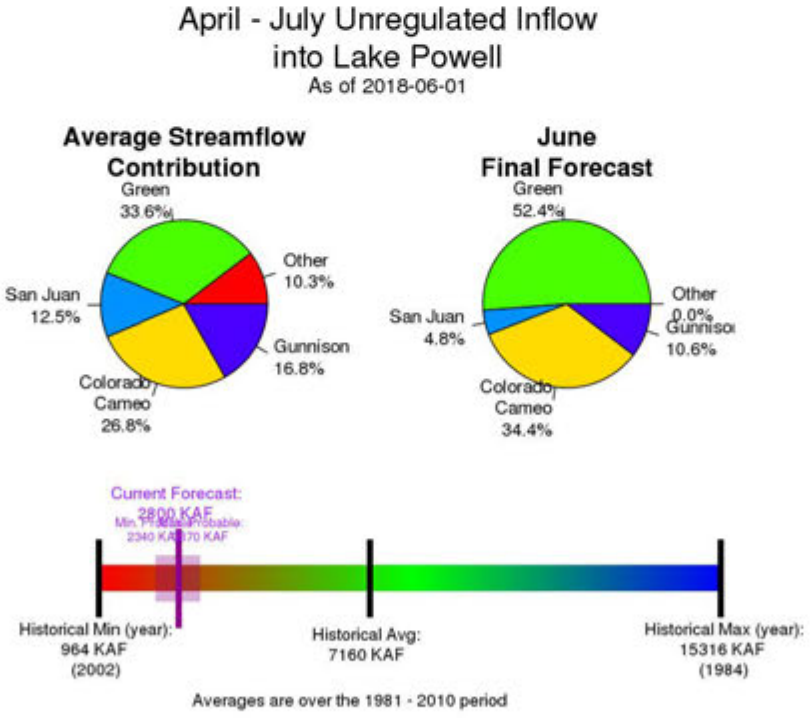
[19] Letter from Rick Gold, Bureau of Reclamation to Don Ostler, Upper Colorado River Commission (March 3, 2007). "Water Marketing from Flaming Gorge Reservoir." Accessed at: http://www.riversimulator.org/Resources/UCRC/UCRCflamingGorgeWaterAvailibilityReclamation2007.pdf

2. NEPA REQUIRES THAT A PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT ON THE UPPER BASIN DROUGHT CONTINGENCY PLAN BE PREPARED BEFORE THE DRAFT EA ON THIS CONTRACT CAN BE COMPLETED

Currently, the Upper Basin States are in the process of negotiating a DCP to deal with the likelihood of future water shortages. A key element in this plan will be the coordinated operations of Navajo, Blue Mesa, and Flaming Gorge Dams. In order to determine whether there is sufficient hydrology for releases from the Flaming Gorge Dam to fulfill Utah's Green River Block water rights, we need to understand these coordinated dam operations and include them in the modeling. The DEA for the Green River Block should be put on hold until the requirements of the DCP are clarified.

In addition, before the Upper Basin DCP can be finalized, and because it is a major federal action, a basin-wide Programmatic Environmental Impact Statement (PEIS) must be prepared that addresses the requirements and potential impacts of coordinated operations of the Navajo, Blue Mesa, and Flaming Gorge Dams. It is essential that this basin-wide PEIS be incorporated in planning for releases from Flaming Gorge Dam, because the operations of these dams will be tied together to ensure compact obligations are met and to prevent critical shortages in Lake Mead.



The importance of evaluating the Upper Basin DCP and its potential to affect Flaming Gorge discharges is illustrated by the pie charts (above),[20] which demonstrate that the Green River could maintain reasonable hydrology while the rest of the Colorado River Basin declines. Lake Powell and Lake Mead will require water from Flaming Gorge to maintain operational elevations. This is because as climate change progresses, the Green River is predicted to be more likely to maintain average snowpack than other drainages in the Colorado River Basin.[21] This year presents a good example of this pattern emerging. The Colorado River Basin Forecast Center under NOAA states:

> "April-July unregulated inflow forecasts for some of the major reservoirs in the Upper Colorado River Basin include Fontenelle Reservoir 980 KAF (135% of average), Flaming Gorge 1120 KAF (114% of average), Blue Mesa Reservoir 270 KAF (40% of average), McPhee Reservoir 46 KAF (16% of average), and Navajo Reservoir 174 KAF (24% of average). The Lake Powell inflow forecast is 2.80 MAF or 39% of average. This would be the 5th lowest April-July inflow on record for Lake Powell dating back to 1964."[22]

We specifically request that the Upper Basin DCP be the subject of a PEIS that is conducted when re-consultation of Interim Guidelines begins on January 1, 2021, if not before. We also request the preparation of a new Hydrologic Determination for the Upper Basin. Additionally, we request that this basin-wide PEIS include consultation with an independent science panel that is involved from the very beginning of the process and that the National Academy of Sciences also sign-off on the PEIS, as well.

The overarching problems that must be thoroughly studied in such a system wide, programmatic evaluation should include, but not limited to:

> • Diminished water supply and water quality • Increased water demand • Over allocation of water rights • Quantifying the water rights of the First Nations • Impacts to national wildlife refuges, parks and monuments (including the international biosphere at the Colorado River delta) • Removal of exotic species • Sedimentation in the reservoirs • Dam, spillway, and floodplain safety • Modernizing the Law of the River • Alternative energy production and conservation • Water storage and conservation alternatives

Our request for a comprehensive PEIS for the Upper Basin DCP is supported by the federal district court of the District of Columbia, which confirmed, in its decision in EDF v. Higginson, that NEPA requires a comprehensive EIS to evaluate proposed federal

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[20] Colorado River Basin Forecast Center, NOAA. June 1, 2018. Accessed at: https://www.cbrfc.noaa.gov/dash/data/PowellPieChart.png

[21] Xiao, M., Udall, B., Lettenmaier, P. (2018). On the causes of declining Colorado River streamflows. American Geophysical Union. p. 10-12, 39. doi: 10.1029/2018WR023153.

[22] Colorado River Basin Forecast Center, NOAA. June 1, 2018 Water Supply Forecast Discussion. Accessed at: https://www.cbrfc.noaa.gov/wsup/pub2/discussion/current.pdf

projects within the entire Colorado River Basin: "All parties to this action agree that NEPA requires the Department of Interior to prepare environmental impact statements that evaluate the synergistic and cumulative effects of the proposed federal projects."[23]

Colorado River management is in critical flux right now with rapidly changing hydrology and the development of a new DCP that will significantly impact Flaming Gorge Dam operations. Jim Lochhead, CEO and manager of Denver Water, was quoted in Aspen Journalism as saying, "With the repeat of historic hydrology beginning in the year 2000, Lake Powell will be dry, and when I say dry I mean empty, within about three years. . . .What we are asking for is that the contingency plans be put into place. We need to have those plans in place before the system collapses."[24]

Consequently, the DEA for the Green River Block Water Rights Exchange should be tabled as premature, since an accurate assessment of water availability in Flaming Gorge can only follow the development of dam operation guidelines under an Upper Basin DCP. In addition, a PEIS is necessary to meet NEPA requirements. Such a PEIS, focused on the Upper Basin DCP, must be completed before the DEA examining the Green River Block Water Exchange can be finalized.

3. THE LEGALITY OF THE MAJORITY OF GREEN RIVER BLOCK RIGHTS IS IN QUESTION

The legality of the water rights that are the subject of the proposed exchange is in question. After 1996, the water rights of the Ultimate Phase were given out by the State of Utah to those who applied for them. The undeveloped rights should have been extinguished 50-years after 1959, if not developed, but instead the state has granted numerous extensions to public water suppliers.

Reclamation's own Area Manager for the Provo Area Office, Bruce Barrett, lodged several protests to water rights from this block. In a protest letter to the Utah Division of Water Rights he states, "After the "Ultimate Phase" was deauthorized, Reclamation assigned this portion of the appropriation to the Utah Board of Water Resources with the understanding that any portion of this water right not developed within 50-years of the original approval date (ending on October 6, 2009) would lapse."[25]

Rather than facilitate depletions based on these illegitimate rights (we are not referring to the small subset of water rights in the Green River Block that are already being put to

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[23] Environmental Defense Fund (EDF) v Higginson. June 21, 1978. (655 FR 2d, 1981). Accessed at http://www.riversimulator.org/Resources/Legal/GCD/1981EDFvHigginson655FR2d.pdf

[24] Gardner-Smith, Brent. Sept. 19, 2018. "Mandatory curtailment of water rights in CO raised as possibility." Aspen Journalism. Accessed at: https://www.aspentimes.com/news/local/mandatory-curtailment-of-water-rights-in-co-raised-as-possibility/

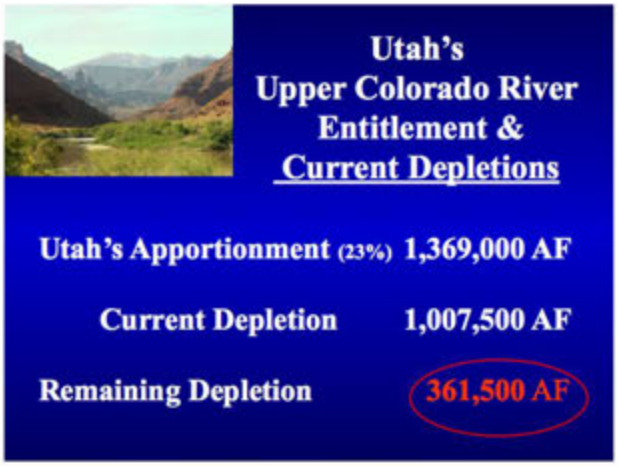
[25] Letter from Bureau of Reclamation to Utah Division of Water Rights. December 7, 2009. Accessed at: https://www.waterrights.utah.gov/asp_apps/DOCDB/DocImageToPDF.asp?file=/docSys/v920/y920/y92000nr.tif

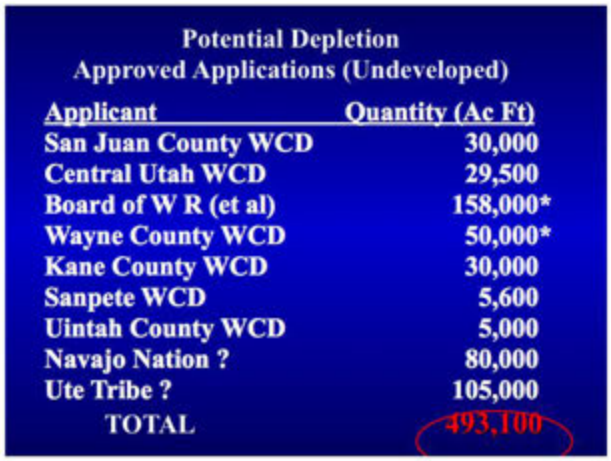
use by private interests), we strongly recommend that the Bureau of Reclamation defer completion of the EA on the Green River Block Water Rights Exchange until a Ute Water Compact is ratified by all parties, sources for the water rights that the tribe is entitled to have been identified, and the legality of the rights that will be subject of the exchange has been clarified.

4. UTAH'S OVERALLOCATION OF WATER THAT IS THE SUBJECT OF THE PROPOSED EXCHANGE

Currently, pursuant to the Colorado River Compact and associated "Law of the River, Utah has 1,369,000 AFY (acre-feet per year) water available to use. In 2009, the Utah Division of Water Resources claimed that Utah had already depleted 1,007,500 AFY, with an additional 493,100 AFY in approved applications that are awaiting development. As enumerated below, these major undeveloped water users include the Northern Ute Tribe (105,000 AFY), the Utah Navajo (81,500 AFY), the Green River Block for Uintah County (72,600 AFY), and the Lake Powell Pipeline (86,000 AFY), among others (the Green River Block and the Lake Powell Pipeline are grouped together as "Board of W R (et al.)."[26]

These new developments increase Utah's depletions to above the current maximum depletion levels allowed to Utah, not even considering the likely cutbacks necessary to uphold Colorado Compact requirements with a changing climate.[27] The uncertainties around what water rights Utah currently has and may have in the future, due to overallocation, makes it difficult to impossible to determine at this point in time, whether there is sufficient hydrology for releases from the Flaming Gorge Dam to fulfill Utah's Green River Block water rights. Consequently, the DEA for the Green River Block should be





[26]Division of Water Resources. Upper Colorado River Basin, Current Policy and Issues Powerpoint Presentation. 2009. Slide 5. Accessed at https://www.waterrights.utah.gov/meetinfo/m20090930/upper_colorado.ppt.

[27]Division of Water Resources. Upper Colorado River Basin, Current Policy and Issues Powerpoint Presentation. 2009. Slide 4 & 5. Accessed at https://www.waterrights.utah.gov/meetinfo/m20090930/upper_colorado.ppt.

put on hold until it can be determined that Utah has the rights to sufficient water to be the subject of an exchange.

5. A SYSTEM OF ACCOUNTING NEEDS TO BE DETAILED IN THE DEA THAT ENSURES UTAH LEAVES WATER IN TRIBUTARIES FOR EXCHANGED RELEASES

The exchange contract and the DEA must outline and analyze a system set in place to ensure that an exchange of water is actually happening, and Utah isn't also diverting essential tributary flows. Where will tributary flows be measured? What are the target flows for specific tributary drainages? How will water users know how much to deplete in a given year? If it is a drought year and flows are lower than the 72,000 af maximum depletion, what mechanisms will ensure that Utah does not use more than the tributaries contribute and endanger critical habitat in the process? All of these questions need to be answered for water rights holders to know what to expect and for the public to be informed and able to fully participate in this NEPA process.

5. FEDERAL WATER RIGHTS CLAIMS OF TRIBES SHOULD BE SETTLED AND WATER IDENTIFIED BEFORE THIS CONTRACT IS SIGNED

Under the Winter's Doctrine, the Northern Ute and Navajo Tribes have federally reserved water rights, dating back to the creation of the reservations, if not since time immemorial, which have yet to be developed. The particular water rights assigned to the Ultimate Phase were intended to go to the Northern Ute tribe. When that project never materialized, the tribe settled with the federal government for the promise of future water rights. Thus far, a water contact has not been agreed upon and full water rights have not been assigned to the Ute tribe.

Because Utah's approved water rights are over-allocated, as acknowledged by the Utah Division of Water Rights,[28] the State of Utah must demonstrate where the water will come from to fulfill the Ute Water Compact before Reclamation further proceeds with this water rights exchange with the State. The DEA must not only include consideration of these factors in its calculation of available water, but must also incorporate this information in its modeling.

In all likelihood, the water to fulfill the Ute Water Compact will come from the Green River. In order to maintain minimum fish flows, this would require a contract with Reclamation for releases from Flaming Gorge Reservoir. As part of the Department of Interior, the Bureau of Reclamation has an obligation to tribes and native people. Secretarial Order 3335 states that, "The trust responsibility consists of the highest moral obligations that the United States must meet to ensure the protection of tribal and individual Indian lands, assets, resources, and treaty and similarly recognized rights."[29]

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[28] http://www.riversimulator.org/Resources/Pipelines/LLP2018/ProposedUtahWaterRightsPolicy2009.pdf

[29] Secretarial order 3335. August 20, 2014. Reaffirmation of the Federal trust responsibility to federally recognized Indian tribes and individual Indian beneficiaries. Accessed at https://www.doi.gov/sites/doi.gov/files/migrated/news/pressreleases/upload/Signed-SO-3335.pdf

Consequently, Reclamation should settle an exchange contract for releases from Flaming Gorge Reservoir with the Northern Ute Tribe before engaging with the State of Utah on an exchange of other, more junior water rights.

We urge Reclamation to put completion of this DEA on hold until the two crucial agreements that will significantly impact the existence and amount of water for the Green River Block water rights exchange are finalized: the Ute Water Compact and the Upper Basin DCP. The exchange contract must also outline an adequate system of accounting for the exchange of water from tributaries for Flaming Gorge water. In addition, we strongly recommend that the modeling for the DEA be expanded so that it does not rely solely on data from the last one hundred years and includes relevant climate forecasts.

Thank you for your consideration of these facts, comments and recommendations.

Sincerely yours,

Sarah Stock
Program Director
Living Rivers & Colorado Riverkeeper

Dr. Robin Silver
Co-founder
Center for Biological Diversity

Gary Wockner
Co-founder
Save The Colorado

Lauren Wood
Program Director
Green River Action Network

Ashley Soltysiak
Director
Utah Chapter of the Sierra Club

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Richard Segerblom
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Rica Fulton
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Upper Green River Network

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Owner and Operator
Dinosaur River Expeditions

David and Vicki Mackay
Owners
Colorado River & Trail Expeditions

WESTERN RESOURCE ADVOCATES

PROTECTING THE WEST'S LAND, AIR, AND WATER

Mr. Jared Baxter
U.S. Bureau of Reclamation, Provo Area Office
Provo, Utah

November 2, 2018

sent via email to greenriverblock@usbr.gov

Western Resource Advocates'
Comments on
Draft Environmental Assessment for Green River Block water exchange contract

Western Resource Advocates (WRA) appreciates the opportunity to comment on the Draft Environmental Assessment (EA) on the proposed Green River Block (GRB) water exchange contract.

WRA's interest in the Green River includes our 15-year experience as an active partner in the Upper Colorado River Endangered Fish Recovery Program (Program), where we are a member of the Program's Implementation Committee and Water Acquisition Committee and coordinate closely with The Nature Conservancy who staffs the Program's Management Committee. We were involved in the process that led to the Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) for re-operation of Flaming Gorge dam to meet Flow and Temperature Recommendations to benefit endangered fish.

First, we want to thank the Bureau of Reclamation (BOR or Bureau) for its work on this Draft EA, and support the overarching purpose of having future development of the GRB avoid impacts to the recommended flows. We are encouraged that the BOR's analysis to date suggests the proposed action could improve flow conditions, at least in the summer months during drier years. It is not yet clear that the analyses in the Draft EA support the BOR's conclusion that the Action Alternative would have no significant impact. We believe the Final EA could better support that conclusion through addressing our comments and questions below.

Flow recommendations—peak flows and base flows:

Although a close reading of other sections of the EA makes it clear the BOR has analyzed the proposed action's impacts on both recommended base flows and peak flows for Reaches 1 and 2 of the Green River, the description of the 2005 FGFEIS, 2006 FGROD, and 2000 Flow and Temperature Recommendations (section 1.7.2 on page 8) could be edited to include the fact these documents prescribe high peak flows ***and*** base flows for Reaches 1, 2 and 3 of the Green River, as evidenced in Table 2-1 from the FGFEIS (included in the Draft EA at "Appendix A to Appendix A"). The impacts to high peak flows and to base flows in Reach 3 should be disclosed, using the same kind of flow duration curves as were presented for Reaches 1 and 2.

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Flaming Gorge Dam operations' ability to offset depletions:

We are encouraged the Draft EA notes the intent to maintain the flow targets in the FGFEIS and ROD. The Draft EA states the exchange contract will allow Flaming Gorge (FG) dam to be operated "within the parameters of the FGROD" (pages 5 and 9). But the Draft EA is confusing when it notes "[a]dditional releases may be necessary to meet target flows in Reach 2 as a result of depletions under the Proposed Action" (page 10) but elsewhere states the "GRB depletion maintains FGROD operations and *no change in operations are made* under the GRB alternative" (page 14—emphasis added).

We suggest the BOR could most cleanly address the issue by clarifying a commitment to continue recent/current efforts to meet 2000 Flow and Temperature recommendations for Reaches 1, 2 and 3—as embraced in the 2005 FGFEIS and 2006 FGROD—through adjusting Flaming Gorge releases to directly offset the impacts that additional water development along the Green River would have on meeting the flow recommendations.

More specifically, because the flow recommendations include a flow range inside each of several year types, to truly offset the impacts of any future GRB water development, BOR could maintain recently managed levels of base flows, rather than let flows drop significantly inside the base flow ranges; recent studies suggest that maintaining flows at the higher end of the base flow range in the summer of average and drier years benefits Colorado pikeminnow, so this distinction is important.[1] For example, if a specific new water development outside of Reach 1 began to consistently divert 100 cfs during the irrigation season, BOR could offset those specific diversions through changed releases from FG to keep flows in the river whole. Because the number and volume of potential future developments have been narrowed to include a relatively small set of entities (see Table 3-2 on Draft EA page 49), monitoring and responding to any future depletions would appear to be feasible.

Modeling assumptions:

We agree with TNC that the cumulative impacts analysis is very challenging to decipher, as several assumptions of future development are not made clear. We incorporate by reference their comments on the subject. Similarly to TNC, we would like to see more details explaining the modeling assumptions and rule logic for Flaming Gorge Dam releases in July (which can be a peak and baseflow month) as well as August and September (baseflow months). Without

[1] Bestgen, K. R., and A. A. Hill. 2016. Reproduction, abundance, and recruitment dynamics of young Colorado pikeminnow in the Green River Basin, Utah and Colorado, 1979-2012. Final report to the Upper Colorado River Endangered Fish Recovery Program, Project FW BW-Synth, Denver, CO. Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins. Larval Fish Laboratory Contribution 183.

these additional details, it is difficult to understand how and when GRB exchange releases are triggered and at what flow rate.

Future depletions:

We agree with TNC that the EA would benefit from greater specifics about exactly what are the reasonably foreseeable new depletions. Whatever is NOT on that list will, of course, trigger additional NEPA if later proposed.

Future hydrology:

It does not appear that the Bureau's modeling considers the more frequent, drier natural inflows under climate change.[2] To avoid under-estimating the amount and frequency of additional releases needed to maintain the current range of baseflows in the Green River, we encourage including an assessment of proposed FG operations under drier future hydrologies.

Thank you for your attention to these comments.

Sincerely,

Bart Miller
Director, Healthy Rivers Program
Western Resource Advocates

[2] *See* Bradley Udall & Jonathan Overpeck, *The Twenty-First Century Colorado River Hot Drought and Implications for the Future* (Feb. 17, 2017), *available at* https://doi.org/10.1002/2016WR019638.

ERRATA SHEET

COMMENTS: Ute Indian Tribe Comments on U.S. Bureau of Reclamation's Green River Block Water Exchange Contract with the State of Utah and Draft Environmental Assessment (11-02-18)

DATE OF SUBMISSION: 11-09-2018 PAGE 1 of 1 pages

Page	Paragraph	Correction
1	2	There is a typographical error for the total volume of the Tribe's Indian reserved water rights in the first sentence of the second paragraph on page 1. The sentence should read: The Tribe has Indian reserved water rights by diversion of 549,685 acre-feet per year in the Upper Colorado River Basin.

UTE INDIAN TRIBE
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Ute Indian Tribe of the Uintah and Ouray Reservation

Comments on United States Bureau of Reclamation's Green River Block Water Exchange Contract with the State of Utah and Draft Environmental Assessment

November 2, 2018

I. INTRODUCTION

The Ute Tribal Business Committee of the Ute Indian Tribe (the "Tribe") of the Uintah and Ouray Indian Reservation submits these comments regarding the United States Bureau of Reclamation's ("USBR") Draft Environmental Assessment for the Green River Block Water Exchange Contract with the State of Utah. The Ute Indian Tribe is located on the Uintah and Ouray Reservation ("Reservation") located in northeastern Utah, approximately 150 miles east of Salt Lake City, Utah. The Reservation lies within the Upper Colorado River Basin. Today, the Reservation is the second largest Indian reservation in the United States, covering more than 4.5 million acres. The Ute Indian Tribe has a tribal membership of almost four thousand individuals, a majority of whom live within the exterior boundaries of the Reservation. All of the Reservation land lies within the drainage of the Colorado River Basin.

The Tribe has Indian reserved water rights by diversion of 530,665 acre-feet per year in the Upper Colorado River Basin. Priorities for these rights are dated 1861 for all historically and practicably irrigable lands of the Uintah Valley portion of the Reservation, including municipal and industrial water rights, and 1882 for all lands served on the Uncompahgre portion of the Reservation, through which the Green River and its tributaries flow and border. The Ute Indian Tribe owns the highest priority water right to natural flows from all rivers within the exterior boundaries of the Reservation.

The northwestern area of the Reservation consists of five major river drainages with seven contributing rivers that generally flow southeast and east into the Green River. The Duchesne River system to the west drains from the Wasatch and Uinta Mountains through major tributaries that include Rock Creek, the Strawberry River, the Lake Fork River (with its major tributary the Yellowstone River), and the Uinta River (with its major tributary the Whiterocks River). The White River and other desert tributaries, including Willow Creek and Bitter Creek, drain the southeastern area of the Reservation into the Green River.

