Record of Decision
Questar Exploration & Production (QEP)

Greater Deadman Bench Oil and Gas Producing Region (GDBR)

Prepared by the Vernal, Utah Field Office

March 2008

Questar Exploration & Production Company (QEP) has proposed to develop hydrocarbon resources within an area encompassing approximately 98,785 within the Bureau of Land Management Vernal Field Office area on lands wholly or partially contained within Townships 6 to 8 South, Ranges 21 to 25 East, Uintah County, Utah, approximately 15 miles south of Vernal, Utah. This Record of Decision (ROD) documents the decision made by the Bureau of Land Management (BLM) regarding QEP's proposal. This ROD and the Final EIS have been published separately. The final EIS was made available to the public for a 30-day review period through a Notice of Availability published in the Federal Register on January 4, 2008.

1.0 DECISION

The BLM has decided to approve the Agency-preferred Alternative (Alternative 1 – Proposed Action) subject to the Conditions of Approval listed in Attachment 1 of this ROD. This decision is hereafter referred to as the selected alternative. The selected alternative recognizes that oil and gas development has been ongoing within the project area for over 50 years. It also minimizes or eliminates impacts to resources within the project area through the Conditions of Approval. The selected alternative balances QEP's right to develop natural gas within their leaseholds, while protecting resources or mitigating impacts over the long term.

This programmatic decision approves up to 4,561 acres of disturbance from the project. This decision includes the following project components, which would be subject to site-specific onsites and approval:

- Up to 1,020 natural gas wells and 348 oil wells;
    - Up to 891 wells on new locations and 346 on existing locations;
    - Oil development would occur in the Green River formation on 40 to 80 acre well spacing using the waterflood technique;
    - Gas development would occur in the Uinta, Green River, Wasatch, Mesaverde, Blackhawk/Mancos, and Frontier/Dakota formations on primarily 40-acre spacing. However, the proposed action includes up to 132 20-acre Wasatch infill wells, which would be directionally drilled off

of 40-acre pads, and twenty 160-acre Blackhawk/Mancos wells, which would be drilled vertically off pads located in the center of the section quarters.

- Up to 169.1 miles of new roads;
- Up to 193.2 miles of new surface natural gas pipelines;
- Up to 41.5 miles of buried oil flowlines;
- Up to 15 2,000-horsepower compressor stations;
- Up to 37 miles of electric power lines;
- Up to 22 central tank facilities; and
- Up to 20 miles of buried water pipelines.
- Total surface disturbance 4,561 acres.

This decision applies only to BLM-administered lands and leases within the project area.

2.0 MANAGEMENT CONSIDERATIONS

The selected alternative represents a reasonable management approach that allows gas development on existing leases while eliminating or minimizing impacts to the area's resources. The decision to approve the selected alternative as made after consideration of the following:

2.1 Purpose and need: The purpose of BLM's action is to respond to QEP's proposal and to facilitate action on future plans related to the proposal. The purpose of QEP's proposed project is to extract and transport oil and natural gas at a profit from their leases in the project area. BLM objectives for the project are to minimize environmental consequences, as well as to ensure conformance with the objectives of the land use plan.

2.2 National policy: Private exploration and development of federal oil and gas leases is an integral part of the BLM oil and gas leasing program under the authority of the Mineral Leasing Act of 1920 and the Federal Land Policy and Management Act of 1976.

2.3 Consistency with the Book Cliffs and Diamond Mountain Resource Management Plans: The selected alternative would take place primarily in the Book Cliffs Resource Area, which is managed through the Book Cliffs Resource Management Plan. However, the portion of the project that is west of the Green River is in the Diamond Mountain Resource Area, which is managed under the Diamond Mountain Resource Management Plan.