The Bureau of Indian Affairs operates the Uintah Indian Irrigation Project, authorized by Congress in 1906, that serves the vast majority of current Tribal agricultural operations on the

Reservation, with water sourced from the Duchesne, Lake Fork, and Uinta River systems. A maximum diversion rate of 1 cfs to 70 acres was established for direct natural flow diversions, with an annual allocation of 3 acre-feet per acre in the Lake Fork and Uinta Basins (under 1923 federally-decreed reserved water rights), 4 acre-feet per acre in the Duchesne River, Bitter, Sweet Water, Willow, and Hill Creeks Basins, 4.8 acre-feet per acre in the White River Basin, and 4.5 acre-feet per acre in the Green River Basin. These Indian water rights belong to our Tribe because, under the *Winters* doctrine, the primary purpose of the federal government's establishment of our Reservation was to require members of our Tribe to become productive farmers, a government policy intended to promote Indian self-sufficiency. These rights are established as a quantified apportionment of Indian reserved water rights in the Upper Colorado River Basin, and are a Tribal trust asset of the Ute Indian Tribe—a sovereign government, federally recognized by the United States. These Indian reserved water rights are present perfected rights, as recognized by the United States Supreme Court in *Arizona v. California* (U.S. Supreme Court, 1963) (1964 Decree). Additionally, the water on the Reservation was recognized by Congress in 1899 as the paramount rights of the Tribe, and this federal legislation directed the Secretary of the Department of Interior to secure and preserve a quantity of water necessary for the present and prospective wants of the Tribe.

Our tribal government provides services to our members and manages the Reservation through 60 tribal departments and agencies including land, fish and wildlife management, housing, education, emergency medical services, public safety, and energy and minerals management. The Tribe is also a major employer and engine for economic growth in northeastern Utah. Tribal businesses include a bowling alley, a supermarket, gas stations, a feedlot, a manufacturing plant, Ute Oil Field Water Services, and Ute Energy. Our governmental programs and tribal enterprises employ approximately 450 people, 75% of whom are tribal members. The Tribe takes an active role in the development of its resources, including as a majority owner of Ute Energy and owns numerous oil and gas wells on the Reservation. We depend on our natural resources as a primary source of economic development to establish a permanent homeland and economic security for our members.

For reasons detailed below, the Tribe requests that an Environmental Impact Statement ("EIS") be conducted, with the final requirements incorporating the serious concerns raised by the Tribe. We also request that a government-to-government consultation be conducted on the Green River Block Water Exchange Contract with the State of Utah and on the Draft Environmental Assessment so that the USBR is aware of, discusses, and understands the Tribe's concerns on both of these issues. This way, we can work together, in accordance with federal law and policy, to ensure that the federal government, as trustee of the Tribe's reserved water rights, adheres to its fiduciary responsibilities to protect and preserve the Tribe's reserved water rights in the Green River and the Upper Colorado River Basin, and assists the Tribe in developing its Indian reserved water rights. We request that USBR takes our concerns into account.

II. FAILURE TO ENGAGE IN GOVERNMENT-TO-GOVERNMENT CONSULTATION

Under the policy of the United States, the USBR is required to conduct government-to-government consultation with the Ute Indian Tribe on this matter in order to be in compliance with Executive Order 13175, Presidential Memoranda, Department of Interior Secretarial Order 3317, and

the Bureau of Reclamation policy. (*See* Correspondence from Wayne G. Pullan, Area Manager of the Upper Colorado Region, to the Ute Tribal Business Committee, dated October 1, 2018).

According to the USBR Draft Environmental Assessment report, "Reclamation sent consultation letters with a determination of No Adverse Effect to historic properties for the Project to [the Ute Indian Tribe of the Uintah and Ouray Reservation] on June 8, 2018. The USBR explained that its consultation has been focused on "identify[ing] any concerns about historic properties; to advise on the identification and evaluation of historic properties; and to participate in the resolution of Project effects. (p. 6). The scope of the USBR's consultation is too narrow, where the primary, if only, focus has been on historical properties.

Although representatives of the Tribe attended a recent public meeting in Vernal, Utah, on September 26, 2018, on the proposed Draft Environmental Assessment, conducted by representatives from the USBR for "stakeholders," the USBR has had no governmental consultation with the Tribal government—even though the USBR has worked on the development of water within the exterior boundaries of the Reservation since the early 1900s. The USBR is very aware of the interests and rights of the Ute Indian Tribe in the Green River and its fiduciary responsibility to the Tribe regarding these trust assets. Most of the USBR efforts, however, have been primarily focused on developing the State-based water rights to the detriment of the Tribe's development and use of its Indian reserved water rights in the Upper Colorado River Basin.

Ironically, the USBR has identified one of the purposes of the Green River Block Water Exchange Agreement as "provid[ing] the State with a reliable water supply for development of the 1996 Assignment." The State's existing water right is a junior natural flow water right that is unreliable, especially during the later part of the summer months. As the Draft Environmental Assessment report stated under the No Action Alternative, "[t]he State may run into shortages in years of drought, especially during the latter part of the summer when tributary flows can be significantly reduced." The Ute Indian Tribe has been under a "no action" plan since 1882, when the Uncompahgre reservation was established, creating a present perfected property right to the water flowing through, on, and bordering the Reservation. In 1965, the Tribe reached an agreement with the federal government on the apportionment of the Tribe's Indian reserved water rights and agreed to defer the development of a portion of its quantified reserved water rights to assist in the development of the CUP. It has been meeting with representatives from the Central Utah Project Completion Act ("CUPCA") Office and the USBR for at least the last ten years about its need to acquire storage in Flaming Gorge in order to have a more reliable water supply for the development of its Green River reserved water rights. This has yet to happen.

After a representative of the Tribe raised the concern at the September 26, 2018, Vernal, Utah, meeting that the USBR had failed to engage in government-to-government consultation between the Tribe and the USBR, the Ute Tribal Business Committee received a request, dated October 1, 2018. At this time, the parties are seeking a mutually agreeable date on which to conduct the required government-to-government consultation. The Tribe requests that no decision be finalized on the adequacy of the Draft Environmental Assessment until after the Tribe has had the opportunity to have a government-to-government consultations with the USBR to discuss its concerns regarding the adverse impact on the availability and development of the Tribe's reserved

water rights and to ensure the protection and preservation of its Indian reserved water rights.

III. BACKGROUND ON THE GREEN RIVER BLOCK EXCHANGE CONTRACT DRAFT ENVIRONMENTAL ASSESSMENT

The USBR published the Green River Block Water Exchange Contract Draft Environmental Assessment (Green River Block Draft EA) in September of 2018. The Tribe's comments describe several concerns of the Tribe that must be taken into consideration by the USBR before concluding that its Proposed Action based on the Draft Environmental Assessment has sufficient evidence to rely on an Environmental Assessment for its compliance with the National Environmental Policy Act ("NEPA"). It is our conclusion that an Environmental Impact Statement is necessary.

As explained in the USBR Draft Environmental Assessment report, "[t]he Colorado River Storage Project Act of April 11, 1956 ("CRSP Act"), authorized construction of the Colorado River Storage Project ("CRSP") which allowed for comprehensive development of the water resources of the Upper Basin states . . . ." (p. 3). The Flaming Gorge Unit is one of the four initial storage units in the CRSP. In addition, "[t]he CRSP Act and subsequent legislation authorized the construction of 16 participating projects, including the Central Utah Project ("CUP")." (p. 3-4). The Ute Indian Unit was one of these CUP units, identified as part of the final phase of the CUP development, known as the "Ultimate Phase," which was intended to transfer water from Flaming Gorge to the Uinta and Duchesne River basins to provide irrigation to lands under the Uintah Indian Irrigation Project (including future irrigated lands) with the Ute Indian Tribe's reserved water rights on the Reservation. When the CUP became too expensive, Congress directed that it be scaled down and, in 1992, the Ute Indian Unit was de-authorized under the Central Utah Project Completion Act ("CUPCA"). Subsequently, of the four units initially identified for development under the CUP, only the Ute Indian Unit was completely abandoned—the only unit dedicated to providing storage and water delivery of the Tribe's Indian reserved water rights for its development and use. (p. 4).

In 1958, USBR filed an application with the State of Utah for water to be stored in Flaming Gorge Reservoir that included 500,000 acre-feet of Green River water supply for the Central Utah Project. According to the Green River Block Draft Environmental Assessment report ("Report"), "[t]he consumptive uses of this appropriation included the support of the Ultimate Phase Units[,]" including the Ute Indian Unit. The Green River Block Draft EA states that because "the Ultimate Phase Units were de-funded under CUPCA," the water rights were reallocated to other uses, and 447,500 acre-feet of diversion remained with the United States. Nevertheless, portions of the stored water right were to be used to deliver Flaming Gorge water to lands on the Uintah and Ouray Reservation for irrigation of historical, current, and future trust lands of the Ute Indian Tribe and its members, as well as for non-tribal members with the right to use the Indian reserved water rights under the Uintah Indian Irrigation Project. This never happened. In 1996, the USBR assigned this remaining water right ("1996 Assignment") to the Utah Board of Water Resources, which "provided the Board an opportunity to develop a portion of the Ultimate Phase Right before it lapsed in 2009"—for State-based water users.

The USBR received a letter dated January 5, 2016, from the State requesting two contracts for the use of its assigned water rights (total of 158,890 acre-feet depletion); one is for

the Lake Powell Pipeline Project, and the second contract is for developing water along the Green River. The second contract, a proposed "Exchange Contract" between the USBR and the State, is the subject of the Green River Block Draft EA and the meeting held September 26, 2018, where representatives of the Ute Indian Tribe participated. With this proposed action between the USBR and the State of Utah, the Ute Indian Tribe may not only be cut out of the storage facility and related water delivery system that the Ute Indian Unit was to provide under the CUP, but also from the ability to use stored water in Flaming Gorge representing a portion of its Indian reserved water rights.

As with the current activity between the USBR and the State of Utah, there appears to have been no consideration by USBR in 1996 of its responsibility to the Ute Indian Tribe as the trustee of the Tribe's present perfected, Indian reserved water rights—a Tribal trust asset. In spite of the fact that the USBR and the State redesigned the CUP units in a manner that cut the Tribe out of any storage facility and water delivery system from which to develop its Indian reserved water rights (according to the report, three of the four "Initial Phase" CUP units have been fully constructed, with the remaining unit nearing completion, and the Uintah Unit from the "Ultimate Phase" being partially developed, with none of these storage facilities providing storage or water delivery for Tribal water), the USBR and the State of Utah have continued their partnership to develop the State's apportionment of the Colorado River, to the detriment of the Tribe's ability to develop its Indian reserved water rights' apportionment in the Colorado River system, including in the Green River.

The Green River Block Draft EA involves a water exchange between the State of Utah and the USBR. Under this Exchange Contract, the State of Utah would agree to pay a base rate of $19 (plus a $3.47 O&M fee) per acre-foot to use USBR released storage from Flaming Gorge Reservoir in exchange for the State's agreement not to develop an equal quantity of water rights. The Green River Block Draft EA states that the purpose of the Exchange Contract is to facilitate a water exchange of 72,641 acre-feet of depletions annually under the 1996 Assignment, which was previously included as part of CRSP (Colorado River Storage Project) participating project water right. The USBR stated that "this contract is needed to resolve a long-standing disagreement between Reclamation and the State regarding the use of the water rights assigned in 1961." The following comments describe potential impacts to the Tribe resulting from the Green River Block Water Exchange Contract and Draft EA, which the USBR has not considered and included in its conclusions as reflected in the Draft EA.

IV. THE DRAFT ENVIRONMENTAL ASSESSMENT IS BASED ON INADEQUATE WATER SUPPLY AND DEMAND MODELING

The Tribe has federal, Indian reserved water rights in the Green River, which are present perfected rights as of the date of the creation of the Reservation, and the method the USBR used to model the potential impacts of the Green River Exchange Contract may underestimate its adverse impacts on the Tribe's natural flow rights in the Green River. In conducting its Environmental Assessment and modeling of the water rights under the Exchange Contract and its effect on the environment, which must include the effect on the water supply, the USBR did not consider the 110-

year trend of decreasing water supply. The Green River Block Draft EA states on page 2 of Appendix A that:

> *"For each depletion scenario (no action, [Green River Block] depletion, and full depletion), one future inflow hydrology scenario was modeled. The inflow scenario uses data from the observed streamflow record (1906-2015)."*

A simple linear trend line through the USBR's estimated natural flow data (https://www.usbr.gov/lc/region/g4000/NaturalFlow/current.html) shows that the Colorado River's water supply at Lee's Ferry has decreased by an average of 34,000 acre-feet per year over the past 110 years.

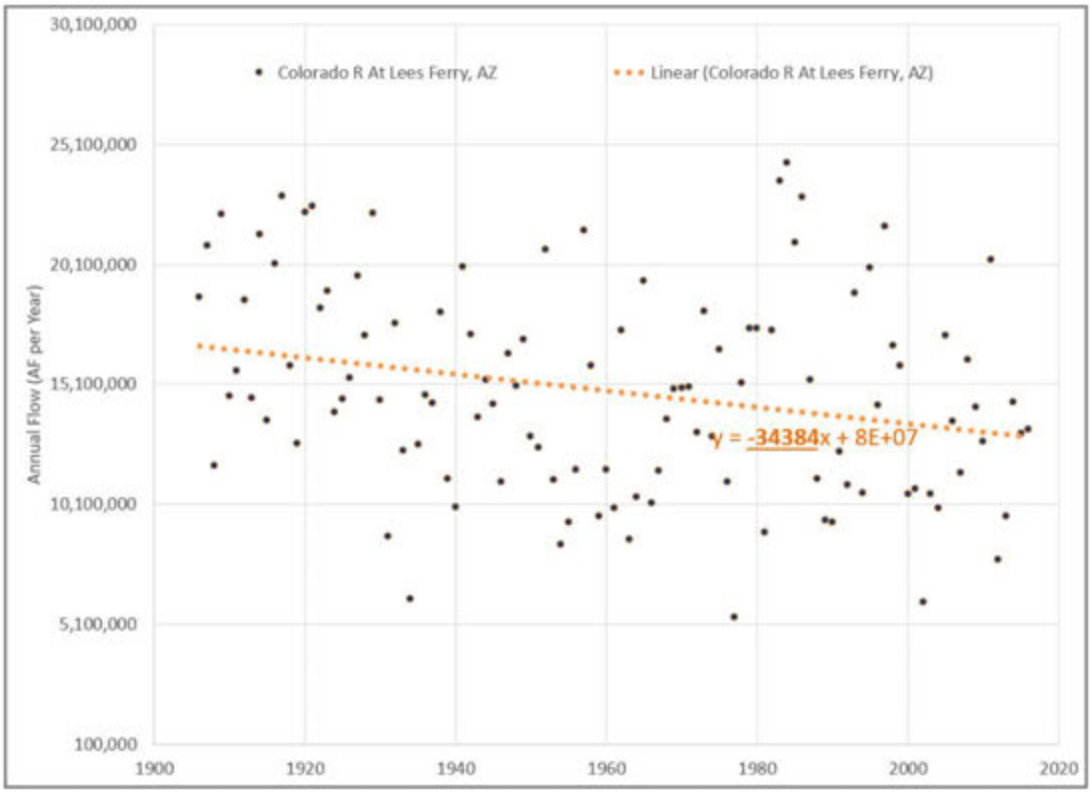

Figure 1: USBR Natural Flow Data for the Colorado River at Lee's Ferry with a linear trend line

This decreasing trend of average annual flow in the Colorado River was also found in the USBR's Colorado River Water Supply and Demand Report (https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/index.html). Table B-3 on page B-82 of Technical Report B – Water Supply Assessment summarized results from the USBR's water supply projections using the downscaled GCM Projected Scenario. This analysis predicted that average annual future flows in the Colorado River would be 7.5% less then historic by 2025, 10.9% less then historic by 2055, and 12.4% less then historic by 2080.

TABLE B-3
Summary of Annual and Monthly Streamflow Statistics for the Downscaled GCM Projected Scenario for the 3 Future 30 Year Time Periods: 2011–2040 (2025), 2041–2070 (2055), and 2066–2095 (2080)

	Statistic	Downscaled GCM Projected 2011–2040 (2025)	Downscaled GCM Projected 2041–2070 (2055)	Downscaled GCM Projected 2066–2095 (2080)
Annual (Water Year)	Average Annual Flow (maf)	13.9	13.4	13.1
	Percent Change from Long-Term Mean (1906–2007)	-7.5%	-10.9%	-12.4%
	Median (maf)	13.8	13.3	13.4
	25th Percentile (maf)	12.8	12.0	11.2
	75th Percentile (maf)	15.1	14.6	14.5
	Minimum Year Flow (maf)	4.4	3.9	3.7
	Maximum Year Flow (maf)	43.8	44.3	44.3
Monthly	Peak Month	June	May	May
	Peak Month Mean Flow (kaf)	3,535	3,388	3,495
	Peak Month Maximum Flow (kaf)	14,693	10,830	12,991
	Month at Which Half of Annual Flow (Water Year) is Exceeded	June	May	May

The last time period is beyond the Study period, but is shown for informational purposes.

Source: Colorado River Water Supply and Demand Report - Technical Report B – Water Supply Assessment (https://www.usbr.gov/lc/region/programs/crbstudy/finalreport/index.html).

Accordingly, it is the Tribe's position that future natural inflows used for modeling should, on average, be lower flows than historic natural flows. These observed reductions in natural flow should not be ignored because reductions in future natural flow will increase impacts predicted by the Green River Block Draft EA.

Also, on page 5 of Appendix A of the Green River Block Draft EA, the USBR states "*In this analysis, except for reasonably foreseeable depletions, future Upper Basin depletions from the 2007* [Upper Colorado River Commission] *UCRC schedule was assumed constant at 2018 levels; this assumption results in depletions significantly lower than the future depletion projections used in long term planning studies such as the Basin Study, which assumed that Upper Basin depletions will grow through 2060.*" The Tribe is concerned that this study does not account for realistic future water development patterns as observed by past trends and predicted under the USBR's Basin Study.

Therefore, the Tribe requests that an EIS be performed that quantifies impacts by accounting for these observed trends of decreasing water supply and increasing water demand.

V. THE FEDERAL GOVERNMENT, ACTING THROUGH THE BUREAU OF RECLAMATION AND THE CENTRAL UTAH PROJECT COMPLETION ACT OFFICE, AS TRUSTEE OF THE TRIBE'S RESERVED WATER RIGHTS, FAILED TO CONSIDER AND ANALYZE THE ADVERSE IMPACT FROM THE EXCHANGE CONTRACT AND ENVIRONMENTAL ASSESSMENT ON THE TRIBE'S ABILITY TO STORE ITS GREEN RIVER RESERVED WATER RIGHTS IN FLAMING GORGE.

The Tribe has expressed its interest in storing a portion of its Indian reserved water rights in the Flaming Gorge Reservoir and, in fact, has been discussing and negotiating for this with the federal government, through the USBR and the Central Utah Project Completion Act ("CUPCA") Office representatives, for at least the past ten years, and more intensely over the last four years. The 1992 CUPCA, Title V, s. 503 (Revised 1990 Water Compact), proposed the transfer of a substantial amount of Tribal reserved water rights from the Duchesne River Basin (known in the E.L. Decker Report quantifying the Tribe's reserved water rights as Group 5 lands in the Duchesne River Basin) to the Green River, Indian reserved water rights that are present perfected rights as of the date of the establishment of the Reservation with an 1861 priority date. This is the basis for the Tribe's negotiations with the federal government for storage in Flaming Gorge, although the parties have not reached an agreement on such a water transfer. In CUPCA, Congress required that the proposed Revised 1990 Water Compact be re-ratified by the Ute Indian Tribe before it can become effective. The Ute Indian Tribe and its members have not and will not re-ratify this proposed Water Compact unless there is sufficient storage to support the development of its Indian reserved water rights. In fact, the Tribe is in litigation against the United States, in part, over this uncertainty.

The Revised 1990 Water Compact proposed to transfer Indian reserved water rights out of the Duchesne River Basin from a portion of the Tribe's practicably irrigable acreage ("PIA") to the Green River. The transfer was made in an area where there are no Indian trust, arable lands to support PIA lands. First, the Green River runs through a deep canyon through the Reservation where it cannot be economically used for irrigation purposes. Without some storage on the Green River, the Tribe will not be able to use the proposed transfer of this Indian water. The proposed transfer of Indian water is to benefit the non-Tribal, State-based water users in the Duchesne River Basin by reducing a portion of the Tribe's use of its senior priority rights in that Duchesne River Basin. The amount of this proposed water transfer ranges from a portion of the Group 5 PIA land water rights with 60,968 acre-feet of diversion annually, to the entirety of the Tribe's Group 5 reserved water rights. In addition, the Tribe has additional water rights under what are known in the Decker Report as Groups 6 and 7 lands in the Green River and its tributaries. The Tribe must have the flexibility of both stored water (in Flaming Gorge Dam) and natural flow water in the Green River if the Tribe, with the assistance of its trustee, the federal government, is to protect and preserve through storage its Indian reserved water rights. The Tribe has discussed this extensively with the federal representatives from the CUPCA Office and the USBR.

And yet, the USBR has failed to consider and study whether, by permitting the State of Utah to exchange natural flow rights of 127,026 acre-feet per year to access low cost, released storage water from the Green River, this will adversely impact ongoing negotiations between the USBR, the CUPCA Office, and the Tribe related to the Tribe's ability to secure a portion of its water rights coming out of released storage water. In a statement in the Draft EA, the USBR presents a

conclusion that "[a]lthough the Green River flows through the Uintah and Ouray Indian Reservation, no negative effects have been identified to the native population as a result of the Proposed Action." (at page 47, Socioeconomics). If the Ute Indian Tribe is unable to fully develop and use its Indian reserved water rights, including those in the Green River, such an outcome will have a direct, significant, and certain economic adverse impact on the Tribe and its members. (*See also* section VII, impact on trust assets, below).

Therefore, the Tribe requests that an EIS be performed that quantifies any impacts under the Exchange Contract on the Tribe's ability to store a portion of its Green River reserved water rights in Flaming Gorge.

VI. THE FEDERAL GOVERNMENT, ACTING THROUGH THE BUREAU OF RECLAMATION AND THE CENTRAL UTAH PROJECT COMPLETION ACT OFFICE, AS TRUSTEE OF THE TRIBE'S RESERVED WATER RIGHTS, FAILED TO CONSIDER AND ANALYZE ANY ADVERSE IMPACT ON THE TRIBE'S ABILITY TO USE ITS GREEN RIVER RESERVED WATER RIGHTS.

Currently, the State of Utah has a 1958 priority natural flow water right (where the flows in some of the streams are intermittent and is only available at certain times of the year). The Green River Block Exchange would provide the State of Utah with access to a firm supply of 127,026 acre-feet of diversion and 72,641 acre-feet of depletion by utilizing year-round storage releases from Flaming Gorge Reservoir and, as stated in the Green River Block Draft EA, "*provide the State with a reliable water supply for development of the 1996 Assignment.*"

As explained in Comment section V, above, the 1992 CUPCA Act, Title V, s. 503 (Revised 1990 Water Compact), proposed the transfer of a substantial amount of Tribal reserved water rights from the Duchesne River Basin (Group 5 lands) to the Green River with an 1861 priority date. Due to the lack of irrigable lands, the primary beneficial use of this water can only be through Tribal water marketing. If the USBR provides a substantial quantity of low-cost, released storage water to the State under the Green River Block Exchange, the USBR will significantly diminish the ability of the Tribe to market water in the Green River and, therefore, reduce the Tribe's ability to develop and use its full apportioned Indian reserved water rights.

In other words, since the State's current water right is a natural flow right, during drought years and towards the summer the State may face shortages. By converting a relatively junior natural flow water right to a more reliable released storage water right and, therefore, providing a more firm water supply to be available to the State throughout the year, the proposed water exchange elevates the State's water right, making it more attractive than the most senior natural flow right of the Ute Indian Tribe in the Green River. Hence, potential water leasing entities will be more interested in the newly acquired released storage right of the State water users compared to the Tribe's most senior natural flow water right, adversely impacting the ability of the Ute Indian Tribe to market its water right—resulting in a significant, adverse socioeconomic impact on the Tribe, in particular, on the economic development of this Tribal natural resource (as mentioned previously). Also, because the purpose of the federal government in creating the Reservation was to provide a permanent homeland for the Ute Indian Tribe and its members, which includes the development of self-

sufficiency, such purpose could be defeated under the proposed Exchange Contract—representing a failure of the federal government's fiduciary duty to the Tribe.

Therefore, the Tribe requests that an EIS be performed that quantifies any impacts from this Exchange on the Tribe's ability to utilize its Green River reserved water rights.