Some of the leases in the project area predate the Book Cliffs RMP. Those leases are in conformance with the RMP because the Book Cliffs RMP recognizes valid existing rights, and does not impose additional restrictions on them (ROD p.4). Development of leases issued after the completion of the Book Cliffs RMP/ROD (1985) is also in conformance with the Book Cliffs RMP because the RMP allows for the leasing of oil and gas in the project area as category 1 (subject to standard stipulations) or category 2 (subject to special stipulations). The Book Cliffs RMP/FEIS analysis assumptions (p. 145) account for impacts associated with oil and gas development. The proposed project is in compliance with the following Book Cliffs RMP stipulations that apply to portions of the project area:

- **Stipulation 4:** In order to protect the seasonal nesting and strutting period of sage grouse, surface disturbance, exploration, drilling, and other development activity will be allowed only during the period from June 15 to March 15. This limitation does not apply to maintenance and operation of producing wells. This stipulation may be waived by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.
- **Stipulation 5:** No drilling or storage facilities will be allowed within 300 feet of the sage grouse strutting grounds. This stipulation may be waived by the authorized officer if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated

Some of the leases in the project area predate the Diamond Mountain RMP. Those leases are in conformance with the RMP because the Diamond Mountain RMP recognizes valid existing rights, and does not impose additional restrictions on them (ROD p.1-2). Development of leases issued after the completion of the Diamond Mountain RMP/ROD (1994) are also in conformance with the Diamond Mountain RMP because the RMP allows for the leasing of oil and gas in the project area as category 2 (subject to special stipulations). The Diamond Mountain RMP/FEIS analysis assumptions (p. 4-3) account for impacts associated with oil and gas development. The proposed project will also be in compliance with the following Diamond Mountain RMP stipulations that apply to portions of the project area:

- **Stipulation C203:** Surface disturbing activities in areas of highly saline and/or erodible soils, municipal watersheds and floodplains during times of saturated soils (usually Spring runoff and Fall rains) will be precluded for the purpose of preserving and protecting those areas from severe erosion as described in the DM RMP. Waivers, Exceptions, or Modifications to this limitation may be specifically approved in writing by the authorized officer of the BLM if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.
- **Stipulation C207:** No surface use is allowed within crucial deer and elk winter range from December 1 through April 30. This stipulation does not apply to operation and maintenance of production facilities, or if animals are not present. For the purpose of preventing adverse impacts that would cause significant displacements of deer or elk herds or loss of habitat as described in the DMRMP/EIS. Waivers, Exceptions, or Modifications to this limitation may be

specifically approved in writing by the authorized officer of the BLM if either the resource values change of the lessee/operator demonstrates that adverse impacts can be mitigated.

- **Stipulation C309/C310:** No surface occupancy or use is allowed on the lands containing Pelican Lake and Pelican Lake Special Recreation Management Area for the purpose of preserving and protecting the area for recreational values as described in the DMRMP/EIS. Waivers, Exceptions, or Modifications to this limitation may be specifically approved in writing by the authorized officer of the BLM if either the resource values change or the lessee/operator demonstrates that adverse impacts can be mitigated.

2.4 Relationships to statutes, regulations, or other plans: There are no comprehensive State of Utah plans for the project area. The School and Institution Trust Lands Administration (SITLA) has leased all of the lands under its administration within the project area for oil and gas production. Because the objectives of SITLA are to produce funding for the State school system, and because production on Federal leases could lead to further interest in drilling State leases in the area, the selected alternative is assumed to be consistent with the objectives of the State.

The selected alternative is consistent with the 2005 *Uintah County General Plan* (County Plan), which encompasses the project area. The County Plan emphasizes multiple-use public land management practices, responsible use, and optimum utilization of public land resources.

2.5 Range of Alternatives

Two alternatives were fully evaluated in the EIS: Alternative 1 – Proposed Action and Alternative 2 – No Action. In addition, eight alternatives were considered as a result of public or other agency involvement, but were eliminated from detailed analysis for the reasons documented below.

Alternative 1 – Proposed Action

The Proposed Action consists of the construction and drilling of 1,239 natural gas and oil wells and the construction of associated facilities within the 98,785-acre project area. Based on public comments on the DEIS, Alternative A in the FEIS was modified such that the proponent will not drill within the 100-year floodplain of the Green River (see Attachment 2).

Alternative 2 – No Action

The No Action Alternative is the environmentally preferable alternative due to the lower level of development that would occur on BLM-administered lands. The No Action alternative analyzes a maximum level of development of up to 209 wells that would include up to 177 natural gas wells and up to 32 oil wells. This alternative was not selected because QEP has valid existing leases on BLM-administered lands in the project area. Those leases include contractual obligations, as well as contractual rights, to develop the mineral resources contained within the leaseholds. In addition, the selected

alternative has incorporated all practicable means to avoid or minimize environmental harm.

Alternatives Considered but not Analyzed in Detail

No New Development on BLM-administered lands: This alternative was eliminated from detailed analysis because it was not feasible for the following reasons:

- The BLM cannot deny reasonable access through Federal lands to private holdings (*Utah v. Andrus*, 486 F. Supp. 995 (1979)), and 130 wells would be on State of Utah and private leases;
- Denial of development on Federal lands could lead to the drainage of federal reserves by wells on adjacent lands, resulting in a loss of federal resources;
- APDs for 79 federal wells have been approved based on other NEPA documents so that these wells could be developed; and
- Not allowing development on Federal lands would not be consistent with the lease rights granted to QEP.

Suspension of Operations: An alternative to delay access to certain leases for an extended period of time was considered. However, this type of delay would not change the environmental effects, but merely put off potential environmental effects for the period of the suspension of lease access. In addition, the impacts would be approximately the same as the No Action Alternative. Therefore, this alternative was not analyzed further.

Exchange of Leases: The potential to exchange the project area leases with leases at some other location was considered. However, it was not be possible to determine relative effects because potential exchange areas were not identified. Furthermore, the Federal Land Policy and Management Act requires that the exchanged assets would have to be of equal value. Without knowing the location or value of other leases that may be involved, evaluation of effects would be impossible.

Full Field Directional Drilling: This alternative was eliminated from detailed analysis because universal application in the project area is constrained by the technical reasons documented in section 2.4.4 of the FEIS. However, directional drilling will be considered on a site-specific basis under the selected alternative in areas where vertical drilling is not feasible, or in areas where vertical drilling will lead to unacceptable environmental impact.

Conventional Oil and Gas Plan Development: This alternative evaluated the effects of developing each of the proposed 1,239 wells on a separate pad. It would have resulted in the disturbance of an additional 1,328 acres. QEP determined that it could twin 216 wells and directionally drill 132 wells, so that overall surface disturbance and other environmental impacts would be reduced. Therefore, this alternative was eliminated from detailed analysis.

Best Management Practices: This eliminated alternative would have required QEP to implement all of the BMPs listed in the BLM National policy guidance. Some of these BMPs were examined in detail in section 2.4.6 of the FEIS and were found to not be feasible in the project area for technical or economic reasons. However, those

BMPs that are feasible in the project area were included in the proposed action, and have been carried forward into the selected alternative.

Phased Development: The phased development alternative would restrict exploration and development in distant areas until all development within a given area would be complete. As a result, the phased development scenario would deny the operator the opportunity to expand far enough out from existing development to drill exploratory type of wells. These exploratory wells are needed to determine the extent, quantity, and quality of oil and gas potential reserves at locations distant from existing development. The exploratory drilling may lessen overall impacts if it is found that the exploratory wells would not have the desired economic potential. Also, in a phased development scenario, the traffic would tend to be more concentrated in distinct areas thereby increasing traffic impacts on the roads in the vicinity of the construction and development. Because this alternative would not meet the purpose and need of minimizing impacts, this alternative was not analyzed in detail.

Minimum Setback Distances: This alternative required minimum setback distances from sensitive resources such as riparian, floodplains, springs, sensitive wildlife, geologic constraints, and cultural resources. It was eliminated from detailed analysis for the following reasons:

- The mitigation and applicant-committed measures take into account the suggested setback distances, both in time and space. In addition, QEP voluntarily revised the proposed action to preclude development in the 100-year floodplain of the Green River so that the concerns were resolved through the proposed action and mitigation; and
- Well sites shown in Figure 2-1 of the FEIS depict conceptual locations, so that the resources of concern can be avoided at a site-specific level through the application of the lease terms, this ROD's COAs, and 43 CFR 3101.1-2 (which allows the well to be moved 200 meters to avoid resource conflicts).