VII. THE GREEN RIVER BLOCK DRAFT ENVIRONMENTAL ASSESSMENT FAILS TO RECOGNIZE THE TRIBE'S RESERVED WATER RIGHTS, HELD IN TRUST BY THE UNITED STATES FOR THE BENEFIT OF THE TRIBE, AS A TRUST ASSET OF THE TRIBE.

As stated in the Draft EA, "[t[he ITAs are legal interests in property held in trust by the United States for Indian tribes and individuals." (at p. 56). The Green River Block Draft EA states that "*Trust assets may include lands, minerals, hunting and fishing rights, traditional gathering grounds, and water rights.*" (p. 57, emphasis added). It also states that "[t]he development and operation of oil and gas wells associated with tribal mineral rights, tribal fishing access, and hunting and gathering are expected to continue within the Project APE [Area of Potential Effects]." It is the Tribe's position that the USBR's analysis of the Proposed Action is insufficient and deficient, and that the USBR failed to properly identify, consider, and analyze the Tribe's reserved water rights as a Tribal trust asset, titled in the United States as trustee for the benefit of the Tribe, and, consequently, has failed to analyze the effects on the Ute Indian Tribe, including the present, reasonably foreseeable, and cumulative effects, the Proposed Action will have on the Ute Indian Tribe's reserved water rights as a trust asset, resulting in a legally flawed Draft EA and the conclusions the USBR has drawn from the Draft EA.

Therefore, the Tribe requests that an EIS be performed to address our concern that the Proposed Action will have a significant, adverse effect on the Tribe's reserved water rights, a Tribal Trust Asset, and a highly relevant factor in analyzing the environmental consequences of the Exchange Contract.

VIII. CONCLUSION

The Ute Indian Tribe appreciates the opportunity to comment on the Green River Block Draft Environmental Assessment. For the reasons described above, it is our conclusion that the USBR's conclusion that no EIS need be prepared because the proposed impact will not have a significant effect on the human environment is based on legally insufficient analysis. Therefore, we ask that the USBR, first, engage in the legally required government-to-government consultation process with the Tribe, as it is required to do under federal law and policy, before issuing a final decision on whether an Environmental Impact Statement is required. Second, it is the Tribe's position that the USBR failed to identify and give legally sufficient consideration to the consequences of the Green River Block Exchange Contract on the Tribe's reserved water rights as a trust asset with the paramount water rights in the Green River—which is to be preserved and protected by the Secretary, such as through storage and sufficient natural flow to allow for the Tribe's use of this trust asset to economically benefit its members—resulting in the conclusion that the Draft Environmental Assessment is flawed and insufficiently accounts for the Tribe's reserved water rights development, including storage and use.

Additional studies resulting in an Environmental Impact Statement are needed to give these Tribal concerns regarding the consequences of the Proposed Action a hard look and the serious consideration that is required under the environmental assessment process. The Tribe appreciates USBR's consideration of these comments and we look forward to consulting with the Department of the Interior on these issues.

November 2, 2018

Lisa Rutherford and Paul Van Dam
173 Painted Hills Drive
Ivins, Utah 84738

Bureau of Reclamation
Jared Baxter
302 E 1860 S, Provo, Utah 84606
greenriverblock@usbr.gov

RE: Green River Block Water Exchange Contract Draft Environmental Assessment PRO-EA-16-020

In January of this year, comments to the Bureau regarding the December 2017 contract negotiation meeting held in St. George, Utah pertaining to water from Flaming Gorge for the Lake Powell Pipeline (LPP) were provided to the Bureau of Reclamation (BOR).

We appreciate having this opportunity to comment on an important – and complex – matter before the Bureau at this time. People more knowledgeable than we will be commenting on this EA in greater detail and with much more scientific knowledge than we have, but from our thirty-thousand foot level after having studied the proposed Lake Powell Pipeline Project (LPP) for over twelve years, this appears to be one more attempt by the state to secure the water for the LPP via very convoluted means.

We realize that the matter under consideration in this EA pertains to one aspect of Utah's remaining water right resulting from the Ultimate Phase of the Central Utah Project, a phase that was never completed. The Green River Block (GRB) (72,641af depletion) water contract is under consideration in this EA. A second contract for another block of Ultimate Phase water, the LPP Block (86,249af depletion), will be handled via a separate contract and EIS conducted by the Federal Energy Regulatory Commission (FERC).

What is troubling to us is that the effects of the depletion by these two blocks of water totaling 158,890af are being considered separately. The combined GRB and LPB 158,890af depletion makes up the majority of the 447,500af diversion assigned in 1996 by Reclamation to the Utah Board of Water Resources (Board). These are two major blocks of water. It seems they should be considered in their entirety not separately due to the cumulative impact they will have.

A May 2010 document from then-Deputy Director Eric Millis to State Engineer Kent Jones (40-year Plan for Water Right No. 41-3479) makes it clear that the two blocks are a "single" block of water for planning purposes. Although two contracts can be issued for the water's use to deal with specific block issues, the two blocks should be studied as one for environmental purposes. FERC will also study the Lake Powell Block in their EIS but that does not mean that the BOR should not include the LPB in their study. The piecemeal approach that BOR is taking in this process does not serve the people of the State of Utah well. The citizens of Utah deserve a more comprehensive approach and more reliable evaluation of the water situation facing our citizens and the natural environment we are affecting.

We also are confused about the priority of these two blocks that resulted from the Ultimate Phase. A May 2011 letter from the BOR to Mr. Kent Jones, State Engineer with Utah's Division of Water Rights, addressed the water rights agreement between the State of Utah and the United States of America regarding Central Utah Project rights and states:

"H. In the interest of securing the water supply for the previously developed portions of the Central Utah Project, the Utah Board of Water Resources passed a motion on January 20, 2010, agreeing to subordinate the priority of Water Right No. 41-3479 (A30414d) and all segregated portions it holds title to, making these rights junior to the water rights for the Bonneville Unit of the Central Utah Project. This motion was based on the condition that the Duchesne County Water Conservancy District and the Unitah Water Conservancy District subordinate the priority of the segregated portions of Water Right No. 41-3479 (A30414d) which they acquired, making them equal in priority to the water rights held for the Bonneville Unit of the Central Utah Project.

I. On May 26, 2010, the Duchesne County Water Conservancy District and the Unitah Water Conservancy District signed an agreement that subordinated the priority of segregated portions of Water Right No. 41-3479 (A30414d) which they acquired, making them equal to the priority of water rights held for the Bonneville Unit of the Central Utah Project."

Section H above indicates that the Board was concerned about protecting the state's investment in CUP facilities by subordinating Water Right No. 41-3479 (A30414d) and the segregated portions to the water rights held for the Bonneville Unit of the CUP with the agreement that Uintah and Duchesne subordinate their rights under the 1996 agreement (25,176 + 31,160 = 56,330 depletion). Section I then indicates that Duchesne and Unitah counties agreed.

What's confusing is that Section H states Water Right No. 41-3479 (A30414d) and "all" segregated portions (apparently including Duchesne and Unitah which had not been developed and should have reverted back to the Board) would be "junior" while at the same time stating that the rights would also be "equal" to those of the Bonneville Unit of CUP. We may be reading this document incorrectly and missing some major points, but it seems there's some question about what political influence the massive Bonneville Unit and its already-existing facilities may have on securing future water for residents that depend on that water while the Lake Powell Pipeline is not even built yet meaning, in our minds, the LPB should have a subordinate position.

These water right subordinations – if legal – seem to be a shell game being perpetrated by those in support of the LPP.

According to information from Utah Reclamation Mitigation and Conservation Commission (https://www.mitigationcommission.gov/aboutus/aboutus_cup.html), the Bonneville unit, the CUP largest unit, services ten counties including Uintah, Duchesne, Wasatch, Summit, Utah, Salt Lake, Juab, Garfield, Piute and Sanpete. The Bonneville system "contain a vast network of reservoirs, aqueducts, tunnels and canals, pipelines, pumping plants and conveyance facilities that develop water for irrigation, municipal and industrial use and power production."

Because of the Bonneville Unit's size and previous (current?) seniority, it's difficult to believe that the BOR would support jeopardizing the water that is provided for that unit while providing junior (equal?) water for other purposes.

As far back as the 60s this water has been a topic of water policy decisions. BOR's position at that time is revealed in a Utah State University archival document titled *Central Utah Project Ultimate Phase: Inventory of Available Data* (http://www.riversimulator.org/Resources/Pipelines/UltimatePhase/CentralUtahProjectUltimatePhaseInventoryAvailableData1965.pdf)

> "The population and related industrial developments are expanding rapidly in the Bonneville Basin area, especially north of Payson. The number of people in Salt Lake and Utah Counties increased 82 percent from 1940-60. This rate of growth is more than three times that of the Nation as a whole and is expected to continue at a relatively high rate. Therefore, it is anticipated that the municipal and industrial water demand will far exceed the local supplies available. Since project water will be limited to Utah's share of the Colorado River water, the municipal and industrial allocation may be increased and the irrigation water decreased correspondingly."

This statement was used by BOR to justify the Ultimate Phase of the CUP. Now the water will not go there but is being planned for other purposes including the GRB and the LPB, with the LPB using the same "growth" justification as was used in the 60s for the Ultimate Phase for the Bonneville Basin area. Although the Salt Lake area has not had the Ultimate Phase water, the growth in the Salt Lake area has not abated, but what will the future hold? With the water right being somewhat in question, given the 2011 BOR/Utah State Water Board Document details, what will happen when the Bonneville Basin area wants its water? It's clear that Utah has over allocated its water rights as has been made clear publicly by Utah's own state engineer fairly recently.

We are also concerned with the predicted reduced flows in the Colorado River system generally and obligations to the Lower Basin. How can the State of Utah assert they still have a sufficient water right remaining? Perhaps on paper that exists (as shown through over allocation) but certainly not in the river now nor in the future.

We are sure that the Bureau is getting much political pressure from above and below to make sure water for the proposed multi-billion dollar LPP is approved. We do not say "available" because the Bureau cannot ensure that the water will be available. Perhaps that's the crux of the matter. For citizens like us in Southern Utah and many thousands of others who will be on the hook financially to pay for this project, including those throughout the state since the state will essentially "subsidize" the county for fifty years for this project, an empty pipeline is a big deal.

Getting to the heart of the EA under consideration, under the No Action Alternative, "The State would remain free to develop their apportioned water right under the 1996 Assignment without the stability of FG stored water being released for this exchange" with this caveat, "The State may run into shortages in years of drought, especially during the latter part of the summer when tributary flows can be significantly reduced." Given our concerns, this seems a reasonable alternative. Utah's overuse of water reveals that perhaps shortages would best be managed by better use of existing water rather than relying on future Colorado River water that may not be there.

We realize that there would some "monetizing" aspects under the preferred alternative that make that option attractive to the BOR but doubt there would be much benefit given the state's balking at paying much for the water as was evidenced at the December 2017 meeting regarding the LP Block. The fact that the provisions of the resulting contract are not provided for public review and comment is a problem.

Although the Proposed Action is the preferred alternative and would allow BOR to meet ESA Recovery Program goals in the Green River, we do not believe it would provide the State with a reliable water supply for development of the 1996 Assignment given our concerns expressed above.

Regarding ESA Recovery, it appears that the No Action Alternative would not harm the situation. The EA states in 3.3.4.1.1 under No Action "The effect of the No Action Alternative would be similar to existing conditions, as the State would remain free to develop their assigned water right using accretion flows. The FG Dam would continue to operate consistent with the FGROD."

In the document it's noted that the preferred "Proposed Action" would have no effect on the sensitive fish species occurring in the Green River below the FG Dam. If that's the case, then the current management situation seems to be working in accordance with the FGROD and no change is needed.

In the "Historic Hydrology – Direct Natural Flow (DNF)" section of the EA it's noted that "In this analysis, except for reasonably foreseeable depletions, future Upper Basin depletions from the 2007 UCRC schedule was assumed constant at 2018 levels; this assumption results in depletions significantly lower than the future depletion projections used in long term planning studies such as the Basin Study, which assumed that Upper Basin depletions will grow through 2060." Then in the Discussion section it's noted "Unique to this analysis is the model assumption that no new projects or depletions will occur in the Upper Basin." It is also noted in Discussion that "It is recognized that the Upper Basin States plan to develop their compact allocated Colorado River water and, as such, it is highly unlikely that depletions will remain at the 2018 level in the future."

We are concerned as we read this that a conservative spin is being put on future river depletions under this EA that may result in future challenges. The State uses the argument that this agreement will benefit species in Green River as the water makes its way to Lake Powell. However, the EA details provided in sections 3.3.4.1.1 and 3.3.4.1.2 seem to make it clear that the conditions in the Green River will be fine with or without this contract.

Certain Colorado River flow models demonstrate that a shortage declaration is possible during severe and prolonged droughts and the scope of the EA does not seem to adequately consider the effects of the warming climate. Although the states are actively identifying and implementing measures to manage the risk, that does not mean they will be successful. Committing more water to allow the building of a pipeline that may end up being an albatross to the State of Utah does the state and citizens no favor.

We are also concerned with the scoping process used by BOR for this EA. Given that this GRB water is closely linked to the LPB, having a meeting only in Vernal, Utah, when the citizens of Washington County and Kane County will be affected by a portion of the water right under consideration gave the public in our area no chance to participate in a scoping process.

As stated early in these comments, others with far more scientific expertise relating to EA specifics will have to deal with details in the Green River Block Water Exchange Contract Draft Environmental Assessment PRO-EA-16-020. Our key concerns are with the overall concept of this EA as it relates to the other water block for the proposed Lake Powell Pipeline and the effects of separating these two blocks in an environmental analysis.

We appreciate having the opportunity to comment on this matter.

Sincerely,

Lisa Rutherford Paul Van Dam

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Western Area Power Administration
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Mr. Jared Baxter
Provo Area Office
U.S. Bureau of Reclamation
302 East 1860 South
Provo, UT 84606

Subject: Green River Block Water Exchange Contract – Environmental Assessment; Comments by Western Area Power Administration

Dear Mr. Baxter:

The purpose of this letter is to list Western Area Power Administration's (WAPA) comments on this Environmental Assessment (EA). We thank you for allowing the opportunity to comment and appreciate your consideration.

It is unclear to us whether the Green River Block Water Exchange Contract would cause a modification in the operation of Flaming Gorge Dam. Table 3-1 states that "*no change in operations is beings considered…*". Also, USBR's October 22, 2018, press release states that the: *operations of Flaming Gorge Dam would remain within the parameters analyzed in the 2005 Operation of Flaming Gorge Dam Final Environmental Impact Statement and established in the 2006 Record of Decision.*

On the other hand, in the EA, Section 3.3.1.4. Proposed Action, describes the differences between the No Action Alternative (which presumably includes the operation under the 2006 Record of Decision (ROD)) and the Proposed Action, as follows:

April-July (Reach 1): *are higher approximately 5 percent of the time when Flaming Gorge (FG) releases are increased in July to maintain Reach 2 flows, and are higher than the No Action Alternative.*

April-July (Reach 2): *Releases from FG under the GRB depletion scenario are higher than the No Action Alternative 30 percent of the time.*

July-September: *The No Action scenario has lower flows than the GRB depletion scenario when the minimum flow release target from FG Reservoir has essentially been altered to compensate for the depletion scenario during drier hydrology.*

October-December: *The GRB depletion ends on September 30, and the remaining months of the year are used to increase reservoir storage within the FGROD base flow requirements. FG releases are maintained at minimum 800 cfs levels approximately 10 percent more time than the*

No Action Alternative, and are at minimum releases for 25 percent of the time. The GRB depletion scenario maintains slightly lower releases as compared against the No Action until 45 percent of the time after which releases converge with the No Action scenario during October-December.

Similar descriptions are included in Section 3.3.1.5 Cumulative Effects, which relates the impacts of implementing the "full depletion scenario." If WAPA's understanding of the description of the impacts of the Proposed Action is correct, then an analysis is needed regarding the impact of the Green River Exchange Agreement on hydropower production and value.

WAPA is also concerned about several other statements in the EA, the essence of which is given in Section 3.3.1.4 (page 16, par. 6). *"The GRB depletion scenario is higher to maintain Reach 2 flows and compensate for higher depletion rates below FG Dam."* WAPA is a participant in the Upper Colorado River Basin Recovery Implementation Program (UC RIP). One of its founding documents is the "Section 7 Agreement." This agreement requires that, for new water depletions, the Fish and Wildlife Service will propose new actions be added to the RIPRAP in order to mitigate for the impact of the new depletion. WAPA believes that this would be the case for new proposed water depletions in the Green River (Reaches 1 & 2). The EA appears to state that Reclamation is committed to increasing Flaming Gorge releases to compensate for new water depletions in these regions.

We are interested in having the EA clarified and WAPA's understanding improved. We propose a meeting in the near future with Reclamation to improve our understanding. We suggest that this occur prior to any final decision regarding the exchange agreement.

Sincerely,

bc: wilhite@wapa.gov, ellsworth@wapa.gov arellano@wapa.gov
RF, OF

L8100:SCPalmer:ca:11/02/18
ENV\PALMER\EA COMMENTS LTR 11-02-18.DOCX

United States Department of the Interior

NATIONAL PARK SERVICE
INTERMOUNTAIN REGION
12795 West Alameda Parkway
Lakewood, CO 80228

IN REPLY REFER TO:
IMRO-RSS-COR (1241)

VIA ELECTRONIC MAIL: NO HARD COPY TO FOLLOW

Memorandum

To:	Jared Baxter, Bureau of Reclamation, Provo, UT
From:	Rob Billerbeck, Colorado River Program, Intermountain Region, National Park Service
Subject:	Comments on Green River Block Exchange EA
Date:	November 2, 2018

The National Park Service appreciates the opportunity to review the Green River Block Exchange EA and the availability of Reclamation staff to discuss some of the questions on the hydrology modeling during a phone call on November 2, 2018. The Green River runs through Dinosaur National Monument and Canyonlands National Park, where the NPS is charged with managing and protecting the resources, so the comments below reflect the concerns and questions from our resource experts associated with these park units.

Hydrology Modeling and Effects

We are concerned that the conclusion in section 3.4, table 3-3 stating 'no effect' on hydrology for the proposed action may be a little misleading. In section 3.3.1.4 you state that "*Releases from FG under the GRB depletion scenario are higher than the No Action alternative 30 percent of the time*," and that the proposed action could result in as much as a six foot drop in reservoir elevation. Furthermore in various sections you point out that flows from April to July may slightly increase during extremely dry years or that there would be small increases (< 300 cfs) during the months of July-September during dry years and slightly lower flows (< 250 cfs difference) in the months of October-December. You also state that modeling has shown that the Proposed Action does not include a change in operations of Flaming Gorge (FG) Dam as outlined in the FG Record of Decision (ROD). Based on this, it may improve the clarity and accuracy in table 3-3 if you state that there are small effects to hydrology, but they are within the hydrologic range of effects of the FG ROD.

There are a few points that we would ask that you clarify in the hydrology section, 3.3.1.2.2 in the main text. There is a statement that "*Spring peak releases during the month of April are nearly identical under all scenarios*," but it's not clear if that is true of all peak flow or not. In general, NPS supports a more natural hydrologic regime on the river and reductions in peak flows would move further away from the natural hydrology, and could have negative effects on a

number of resources along the river. If there are no reductions in peak flows, it would be good clarify that is true for all peak flows.

Also there is a statement that "*The No Action Alternative along with the GRB depletion scenario have similar results … Both scenarios indicate that meeting the daily maximum flow at Jensen at or above 18,600 cfs 50% of the time is not achievable …*" We would suggest that you provide the percent of time that each target is achieved under No Action and the Proposed Action, so they can be compared.

The terms "flow targets", "flow thresholds", "Recovery program goals" and "flow recommendations" are all used in the EA, but it is not clear if these are all completely interchangeable. We would ask that you standardize this language or articulate clearly any differences.

Despite our best efforts to understand the rigorous hydrology modeling in the EA appendix, we still find a lack of clarity within the EA for where (or how much) water will be diverted from the Green River and where return flows might come back into the Green River. This makes it difficult to clearly understand which reaches might see more/less water. If it were possible to improve this clarity in section 3.3.1, this would be very helpful for disclosing any potential impacts. There is a statement on p. 14 that "*The GRB depletion maintains FGROD operations and no change to operations are made under the GRB alternative. Releases from FG Dam maintain Reach 1 and 2 flow thresholds,*" and yet on there is also the statement on Pg. 10 that: "*Additional releases may be necessary to meet target flows in Reach 2 as a result of depletions under the Proposed Action. Should Reach 2 target flows not be able to be met through FG operations, the State would coordinate with the Recovery Program and USFWS.*" It is not completely clear what "coordinate" means in this context, and whether the State will commit to satisfying Flow Recommendations, or how potential shortfalls in meeting Reach 2 flow targets may affect Reach 3 flow targets.

One very important concern we have regarding the hydrology modeling is the lack of evaluation under a drier scenario. After 19 years of drought in this system, there is growing consensus among partners and among scientific studies that the future 'new normal' may be warmer and drier years on average. We note that the Bureau of Reclamation and the basin states are regularly evaluating effects under a drier subset of hydrology runs for other Colorado River water projects and we would recommend that this be conducted for this project as well. These warmer and drier scenario runs would be important to ensuring that the hydrology does indeed fall within the range of the FG ROD under likely future scenarios.

It is also not completely clear how this project may interact with other proposed changes to releases from Flaming Gorge. There are proposed changes for Drought Operations Response from the basin states, and proposed elevated base flows from the Upper Colorado River Endangered Fish Recovery Program. While both of those individually are also believed to produce changes that are within the existing FG ROD, we have substantial concerns as to whether the cumulative effects analysis has fully explored whether the combination of these proposals might create situations that fall outside the FG ROD analysis, and again particularly under warmer and drier scenarios. We would suggest addressing this further under section 3.3.1.5, the cumulative effects section for the hydrology.

Vegetation Effects

Some of the hydrologic changes described under the proposed action in this EA indicate that base flows could increase slightly from April to July during extremely dry years or that there would be small increases (< 300 cfs) during the months of July-September during dry years. In section 3.3.3.2, you state riparian areas would likely be unaffected by implementing the Proposed Action, or that there could be a minimal positive impact for some patches of vegetation. Though the changes may increase patches of vegetation, the NPS would not consider those increases a positive impact, but rather a negative one, as it would further lead to channel narrowing and simplification. This has some similarity to a recent paper prepared by Dr. Jonathan Friedman, a Research Hydrologist with US Geological Survey entitled "Potential Effects of Elevated Base Flow and Midsummer Spike Flow Experiments on Riparian Vegetation along the Green River". In this paper, Dr. Friedman describes how slightly elevated baseflows could cause channel narrowing and simplification, which would be undesirable future conditions for river-related resources on the National Park units. This paper is available at: https://irma.nps.gov/DataStore/Reference/Profile/2252016. This study was funded by the NPS to evaluate potential slight increases in summer baseflows proposed by the Upper Colorado River Endangered Fish Recovery Program. We would ask that Reclamation consider this paper and revise section 3.3.3.2 to reflect that there is a chance of increasing vegetation that could result in channel narrowing and simplification rather than no effect. Thus, in summary section 3.4, table 3-3, we would ask that you consider changing the result from 'no effect' to potentially negative effects. Furthermore, you may again need to clarify that you believe those impacts would be within the range of current effects addressed in the FG ROD if that is the case.

Wilderness

In section 3.2, you state that wilderness was eliminated from further analysis, and we would just request that you mention that there is recommended, though not designated wilderness, which the Green River runs through in Dinosaur National Monument and Canyonlands National Park.

The NPS would be happy to discuss these issues further with you and work with you if desired as you address comments on this EA. We appreciate the collaboration on our shared goals for management of the river for water delivery and protection of resources and endangered fish. Please let us know if you would like to discuss any of our concerns further or if you need any additional information, by contacting Rob Billerbeck, Jenny Rebenack, Mark Wondzell, Melissa Trammell, Terry Fisk or Lisa Baldwin.

//s//
Rob Billerbeck

cc: Kate Cannon, Superintendent, Southeast Utah Group
Patrick Walsh, Acting Superintendent, Dinosaur National Monument
Billy Shott, Chair, NPS Colorado River Steering Committee
Mark Wondzell, Hydrologist, NPS Water Resources Division
Dusty Perkins, Program Manager, Northern Colorado Plateau Network
Melissa Trammell, Fisheries Biologist, Intermountain Region
Terry Fisk, Chief of Resources, Canyonlands National Park
Lisa Baldwin, Chief of Resources, Dinosaur National Monument
Ken Hyde, Chief of Resources, Glen Canyon National Recreation Area

GreenRiverBlock, BOR-sha-PRO <greenriverblock@usbr.gov>

[EXTERNAL] comments

2 messages

Mary Moran <marymoran3333@gmail.com> Fri, Nov 2, 2018 at 3:37 PM
To: greenriverblock@usbr.gov

I am commenting on the proposed Green River Block Water Exchange Contract.