2.6 Measures to avoid or minimize environmental harm: Applicant-committed measures and BMPs were integrated into the alternatives analyzed in the FEIS. Mitigation measures were developed based on impact analysis. These measures were developed based on preliminary data and experience from over 50 years of oil and gas operations in the Uinta Basin, as well as the input of BLM's technical specialists, other agencies, and the public. Most of these measures were carried forward as Conditions of Approval in this ROD (see Attachment 1). The following measures were not carried forward for the reasons listed:

- *Developing closed loop roads within mule deer winter habitat and pronghorn antelope critical winter habitat will be avoided.* This measure was not carried forward because the Book Cliffs Land Use Plan does not identify BLM-designated mule deer or pronghorn antelope habitat in the project area.
- *Existing nest sites will be enhanced within the boundaries of the project area as directed by the AO.* This measure was not carried forward because the best

management is avoidance of nest sites, which avoidance was carried forward as a COA.

2.7 Public and Agency involvement. The public and agency involvement process for this project met the NEPA requirements for public involvement. These opportunities included:

Cooperating Agencies:
- Uintah County;
- Bureau of Indian Affairs;

Public scoping:
- Federal Register Notice of Intent published December 19, 2003 announcing the public scoping period held through February 4, 2004;
- A public scoping open house held January 14, 2004 in Vernal, Utah;

Public Comment:
- Federal Register Notice of Availability of the Draft EIS published February 10, 2006 beginning the public comment period held from February 10 to April 27, 2006;
- A public comment open house held March 1, 2006 in Vernal, Utah; and
- Responses to written comments contained in Chapter 6 of the FEIS.

FEIS Availability Period:
- Federal Register Notice of Availability of the FEIS published January 4, 2008 announcing a public availability period held from January 4, 2008 through February 4, 2008;
- Consideration of written comments received on the FEIS.

2.8 Clarifications based on comments on the FEIS:

Three comment letters on the FEIS were received during the public availability period from January 4, 2008 through February 4, 2008. Letters were submitted by the Environmental Protection Agency (EPA), Southern Utah Wilderness Alliance (SUWA), and Questar. Two substantive comments were extracted from those letters and were determined to need clarification. Those comments and the clarifying responses to those comments are included below:

Comment (EPA): The FEIS failed to compare the proposed action to any alternative that meets the purpose and need. Only by providing a range of alternatives to consider in the EIS process can the decision maker have latitude in managing the development of the resource and their resulting environmental impacts. The FEIS lacks this basic requirement of an EIS.

Response: NEPA Section 102(E) requires all agencies of the Federal Government study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources. EPA has not identified any conflicts not resolved by the proposed action and has not identified any specific alternatives that should have been addressed. By incorporating all practical mitigation into the proposed action, the proposed action resolved conflicts and streamlined the NEPA process in a way that reduces paperwork and delay as called for in the Council on Environmental Quality (CEQ) Guidelines for

Implementation of NEPA (40 CFR 1500.4 and 1500.5). The CEQ has stated that "range of alternatives" as referred to in Sec. 1505.1(e) includes all reasonable alternatives, which must be rigorously explored and objectively evaluated, as well as those other alternatives, which are eliminated from detailed study with a brief discussion of the reasons for eliminating them (CEQ 40 Most Asked Questions 1a.). As discussed above in this ROD and in the FEIS, the range of alternatives considered for the QEP proposal includes two alternatives that were fully evaluated in detail in the EIS, Alternative A – Proposed Action and Alternative B – No Action, and eight additional alternatives that were considered as a result of public or other agency involvement, but were eliminated from detailed analysis with a brief discussion of the reasons for eliminating them. Therefore, BLM has met the NEPA requirement for consideration of alternatives during the EIS process.

Comment (EPA and SUWA): The BLM must update its modeling for $PM_{2.5}$, PM_{10}, NO_2, and ozone to reflect the present ambient conditions of the project area and the Uinta Basin. We suggest that the Record of Decision consider the new air quality information from the Vernal Monitoring station and implement additional mitigation that would reduce air emissions or phase the development over a longer time period to maintain air quality within $PM_{2.5}$ standards.