As you know, flow in the Colorado River is predicted to decrease substantially over the next decades, and indeed, is already decreasing, due to increasing average air temperatures and resultant increased evaporation associated with climate change.

The Upper and Lower Basin states are finally completing drought contingency planning. This planning involves efforts to decrease water use throughout the Colorado River Basin.

This contract is in direct conflict with the drought contingency planning efforts. Exchanging water in order to provide water for new developments, when we are trying to decrease water use, makes no sense. Please deny this contract.

Sincerely,

Mary Moran

1991 Highland Dr

Moab, UT 84532

GreenRiverBlock, BOR-sha-PRO <greenriverblock@usbr.gov> Fri, Nov 2, 2018 at 3:39 PM
To: Mary Moran <marymoran3333@gmail.com>

This email serves as notification that your comments have been placed in the administrative record. Thank you!
[Quoted text hidden]

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OTHER OFFICES
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WASHINGTON, D.C.

November 2, 2018

Via electronic and first class mail

Jared Baxter
U.S. Department of Interior
Bureau of Reclamation
Provo Area Office
302 E. 1860 S
Provo, Utah 84606
greenriverblock@usbr.gov
jbaxter@usbr.gov

Re: Green River Block Water Exchange Contract Draft Environmental Assessment; PRO-EA-16-020

Mr. Baxter:

American Rivers provides these comments in response to the Bureau of Reclamation's (Reclamation) "Green River Block Water Exchange Contract Draft Environmental Assessment" (PRO-EA-16-020; September 2018) (DEA).

DESCRIPTION OF AMERICAN RIVERS

American Rivers is a national, non-profit, 501(c)(3) conservation organization with offices nationwide, including one in Denver, Colorado and headquarters in Washington, D.C. It serves more than 275,000 members and supporters nationwide, and over 30,000 members in the seven-state Colorado River Basin region.

Throughout the Colorado River Basin, American Rivers is actively engaged in efforts to support system conservation and water demand reduction solutions to maintain water levels in Lake Powell and Lake Mead, to increase water supply reliability and security for people and

farms, to protect water quality and instream uses like fish and recreation, and to promote low-impact hydropower generation. The goal of these efforts is to ensure the Colorado River can continue to provide water for human and environmental needs in the face of drought, long-term climate change, and population growth.

American Rivers is also a party to the licensing proceeding pending before the Federal Energy Regulatory Commission (FERC) for the Utah Board of Water Resources' Lake Powell Pipeline (LPP) Project, which proposes to divert up to 100,000 acre feet (AF) of water annually from Reclamation's Lake Powell through a buried 69-inch diameter pipeline to southern Utah. We have stated opposition to the LPP Project as currently proposed due to concerns that it would undermine basin-wide efforts for sustainable water resource management.

COMMENTS

As we understand it, the proposed action would modify how Utah exercises its water apportionment under the Upper Colorado River Basin Compact. Rather than take water from the Green River and tributaries, Utah would allow its allotment to remain in Reaches 1 and 2 of the Green River. Allowing this water to remain in Reaches 1 and 2 would assist Reclamation in meeting its obligations under the Endangered Species Act for the recovery of endangered fish species in the Green River, as established in the 2006 Record of Decision on the 2005 Operation of Flaming Gorge Dam Final Environmental Impact Statement. In exchange, Utah would take its allotment below Reaches 1 and 2, from Flaming Gorge releases. "On an annual basis, the direct flows that would be left in the river and used to meet ESA requirements would equal the

FG [Flaming Gorge] project releases used for depletion by the State under the Contract Entitlement right."[1]

The DEA focuses on the effects of Utah taking water from Flaming Gorge releases rather than direct diversion from the Green River. As discussed below, we are concerned that this scope is too narrow and that the analysis does not adequately address the direct, indirect, and cumulative effects of the additional depletion of surface water flow from the Colorado River Basin.

American Rivers requests that Reclamation revise its environmental analysis to address the effects of the additional depletion of water from the Colorado River Basin in the context of climate change and other connected, similar, and cumulative actions occurring with the basin. Reclamation must disclose the impacts of the proposed action in the context of other demands on this river system, which already is under tremendous strain.

We provide more specific comments below, organized according to the headings in the DEA.

Section 1.4 Purpose of and Need for Proposed Action

The DEA states that the proposed action is responding to a request from the State of Utah for two water contracts that would facilitate use of its "assigned water right"[2] of 158,890 acre feet:

> "One contract represents 86,249 AF depletion to be used for the LPP [Project] proposed to be constructed by the State; the second contract, called the Green River Block, or simply GRB, represents the remaining amount of the assigned water right (72,641 AF depletion) to be used for development along the Green River. The purpose of the

---

1 DEA, p. 9.

2 The draft contract defines "assigned water right" to mean: "an interest in Application to Appropriate number A30414d (as numbered by the Utah State Engineer) for the diversion of 447,500 acre-feet with 158,800 acre-feet of depletion or segregated pieces of water right from it including change applications which have or will be filed based on that application...." Contract No. 17-WC-40-655, Technical Draft 10/05/2017, p. 3.

> Exchange Contract is to facilitate a water exchange of 72,641 AF of depletions annually under the 1996 Assignment, which was previously included as part of a CRSP [Colorado River Storage Project] participating project water right. This contract is needed to resolve a long standing disagreement between Reclamation and the State regarding use of the water right assigned in 1996."[3]

American Rivers is concerned that the scope of analysis for the DEA, which is limited to the Green River Block contract, is narrower than the purpose and need statement, which addresses Utah's development of its "assigned water right" of 158,890 AF. The DEA does not explain how limiting the scope to just one of the contracts that will be needed to develop Utah's "assigned water right" is consistent with NEPA regulations requiring that connected and similar actions be analyzed in the same document, as discussed below.

Section 1.8 Scope of Analysis

The DEA states the geographic scope of analysis excludes Lake Powell: "[a]nalysis in the EA includes impacts from depletions of water along the Green River, from FG Dam down to, but not including, Lake Powell."[4] This geographic scope seems too limited given that the Green River is hydrologically connected to Lake Powell, and there are other actions related to management of Lake Powell that currently are pending before Reclamation.

The DEA refers to the LPP Project as a related project, but does not analyze it as a "connected action":

> "[FERC] is the lead agency in preparing an EIS [Environmental Impact Statement] for the [LPP Project]. The project would bring water to residents in southern Utah by building a 139 miles long, 69-inch-diameter pipeline from Lake Powell to Kane and Washington [C]ounties, Utah. Water delivered by the project will be based on the established water right."[5]

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3 DEA, pp. 5-6.
4 *Id.* at 8.
5 *Id.* at 7.

The DEA does not address Reclamation's role in authorizing the LPP Project. However, in its comments on the Utah Board of Water Resources' Draft Preliminary Licensing Proposal, Reclamation described its role in the LPP Project as deciding:

> "(1) whether to approve a water service contract for water diversion from Flaming Gorge. Water stored in Flaming Gorge would be delivered down the Green River, providing in-stream benefits, and from Lake Powell it would be diverted into the pipeline; and (2) whether to approve a ROW [right-of-way] license agreement for constructing and operating the pipeline and other LPP facilities within the Reclamation Primary Jurisdiction Area near Glen Canyon."[6]

Under regulations implementing NEPA, the scope of an agency's review must include connected, cumulative, and similar actions:

> "(1) Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they:
>
> (i) Automatically trigger other actions which may require environmental impact statements.
>
> (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously.
>
> (iii) Are interdependent parts of a larger action and depend on the larger action for their justification.
>
> (2) Cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement.
>
> (3) Similar actions, which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement."[7]

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6 "Comments from the Bureau of Reclamation Lake Powell Pipeline Project Preliminary Draft Preliminary Licensing Proposal November 2015," eLibrary no. 20160316-5117 (Mar. 16, 2016).

7 40 C.F.R. § 1508.25(a).

NEPA disfavors "segmenting" the analysis of connected, cumulative, or similar actions into different environmental documents:

> "An agency impermissibly 'segments' NEPA review when it divides connected, cumulative, or similar federal actions into separate projects and thereby fails to address the true scope and impact of the activities that should be under consideration. The Supreme Court has held that, under NEPA, 'proposals for … actions that will have cumulative or synergistic environmental impact upon a region … pending concurrently before an agency … must be considered together. Only through comprehensive consideration of pending proposals can the agency evaluate different courses of action.'"[8]

American Rivers is concerned that the DEA improperly segments review of the Green River Block water exchange contract from other connected, cumulative, and similar actions related to development of water in the Colorado River Basin, notably the LPP water exchange contract and the right-of-way license agreement for construction of the LPP Project, both of which are pending before Reclamation. The purpose statement explicitly refers to Utah's desire to develop its "assigned water right," yet the DEA does not explain why the two contracts necessary to develop the assigned water right would be reviewed separately under NEPA.

Further, the DEA does not address the development of a Drought Contingency Management Plans for the Upper and Lower Colorado River Basin. The draft "Agreement Concerning Colorado River Drought Contingency Management and Operations"[9] was published in October 2018. The draft Agreement calls for an Upper Basin Demand Management Program that will, in part, coordinate operations of the Colorado River Storage Project Act Initial Units, including Flaming Gorge, to help minimize the risk of Lake Powell declining below minimum power pool and maintain the Upper Basin States' compliance with the Colorado River

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[8] *Delaware Riverkeeper Network v. F.E.R.C.*, 753 F.3d 1304, 1313 (D.C. Cir. 2014) (quoting *Kleppe v. Sierra Club*, 427 U.S. 390, 410 (1976).

[9] *Available at* https://www.usbr.gov/dcp/docs/DCP_Agreements_Final_Review_Draft.pdf.

Compact.[10] Reclamation Commissioner Burman has, "emphasized the need for prompt action following another year of low runoff in the ongoing drought and called on the states to complete their drought planning by December of 2018."[11] The DEA does not explain why this drought planning effort was not considered. This oversight is striking given that Reclamation has designated the planning effort as high priority and played a significant role in the negotiations.

Reclamation's segmented environmental analysis may prevent full disclosure of the impacts of these several actions, which could be substantial when considered together. Segmentation may also interfere with identification of effective measures to mitigate cumulative effects on a basin-wide scale.

American Rivers requests that Reclamation revise its environmental analysis to address connected, cumulative, and similar actions as required by NEPA and implementing regulations. One option for accomplishing this would be to cooperate with FERC in jointly preparing a comprehensive Environmental Impact Statement (EIS) that at least addresses both water exchanges and the LPP Project.[12] Reclamation's expanded role in preparing the EIS for the LPP Project would be consistent with FERC's finding that the project "is, first and foremost, a large water conveyance system, whose primary purpose is not hydropower development but delivery of water from Lake Powell In Arizona 140 miles to southwestern Utah for municipal and industrial use."[13] Reclamation has greater expertise and experience than FERC in the hydrologic modeling and analysis that will be necessary to evaluate the LPP Project's impacts on water

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10 *See id.*

11 Reclamation, "Colorado River Drought Conservation Plans" (Oct. 18, 2018) *available at* https://www.usbr.gov/newsroom/newsletter/2018/2018-10-19newsletter.html.

12 40 C.F.R. § 1501.5(b) ("Federal, State, or local agencies, including at least one Federal agency, may act as joint lead agencies to prepare an environmental impact statement (§ 1506.2).").

13 FERC, "Order Denying Petition for Declaratory Order on Jurisdiction," eLibrary no. 20180920-3043 (Sept. 20, 2018), p. 26.

resources, including but not limited to, "[e]ffects of project proposal on water availability and water use, ***including water availability during droughts or under other adverse hydrologic conditions.***"[14]

3.3.1.2.2 Future Inflow Scenarios

The DEA states that it analyzed future inflow hydrology scenarios. The DEA describes Reclamation's methodology for determining the "Direct Natural Flow" for future inflow, in part, as follows:

> "Natural flow is the observed flow adjusted for the effects of diversions and the operation of reservoirs upstream of the flow gage. This natural flow record was developed by Reclamation and is used extensively in their hydrologic modeling and Environmental Impact Statements. In this inflow scenario, the existing historical record of natural flows was used to create a number of different future hydrologic sequences using a resampling technique known as the Index Sequential Method (ISM). The ISM provides the basis for quantification of the uncertainty and an assessment of the risk with respect to future inflows and is based upon the best available measured data."[15]

American Rivers is concerned that this methodology does not appear to consider the impacts of climate change on inflow. Based on our review, the DEA does not address the effects of climate change on the hydrology of the Colorado River and tributaries at all. This is inconsistent with NEPA's directive to describe the affected environment, and the cumulative effects of a proposed action in light of other reasonably foreseeable changes to the affected environment.[16] It is inconsistent with scientific data showing that:

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14 FERC, "Scoping Document 2 for the Lake Powell Pipeline Project," eLibrary no. 20080821-3005 (Aug. 21, 2008), p. 27 (emphasis in original).

15 DEA, p. 14.

16 40 C.F.R. §§1502.15, 1502.16. "The current and projected future state of the environment within the proposed action (i.e., the no action alternative) represents the reasonably foreseeable affected environment, and this should be described based on authoritative climate change reports...." Council on Environmental Quality, "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews" (Aug. 1, 2016) (CEQ Climate Change Guidance), pp. 20-21 (subsequently withdrawn for further consideration pursuant to Executive Order 13783, "Promoting Energy Independence and Economic Growth" (Mar. 28, 2017)).

> "Climate change can make a resource, ecosystem, human community, or structure more susceptible to many types of impacts and lessen its resilience to other environmental impacts apart from climate change. This increase in vulnerability can exacerbate the effects of the proposed action."[17]

Reclamation has identified the Colorado River Basin as already being impacted by climate change, the effects of which are likely to increase and intensify in the coming years. It has described some of these impacts as follows:

- Spring and early summer runoff reductions could translate into less water supply for meeting irrigation demands and adversely impact hydropower operations at reservoirs.

- Warming could also lead to significant reservoir evaporation, increased agricultural water demands and losses during water conveyance and irrigation.

- Growing demands in the Colorado River system, coupled with the potential for reduced supplies due to climate change, may put water users and resources relying on the Colorado River at risk of prolonged water shortages in the future.[18]

Reclamation's "Colorado River Basin Water Supply and Demand Study" also found:

> "[I]n the absence of timely action, there is likely to be significant shortfalls between projected water supplies and demands in the basin in coming decades, which is likely to affect each sector (for example, agricultural, municipal, energy, and environmental) dependent on the Colorado River and its tributaries. The Basin Study also confirmed a wide range of solutions are needed to mitigate and adapt to such shortfalls."[19]

American Rivers requests that Reclamation consider the potential impacts of the proposed action and alternatives in light of the basin's increased vulnerability due to climate change.

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17 CEQ Climate Change Guidance, p. 21.

18 Reclamation Climate Change Fact Sheet: Colorado Basin, *available at* https://www.usbr.gov/climate/secure/docs/2016secure/factsheet/ColoradoRiverBasinFactSheet.pdf, p. 1.

19 *Id.* at 2.

3.3.1.4 Proposed Action (Hydrology)

In its analysis of effects on hydrology, the DEA states that the proposed action would not have significant adverse impacts:

> "The Proposed Action would have minimal impacts on hydrology, with potential effects occurring mostly in moderately dry to dry years (>70 percent exceedance). The model isolates the impacts of the GRB depletion against future depletions on the Green River. The modeling shows impacts of the GRB depletion are insignificant as compared against both the No Action and the Full Depletion scenarios."

The DEA similarly finds that, "[c]umulatively, there would not be a significant impact to hydrology based on the analysis performed in this EA."[20]

As stated above, the DEA does not adequately consider connected, cumulative, and similar actions affecting hydrology within the Colorado River Basin. It also omits climate change, even though Reclamation has found that climate change is having and will continue to have a significant effect on hydrology within the basin. Reclamation must correct these omissions from the hydrologic analysis in order to support findings regarding the proposed action's effects on hydrology.

3.3.8 Water Rights

The DEA's discussion of the proposed action's impacts on water rights focuses on how the proposed action would benefit Reclamation and Utah.[21] It also finds that,

> "Cumulatively, there would not be a significant impact to water rights based on the analysis performed in this EA. Under the No Action Alternative the State would be able to develop the water right that was assigned to them in 1996, but would not be able to rely on the exchange of water between the Yampa and FG reservoir."[22]

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20 DEA, p. 17.
21 *Id.* at 49.
22 *Id.* at 50.

The analysis does not adequately support the finding that the proposed action, when considered with other actions, would not have significant impacts to water rights. It does not reference or otherwise address Reclamation's previous objection that Central Utah Project water rights could be adversely impacted by Utah's development of its assigned water right: "[i]f all the senior undeveloped water rights in the Green River and San Juan River Basins are developed, Utah would exceed its portion of the Colorado River Compact and the Central Utah Project water rights would be adversely impacted."[23] Reclamation should revise the analysis to address the effects of the proposed action and alternatives on water rights in addition to the other connected, cumulative, and similar actions that are proposed or underway within the Colorado River Basin.

CONCLUSION

Thank you for considering these comments. We look forward to working with Reclamation on sustainable management of the Colorado River Basin going forward.

Dated: November 2, 2018

Respectfully submitted,

Matt Rice
Colorado River Basin Director
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Denver, Colorado 80202
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[23] Letter from Bruce C. Barrett to Kent L. Jones, P.E. (Dec. 17, 2009).

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ARIZONA
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Arizona Power Authority

Arizona Power Pooling Association

Irrigation and Electrical Districts Association

Navajo Tribal Utility Authority
(also New Mexico, Utah)

Salt River Project

COLORADO
Colorado Springs Utilities

Intermountain Rural Electric Association

Platte River Power Authority

Tri-State Generation & Transmission Association, Inc.
(also Nebraska, Wyoming, New Mexico)

Yampa Valley Electric Association, Inc.

NEBRASKA
Municipal Energy Agency of Nebraska
(also Colorado, Wyoming

NEVADA
Colorado River Commission of Nevada

Silver State Energy Association

NEW MEXICO
Farmington Electric Utility System

Los Alamos County

City of Truth or Consequences

UTAH
City of Provo

City of St. George

South Utah Valley Electric Service District

Utah Associated Municipal Power Systems

Utah Municipal Power Agency

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November 2, 2018

Mr. Jared Baxter
Bureau of Reclamation
302 E 1860 S
Provo, Utah 84606
Via Email at greenriverblock@usbr.gov

Subject: Comments on Green River Block Water Exchange Contract Draft Environmental Assessment

Dear Mr. Baxter:

The Colorado River Energy Distributors Association (CREDA) is very appreciative of the opportunity to review and comment on the Green River Block Water Exchange Contract Draft Environmental Assessment (DEA). CREDA represents Colorado River Storage Project (CRSP) firm electric service customers, non-profit entities who collectively serve over 4 million customers in the States of Arizona, Colorado, Nevada, New Mexico, Utah and Wyoming. As Flaming Gorge Dam is a key resource of the CRSP, CREDA and its members have a unique interest in any proposed actions related to Flaming Gorge Dam. Attached are CREDA's comments are proposed revisions to the DEA.

We reviewed the discussion in the DEA on potential impacts to water resources and how any potential impacts are within the impacts analyzed and approved in the 2006 Record of Decision on the Flaming Gorge Environmental Impact Statement (2006 ROD). In addition, as a member of the Upper Colorado River Endangered Fish Recovery Program committees, we considered how the proposed action relates to the elements and processes associated with that Program. In general, we recommend that the body of the DEA explain the proposed action's operational changes and impacts to the hydropower resource.

Once again, we appreciate opportunity to review and comment on the DEA. Please let us know if you have any questions.

Sincerely,

Leslie James

Leslie James
Executive Director

Cc: CREDA Board
John Bezdek
Steve Johnson - WAPA

CREDA Comments 11/2/18
Green River Block Draft Environmental Assessment

Pg.	*Reference*	*Comment*
3	Second paragraph, last sentence: *Reclamation's obligations for the recovery of the endangered fish in the Green River implementing ESA provisions were established in the 2006 Record of Decision (FGROD) on the 2005 Operation of Flaming Gorge Dam Final Environmental Impact Statement (FGFEIS),* is inconsistent with Reclamation's role with regard to endangered fish.	Suggest replacing this sentence with text from FG ROD, at pp. 5, 3 and 6, respectively, to clarify the role of Reclamation v. the role of the Recovery Program in regard to recovery. *The goal of the* ***Recovery Program****, therefore, is to* ***recover the listed species of the Upper Colorado River to the point of de-listing, while allowing for the continued operation*** *and development of the water resources of the Upper Colorado River Basin.* *...to* ***operate*** *Flaming Gorge Dam to* ***protect and assist in recovery*** *of the populations and designated critical habitat of the four endangered fishes, while maintaining all authorized purposes of the Flaming Gorge Unit of the Colorado River Storage Project (CRSP), including those related to the development of water resources in accordance with the Colorado River Compact* *Implementation of the Recovery Program's 2000 Flow and Temperature Recommendations, in concert with other Recovery Program actions, is intended to* ***avoid jeopardy and assist in recovery***
8	1.7.2 Describing the purpose and need of the FG ROD is not entirely consistent with the Purpose and Need statement in the ROD. *The Preferred Alternative analyzed in the FGFEIS was to operate FG Dam in concert with the 2000 Flow and Temperature Recommendations for Endangered Fishes in the Green River Downstream of Flaming Gorge Dam (Muth et al. 2000; Flow Recommendations)* ***prescribing***	In describing the Action (Preferred) Alternative, the ROD states: *Under the Action Alternative, Flaming Gorge Dam would be operated with the* ***goal of achieving the 2000 Flow and Temperature Recommendations, while maintaining and continuing all authorized purposes*** *of Flaming Gorge Dam and Reservoir.*

Pg.	*Reference*	*Comment*
	high spring flows along the Green River, mimicking pre-dam flows.	We recommend the ROD language be substituted, or in the alternative, delete the bolded language starting "prescribing…" and replace with the bolded language starting "while maintaining and continuing…"
11, 16	Table 3-1 states there are **no changes to operations**; page 16 states: *Releases from FG under the GRB depletion scenario* ***are higher than the No Action Alternative 30 percent of the time****. The GRB* ***depletion scenario is higher to maintain Reach 2 flows and compensate for higher depletion rates*** *below FG Dam.*	These statements appear inconsistent. See also last comment below regarding impacts to hydropower. If depletions are changing, would there be impacts that can be described in the DEA and considered by the Recovery Program?
13	First paragraph, last sentence should conform to text in section 1.7.2: *The FGROD directs Reclamation to operate to achieve, to the extent possible, the Flow Recommendations as described in the FGFEIS.*	Suggest replacing with ROD language included in the comments on p. 8, page 1 above.
18	First full paragraph, first full sentence, is incorrect. *The FGROD* ***requires*** *meeting a daily maximum of 18,600 cfs 50 percent of the time.*	ROD p. 3 describes the Action (Preferred) Alternative: *Under the Action Alternative, releases from Flaming Gorge Dam would be patterned so that the peak flows, durations, and base flows and temperatures, described in the 2000 Flow and Temperature Recommendations for Reaches 1, 2, and 3 of the Green River, would be* ***achieved to the extent possible***
25+	3.3.4 Fish and Wildlife Resources/3.3.5 Threatened and Endangered Species.	Recommend that information regarding the HBC Species Status Assessment and upcoming proposed status change be included in the EA.
		We question the inclusion / analysis of species that are not within the project area (as noted in Table 3-2). If a species is not within the Project Area, why would Reclamation need to make an impact assessment? Same question regarding species that are only *proposed* as threatened or endangered.
47	3.3.7.2. Socioeconomics Evaluation excludes hydropower from impact assessment. *The areas*	Our concerns are threefold: A) failure to evaluate hydropower impacts, which are

Pg.	*Reference*	*Comment*
	studied for potential effect were the potential changes in costs of agricultural production due to flooding on irrigated acreage, differences in recreational expenditures based on changes in reservoir water levels and river flows, and the changes to the costs of electricity due to changes in ***timing and production of hydropower with the fluctuation and releases from FG Dam****. Due to the* ***minor changes*** *in agricultural production and* ***hydropower****,* ***these topics were deemed insignificant*** *and were dropped from the study, leaving recreation as the only variable for further analysis.*	also dependent not just on **fluctuation and releases,** but also **volumes**. In fact, the FG ROD acknowledged that *In particular, the hydrology analysis shows that the* ***greatest potential for negative effects*** *to several resources, including land use, recreation, mosquito control, and* ***power generation*** *are associated with one particular flow recommendation, specifically a spring peak release of at least 18,600 cubic feet per second (cfs).* As an authorized purpose of the CRSP, hydropower impacts should be included in the DEA. B) The FG ROD requires, among other things, that *In coordination with the Recovery Program, a technical working group, consisting of biologists and hydrologists from Reclamation,* ***Western*** *and FWS,* ***will annually propose an initial flow regime*** *to the existing Flaming Gorge Working Group.* ***This process will concurrently fulfill informal consultation and coordination requirements of ESA for the action agencies.*** This commitment could be restated or referenced in the DEA. C) How was a determination that impacts were "minor" and "insignificant"? Please include in the DEA information that describes the specific monthly volume/releases associated with the proposed action. The last FG hydropower analysis for environmental documentation purposes was nearly 15 years ago; please consider requesting WAPA's assessment of impacts to the hydropower resource and SLCA/IP contract obligations.

Appendix D Responses to Comments

Comment Number	Commentor(s)	Corresponding Entity(ies)	Page	Comment (or Summary of Comment)	Response
1	Dave Speas	USBR	12	Replace "these species" with "The species listed in the IPaC report..."	Change made.
2	Dave Speas	USBR	14	Sec. 2.3 says just "tributary flows". Is the state exchanging depletions from only high spring peak flows from tributaries, or all depletions from tributaries, regardless of timing?	Change made to be consistent throughout document.
3	Dave Speas	USBR	15	Is it "Contract" or "Compact" Entitlement Water right?	Language in Section 2.3 has been updated to clarify the difference between Compact Entitlement Water and the Green River Block portion of the assigned water rights. The state is entitled to divert Green River direct flows because of the terms of the Colorado River Compact. The amount of this Compact Entitlement water the State may deplete on an annual basis for the Green River Block water users is in part regulated by the Green River Block portion of the assigned water right.
4	Dave Speas	USBR	19	This is also referred to as the "reasonable and foreseeable alternative", which makes a total of three ways that this doc refers to this type of hydrologic simulation. This gets a little hard to follow after a while, suggest picking one of them to preserve readability. Whichever is used, I would suggest eliminating use of "alternative" which is also easily confused with the Proposed Action (preferred alternative). "Cumulative effects scenario" also is also a little problematic because it can get confused with the "cumulative effects analysis" as a NEPA term. Suggest "full depletion scenario" as it actually refers to a type of hydrologic simulation, not an alternative or the NEPA definition of cumulative effects. The "full depletion scenario" is (correctly) what appears in the cumulative effects section but as such, it's the results of a simulation, not an action alternative.	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
5	Dave Speas	USBR	20	This is an important section because it explains how the resource impacts are analyzed in relation to the No Action Alternative. There is really only one "alternative" being analyzed, that is the "preferred alternative" or the Proposed Action. It appears that the GRB scenario (not alternative) is used to look at the Proposed Action per se in relation to the No Action, and the full depletion scenario is used to evaluate Cumulative Effects. This distinction must be made much more clearly since there are two simulations or scenarios (NOT alternatives) used to evaluate the Proposed Action. Also numbering is off, this should be 3.3.1.2.2.2 (I think?)	See Technical Appendix for further discussion and description of scenarios and alternatives analyzed. Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
6	Dave Speas	USBR	23	Sentence is very hard to follow. Suggest "The GRB depletion scenario maintains slightly lower releases as compared against the No Action but converges with the No Action scenario beyond the 45th percentile during October-December"	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
7	Dave Speas	USBR	21	It appears that the relevant portions of Appendix A have been parsed and moved to the corresponding Proposed Action and Cumulative Effects section of the EA. I would urge the preparers to make sure all relevant details in Appendix A make it into the main body of the EA so that the original context is preserved.	See Technical Appendix for further discussion and description of scenarios and alternatives analyzed. Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
8	Dave Speas	USBR	23	This section contains a lot of repeats from 3.3.1.4 and I think that is so because the GRB scenario and the full depletion scenario are both simulations of the same Proposed Action. Suggest restricting section 3.3.1.4 (Proposed Action) to the GRB-only scenario and using 3.3.1.5 to cover the full depletion (AKA cumulative effects) scenario.	See Technical Appendix for further discussion and description of scenarios and alternatives analyzed. Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
9	Dave Speas	USBR	23	"These impacts are seen throughout the graphical results..." It would be a much easier document to read and understand if the figures in Heather Patno's report (in appendix) were brought forward into the main text of the EA so the descriptions could be better illustrated.	See Technical Appendix for further discussion and description of scenarios and alternatives analyzed. Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
10	Dave Speas	USBR	42	This is not a true statement as Green River Colorado pikeminnow have been in severe decline since at least 2008. See Betgen et al. 2018 http://www.coloradoriverrecovery.org/documents-publications/technical-reports/rsch/Bestgen-pikeminnowAbd2011-2013March2018.pdf	Capture probabilities were extremely low and the results contained high variance. We simply cannot make an informed inference on population dynamics based on the limited data collected. An alternative to a low existing population could just be a result of the field crew's inability to catch them (perhaps indicated by the low recapture rate).
11	Dave Speas	USBR	42	Suggest deleting, repeat of previous paragraph	Section 3.3.5.3 - Colorado Pikeminnow Fixed
12	Dave Speas	USBR	45	Stewart Lake is referred to as a floodplain wetland; backwaters are usually refer to in-channel features.	Section 3.3.5.3 - Razorback Sucker Fixed
13	Dave Speas	USBR	45	Large-bodied predators are excluded by way of a screen, not the headgates. The gates get closed to regulate water level, usually to keep water and larvae from flowing out again. They open it periodically if there are short-term (hours) bumps in discharge, to entrain more fish	Section 3.3.5.3 - Razorback Sucker Fixed
14	Dave Speas	USBR	45	PIT tags (acronym)	Section 3.3.5.3 - Razorback Sucker Fixed
15	Dave Speas	USBR	45	Citation should probably be 2012 if it's the 5 year review from 2012?	Section 3.3.5.3 - Razorback Sucker The downlisting criteria provided in the 2002c publication is what was cited. We have also included the 2012 review document citation as well.
16	Dave Speas	USBR	45	Perhaps some spawning takes place in these areas, but most spawning occurs on cobble bars in the main channel. Suggest deleting as the next sentence is better.	Section 3.3.5.3 - Razorback Sucker Fixed. Additional citation included to provide clarity
17	Dave Speas	USBR	46	Under what hydrologic conditions would this happen?	Section 3.3.5.3 - Razorback Sucker Fixed
18	Dave Speas	USBR	47	But the elevated flows are there for the purposes of depletion, so it could be a wash. If the flows were protected, then certainly it would be beneficial, but they probably won't be because that's the purpose of the EA. Is there a brief way to resolve this?	Section 3.3.5.43 - Bonytail Unfortunately, we do not know the details of how the state would exercise their water right. The models we referenced predict flows at the Jensen gauge, with depletion assumptions incorporated into the model for upstream of Jensen. Therefore, some additional flow is predicted to at least make it that far downstream.

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19	Dave Speas	USBR	47	Greatest potential impact to flows, as opposed to fish I would assume? (fish would be most vulnerable during the spring peak and summer base flows).	That would be the greatest divergence from the No Action Alternative based on the amount of flow. Spring peak flows would not change and summer flows would potentially increase, especially during the driest years, providing a benefit to the fish.
20	Dave Speas	USBR	83	This statement as written could lead some to believe that the full depletion scenario is a "significant" departure from no action. It might be worthwhile to add "...however the projected range of reservoir elevations is still within that analyzed in the FEIS" to the end of the sentence (this appears a few sentences prior on page 8, but the connection to the "significantly greater" impact statement (left) is not specific).	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
21	Dave Speas	USBR	88	"increased optics" = "increased detail"?	See Technical Appendix for further discussion and description of scenarios and alternatives analyzed.
22	Nick Schou	Utah Rivers Concil		The EA ignores agency-documented risks from expected water supply shortage declarations and contains major inconsistencies between available water supplies in the Colorado River Basin and the water rights that Utah Division of Water Resources ('DWRe') holds on paper for the Lake Powell Pipeline and for the Green River Block.	The 2012 Basin Study report analysis specifically detailed the overall Colorado River Basin. This EA provides a specific and detailed look at the impacts of signing a water exchange contract with the State of Utah, as required under NEPA, and purusant to water rights held by the State of Utah under the 1922 Compact.
23	Nick Schou	Utah Rivers Concil		The stated purpose and need for the proposed Green River Block exchange contract is flawed.	In the last 20 years over 13kAF of the GRB WR has been developed. It is not unreasonable that the State could develop a significant portion of the remaining GRB WR water in the next 40 years. This contract will support the development of GRB water whenever it occurs and allow this water development to occur over time and according to the provisions of the 1996 assignment.
24	Nick Schou	Utah Rivers Concil		The EA represents segmentation of NEPA and therefore violates federal law.	The proposed GRB exchange contract is separate from the LPP contract in geography (Green River vs Lake Powell), timing (the LPP project has been in the works for years, this EA has not), development (LPP water would most likely be M&I, GRB water could be ag, M&I,etc.). Therefore there is no segmentation under NEPA. The GRB contract and LPP contract are separate and distinct, associated with extremely different and unrelated projects.
25	Nick Schou	Utah Rivers Concil		The exchange contract would result in a total of 158,890 acre-foot depletion of the Green and Colorado River system and would have numerous connected cumulative impacts and as such requires a full Environmental Impact Statement.	The GRB contract would only result in an exchange contract for 72,641 acre-feet. "Connected impacts" is not defined under NEPA. "Cumulative impacts" is defined under NEPA and generally refers to the effects of reasonably foreseeable projects. The volume of water associated with the LPP contract was accounted for under the reasonably foreseeable depletions. Therefore, no EIS is required.
26	Nick Schou	Utah Rivers Concil		The proposed contract includes no mechanism to prevent Utah from advancing new diversions of Green River tributaries they would be required to forebear.	The publically negotiated contract states in the Recitals sections a, c, g, and h the authority by which the state of Utah and Reclamation are entering into the contract, the number of acre feet of water that this contract covers (which is within the allocation described under the 1922 and 1948 Compacts), and the ways in which we are in alignment with the FG FEIS/ROD. The state of Utah is responsible for accounting for and reporting to Reclamation the water associated with this contract up to 72,641 acre feet. Any other water that the state of Utah chooses to deplete on the Green River or any of its tributaries is up to them. Reclamation does not have any authority to enforce state water law on the state itself.

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27	Bill James	UDWR		Scope of Analysis. Because increased releases from Flaming Gorge Dam (FGD) have the potential to draw Flaming Gorge Reservoir (FGR) down to a lower operating level, the scope of analysis should be expanded to include impacts to Flaming Gorge Reservoir. The assessment states that the analysis included the following: • Flaming Gorge pool elevation on April 31st • Flaming Gorge elevation ≤ 5,980 ft • Flaming Gorge Release and Jensen Flows (January-February) • Flaming Gorge Release and Jensen Flows (March) • Flaming Gorge Release (April) • Flaming Gorge Release and Jensen Flows (July-September) • Flaming Gorge Release and Jensen Flows (October-December) • Jensen Flows (April-July) • Jensen Maximum Annual Flow (April-July) • Jensen Sustained 14-Day Duration Flows (April-July) • Jensen Flows (August-September) But the variables having to do with FGR are never mentioned. If an analysis was conducted, its conduct and results should be made clear in the assessment.	The worst case scenario of full and immediate depletion permitted under this contract, if signed and implemented, combined with all other cumulative effects, on the reservoir level, was analyzed in the 2005 FG FEIS. Our current modeling/ analysis showed that any potential resultant draw down would be within the sideboards already analyzed in the 2005 FG FEIS. Therefore we did not include the reservoir itself in our scope of Analysis. Added the following line at the end of section 1.8, "Analysis of the reservoir basin was not included because modeling results showed drawdowns within the operational flexibility permitted and analyzed in the 2005 FEIS (Table 4-29)."
28	Bill James	UDWR	9	We feel additional information is needed for proper evaluation of the No Action alternative. The last sentence states that in drought years tributary flows can be significantly reduced. Tributaries have proven to be vital for bolstering upper basin native fish recruitment (e.g., Bottcher et al. 2013; https://doi.org/10.1080/02755947.2013.785993). We would like to see specific details on which tributaries will be most affected under this scenario, because tributary impacts could influence native fish recruitment. Surely this constitutes an important factor in the Bureau of Reclamation making a decision. Water delivery enabling attainment of species recovery goals under the Endangered Species Act seemingly would still need to occur under the No Action alternative, but the document is unclear on this point. Please clarify.	The FGROD requirements to meet ESA commitments are modeled under all scenarios. Reclamation is required to meet flow targets at Jensen, Utah, as described in the FGROD and FEIS. This analysis indicates impacts to the system by entering into a water exchange contract with the State of Uah are within those analyzed in the FGEIS.
29	Bill James	UDWR	10	more information is needed on how the state would coordinate with the Recovery Program and U.S. Fish and Wildlife Service, should Reach 2 flows not be met from FGR releases. What would be done and where would this water come from?	Reclamation will not prescribe, through this EA, the manner in which the state of Utah works together with the USFWS and the RIP. Reclamation will work together with the state and the USFWS and RIP with the water related to this contract. There would not be additional releases, if said releases were not permitted under the ROD. Therefore, curttailment or other reductions may be necessary if targets cannot be met. Additionally, we met with the state, the USFWS, and the RIP and they all agreed to this prior to us putting it into the contract.
30	Bill James	UDWR	13	for a decision of this magnitude this analysis is extremely limited. Using 2018 release levels is a poor choice for a baseline because it was an exceptionally dry year, with drier hydrology. Also, using a single unrepresentative year to base this analysis on is much too simplistic and not revealing of the actual, typical hydrology. A much more comprehensive analysis should occur in which releases from a variety of years representing a broad spectrum of hydrologic conditions (dry-wet hydrologies) is included. We need to see representative sampling of observed flows, spread over more than one year. Furthermore, it is unclear how this model accounts for future climate change and lack of inflow given that a clear indication from a variety of climate models indicates that more precipitation will come in the form of rain, and not snowpack equivalent.	See Technical Appendix for further discussion and description of scenarios and alternatives analyzed. The hydrologic analysis included 110 years of historic hydrology. A drought response section has been added to the Technical Appendix to further address concerns regarding potential impacts from future drought scenarios.
31	Bill James	UDWR	14	if the diversion is immediately below FGD, how would the Reach 2 flows continue to be met? Because more water would be released from the dam during the irrigation season? If this is the case, the impacts to recreation on the Green River below the dam and in the reservoir were not adequately analyzed. Utah Division of Wildlife Resources (UDWR) just completed a creel survey on the Green River, A and B sections, and it shows usage and how dependent customer satisfaction is on flows. This creel survey data should be incorporated into the analysis, and is readily available from our Aquatics staff in the Vernal office.	The 2006 FGROD states "The intent of the Action Alternative is first to meet the 2000 Flow and Temperature Recommendations for Reach 2 by timing releases to supplement the larger Yampa River spring peak flows and then, if necessary, make adjustments to releases so that the 2000 Flow and Temperature Recommendations for Reach 1 could also be met. The Flaming Gorge Model assumes that the 2000 Flow and Temperature objectives in Reach 3 are met whenever the flow objectives are met in Reach 2." Under the Proposed Action in this EA, Flaming George Dam would continue to operate within the sideboards of the 2006 FGROD.
32	Bill James	UDWR	15	Is the maximum 6-ft storage drop of the reservoir a new operating level? If annually there is anticipated to be higher releases during the irrigation season, how is the maximum drop only 6 ft? How can the No Action and GRB scenarios be similar unless base flow releases are significantly decreased to accommodate the increased releases during irrigation? Please be more specific. Decreased releases at certain times of year could be beneficial to the Flaming Gorge kokanee fishery, yet detrimental to angling on the Green River. It is difficult to provide valuable comments when the specific action is not clearly described in the assessment.	See Technical Appendix for further discussion and description of scenarios and alternatives analyzed. The 6 ft decrease in reservoir elevation occurs annually and is within the normal operating range and within the parameters established in the FGEIS.

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33	Bill James	UDWR	16	It looks like part of the way the Bureau will meet the additional irrigation demands is to reduce the frequency of bypass flows? If this is the case, how can Larval Trigger Study Plan (LTSP) needs still be met? Also, UDWR would like to see spring flushing flows in more than 4% of years, although we clearly do not need them every year. Flushing flows move sediments and dislodge algae, increasing surfaces for bugs to adhere to and increasing overall productivity of the river. The sport fishery has responded very positively to the high flow releases we have received since 2011, in stark contrast to the sport fishery before 2011 during the decade between flushing flows. Does the Bureau's estimate of flows staying above 18,600 cfs at Jensen for 14 days or more in 25% of years rely heavily on Yampa River flows? Please specify, as contributions from the Yampa River appear to be overstated and should also be modeled in a comprehensive manner to account for future declines from predicted climate change.	Bypass releases are unaffected from implementing the exchange agreement. See Technical Appendix for further discussion and description of scenarios and alternatives analyzed.
34	Bill James	UDWR		Under Recreation 3.3.2, page 19, it states the analysis used data from the 2005 FGFEIS. There was no reference to when those data were originally collected, but obviously they were at least 13 years old. If the original data was from the 1991 U.S. Forest Service Use Capacity Survey, that would be of clear concern based on human population growth in Utah since that time. UDWR spent all spring and summer on the ramps at Little Hole and Indian Crossing for a creel survey and we observed how busy the tailrace has become. For example, just in our creel data from this year, the average number of users in A Section was 640 people (2 weekend days and 2 week days). In the 1991 Use Capacity Survey, it stated 474 people was the average for July. The Forest Service count data may even exceed ours. We also wonder about the comparison "visitation at the reservoir far surpasses that of the river" and "the river only contributes 11% of the total visitation to the NRA". Once again, where did these numbers come from? The only place we know that visitor counts occur is the river. On page 20, there is no reference to the fishing pier/visitor dock at Dam Point, which is a big concern with lower reservoir levels. It would have to be moved or re-engineered. In the big picture, these infrastructures and how they are adjusted might not be a huge issue, but the information in the document should be as accurate as possible.	Date of data collection was 2001 which has been added in Section 3.3.2 of the EA and the study has been included in Chapter 6 References. Fishing Pier/Visitor Dock at Dam Point was added in Section 3.3.2 of the EA. According to email communication with the Vernal UDWR Aquatics Staff on 3 DEC 2018, the 2018 creel data for the Green River is still in the process of being analysed and is not yet ready for distribution. The data will be available sometime before the 2019 field season. A request for the most up-to-date Green River visitation/permit data was submitted to the Dinosaur National Monument River Office on 3 DEC 2018. The River Office responded that they would try to get us the numbers but some of the data had been lost with the new conversion of recreation.gov. No data had been received by 3 Jan 2019. Therefore, the data used in the draft EA was the best available data.
35	Bill James	UDWR		there is discussion in regard to the impacts to riparian habitat below the dam, but was there an analysis of lower reservoir elevations and the impacts of non-native vegetation along the reservoir shoreline? It's likely that lower reservoir elevations would create an opportunity for pioneer species like tamarisk and Russian olive to flourish, creating massive non-native forests similar to those observed at lower basin reservoirs or even the Open Hills of FGR. This would be a huge seed source to deal with and could also have impacts to shoreline angler access, specifically north of the Boar's Tusk. For the river portion, the document mentions seed dispersal but not need for inundation to get cottonwood germination in the river reaches. Please discuss how many years we might expect to see cottonwood germination and establishment between the current situation and the Proposed Alternative.	Potential effects to reservoir shoreline vegetation were adequately addressed in the *Operation of Flaming Gorge Dam Final Environmental Impact Statement* (September 2005), which is the parent document to the current draft Environmental Assessment. This treatment is found in sections 3.7.1.3 and 4.7.1.3 of that document. A comprehensive treatment of potential vegetation changes over time and how these changes might affect the river are addressed in the revised draft EA, section 3.3.3. Regarding the specific recruitment and establishment period for cottonwoods, it is addressed in general terms for the Proposed Alternative in the revised draft EA section. But more specifically, cottonwoods are not expected to recruit and establish at a rate any different than current conditions are the expected seasonal stream flows may not substantially change from current operations.
36	Bill James	UDWR	22	The assumption that rafting activities will likely not vary substantially given this scenario is likely faulty, especially since it appears the Bureau is using outdated use information/numbers for this analysis.	Under the Proposed Action, Flaming George Dam would continue to operate within the sideboards of the 2006 FGROD and recreation activities within the study area would continue according to historical practice. A request for the most up-to-date Green River visitation/permit data was submitted to the Dinosaur National Monument River Office on 3 DEC 2018. The River Office responded that they would try to get us the numbers but some of the data had been lost with the new conversion of recreation.gov. No data had been received by the deadline of 7 DEC 2018 to have all draft EA comments responded to. Therefore, the data used in the draft EA was the best available data.
37	Bill James	UDWR	25	Under Fish and Wildlife Resources, page 25, would the Proposed Alternative increase or decrease fall/winter drawdown on the reservoir? Also, please discuss wetted width of the river as it relates to spawning habitat for rainbow trout in the spring and brown trout in the fall. With lower base flows, brown trout spawning and nursery habitat may be reduced. Brown trout are certainly one of the most important sportfish species in the river.	We are not analyzing any effects within the reservoir for this EA. Trout, although non-native and considered detrimental to the native fish community in the Green River, are an important sport fish. Additional analysis has been provided.
38	Bill James	UDWR	33	fisheries managers generally no longer call these bonytail chub, preferring simply "bonytail."	Section 3.3.4.1 Fish Species Fixed to maintain consistency throughout rest of document. Both instances can be found throughout recent FWS and peer-reviewed literature.
39	Bill James	UDWR	36	the dependence of native fish on hydrologic cycles is poorly represented and needs to be expanded greatly (e.g., Bestgen and Hill 2016).	Thank you for your comment.

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40	Bill James	UDWR	36	the first sentence is incorrect using an outdated reference. Pikeminnow population status has changed significantly. See Bestgen, K.R., C.D. Walford, G.C. White, J.A. Hawkins, M.T. Jones, P.A. Webber, M. Breen, J.A. Skorupski Jr., J. Howard, K. Creighton, J. Logan, K. Battige, and F.B. Wright. 2018. Population Status and Trends of Colorado pikeminnow in the Green River Sub-Basin, Utah and Colorado, 2000-2013. Final Report of the Larval Fish Laboratory, Colorado State University to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.	References have been updated to the best of our ability. Data is certainly lacking and the author's willingness to acknowledge the immense uncertainty in this report's data does not bolster our estimates of pikeminnow populations. Below are a few excerpts highlighting why this data is suspect. "Abundance estimates for the middle Green River reach had moderate to low precision, with CV's ranging from 21 (2011) to 38% (2013). The high 2013 estimate had particularly low precision and was based on capture of only 44 adult Colorado pikeminnow. The relatively high CV's for all years were due to the relatively low numbers of captured and recaptured fish." "Estimates of Colorado pikeminnow recruit abundance in the lower Green River reach were relatively high and variable over 2011–2013 as well as for the entire study period. Estimates of Colorado pikeminnow recruit abundance in the lower Green River were imprecise and especially so in 2013. Lower Green River sampling in 2013 was hindered by electrofishing equipment issues so abundance estimates for Colorado pikeminnow of any size in that reach and year are suspect and should be treated cautiously, as should estimates from other reaches that are discussed later." "It is important to note that nearly 50% of the 2013 abundance estimate for adult Colorado pikeminnow in the Green River sub-basin is from the unreliable middle Green River reach estimate; recall that estimate was based on capture of only 44 individual Colorado pikeminnow. The middle Green River reach estimate, which when coupled with the unreliable lower Green River estimate in 2013, makes the entire sub-basin estimate questionable." "As was apparent from estimation and model selection, probabilities of capture were relatively low, imprecise, and varied widely among sampling occasions, reaches, and years" Section 3.3.5.3 – Colorado Pikeminnow
41	Bill James	UDWR	37	this section needs to be updated with information from the recent PVA analysis conducted by the Recovery Program	Updated to include the most recent research Section 3.3.5.3 – Humpback Chub
42	Bill James	UDWR	39	the LTSP benefits numerous wetlands, not just Stewart Lake as mentioned: "Flows are increased to allow larvae to be entrained in Stewart Lake, a backwater near Jensen, Utah." Stewart Lake is not a backwater, more a wetland wildlife management area. Also wetland operations are misrepresented for the remainder of this paragraph and several incorrect numbers are reported. A more comprehensive discussion on how FG flows are linked to wetlands and how those operations unfold is needed. See Speas, D., M. Breen, T. Jones, and B. Schelly. 2017. Wetlands White Paper: Updated floodplain wetland priorities for recovery of endangered fish in the Middle Green River. to accurately portray the details as well as Schelly et al. 2016 (referenced incorrectly here; see http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2016/hab/FR-165.pdf) to accurately report findings.	Amended Section 3.3.5.3 – Razorback Sucker
43	Bill James	UDWR	40	more is known about bonytail than reflected here, see (Bestgen, K.R., R.C. Schelly, R.R. Staffeldt, M.J. Breen, D.E. Snyder & M.T. Jones. 2017. First Reproduction by Stocked Bonytail in the Upper Colorado River Basin. North American Journal of Fisheries Management, 37:2, 445-455, DOI: 10.1080/02755947.2017.1280571.). The last paragraph of this bonytail section makes several presumptions (e.g., "probably") without any actual references; riverine and reservoir habitats are not comparable as suggested.	Information has been amended and citations have been provided. Much like comparing reservoir habitat to riverine habitat is problematic, so is comparing stocked hatchery fish behavior to wild fish behavior. However, we must use the best available information readily obtainable. Section 3.3.5.3 – Bonytail
44	Bill James	UDWR	40	Although only ~100 cfs in estimated losses under the proposed action it cannot be said that this will have no effect on these fish species: any loss of water will have an impact as their life cycles highly depend on annual hydrology for numerous reasons discussed in the previous pages. The same goes for nonnative fish interactions; several species would benefit from even minor losses (e.g., Bestgen and Hill 2016).	There would be "no effect" to the riverine system based on the limited scale and timing of the estimated losses (winter) and gains (summer). Operation would continue consistent with the FGROD and a minimum of 800 cfs would be provided to the fish. Releases from FG Dam would maintain Reach 1 and 2 flow targets.