Response: The ambient conditions of the project area used for air quality background concentrations are based on current Utah Department of Environmental Quality – Division of Air Quality (UDEQ-DAQ) estimates. Estimates are included in the FEIS for $PM_{2.5}$, PM_{10}, and NO_x. As ozone prediction is often based upon a regional analysis, it is highly doubtful that the impacts from this individual project would be detected. Although the UDEQ-DAQ installed a $PM_{2.5}$ monitor in December 2006 in Vernal UT to obtain background concentration data, the required three-year average concentration data is not available for the Uinta Basin. The closest monitoring station with the three-year average is located in Grand Junction, and is not representative of the Uinta Basin. All identified air quality mitigation has been carried forward as conditions of approval for this decision.

Please note that emission inventories were developed for PM_{10} and $PM_{2.5}$ emissions associated with the Greater Deadman Bench Region (GDBR) EIS. The air quality analysis for the EIS was started in January 2004 and completed in September 2004 with the submission of the Air Quality Technical Support Document to BLM. The analysis did not include modeling of $PM_{2.5}$ because the $PM_{2.5}$ National Ambient Air Quality Standard was in litigation at the time. However, the $PM_{2.5}$ ambient air concentrations (impacts) can now be easily estimated from the PM_{10} results for two reasons. First, the sources of $PM_{2.5}$ (earth moving, road dust, combustion engines) are identical to the sources of PM_{10}. Also, ambient air impacts are directly proportional to emissions. Therefore, the ratio of PM_{10} to $PM_{2.5}$ emissions can be applied to the modeled PM_{10} concentration to determine the $PM_{2.5}$ concentration.

The following tables show the ratio of $PM_{2.5}$ to PM_{10} emissions. Then the modeled concentrations of $PM_{2.5}$ are scaled to the PM_{10} values. $PM_{2.5}$ is the highest during the construction of an individual well pad and road but all the $PM_{2.5}$ ambient concentrations are below the NAAQS for all levels of development and operations.

GDBR Proposed Action PM_{10} and $PM_{2.5}$ Construction Emissions (tons/year)

Pollutant	Pad/Road Construction	Drilling	Completion
PM10	45.7	673.1	177.9
PM2.5	11.2	115.6	27.3
Ratio PM2.5/PM10	0.245	0.172	0.153

PM_{10} and $PM_{2.5}$ Impacts from GDBR Construction and Development

Activity	24-Hour Maximum Ambient Air Concentration ($\mu g/m^3$)			Annual Maximum Ambient Air Concentration ($\mu g/m^3$)		
	Modeled	With Background2	Percent of 24-Hour Standard 3 (Project + Background)	Modeled	With Background4	Percent of Annual Standard 5 (Project + Background)
Modeled PM10						
Pad and Road Construction	40.7	68.7	45.8	7.2	17.2	34.4
Drilling	35.7	63.7	42.4	8.8	18.8	37.6
Completion	19.3	47.3	31.5	4.7	14.7	29.4
Scaled PM2.5						
Pad and Road Construction	(40.7*.245 =) 9.97	34.97	99.9	1.76	10.76	71.7
Drilling	(35.7 x .172 =) 6.13	31.13	88.9	1.51	10.51	70.0
Completion	(19.3 x .153 =) 2.96	27.96	79.9	0.72	9.72	64.8

1. µg/m3 is micrograms of pollutant per cubic meter of air
2. [2] 24-hour PM_{10} background is 28 $\mu g/m^3$
3. [3] 24-hour PM_{10} standard is 150 $\mu g/m^3$
4. [4] Annual background is 10 $\mu g/m^3$
5. [5] Annual standard is 50 $\mu g/m_3$
6. [6] 24-hour $PM_{2.5}$ background is 25 $\mu g/m^3$
7. 7 Annual $PM_{2.5}$ background is 9 $\mu g/m^3$

GDBR Proposed Action Annual Operations Emissions (tons/year)

Pollutant	15 Compressor Stations	15 Dehydrator Reboilers	969 Gas Well Pad Heater Separators	Vehicles	52 Oil Well Pad Pumping Units	22 CTF Heater Separator	Project Total
PM_{10}	20.5	0.4	12.1	249.1	0	0.6	282.6
$PM_{2.5}$	0	0.4	12.1	38.2	0	0.6	51.2
Ratio $PM_{2.5}/PM_{10}$							0.181