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45	Bill James	UDWR	41	"Any increased flows proposed during August - September would result in a positive effect on endangered fishes as greater flows and river fluctuations are conditions that these riverine fishes are well adapted to." This statement is taken completely out of context. Re-read Bestgen and Hill 2016 to better understand that there is a careful balance and specific flow ranges are necessary to benefit native fishes and disadvantage nonnative fishes.	Our comment was pertaining to the endangered fishes. The citation provided primarily addresses the Colorado Pikeminnow and we have provided some excerpts below that support the analysis contained within the EA based on the hydrologic modelling. "... a clear signal was that higher summer base flows in the drier years in the Green River may favor survival of larger numbers of age-0 Colorado pikeminnow" (Bestgen and Hill 2016). "For example, in the middle Green River, abundance of age-0 Colorado pikeminnow was above average in 63% of years when mean August-September base flow levels were 48-85 m3/sec (1,700-3,000ft3/sec)" (Bestgen and Hill 2016). The largest potential difference in August-September flows would occur during the drier years and could provide additional and beneficial flows for the endangered fishes.
46	Bill James	UDWR	45	prefer simply "bonytail."	Noted
47	Bill James	UDWR	45	Flannelmouth sucker, bluehead sucker and roundtail chub are poorly represented in detail here, and the detail is warranted given the State of Utah manages these species under a conservation agreement to preclude the need for federal listing. See the 2006 Range-wide conservation agreement and strategy for roundtail chub, bluehead sucker, and flannelmouth sucker for more details on these species and the 2016 Utah statewide monitoring summary for up-to-date population status.	Although the background for these fish is not provided to the same extent as the endangered fish, there is no reason to believe the proposed action would have an impact on the conservation agreement species based on similar biological requirements.
48	Bill James	UDWR	47	the last sentence states "it is highly unlikely the proposed action would have any real effect on the socioeconomic situation in the area". It would be nice to see the information and analysis which led to such a conclusion. Based on what we have heard over the years, and captured in our creel/angler survey this year, it appears visitors are very sensitive to flows. Visitation is highly related to social and economic changes. We feel justified in disagreeing with these conclusions, as the Bureau has made them without supplying any basis or reasoning.	The analysis can be found in the 2005 Flaming Gorge Final Environmental Impact Statement Appendix 8 Socioeconomics Technical Analysis which can be located at https://www.usbr.gov/uc/envdocs/eis/fgFEIS/index.html. The EA has been revised to include "Appendix 8" in Section 3.3.7.2.
49	Bill James	UDWR		There appears to be no mention of impacts to power generation. This seems a significant oversight. Surely increasing water releases in the summer will decrease water releases in the winter when the Western Area Power Administration wants to double peak releases?	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
50	Jen Callantine	None Provided	19	The recreation analysis was conducted in 2005 to address impacts at Flaming Gorge Reservoir and downstream of the dam along the Green River. Our first concern here is the time frame and the growth that has occured with river use since 2005. The volume of river user groups has grown significantly since 2005 and particularly in the last 3 years. I feel that a more current and up to date analysis should be used to better reflect today's recreation numbers for the reservoir and the river corridor. Our second concern with this section of the proposal is rafting in Dinosaur National Monument. In the proposal it states "If flow conditions deteriorated on the Green River to the point of adversely impacting rafting activity, there exists the possibility of shifting activity to the Yampa River." There is not truly a possibility of switching activity to the Yampa River. In theory that is true but due to demand of the both the Green River Gates of Lodore and the Yampa River switching permits would be near impossible. The other issue is the Yampa River flows are dictated by snow melt run off. Last summer 2018 the Yampa River was not raft able most of the summer season due to lack of water. With the increase of recreational river use the odds of even obtaining a Dinosaur National Monument permit let alone switching from the Green River to the Yampa River are one in 9000. In 2005 Dinosaur National Monument maybe had 1500 applicants apply for the river lottery. Now it's 9000. Once again I feel that the information and analysis utilized for the recreation portion of this plan is antiquated and out of date in comparison to the dramatic growth that has been seen in recreation along the Green River below Flaming Gorge Dam.	Under the Proposed Action, Flaming George Dam would continue to operate within the sideboards of the 2006 FGROD and recreation activities within the study area would continue according to historical practice. A request for the most up-to-date Green River visitation/permit data was submitted to the Dinosaur National Monument River Office on 3 DEC 2018. The River Office responded that they would try to get us the numbers but some of the data had been lost with the new conversion of recreation.gov. No data had been received by 7 DEC 2018. Therefore, the data used in the draft EA was the best available data.
51	Jen Callantine	None Provided	5	I understand the State of Utah is requesting the use of its assigned water right a total of 158,890 AF of depletion. Our concerns are one that it does not describe what the development along the Green River will be and why this water is needed for that development. Our second concern is for the Lake Powell Pipeline. To begin this water should stay in the Upper Basin for drought contingency, Flaming Gorge Reservoir has proven to be a substantial water storage facility in comparison to the lower basin storage reservoirs such as Lake Powell which has an extremely high rate of evaporation. The other issue is this water would be diverted to a region of Utah notorious for the highest levels of water waste in the United States. If Kane and Washington Counties were to implement and use wise water use practices yet still needed additional water sources then at that time it maybe viable to revisit the option of depleting water from Flaming Gorge Dam to Lake Powell for their use. At this time those counties need to address their misuse of the resources available to them and mitigate the water that is currently wasted.	This EA only deals with the GRB portion of the assigned water right. The GRB water development will occur over time and will be located entirely within the Upper Basin (more specifically within the Green River between Flaming Gorge and Lake Powell) and will not result in more evaporation from Lake Powell. The GRB will be developed overtime and this EA looks at the maximum potential impacts of this water development by assuming full allowable depletions will occur immediately at a point high in the river system where it would have the greatest impact instream flows. The modelling showed that FG ROD operations and Green River target flows could be maintained under this worse case scenario. Water use in Washington and Kane Counties is outside the area where the GRB will be developed and outside the scope of this EA.

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52	Tyler Callantine	Dinosaur River Expeditions	19	The recreation analysis was conducted in 2005 to address impacts at Flaming Gorge Reservoir and downstream of the dam along the Green River. Our first concern here is the time frame and the growth that has occured with river use since 2005. The volume of river user groups has grown significantly since 2005 and particularly in the last 3 years. I feel that a more current and up to date analysis should be used to better reflect today's recreation numbers for the reservoir and the river corridor. Our second concern with this section of the proposal is rafting in Dinosaur National Monument. In the proposal it states "If flow conditions deteriorated on the Green River to the point of adversely impacting rafting activity, there exists the possibility of shifting activity to the Yampa River." There is not truly a possibility of switching activity to the Yampa River. In theory that is true but due to demand of the both the Green River Gates of Lodore and the Yampa River switching permits would be near impossible. The other issue is the Yampa River flows are dictated by snow melt run off. Last summer 2018 the Yampa River was not raft able most of the summer season due to lack of water. With the increase of recreational river use the odds of even obtaining a Dinosaur National Monument permit let alone switching from the Green River to the Yampa River are one in 9000. In 2005 Dinosaur National Monument maybe had 1500 applicants apply for the river lottery. Now it's 9000. Once again I feel that the information and analysis utilized for the recreation portion of this plan is antiquated and out of date in comparison to the dramatic growth that has been seen in recreation along the Green River below Flaming Gorge Dam.	Under the Proposed Action, Flaming Gorge Dam would continue to operate within the sideboards of the 2006 FGROD and recreation activities within the study area would continue according to historical practice. A request for the most up-to-date Green River visitation/permit data was submitted to the Dinosaur National Monument River Office on 3 DEC 2018. The River Office responded that they would try to get us the numbers but some of the data had been lost with the new conversion of recreation.gov. No data had been received by 7 DEC 2018. Therefore, the data used in the draft EA was the best available data.
53	Tyler Callantine	Dinosaur River Expeditions	5	I understand the State of Utah is requesting the use of its assigned water right a total of 158,890 AF of depletion. Our concerns are one that it does not describe what the development along the Green River will be and why this water is needed for that development. Our second concern is for the Lake Powell Pipeline. To begin this water should stay in the Upper Basin for drought contingency, Flaming Gorge Reservoir has proven to be a substantial water storage facility in comparison to the lower basin storage reservoirs such as Lake Powell which has an extremely high rate of evaporation. The other issue is this water would be diverted to a region of Utah notorious for the highest levels of water waste in the United States. If Kane and Washington Counties were to implement and use wise water use practices yet still needed additional water sources then at that time it maybe viable to revisit the option of depleting water from Flaming Gorge Dam to Lake Powell for their use. At this time those counties need to address their misuse of the resources available to them and mitigate the water that is currently wasted.	This EA only deals with the GRB portion of the assigned water right. The GRB water development will occur over time and will be located entirely within the Upper Basin (more specifically within the Green River between Flaming Gorge and Lake Powell) and will not result in more evaporation from Lake Powell. The GRB will be developed overtime and this EA looks at the maximum potential impacts of this water development by assuming full allowable depletions will occur immediately at a point high in the river system where it would have the greatest impact instream flows. The modelling showed that FG ROD operations and Green River target flows could be maintained under this worse case scenario. Water use in Washington and Kane Counties is outside the area where the GRB will be developed and outside the scope of this EA.
54	Taylor Hawes	The Nature Conservancy		The draft EA defines the 2018 level of depletions from the Green River and the rest of the Upper Colorado River Basin by reference to the depletion schedule adopted by the Upper Colorado River Commission (UCRC) in 2007 and holds this level of depletions steady without any increases for the no action scenario, while observed depletion levels as of 2018 were not used because the USBR Consumptive Uses and Losses (CUL) Report for 2018 was not available (Appendix A – Modeling Technical Report, pages 2-3). The UCRC schedule is expressed in 10-year intervals so that the depletion level for 2018 seems to have been interpolated between those in the UCRC schedule for 2010 and 2020. For more complete disclosure and better understanding of the flow impacts, the final EA should specify the interpolated level for 2018, by sector (e.g., municipal, agricultural), for the Green River in Utah, the rest of Utah in the Upper Basin, and the rest of the Upper Basin states. Prior to the release of the CUL Report for 2018, the final EA could tell us what a recent average of current depletions has been based on the CUL Reports through 2016 or 2017 for better context.	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
55	Taylor Hawes	The Nature Conservancy		To simplify the analysis, the GRB of depletions are modeled for the draft EA as being taken out of the Green River during an irrigation season from July to September immediately below the Flaming Gorge Dam (Appendix A, page 3), and presumably immediately above the Greendale gage. To better understand this simplifying assumption, the final EA should specify where these depletions may actually occur and whether they may actually be limited in duration to an irrigation season from July to September. This specification should be based on the water needs and plans of the expected GRB contractees.	Future depletions are unknown at this time for use in this analysis. The simplifying assumption of the depletions taken out directly below the dam is the worst case scenario and the resulting analysis would capture future depletions taken out of the system.

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56	Taylor Hawes	The Nature Conservancy		To define reasonably foreseeable future depletions that are added to 2018 depletions and the GRB of depletions for a cumulative impact analysis, in one place (Appendix A, page 2), the draft EA excludes any future depletions without state legislation, a tribal resolution or federal Indian water settlement, or a federal finding of no significant impact (FONSI) or record of decision (ROD), and holds those future depletions at 2018 levels. In another place, the draft EA says that the modeling assumes that no new depletions will occur in the Upper Colorado River Basin (Appendix A, page 19). In another place, it indicates that some reasonably foreseeable new depletions were assumed for the cumulative analysis in the State of Utah on the Green, White and Yampa tributaries and included the Utah Indian Compact and Upalco [unit of the Central Utah Project] (Appendix A, page 2). In another place, it says holding most depletions, presumably including future ones, at 2018 levels results in significantly lower depletions than the increases projected through 2060 for the 2012 Basin Study (Appendix A, pages 4, 5) and the increases projected through 2060 by the Upper Basin states (Appendix A, page 20). In another place, the draft EA refers to an Attachment B that appears to specify the demand nodes in the USBR's Colorado River Simulation System (CRSS) for all reasonably foreseeable future depletions that are held constant at 2060 levels, but this Attachment B was not attached to Appendix A and was not well explained. These disclosures of the reasonably foreseeable future depletions for the cumulative analysis in the draft EA seem to conflict and are confusing. To clear them up, the final EA should include a straightforward table with a column that identifies recognizable projects for the future depletions that are considered reasonably foreseeable in each of the Upper Basin states and that will impact flows in the Green River below Flaming Gorge Dam, with another column that associates these new depletions with the increases by sector since 2018 in the UCRC's 2007 depletion schedule, with another column that specifies the state legislation, tribal resolution or federal Indian water settlement, or federal finding of no significant impact or record of decision that makes them reasonably foreseeable, and with a last column that names the CRSS demand node used to model each of these future depletions. Such a straightforward table could look like this: Prospective Project/River Reach Estimated New Depletion by 2060 (kaf/yr)/State Project Plan or Authorization/Sector CRSS Demand Node Used for Model Runs To put such a table in spatial context, the final EA should include a schematic with the named CRSS nodes overlaid on watersheds at the HUC-8 scale.	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
57	Brian Caruso	USFWS		We suggest additional description be provided regarding how Reclamation intends to operate to meet these exchange contract commitments, beyond what's currently provided on the bottom of page 9 and top of page 10. It is not entirely clear why the modeling yields the results it does in the absence of additional description of the model operating rules.	See Technical Appendix for further discussion and description of scenarios and alternatives analyzed.
58	Brian Caruso	USFWS	10	From Page 10: "should Reach 2 target flows not be able to be met through FG operations, the State would coordinate with the Recovery Program and the USFWS." Is this language currently in proposed Contract 17-WC-40-655? If so, we have concerns that this commitment for the State to "coordinate with" the Program is weak, as it does not commit to making serious efforts to address shortfalls to endangered species flow targets. We would like to discuss with Reclamation and the State of Utah options for strengthening this commitment.	Yes, this language is in the contract. Reclamation will not prescribe, through this EA, the manner in which the state of Utah works together with the USFWS and the RIP. Reclamation will work together with the state and the USFWS and RIP with the water related to this contract. Curttailment or other reductions may be necessary if targets cannot be met. Additionally, we met with the state, the USFWS, and the RIP and they all agreed to this prior to us putting into the contract.
59	Brian Caruso	USFWS	14	On Page 14: Reclamation's modeling is based on the 1906 through 2015 hydrologic record, with no consideration of hydrologic changes or trends associated with warming temperatures. Is it realistic to assume that upper Colorado River basin hydrology in the future will look like that of the past, given recent research suggesting otherwise (e.g., USBR 2012; Udall and Overpeck 2017, McCabe et al. 2017; Xiao et al. 2018)? Reclamation may have information more specific to the Yampa and upper Green River subbasins that would help address this concern.	See Technical Appendix for further discussion and description of scenarios and alternatives analyzed. The hydrologic analysis included 110 years of historic hydrology. A drought response section has been added to the Technical Appendix to further address concerns regarding potential impacts from future drought scenarios.
60	Brian Caruso	USFWS	15	From Page 15: "Under the No Action Alternative ... there would be no effect to the current hydrology of the Green River." We suggest adding to this sentence the words "associated with the proposed contracting action." Clearly, Utah's development of their apportioned water right under the 1996 Assignment without replacement water from Flaming Gorge releases would affect the current hydrology of the Green River.	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
61	Brian Caruso	USFWS	16	From Page 16: "Jensen flows for the April-July period incorporate the unregulated nature of the Yampa River ...". We suggest changing "unregulated" to "largely unregulated", as some storage on the mainstem and tributaries (Stagecoach Reservoir, Catamount Reservoir, Elkhead Reservoir, Juniper Reservoir) does affect spring flows on the Yampa River, albeit to a much lesser extent than on other major upper Colorado Basin tributaries.	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
62	Brian Caruso	USFWS		Much of the language contained within Section 3.3.1 (Hydrology) describes changes in Flaming Gorge releases and Green River discharge in relative qualitative terms such as: "insignificant", "nearly identical", "almost identical", "slightly lower", "negligible", etc. None of these terms provide quantitative descriptions of the change that allow the reader to understand the magnitude of the change. We suggest changing these terms to actually describe the quantitative change, refer to specific figures that show the change (in Appendix A), or reference some other table that allows the user to understand what these nebulous terms mean.	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.

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63	Brian Caruso	USFWS	29 & 31	The EA states (pages 29 and 31) that "releases from FG would not deviate considerably from the current seasonal releases". Similarly, on page 20 of the hydrology appendix, it states that "releases would essentially remain the same". It is unclear how 58,957 AF of additional releases from FG to offset Green River consumptive can be considered "essentially the same as" current releases, as this equates to roughly 300 cfs of additional releases over a 100-day irrigation season. Related, the statement is made on page 11 that "no change in operations is being considered", which seems inconsistent with the EA analysis. Would it be more accurate to say "there would be no change in operations outside of the parameters set by the FGROD"?	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
64	Brian Caruso	USFWS	35	Page 35 states: "The Southwestern willow flycatcher ... for nesting ... requires dense riparian habitats (cottonwood/willow and tamarisk vegetation)." This statement implies the flycatcher requires tamarisk vegetation to nest. We suggest modifying the wording to read something like" ... requires dense riparian habitats which may include cottonwood, willow, and/or tamarisk vegetation".	Change made.
65	Brian Caruso	USFWS		We appreciate the presentation of modeling results for the Reach 2/Jcnscn gage location (including flow duration rnrves). We suggest that Reclamation also provide modeling results for Reach 3, including for the No Action, GRB, and Reasonably Foreseeable Depletion scenarios.	Reclamation's commitments outlined in the FEIS and FGROD are limited to Reaches 1 and 2. Reclamation continues to meet its commitments under the FGROD.
66	Brian Caruso	USFWS	2	The first paragraph under 'Data' cites the figure of 58,997 acre-feet of remaining water under the 72,641 af total Green River Block depletion. We believe this figure is supposed to be 58,957 af.	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
67	Brian Caruso	USFWS	6	The third paragraph on this page references "spring base flow recommendations", when we believe you mean "spring peak flow recommendations".	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
68	Brian Caruso	USFWS	8	Figure 1 would benefit by adding a line labeling the minimum drawdown elevation from the 2005 EIS (5980'). The associated discussion (page 47) also references the "minimum power pool elevation", but that elevation is never specified (is it 5873 feet?).	See Technical Appendix
69	Jane Whalen et al.	Conserve Southwest Utah et al.	5	As mentioned above, both 50-year service contracts requests for water from Flaming Gorge Reservoir should be carefully studied in the context of the Lake Powell Pipeline EIS. Utah's claim that it still has this large remaining water right of 72,641 AFY in the spring high water Green River tributaries needs to be verified, because water supplies are declining and Utah has over-allocated its water rights in this region. Utah provides no evidence in this EA to support the claim that they have this water. One possible reason why there is not much undeveloped high water in the Green River tributary flows is because it may all be going to the Central Utah Project. Furthermore, the EA does not explain how 72,641 AFY of undeveloped Green River tributary flows below Flaming Gorge Reservoir will be left in the Green River tributaries for the endangered fishes. Will water be identified and measured in these Green River tributaries before it is released from Flaming Gorge Reservoir? Additionally, Utah should disclose the source of the water supply it wants to exchange. This supply should remain physically available for the endangered fishes to assure that it stays in the system for the 50-year term of the service contract. Utah should also be required to show proof of this claim so it can be evaluated against claims of senior water right holders and the remaining water supply. A study of water supply availability in Green River tributaries needs to be included in the EIS. Moreover, months ago, CSU sent a GRAMA records request to the Utah Division of Water Resources to ask for details on where these undeveloped high water Green River tributary flows are located. We were told that the information provided by the Utah Division of Water Rights records was inconsistent with the records of the Utah Division of Water Resources. We are still waiting to obtain this information.	Reclamation has an obligation outlined in the 2006 FGROD and 2005 FEIS to meet targets at Jensen, Utah. The modeling shows that targets will continue to be met in the future within those operational constraints. Furthermore, the depletion water has been modeled coming out of the system directly below FG Dam, which is the worst case scenario. (See Technical Appendix) Section 9 of the contract requires measurement and accounting of the water by the State of Utah.

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70	Jane Whalen et al.	Conserve Southwest Utah et al.	5	CSU is concerned that this exchange will further diminish an already over-allocated Colorado River, where existing deficits have not yet been addressed. It is well-documented by the BOR that there is more water allocated in the Colorado River than the river produces annually, even without considering a warming climate. The releases from Lake Powell continue to exceed inflows. This over-allocation has drained the reservoirs faster than anyone predicted. This EA did not consider Utah's water right laws in its water use exchange concept. The Doctrine of Prior Appropriation states the fundamental principle by which water rights are managed within the western states and Utah: "first in time, first in right." This doctrine is not used in allocations in the Colorado River Compact between the states, but it is the basis for Utah's water laws. This means that those holding a water right with the earliest priority date, and who have continued to make beneficial use of the water, have the right to water from a certain source before others with water rights having later priority dates. As water supplies decline, this principle will decide whose water supply gets shut off and who can continue to access the water. The GRB's 1958 water right 41-3479 is junior to many senior water right holders and is at high risk of being shut off. BOR is ignoring this risk. As Colorado River flows diminish over time, Utah's junior priority GRB's water rights of 1958 will be subordinate to those of senior water rights holders. Utah's water laws and water rights should be made part of this EA's decision-making process, but so far, they have not been considered. All of the Ultimate Phase CUP water rights have to show proof of beneficial use by 2020. This includes the GRB's water rights. Is BOR changing all the GRB's water rights proof of beneficial use dates past 2020 by ignoring this provision and including the water in a 50-year service contract? This gives Utah's water rights a senior position above all others. Furthermore, Utah's water law concerning instream flows may also have to be updated to accommodate this exchange, so that water can be left in a stream for the fishes and not developed. Thus far, this EA includes no discussion of how Utah's water rights laws will govern the exchange of water use in this 50-year service contract. For instance, the priority date for all GRB water rights is 1958. This means that all water rights granted prior to 1958 have priority over the GRB's water rights. Also, the GRB's water rights are junior to: the Bonneville Unit of Central Utah Project, the Lower Basin states, and water for Mexico, as well as tribal water rights and other unsettled Federal Reserve Water Rights yet unresolved. All of these risks to this GRB's water rights need to be evaluated in an EIS. We were told by BOR staff that the GRB's water right's 1958 priority dates would not change, and it would remain junior to the CUP. CSU is concerned that the BOR intends to give a service contract for 50 years for 72,641 AFY without considering the risks that the GRB's water rights could be shut off. This would happen if Utah's water rights laws are followed. CSU does not understand how BOR's own goals would be met in this proposed exchange concept. It doesn't solve any of over-allocation of the Green River basin, and it is unclear whether sufficient water would remain available to protect the endangered fishes. The exchange also does not seem to appear in keeping to Utah's previous pledge to not issue water rights or do any change applications in this section of the Green River. In this 2009 proposed Green River Water Rights Policy Agreement, Utah had been tasked with providing legal protections for the endangered fish flows from Flaming Gorge Reservoir to Lake Powell under the Recovery Implementation Program Recovery Action Plan (RIPRAP).6 Also, the Department of Interior recommends that each action be consistent with the goals of BOR. CSU does not think this proposed action meets the goals of BOR to try the solve the long-term imbalance between supply and demand. It certainly meets Utah's goals—but at what expense to the environment and the public good? EA page 5. Purpose continues: "This contract is needed to resolve a long standing disagreement between Reclamation and the State regarding use of the water right assigned in 1996." CSU does not understand how this EA would solve the core issue that BOR faced in 2009: that the Green River was over-allocated. This Ultimate Phase CUP Water Right No. 41-3479 should have lapsed in 2009, as the state agreed to do. Rather than resolving the over-allocation of the Green River, this EA makes it worse. In 2009, the BOR had a different position about the Ultimate Phase CUP Water Right No. 41-3479. BOR stated in their protest letter that this water right should have lapsed due to the over-allocation of senior water rights holders in this region. 7 The GRB is a portion of this same water right. This letter reads as follows:	This exchange will not modify the water allocations of the Colorado River Compact. Utah already has the right to develop water according to the Colorado River Compacts. This exchange trades Compact Entitlement Water with Flaming Gorge releases on a one to one basis. Therefore Utah's allowable use of Colorado River water remains the same whether under Compact Entitlement Water or under the exchange contract. Utah water law allows for exchanges of water and before the GRB is developed it is anticipated that Utah Water Right applications will be filed to modify the GRB portion of the assigned water rights to reflect future water uses and this exchange contract. The State Engineer decisions on these water right applications will include provisions to protect senior water rights. As part of this Contract the State will demonstrate that it has Compact Entitlement Water that would have been allocated to the GRB portion of the assigned water rights that it can exchange with FG storage releases. The hydrology modelling for this EA show that there should be sufficient Compact Entitlement water to satisfy this exchange requirements.
71	Jane Whalen et al.	Conserve Southwest Utah et al.	6	Scoping was not done in a reasonable time period. BOR only held one scoping meeting on the EA in Vernal, Utah, and gave short notice for that meeting. Scoping is supposed to identify the issues to be addressed in the study, but the public was not given a meaningful chance to participate in a scoping process. The EA does not address the risk and uncertainty of the GRB water rights that Utah wants to exchange with BOR. CSU gave written comments to BOR on the proposed contract after the Open House in St George in December of 2017. However, this EA does not address any of the concerns expressed in our comments.	Scoping is a general process related to the gathering of information and can vary for EAs. Emails and a press release went out in mid-September with the meeting in Vernal, Utah on the 26th. A 50-day comment period was also held. Comments given on the contract are outside the scope of this EA.
72	Jane Whalen et al.	Conserve Southwest Utah et al.	8	This EA did not provide sufficient evidence or information to make a decision possible. Therefore, BOR needs to do an EIS. There is nothing in the EA that describes where the Green River seasonal high water tributary flows of 72,641 AFY are located. This EA also does not indicate where all the GBR's possible water diversions along the Green River will be, or how they might impact the endangered fishes.	Exchanged water used to meet ESA flow targets in Reaches 1 and 2 would come from tributaries of the Green River. Under this water right, by law the State is able to develop water along the Green River and its tributaries but it is not known where those depletions would occur. The EA covers those depletions with the best information available. Section 3.3.5 details effects to the endangered fish.

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73	Jane Whalen et al.	Conserve Southwest Utah et al.	9	The EA identifies two alternatives: No Action and Proposed Action (defined as the "preferred alternative"). However, the EA does not provide adequate information to show that Reclamation's preferred alternative, i.e., the Proposed Action, is appropriate or feasible. More specifically, the EA does not include any inquiry into whether Utah has the water rights necessary to implement the Proposed Action for the 50-year term of the service contract. As discussed in these comments, BOR needs to reveal how it determined that Utah has the 72,641 AFY seasonal high Green River tributary flows to exchange with BOR to protect the endangered fishes. Also, the BOR needs to disclose how it made the decision that the GRB's 1958 junior water rights, which have to show proof of beneficial use by 2020, can be given a 50-year service contract for 72,641 AFY from Flaming Gorge Reservoir. As such, there is insufficient information in the record to show that the Proposed Action is appropriate or feasible. We again request that Reclamation provide information that demonstrates Utah has the water rights necessary to implement the Proposed Action.	The GRB portion of the assigned water right is a valid water right entitled to divert Green River flows under a 1958 priority date. Utah water law allows for exchanges of water and before the GRB is developed it is anticipated that Utah Water Right applications will be filed to modify the GRB portion of the assigned water rights to reflect future water uses and this exchange contract. The State Engineer decisions on these water right applications will include provisions to protect senior water rights. As part of this Contract the State will demonstrate that it has Compact Entitlement Water that would have been allocated to the GRB portion of the assigned water rights that it can exchange with FG storage releases. The hydrology modelling for this EA show that there should be sufficient Compact Entitlement water to satisfy this exchange requirements. Additionally, current Utah Water Law allows the proof due dates of assigned water rights to extended as long as there is a future public need for this water. Because these water rights can be extended until they are perfected, it is reasonable to assume these rights will last the term of the exchange contract.
74	Jane Whalen et al.	Conserve Southwest Utah et al.	9	These statements from the EA are very confusing, because they do not explain how these direct high Green River tributary flows will be measured so an exact amount can be drawn from Flaming Gorge Reservoir. It also does not identify where the flows are that the Utah will forebear and give to the endangered fishes.	The State of Utah will annually show that there is sufficient Compact Entitlement water for the exchange contract. It is anticipated that the State and Reclamation will identify and quantify the Compact Entitlement water within the flows during the spring runnoff period for this exchange.
75	Jane Whalen et al.	Conserve Southwest Utah et al.	12	CSU questions BOR's exclusive use of CRSS, DNF models, and the Index Sequential Method (ISM) because these methods do not account for the impact of a warming climate. The models used in this EA only use the 100-year average of 15 MAFY at Lees Ferry. As mentioned above stream flows have continued to diminish. The BOR does have the option to use other available models that reflect diminishing flows, such as the Downscaled GCM projected scenarios results in the Basin Study, which use a mean annual flow of approximately 13.6 MAFY at Lees Ferry.	The modeling uses hydrologic sequences that include the 16-year drought from 2000-2015. This hydrologic sequencing provides enough variability to determine impacts to the system when stressed. Additionally, the scope of this EA is to determine the impacts of signing the exchange contract with the State of Utah; as such, any comparison made will be against a No Action baseline and the comparative impacts will be the same. The Technical Appendix has been modified to include a detailed look at hydrology under these drought scenarios.
76	Jane Whalen et al.	Conserve Southwest Utah et al.	17	The models do not consider a warming climate, which is likely to have a significant impact on the environment and the diminishing water supplies. As a result, these models do not accurately assess the cumulative effects of this action. These models do not reveal the full impact of the depletions, and they do not account for the projected diminishing future stream flows predicted by the BOR.	The modeling uses hydrologic sequences that include the 16-year drought from 2000-2015. This hydrologic sequencing provides enough variability to determine impacts to the system when stressed. Additionally, the scope of this EA is to determine the impacts of signing the exchange contract with the State of Utah; as such, any comparison made will be against a No Action baseline and the comparative impacts will be the same. The Technical Appendix has been modified to include a detailed look at hydrology under these drought scenarios.
77	Sarah Stock et al.	Living Rivers et al.		THE DRAFT EA MUST ADDRESS CHANGING HYDROLOGY DUE TO CLIMATE CHANGE IN MODELING AND IN SECTION 3.3.1.5. CUMULATIVE EFFECTS	The modeling uses hydrologic sequences that include the 16-year drought from 2000-2015. This hydrologic sequencing provides enough variability to determine impacts to the system when stressed. Additionally, the scope of this EA is to determine the impacts of signing the exchange contract with the State of Utah; as such, any comparison made will be against a No Action baseline and the comparative impacts will be the same. The Technical Appendix has been modified to include a detailed look at hydrology under these drought scenarios.
78	Sarah Stock et al.	Living Rivers et al.		NEPA REQUIRES THAT A PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT ON THE UPPER BASIN DROUGHT CONTINGENCY PLAN BE PREPARED BEFORE THE DRAFT EA ON THIS CONTRACT CAN BE COMPLETED	NEPA does not require a PEIS be completed prior to this EA. NEPA considers actions on a first-in-line basis, while considering reasonably foreseeable actions in the cumulative effects.
79	Sarah Stock et al.	Living Rivers et al.		THE LEGALITY OF THE MAJORITY OF GREEN RIVER BLOCK RIGHTS IS IN QUESTION	The GRB portion of the assigned water right is a valid unperfected water right entitled to divert Green River flows under a 1958 priority date. Utah water law allows for exchanges of water and before the GRB is developed it is anticipated that Utah Water Right applications will be filed that reflect the new water uses and exchange contract.
80	Sarah Stock et al.	Living Rivers et al.		UTAH'S OVERALLOCATION OF WATER THAT IS THE SUBJECT OF THE PROPOSED EXCHANGE	Utah is currently depleting significantly less than allowed under the Compact. All depletions under this contract will have to fall within Compact Entitlement Water for Utah.

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81	Sarah Stock et al.	Living Rivers et al.		A SYSTEM OF ACCOUNTING NEEDS TO BE DETAILED IN THE DEA THAT ENSURES UTAH LEAVES WATER IN TRIBUTARIES FOR EXCHANGED RELEASES	Reclamation has an obligation outlined in the 2006 FGROD and 2005 FEIS to meet targets at Jensen, Utah. The modeling shows that targets will continue to be met in the future within those operational constraints. Furthermore, the depletion water has been modeled coming out of the system directly below FG Dam, which is the worst case scenario. (See Technical Appendix) Section 9 of the contract requires measurement and accounting of the water by the State of Utah.
82	Sarah Stock et al.	Living Rivers et al.		FEDERAL WATER RIGHTS CLAIMS OF TRIBES SHOULD BE SETTLED AND WATER IDENTIFIED BEFORE THIS CONTRACT IS SIGNED	The Federal water right claims for the Ute and Navajo tribes within Utah are both senior to the 1958 priority date of the assigned water right. If there is insufficient water in the future for tribal water uses all water right uses junior to the Tribal uses will be curtailed to satisfy the senior water rights. This curtailment will occur to the prior appropriation doctrine and Utah water law. Consequently there is no need to postpone the enactment of the exchange contract as the Tribal interests are already protected.
83	Bart Miller	Western Resource Advocates		Although a close reading of other sections of the EA makes it clear the BOR has analyzed the proposed action's impacts on both recommended base flows and peak flows for Reaches 1 and 2 of the Green River, the description of the 2005 FGFEIS, 2006 FGROD, and 2000 Flow and Temperature Recommendations (section 1.7.2 on page 8) could be edited to include the fact these documents prescribe high peak flows and base flows for Reaches 1, 2 and 3 of the Green River, as evidenced in Table 2-1 from the FGFEIS (included in the Draft EA at "Appendix A to Appendix A"). The impacts to high peak flows and to base flows in Reach 3 should be disclosed, using the same kind of flow duration curves as were presented for Reaches 1 and 2.	The 2006 FGROD states "The intent of the Action Alternative is first to meet the 2000 Flow and Temperature Recommendations for Reach 2 by timing releases to supplement the larger Yampa River spring peak flows and then, if necessary, make adjustments to releases so that the 2000 Flow and Temperature Recommendations for Reach 1 could also be met. The Flaming Gorge Model assumes that the 2000 Flow and Temperature objectives in Reach 3 are met whenever the flow objectives are met in Reach 2." Under the Proposed Action in this EA, Flaming George Dam would continue to operate within the sideboards of the 2006 FGROD.
84	Bart Miller	Western Resource Advocates		We are encouraged the Draft EA notes the intent to maintain the flow targets in the FGFEIS and ROD. The Draft EA states the exchange contract will allow Flaming Gorge (FG) dam to be operated "within the parameters of the FGROD" (pages 5 and 9). But the Draft EA is confusing when it notes "[a]dditional releases may be necessary to meet target flows in Reach 2 as a result of depletions under the Proposed Action" (page 10) but elsewhere states the "GRB depletion maintains FGROD operations and no change in operations are made under the GRB alternative" (page 14—emphasis added). We suggest the BOR could most cleanly address the issue by clarifying a commitment to continue recent/current efforts to meet 2000 Flow and Temperature recommendations for Reaches 1, 2 and 3—as embraced in the 2005 FGFEIS and 2006 FGROD—through adjusting Flaming Gorge releases to directly offset the impacts that additional water development along the Green River would have on meeting the flow recommendations. More specifically, because the flow recommendations include a flow range inside each of several year types, to truly offset the impacts of any future GRB water development, BOR could maintain recently managed levels of base flows, rather than let flows drop significantly inside the base flow ranges; recent studies suggest that maintaining flows at the higher end of the base flow range in the summer of average and drier years benefits Colorado pikeminnow, so this distinction is important.1 For example, if a specific new water development outside of Reach 1 began to consistently divert 100 cfs during the irrigation season, BOR could offset those specific diversions through changed releases from FG to keep flows in the river whole. Because the number and volume of potential future developments have been narrowed to include a relatively small set of entities (see Table 3-2 on Draft EA page 49), monitoring and responding to any future depletions would appear to be feasible.	See Technical Appendix.
85	Bart Miller	Western Resource Advocates		We agree with TNC that the cumulative impacts analysis is very challenging to decipher, as several assumptions of future development are not made clear. We incorporate by reference their comments on the subject. Similarly to TNC, we would like to see more details explaining the modeling assumptions and rule logic for Flaming Gorge Dam releases in July (which can be a peak and baseflow month) as well as August and September (baseflow months). Without these additional details, it is difficult to understand how and when GRB exchange releases are triggered and at what flow rate.	See Technical Appendix
86	Bart Miller	Western Resource Advocates		We agree with TNC that the EA would benefit from greater specifics about exactly what are the reasonably foreseeable new depletions. Whatever is NOT on that list will, of course, trigger additional NEPA if later proposed.	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.

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87	Bart Miller	Western Resource Advocates		It does not appear that the Bureau's modeling considers the more frequent, drier natural inflows under climate change.2 To avoid under-estimating the amount and frequency of additional releases needed to maintain the current range of baseflows in the Green River, we encourage including an assessment of proposed FG operations under drier future hydrologies.	The modeling uses hydrologic sequences that include the 16-year drought from 2000-2015. This hydrologic sequencing provides enough variability to determine impacts to the system when stressed. Additionally, the scope of this EA is to determine the impacts of signing the exchange contract with the State of Utah; as such, any comparison made will be against a No Action baseline and the comparative impacts will be the same. The Technical Appendix has been modified to include a detailed look at hydrology under these drought scenarios.
88		Ute Indian Tribe		FAILURE TO ENGAGE IN GOVERNMENT-TO-GOVERNMENT CONSULTATION	Reclamation initiated Section 106 consultation on June 8, 2018. Reclamation sent notification letters of the Draft EA on September 13 to interested parties including the Ute Tribe. Representatives and members of the Tribe attended the public meeting on the 26th of September. Another meeting was scheduled and held at the request of the Tribe in Las Vegas, NV on December 13, 2019. Reclamation has not failed to engange in government-to-government consultation and welcomes continued conversations regarding all water issues in the future.
89		Ute Indian Tribe		BACKGROUND ON THE GREEN RIVER BLOCK EXCHANGE CONTRACT DRAFT ENVIRONMENTAL ASSESSMENT	Thank you for your comment.
90		Ute Indian Tribe		THE DRAFT ENVIRONMENTAL ASSESSMENT IS BASED ON INADEQUATE WATER SUPPLY AND DEMAND MODELING	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
91		Ute Indian Tribe		THE FEDERAL GOVERNMENT, ACTING THROUGH THE BUREAU OF RECLAMATION AND THE CENTRAL UTAH PROJECT COMPLETION ACT OFFICE, AS TRUSTEE OF THE TRIBE'S RESERVED WATER RIGHTS, FAILED TO CONSIDER AND ANALYZE THE ADVERSE IMPACT FROM THE EXCHANGE CONTRACT AND ENVIRONMENTAL ASSESSMENT ON THE TRIBE'S ABILITY TO STORE ITS GREEN RIVER RESERVED WATER RIGHTS IN FLAMING GORGE.	The Ute Tribe does not currently have any right to store Ute reserved water rights in Flaming Gorge Reservoir. Reclamation's hydrology analysis show no need for this storage due to the Tribes priority dates being senior to all other water rights on the Green River including Flaming Gorge storage rights.
92		Ute Indian Tribe		THE FEDERAL GOVERNMENT, ACTING THROUGH THE BUREAU OF RECLAMATION AND THE CENTRAL UTAH PROJECT COMPLETION ACT OFFICE, AS TRUSTEE OF THE TRIBE'S RESERVED WATER RIGHTS, FAILED TO CONSIDER AND ANALYZE ANY ADVERSE IMPACT ON THE TRIBE'S ABILITY TO USE ITS GREEN RIVER RESERVED WATER RIGHTS.	The Ute reserved water rights are senior to the assigned water right and FG storage as outlined in Utah law of prior appropriation. Therefore these reserved water rights have first call to the Compact Entitlement Water and the direct flows FG would normally store. Given their senior priority date, there will be no impact to the Ute water rights from the use of the assigned water rights or Flaming Gorge operations.
93		Ute Indian Tribe		THE GREEN RIVER BLOCK DRAFT ENVIRONMENTAL ASSESSMENT FAILS TO RECOGNIZE THE TRIBE'S RESERVED WATER RIGHTS, HELD IN TRUST BY THE UNITED STATES FOR THE BENEFIT OF THE TRIBE, AS A TRUST ASSET OF THE TRIBE.	The EA recognized the full future use of Ute reserved water rights in the cumulative effects analysis. This analysis showed that it was feasible to operated the exchange and still fully satisfy the reserved water rights.
94	Lisa Rutherford & Paul Van Dam	None Provided		What is troubling to us is that the effects of the depletion by these two blocks of water totaling 158,890af are being considered separately. The combined GRB and LPB 158,890af depletion makes up the majority of the 447,500af diversion assigned in 1996 by Reclamation to the Utah Board of Water Resources (Board). These are two major blocks of water. It seems they should be considered in their entirety not separately due to the cumulative impact they will have. A May 2010 document from then-Deputy Director Eric Millis to State Engineer Kent Jones (40-year Plan for Water Right No. 41-3479) makes it clear that the two blocks are a "single" block of water for planning purposes. Although two contracts can be issued for the water's use to deal with specific block issues, the two blocks should be studied as one for environmental purposes. FERC will also study the Lake Powell Block in their EIS but that does not mean that the BOR should not include the LPB in their study. The piecemeal approach that BOR is taking in this process does not serve the people of the State of Utah well. The citizens of Utah deserve a more comprehensive approach and more reliable evaluation of the water situation facing our citizens and the natural environment we are affecting.	The GRB and the LPP Block are independent of each other and are covered by separated exchange contracts. The GRB will be developed along the Green River and does not depend the the LPP project. Conversely, the LPP water development does not depend on the development of the GRB. In other words the development of the GRB along the Green River has no nexus to the LPP and can be analyzed independently.
95	Lisa Rutherford & Paul Van Dam	None Provided		We also are confused about the priority of these two blocks that resulted from the Ultimate Phase.	The asisgned water right has a 1958 priority date. The portion of this water that will be used for the GRB has the same priority date.
96	Lisa Rutherford & Paul Van Dam	None Provided		We are also concerned with the predicted reduced flows in the Colorado River system generally and obligations to the Lower Basin. How can the State of Utah assert they still have a sufficient water right remaining? Perhaps on paper that exists (as shown through over allocation) but certainly not in the river now nor in the future.	The availability of water for the GRB Exchange is shown in the hydrology analysis of this EA. This hydrology analysis not only included the GRB uses but all the reasonably foreseeable uses (as described by the BOR NEPA handbook) within the river system including the undeveloped Ute Tribal water rights.

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97	Lisa Rutherford & Paul Van Dam	None Provided		Getting to the heart of the EA under consideration, under the No Action Alternative, "The State would remain free to develop their apportioned water right under the 1996 Assignment without the stability of FG stored water being released for this exchange" with this caveat, "The State may run into shortages in years of drought, especially during the latter part of the summer when tributary flows can be significantly reduced." Given our concerns, this seems a reasonable alternative. Utah's overuse of water reveals that perhaps shortages would best be managed by better use of existing water rather than relying on future Colorado River water that may not be there.	This is the No Action Alternative and the Proposed Action has been compared against that scenario to understand potential impacts.
98	Lisa Rutherford & Paul Van Dam	None Provided		We realize that there would some "monetizing" aspects under the preferred alternative that make that option attractive to the BOR but doubt there would be much benefit given the state's balking at paying much for the water as was evidenced at the December 2017 meeting regarding the LP Block. The fact that the provisions of the resulting contract are not provided for public review and comment is a problem.	Contract negotiations and the "monetizing" aspects are outside the scope of the EA.
99	Lisa Rutherford & Paul Van Dam	None Provided		Although the Proposed Action is the preferred alternative and would allow BOR to meet ESA Recovery Program goals in the Green River, we do not believe it would provide the State with a reliable water supply for development of the 1996 Assignment given our concerns expressed above.	The exchange contract would provide the State with a more reliable water supply than without the contract.
100	Lisa Rutherford & Paul Van Dam	None Provided		Regarding ESA Recovery, it appears that the No Action Alternative would not harm the situation. The EA states in 3.3.4.1.1 under No Action "The effect of the No Action Alternative would be similar to existing conditions, as the State would remain free to develop their assigned water right using accretion flows. The FG Dam would continue to operate consistent with the FGROD."	The No Action Alternative would not harm the situation but neither would the Proposed Action. FG Dam would continue to operate consistent with the FGROD even with the Proposed Action implemented.
101	Lisa Rutherford & Paul Van Dam	None Provided		In the document it's noted that the preferred "Proposed Action" would have no effect on the sensitive fish species occurring in the Green River below the FG Dam. If that's the case, then the current management situation seems to be working in accordance with the FGROD and no change is needed.	The purpose of the project is to help the State develop their assigned water right. Because the Proposed Action would allow the State to develop their assigned water right without impacting sensitive fish species (or any other resource), the Proposed Action is the preferred alternative.
102	Lisa Rutherford & Paul Van Dam	None Provided		In the "Historic Hydrology – Direct Natural Flow (DNF)" section of the EA it's noted that "In this analysis, except for reasonably foreseeable depletions, future Upper Basin depletions from the 2007 UCRC schedule was assumed constant at 2018 levels; this assumption results in depletions significantly lower than the future depletion projections used in long term planning studies such as the Basin Study, which assumed that Upper Basin depletions will grow through 2060." Then in the Discussion section it's noted "Unique to this analysis is the model assumption that no new projects or depletions will occur in the Upper Basin." It is also noted in Discussion that "It is recognized that the Upper Basin States plan to develop their compact allocated Colorado River water and, as such, it is highly unlikely that depletions will remain at the 2018 level in the future." We are concerned as we read this that a conservative spin is being put on future river depletions under this EA that may result in future challenges. The State uses the argument that this agreement will benefit species in Green River as the water makes its way to Lake Powell. However, the EA details provided in sections 3.3.4.1.1 and 3.3.4.1.2 seem to make it clear that the conditions in the Green River will be fine with or without this contract. Certain Colorado River flow models demonstrate that a shortage declaration is possible during severe and prolonged droughts and the scope of the EA does not seem to adequately consider the effects of the warming climate. Although the states are actively identifying and implementing measures to manage the risk, that does not mean they will be successful. Committing more water to allow the building of a pipeline that may end up being an albatross to the State of Utah does the state and citizens no favor.	The modeling uses hydrologic sequences that include the 16-year drought from 2000-2015. This hydrologic sequencing provides enough variability to determine impacts to the system when stressed. Additionally, the scope of this EA is to determine the impacts of signing the exchange contract with the State of Utah; as such, any comparison made will be against a No Action baseline and the comparative impacts will be the same. The Technical Appendix has been modified to include a detailed look at hydrology under these drought scenarios.
103	Lisa Rutherford & Paul Van Dam	None Provided		We are also concerned with the scoping process used by BOR for this EA. Given that this GRB water is closely linked to the LPB, having a meeting only in Vernal, Utah, when the citizens of Washington County and Kane County will be affected by a portion of the water right under consideration gave the public in our area no chance to participate in a scoping process.	Scoping is a very general process related to the gathering of information and can vary for EAs. Emails and a press release went out in mid-September with the meeting in Vernal, Utah on the 26th. A 50-day comment period was also held. The GRB water is only linked as being under the same water right. It is separate in geography, timing, development, etc.