Note: emissions based on full-field operation after all development complete

GDBR Proposed Action Impacts

Pollutant	Averaging Period	GDBR Max (µg/m3)	Project + Background (µg/m3)	% of NAAQS (Project + Background)
Modeled PM_{10}	24-hour	20.9	48.9	32.6
Modeled PM_{10}	Annual	5.3	15.3	30.6
Scaled $PM_{2.5}$	24-hour	(20.9x.181 =) 3.78	28.78	82.2
Scaled $PM_{2.5}$	Annual	(5.3 x .181 =) 0.98	9.98	65.5

Note:

1. Impacts based on full-field operation after all development complete
2. $\mu g/m^3$ is micrograms of pollutant per cubic meter of air
3. 24-hour PM_{10} background is 28 $\mu g/m^3$
4. 24-hour PM_{10} standard is 150 $\mu g/m^3$
5. Annual background is 10 $\mu g/m^3$
6. Annual standard is 50 $\mu g/m^3$
7. 24-hour $PM_{2.5}$ background is 25 $\mu g/m^3$
8. Annual $PM_{2.5}$ background is 9 $\mu g/m^3$

Cumulative Impacts

As shown in the Proposed Action modeling, PM_{10} impacts are highest very near construction activities. Since construction activities do not tend to overlap in time or space, the incremental effects would not be additive. Therefore, the cumulative effects of both PM_{10} and $PM_{2.5}$ would be minimal.

2.9 Consultation:

U.S. Fish and Wildlife Service: The U.S. Fish and Wildlife Service was notified during the scoping process. The USFWS responded with a letter (see Appendix 3.5.2) indicating the requirement for formal consultation under Section 7 of the Endangered Species Act and the requirement for a Biological Assessment to be prepared in conjunction with the EIS process. During the public scoping period consultation was initiated by a letter dated January 18, 2004, that requested a list of species. A reply, including a list of species, was received on February 3, 2004. Prior to issuance of the FEIS, formal consultation was initiated on January 23, 2007. The response and Biological Opinion were received on May 15, 2007. Conservation measures were identified in the Opinion. Those were incorporated into this ROD as conditions of approval. Consultation will be reinitiated as necessary during the site specific review phase of individual applications.

Utah State Historic Preservation Office: During the scoping period, and in a letter dated January 8, 2004, BLM initiated consultation with the Utah State Historic Preservation Office. A reply was received on January 26, 2004, stating that statements in the scoping notice were accurate, and that consultation concerning the undertaking would occur as the undertaking was developed. A second letter requesting consultation was sent on February 13, 2005. SHPO did not respond to BLM, therefore BLM considers consultation closed in accordance with 36 CFR 800.3(c)(4). However, consultation will be reinitiated as necessary during the site specific review phase of individual applications.

Native American Tribes: During the scoping period, and in a letter dated January 8, 2004, BLM initiated consultation with the following Native American Tribes: Southern Ute Tribe, Navajo Nation, Paiute Indian Tribe of Utah, Pueblo of Zuni and Ute Mountain Ute, Hopi Tribe, Northern Ute Tribe, Shoshone-Bannock Tribe, and the Ute Indian Tribe. Scoping letters were received from the Hopi, Paiute, and the Southern Ute Tribes. The Southern Ute Tribe, in a letter dated January 28, 2004, stated that no known impacts to sites sensitive to the tribe were expected to occur, but that new discoveries should be reported immediately. The Paiute Tribe, in a letter dated January 15, 2004, expressed interest in the project and its impacts and asked for future copies of the EIS. No specific concerns were identified. The Hopi Tribe, in a letter dated January 13, 2004, expressed support for the identification and avoidance of prehistoric archaeological sites, and expressed interest in the need to identify and avoid those sites. Additional consultation occurred with the tribes during the public comment period. On February 17, 2006 a response was received from the Confederated tribes of the Goshute Reservation that stated they had no comments on the project. On February 22, 2006 a response was received from the Pueblo of the Laguna stating that the project would have No Affect, but that they would like to be notified if sites are discovered. Consultation is therefore considered to be closed. However, consultation will be reinitiated as necessary during the site specific review of individual applications