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104	Stanley Palmer	WAPA		It is unclear to us whether the Green River Block Water Exchange Contract would cause a modification in the operation of Flaming Gorge Dam. Table 3-1 states that "no change in operations is beings considered...". Also, USBR's October 22, 2018, press release states that the: operations of Flaming Gorge Dam would remain within the parameters analyzed in the 2005 Operation of Flaming Gorge Dam Final Environmental Impact Statement and established in the 2006 Record of Decision. On the other hand, in the EA, Section 3.3.1.4. Proposed Action, describes the differences between the No Action Alternative (which presumably includes the operation under the 2006 Record of Decision (ROD)) and the Proposed Action, as follows: April-July (Reach 1): are higher approximately 5 percent of the time when Flaming Gorge (FG) releases are increased in July to maintain Reach 2 flows, and are higher than the No Action Alternative. April-July (Reach 2): Releases from FG under the GRB depletion scenario are higher than the No Action Alternative 30 percent of the time. July-September: The No Action scenario has lower flows than the GRB depletion scenario when the minimum flow release target from FG Reservoir has essentially been altered to compensate for the depletion scenario during drier hydrology. October-December: The GRB depletion ends on September 30, and the remaining months of the year are used to increase reservoir storage within the FGROD base flow requirements. FG releases are maintained at minimum 800 cfs levels approximately 10 percent more time than the No Action Alternative, and are at minimum releases for 25 percent of the time. The GRB depletion scenario maintains slightly lower releases as compared against the No Action until 45 percent of the time after which releases converge with the No Action scenario during October-December. Similar descriptions are included in Section 3.3.1.5 Cumulative Effects, which relates the impacts of implementing the "full depletion scenario." If WAPA's understanding of the description of the impacts of the Proposed Action is correct, then an analysis is needed regarding the impact of the Green River Exchange Agreement on hydropower production and value. WAPA is also concerned about several other statements in the EA, the essence of which is given in Section 3.3.1.4 (page 16, par. 6). "The GRB depletion scenario is higher to maintain Reach 2 flows and compensate for higher depletion rates below FG Dam." WAPA is a participant in the Upper Colorado River Basin Recovery Implementation Program (UC RIP). One of its founding documents is the "Section 7 Agreement." This agreement requires that, for new water depletions, the Fish and Wildlife Service will propose new actions be added to the RIPRAP in order to mitigate for the impact of the new depletion. WAPA believes that this would be the case for new proposed water depletions in the Green River (Reaches 1 & 2). The EA appears to state that Reclamation is committed to increasing Flaming Gorge releases to compensate for new water depletions in these regions.	Reclamation is also a participant of the UC RIP and is committed to Section 7 Compliance outlined in the FGROD and FEIS. Reclamation is exploring the potential impacts of entering into an Exchange Agreement with the State of Utah, which would be a federal action. As such, the requirements under the UCRIP are covered under this EA rather than through the RIPRAP.
105	Stanley Palmer	WAPA		We are interested in having the EA clarified and WAPA's understanding improved. We propose a meeting in the near future with Reclamation to improve our understanding. We suggest that this occur prior to any final decision regarding the exchange agreement.	We held the scheduled meeting and resolved the issues brought forward by WAPA.

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106	Rob Billerbeck	NPS		We are concerned that the conclusion in section 3.4, table 3-3 stating 'no effect' on hydrology for the proposed action may be a little misleading. In section 3.3.1.4 you state that "Releases from FG under the GRB depletion scenario are higher than the No Action alternative 30 percent of the time," and that the proposed action could result in as much as a six foot drop in reservoir elevation. Furthermore in various sections you point out that flows from April to July may slightly increase during extremely dry years or that there would be small increases (< 300 cfs) during the months of July-September during dry years and slightly lower flows (< 250 cfs difference) in the months of October-December. You also state that modeling has shown that the Proposed Action does not include a change in operations of Flaming Gorge (FG) Dam as outlined in the FG Record of Decision (ROD). Based on this, it may improve the clarity and accuracy in table 3-3 if you state that there are small effects to hydrology, but they are within the hydrologic range of effects of the FG ROD. There are a few points that we would ask that you clarify in the hydrology section, 3.3.1.2.2 in the main text. There is a statement that "Spring peak releases during the month of April are nearly identical under all scenarios," but it's not clear if that is true of all peak flow or not. In general, NPS supports a more natural hydrologic regime on the river and reductions in peak flows would move further away from the natural hydrology, and could have negative effects on a number of resources along the river. If there are no reductions in peak flows, it would be good clarify that is true for all peak flows. Also there is a statement that "The No Action Alternative along with the GRB depletion scenario have similar results ... Both scenarios indicate that meeting the daily maximum flow at Jensen at or above 18,600 cfs 50% of the time is not achievable ..." We would suggest that you provide the percent of time that each target is achieved under No Action and the Proposed Action, so they can be compared. The terms "flow targets", "flow thresholds", "Recovery program goals" and "flow recommendations" are all used in the EA, but it is not clear if these are all completely interchangeable. We would ask that you standardize this language or articulate clearly any differences. Despite our best efforts to understand the rigorous hydrology modeling in the EA appendix, we still find a lack of clarity within the EA for where (or how much) water will be diverted from the Green River and where return flows might come back into the Green River. This makes it difficult to clearly understand which reaches might see more/less water. If it were possible to improve this clarity in section 3.3.1, this would be very helpful for disclosing any potential impacts. There is a statement on p. 14 that "The GRB depletion maintains FGROD operations and no change to operations are made under the GRB alternative. Releases from FG Dam maintain Reach 1 and 2 flow thresholds," and yet on there is also the statement on Pg. 10 that: "Additional releases may be necessary to meet target flows in Reach 2 as a result of depletions under the Proposed Action. Should Reach 2 target flows not be able to be met through FG operations, the State would coordinate with the Recovery Program and USFWS." It is not completely clear what "coordinate" means in this context, and whether the State will commit to satisfying Flow Recommendations, or how potential shortfalls in meeting Reach 2 flow targets may affect Reach 3 flow targets. One very important concern we have regarding the hydrology modeling is the lack of evaluation under a drier scenario. After 19 years of drought in this system, there is growing consensus among partners and among scientific studies that the future 'new normal' may be warmer and drier years on average. We note that the Bureau of Reclamation and the basin states are regularly evaluating effects under a drier subset of hydrology runs for other Colorado River water projects and we would recommend that this be conducted for this project as well. These warmer and drier scenario runs would be important to ensuring that the hydrology does indeed fall within the range of the FG ROD under likely future scenarios. It is also not completely clear how this project may interact with other proposed changes to releases from Flaming Gorge. There are proposed changes for Drought Operations Response from the basin states, and proposed elevated base flows from the Upper Colorado River Endangered Fish Recovery Program. While both of those individually are also believed to produce changes that are within the existing FG ROD, we have substantial concerns as to whether the cumulative effects analysis has fully explored whether the combination of these proposals might create situations that fall outside the FG ROD analysis, and again particularly under warmer and drier scenarios. We would suggest addressing this further under section 3.3.1.5, the cumulative effects section for the hydrology.	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.
107	Rob Billerbeck	NPS		Some of the hydrologic changes described under the proposed action in this EA indicate that base flows could increase slightly from April to July during extremely dry years or that there would be small increases (< 300 cfs) during the months of July-September during dry years. In section 3.3.3.2, you state riparian areas would likely be unaffected by implementing the Proposed Action, or that there could be a minimal positive impact for some patches of vegetation. Though the changes may increase patches of vegetation, the NPS would not consider those increases a positive impact, but rather a negative one, as it would further lead to channel narrowing and simplification. This has some similarity to a recent paper prepared by Dr. Jonathan Friedman, a Research Hydrologist with US Geological Survey entitled "Potential Effects of Elevated Base Flow and Midsummer Spike Flow Experiments on Riparian Vegetation along the Green River". In this paper, Dr. Friedman describes how slightly elevated baseflows could cause channel narrowing and simplification, which would be undesirable future conditions for river-related resources on the National Park units. This paper is available at: https://irma.nps.gov/DataStore/Reference/Profile/2252016. This study was funded by the NPS to evaluate potential slight increases in summer baseflows proposed by the Upper Colorado River Endangered Fish Recovery Program. We would ask that Reclamation consider this paper and revise section 3.3.3.2 to reflect that there is a chance of increasing vegetation that could result in channel narrowing and simplification rather than no effect. Thus, in summary section 3.4, table 3-3, we would ask that you consider changing the result from 'no effect' to potentially negative effects. Furthermore, you may again need to clarify that you believe those impacts would be within the range of current effects addressed in the FG ROD if that is the case.	Draft EA section 3.3.3 has been revised to address potential for channel narrowing based on possible future regulated seasonal flows.
108	Rob Billerbeck	NPS		In section 3.2, you state that wilderness was eliminated from further analysis, and we would just request that you mention that there is recommended, though not designated wilderness, which the Green River runs through in Dinosaur National Monument and Canyonlands National Park.	Change made.

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109	Mary Moran	None Provided		As you know, flow in the Colorado River is predicted to decrease substantially over the next decades, and indeed, is already decreasing, due to increasing average air temperatures and resultant increased evaporation associated with climate change. The Upper and Lower Basin states are finally completing drought contingency planning. This planning involves efforts to decrease water use throughout the Colorado River Basin. This contract is in direct conflict with the drought contingency planning efforts. Exchanging water in order to provide water for new developments, when we are trying to decrease water use, makes no sense. Please deny this contract.	The modeling uses hydrologic sequences that include the 16-year drought from 2000-2015. This hydrologic sequencing provides enough variability to determine impacts to the system when stressed. Additionally, the scope of this EA is to determine the impacts of signing the exchange contract with the State of Utah; as such, any comparison made will be against a No Action baseline and the comparative impacts will be the same. The Technical Appendix has been modified to include a detailed look at hydrology under these drought scenarios.
110	Matt Rice	American Rivers		American Rivers is concerned that the scope of analysis for the DEA, which is limited to the Green River Block contract, is narrower than the purpose and need statement, which addresses Utah's development of its "assigned water right" of 158,890 AF. The DEA does not explain how limiting the scope to just one of the contracts that will be needed to develop Utah's "assigned water right" is consistent with NEPA regulations requiring that connected and similar actions be analyzed in the same document, as discussed below. The DEA states the geographic scope of analysis excludes Lake Powell: "[a]nalysis in the EA includes impacts from depletions of water along the Green River, from FG Dam down to, but not including, Lake Powell." This geographic scope seems too limited given that the Green River is hydrologically connected to Lake Powell, and there are other actions related to management of Lake Powell that currently are pending before Reclamation. The DEA refers to the LPP Project as a related project, but does not analyze it as a "connected action": "[FERC] is the lead agency in preparing an EIS [Environmental Impact Statement] for the [LPP Project]. The project would bring water to residents in southern Utah by building a 139 miles long, 69-inch-diameter pipeline from Lake Powell to Kane and Washington [C]ounties, Utah. Water delivered by the project will be based on the established water right."5 The DEA does not address Reclamation's role in authorizing the LPP Project. However, in its comments on the Utah Board of Water Resources' Draft Preliminary Licensing Proposal, Reclamation described its role in the LPP Project as deciding: "(1) whether to approve a water service contract for water diversion from Flaming Gorge. Water stored in Flaming Gorge would be delivered down the Green River, providing instream benefits, and from Lake Powell it would be diverted into the pipeline; and (2) whether to approve a ROW [right-of-way] license agreement for constructing and operating the pipeline and other LPP facilities within the Reclamation Primary Jurisdiction Area near Glen Canyon."6 Under regulations implementing NEPA, the scope of an agency's review must include connected, cumulative, and similar actions:	The GRB and the LPP Block are independent of each other and are covered by separated exchange contracts. The GRB will be developed along the Green River and does not depend the the LPP project. Conversely, the LPP water development does not depend on the development of the GRB. In other words the development of the GRB along the Green River has no nexus to the LPP and can be analyzed independently.
111	Matt Rice	American Rivers		"(1) Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they: (i) Automatically trigger other actions which may require environmental impact statements. (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously. (iii) Are interdependent parts of a larger action and depend on the larger action for their justification. (2) Cumulative actions, which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement. (3) Similar actions, which when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement."7 NEPA disfavors "segmenting" the analysis of connected, cumulative, or similar actions into different environmental documents: "An agency impermissibly 'segments' NEPA review when it divides connected, cumulative, or similar federal actions into separate projects and thereby fails to address the true scope and impact of the activities that should be under consideration. The Supreme Court has held that, under NEPA, 'proposals for ... actions that will have cumulative or synergistic environmental impact upon a region ... pending concurrently before an agency ... must be considered together. Only through comprehensive consideration of pending proposals can the agency evaluate different courses of action.'"8 American Rivers is concerned that the DEA improperly segments review of the Green River Block water exchange contract from other connected, cumulative, and similar actions related to development of water in the Colorado River Basin, notably the LPP water exchange contract and the right-of-way license agreement for construction of the LPP Project, both of which are pending before Reclamation. The purpose statement explicitly refers to Utah's desire to develop its "assigned water right," yet the DEA does not explain why the two contracts necessary to develop the assigned water right would be reviewed separately under NEPA. Further, the DEA does not address the development of a Drought Contingency Management Plans for the Upper and Lower Colorado River Basin. The draft "Agreement Concerning Colorado River Drought Contingency Management and Operations"9 was published in October 2018. The draft Agreement calls for an Upper Basin Demand Management Program that will, in part, coordinate operations of the Colorado River Storage Project Act Initial Units, including Flaming Gorge, to help minimize the risk of Lake Powell declining below minimum power pool and maintain the Upper Basin States' compliance with the Colorado RiverCompact.10 Reclamation Commissioner Burman has, "emphasized the need for prompt action following another year of low runoff in the ongoing drought and called on the states to complete their drought planning by December of 2018."11 The DEA does not explain why this drought planning effort was not considered. This oversight is striking given that Reclamation has designated the planning effort as high priority and played a significant role in the negotiations. Reclamation's segmented environmental analysis may prevent full disclosure of the impacts of these several actions, which could be substantial when considered together. Segmentation may also interfere with identification of effective measures to mitigate cumulative effects on a basin-wide scale.	Reclamation's practice is to use the "Related Projects" portion of the EA to aid readers in identifying other projects that could be included in a cumulative effects analysis. This does not mean the project should be analyzed as a connected, cumulative, or similar actions. Having a cumulative impact is not the same as a cumulative action, as is cited in this comment. The GRB contract does not meet any of the cited criteria: 1(i)-GRB does not trigger any other action 1(ii)-GRB can and would (if approved) proceed with or without approval of the LPP 1(iii)-GRB and LPP are not interdependent and one does not depend on the other for justification 2-The GRB and LPP are not cumulative actions because there would not be cumulative significant impacts to the Green River (the project area for the GRB contract) 3-Water from the GRB cannot be developed/utilized in the same area as the proposed LPP project (distinct geography); LPP has had and will continue to have different timing than GRB; etc. NEPA does not require a basinwide analysis for this project to satsify NEPA requirements. A drought analysis was added to the hydrology section of the EA and also the technical appendix.

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112	Matt Rice	American Rivers		The DEA states that it analyzed future inflow hydrology scenarios. The DEA describes Reclamation's methodology for determining the "Direct Natural Flow" for future inflow, in part, as follows: "Natural flow is the observed flow adjusted for the effects of diversions and the operation of reservoirs upstream of the flow gage. This natural flow record was developed by Reclamation and is used extensively in their hydrologic modeling and Environmental Impact Statements. In this inflow scenario, the existing historical record of natural flows was used to create a number of different future hydrologic sequences using a resampling technique known as the Index Sequential Method (ISM). The ISM provides the basis for quantification of the uncertainty and an assessment of the risk with respect to future inflows and is based upon the best available measured data."15 American Rivers is concerned that this methodology does not appear to consider the impacts of climate change on inflow. Based on our review, the DEA does not address the effects of climate change on the hydrology of the Colorado River and tributaries at all. This is inconsistent with NEPA's directive to describe the affected environment, and the cumulative effects of a proposed action in light of other reasonably foreseeable changes to the affected environment.16 It is inconsistent with scientific data showing that: "Climate change can make a resource, ecosystem, human community, or structure more susceptible to many types of impacts and lessen its resilience to other environmental impacts apart from climate change. This increase in vulnerability can exacerbate the effects of the proposed action."17 Reclamation has identified the Colorado River Basin as already being impacted by climate change, the effects of which are likely to increase and intensify in the coming years. It has described some of these impacts as follows: • Spring and early summer runoff reductions could translate into less water supply for meeting irrigation demands and adversely impact hydropower operations at reservoirs. • Warming could also lead to significant reservoir evaporation, increased agricultural water demands and losses during water conveyance and irrigation. • Growing demands in the Colorado River system, coupled with the potential for reduced supplies due to climate change, may put water users and resources relying on the Colorado River at risk of prolonged water shortages in the future.18 Reclamation's "Colorado River Basin Water Supply and Demand Study" also found: "[I]n the absence of timely action, there is likely to be significant shortfalls between projected water supplies and demands in the basin in coming decades, which is likely to affect each sector (for example, agricultural, municipal, energy, and environmental) dependent on the Colorado River and its tributaries. The Basin Study also confirmed a wide range of solutions are needed to mitigate and adapt to such shortfalls."19 American Rivers requests that Reclamation consider the potential impacts of the proposed action and alternatives in light of the basin's increased vulnerability due to climate change.	The modeling uses hydrologic sequences that include the 16-year drought from 2000-2015. This hydrologic sequencing provides enough variability to determine impacts to the system when stressed. Additionally, the scope of this EA is to determine the impacts of signing the exchange contract with the State of Utah; as such, any comparison made will be against a No Action baseline and the comparative impacts will be the same. The Technical Appendix has been modified to include a detailed look at hydrology under these drought scenarios.
113	Matt Rice	American Rivers		In its analysis of effects on hydrology, the DEA states that the proposed action would not have significant adverse impacts: "The Proposed Action would have minimal impacts on hydrology, with potential effects occurring mostly in moderately dry to dry years (>70 percent exceedance). The model isolates the impacts of the GRB depletion against future depletions on the Green River. The modeling shows impacts of the GRB depletion are insignificant as compared against both the No Action and the Full Depletion scenarios." The DEA similarly finds that, "[c]umulatively, there would not be a significant impact to hydrology based on the analysis performed in this EA."20 As stated above, the DEA does not adequately consider connected, cumulative, and similar actions affecting hydrology within the Colorado River Basin. It also omits climate change, even though Reclamation has found that climate change is having and will continue to have a significant effect on hydrology within the basin. Reclamation must correct these omissions from the hydrologic analysis in order to support findings regarding the proposed action's effects on hydrology.	As stated above, there are no connected, cumulative, or similar actions to the GRB.
114	Matt Rice	American Rivers		The DEA's discussion of the proposed action's impacts on water rights focuses on how the proposed action would benefit Reclamation and Utah.21 It also finds that, "Cumulatively, there would not be a significant impact to water rights based on the analysis performed in this EA. Under the No Action Alternative the State would be able to develop the water right that was assigned to them in 1996, but would not be able to rely on the exchange of water between the Yampa and FG reservoir."22 The analysis does not adequately support the finding that the proposed action, when considered with other actions, would not have significant impacts to water rights. It does not reference or otherwise address Reclamation's previous objection that Central Utah Project water rights could be adversely impacted by Utah's development of its assigned water right: "[i]f all the senior undeveloped water rights in the Green River and San Juan River Basins are developed, Utah would exceed its portion of the Colorado River Compact and the Central Utah Project water rights would be adversely impacted."23 Reclamation should revise the analysis to address the effects of the proposed action and alternatives on water rights in addition to the other connected, cumulative, and similar actions that are proposed or underway within the Colorado River Basin.	How Utah stays within its compact allotment is a matter for the state to determine. For the GRB exchange contract, the State must demonstrate that there is Compact Entitlement water that would have been available to the GRB portion of the assigned water rights and that this water can be left in the Green River for Reclamation's use to meet instream flows during the spring period. If the State is unable to identify this water, then the exchange contract will be curtailed based on the amount of the water available for exchange.
115	Leslie James	CREDA	3	Suggest replacing this sentence with text from FG ROD, at pp. 5, 3 and 6, respectively, to clarify the role of Reclamation v. the role of the Recovery Program in regard to recovery. The goal of the Recovery Program, therefore, is to recover the listed species of the Upper Colorado River to the point of de-listing, while allowing for the continued operation and development of the water resources of the Upper Colorado River Basin. ...to operate Flaming Gorge Dam to protect and assist in recovery of the populations and designated critical habitat of the four endangered fishes, while maintaining all authorized purposes of the Flaming Gorge Unit of the Colorado River Storage Project (CRSP), including those related to the development of water resources in accordance with the Colorado River Compact Implementation of the Recovery Program's 2000 Flow and Temperature Recommendations, in concert with other Recovery Program actions, is intended to avoid jeopardy and assist in recovery	Change made.
116	Leslie James	CREDA	8	In describing the Action (Preferred) Alternative, the ROD states: Under the Action Alternative, Flaming Gorge Dam would be operated with the goal of achieving the 2000 Flow and Temperature Recommendations, while maintaining and continuing all authorized purposes of Flaming Gorge Dam and Reservoir. We recommend the ROD language be substituted, or in the alternative, delete the bolded language starting "prescribing..." and replace with the bolded language starting "while maintaining and continuing..."	Change made.
117	Leslie James	CREDA	11, 16	These statements appear inconsistent. See also last comment below regarding impacts to hydropower. If depletions are changing, would there be impacts that can be described in the DEA and considered by the Recovery Program?	Comments have been incorporated in the DEA and Hydrologic Modeling Technical Report.

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118	Leslie James	CREDA	13	Suggest replacing with ROD language included in the comments on p. 8, page 1 above.	Change made.
119	Leslie James	CREDA	18	ROD p. 3 describes the Action (Preferred) Alternative: Under the Action Alternative, releases from Flaming Gorge Dam would be patterned so that the peak flows, durations, and base flows and temperatures, described in the 2000 Flow and Temperature Recommendations for Reaches 1, 2, and 3 of the Green River, would be achieved to the extent possible	Change made.
120	Leslie James	CREDA	25+	Recommend that information regarding the HBC Species Status Assessment and upcoming proposed status change be included in the EA.	Updated Section 3.3.5.3 – Humpback Chub
121	Leslie James	CREDA		We question the inclusion / analysis of species that are not within the project area (as noted in Table 3-2). If a species is not within the Project Area, why would Reclamation need to make an impact assessment? Same question regarding species that are only proposed as threatened or endangered.	These species came up in the USFWS IPaC report. This was simply an attempt to be thorough in our treatment of T&E species.
122	Leslie James	CREDA	47	Our concerns are threefold: A) failure to evaluate hydropower impacts, which are also dependent not just on fluctuation and releases, but also volumes. In fact, the FG ROD acknowledged that In particular, the hydrology analysis shows that the greatest potential for negative effects to several resources, including land use, recreation, mosquito control, and power generation are associated with one particular flow recommendation, specifically a spring peak release of at least 18,600 cubic feet per second (cfs). As an authorized purpose of the CRSP, hydropower impacts should be included in the DEA. B) The FG ROD requires, among other things, that In coordination with the Recovery Program, a technical working group, consisting of biologists and hydrologists from Reclamation, Western and FWS, will annually propose an initial flow regime to the existing Flaming Gorge Working Group. This process will concurrently fulfill informal consultation and coordination requirements of ESA for the action agencies. This commitment could be restated or referenced in the DEA. C) How was a determination that impacts were "minor" and "insignificant"? Please include in the DEA information that describes the specific monthly volume/releases associated with the proposed action. The last FG hydropower analysis for environmental documentation purposes was nearly 15 years ago; please consider requesting WAPA's assessment of impacts to the hydropower resource and SLCA/IP contract obligations.	Reclamation will incoporate a hydropower section in the DEA. Implementation of the proposed alternative will benefit hydropower through exchange of tributary inputs from the State of Utah to increased base flows during high electrical demand months of June-August. The elevation analysis illustrates that impacts from elevation would maximize at six feet, which is consistent with annual elevation fluxuations within current operations.