Signature Page

For

Greater Deadman Bench Oil and Gas Producing Region

Record of Decision

Signature and Title of Responsible Official:

William Stringer

Signature

Field Manager

Title

March 31, 2008

Date

APPEALS: This decision is effective upon the date it is signed by the authorized officer. The decision is subject to appeal. Under BLM regulation, this decision is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this decision must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, Utah State Office, P.O. Box 45155, Salt Lake City, Utah, 84145-0155, within 20 business days of the date this Decision is received or considered to have been received.

If you wish to file a petition for stay, the petition for stay should accompany your notice of appeal and shall show sufficient justification based on the following standards:

(1) The relative harm to the parties if the stay is granted or denied;
(2) The likelihood of the appellant's success on the merits;
(3) The likelihood of irreparable harm to the appellant or resources if the stay is not granted; and,
(4) Whether the public interest favors granting the stay.

If a petition for stay is submitted with the request for administrative review, a copy of the request for administrative review and petition for stay must be served on each party named in the decision from which the appeal is taken, and with the State Director at the same time it is filed with the authorized officer.

ATTACHMENT 1

Conditions of Approval

Operator Committed BMPs	Mitigation Measures	USFWS Conservation Measures	Conditions of Approval for the Greater Deadman Bench Project
			AIR QUALITY
X			QEP would install remote monitoring to measure production on gas and oil wells. This monitoring would reduce trips to individual sites by pumpers to once every three days instead of daily trips.
	X		Mitigation of air quality impacts will be accomplished through the permitting of all regulated air pollution sources through the Environmental Protection Agency, Region 8. The permitting process, where applicable (compressor engines, large glycol dehydration units), typically requires the use of clean burning engines and emission controls to reduce air pollution.
	X		To reduce the emission of fugitive dust from major roads, routine road watering and/or application of magnesium chloride will be considered.
			SOILS / WATER / EROSION CONTROL
X			QEP has committed to twin 216 wells and directionally drill 132 wells on/from other well pads.
X			All existing and newly constructed roads would be maintained during all drilling, completion, and production operations associated with the wells.
X	X		Planned access roads and surface disturbing activities would conform to standards outlined in the BLM and Forest Service publication: Surface Operating Standards for Oil and Gas Exploration and Development, 2006.
X			If a new road is needed to replace an existing road (realignment), QEP would reclaim and revegetate the existing road.
X			Where directed by the AO, QEP will construct erosion control devises (riprap, bales heavy vegetation) at culvert outlets.
X			QEP would use secondary containment (berms, metal containment rings) around chemical storage devises.
X			If it is determined by the AO that an access road in the project area is no longer used or needed, QEP will reseed the road and return it to its native condition. Access roads are typically the 30 ft. by 1,000 ft. roads that branch off the main Class B and D County roads.
X			QEP will maintain new access roads leading to their facilities inside the project area. Access roads are typically the 30 ft. by 1,000 ft. roads that branch off the main Class B and D County roads.
	X		Well pads located adjacent to drainages will be constructed with sufficient berms to prevent pad runoff from entering the drainage.
	X		Diversion ditches constructed to reroute drainages around well pads will be designed to divert the water back to the original channel. If the water cannot be returned to the original channel, then the water will be diverted to the nearest channel with energy dissipating devices installed to prevent channel degradation
	X		Well pads and facility sites will be constructed to prevent overland flow of water from entering or leaving sites through the use of berms, terraces, and grading from depressions.
	X		Well pads will be moved to avoid placement in the 100-year floodplains. If, due to topography or other environmental constraints, the well pads could not be moved out of the 100-year floodplains, the well pads would be sited as far as possible to the edge of the 100-year floodplain and would be designed and constructed in a manner that would minimize harm to or within the floodplain.

Operator Committed BMPs	Mitigation Measures	USFWS Conservation Measures	Conditions of Approval for the Greater Deadman Bench Project
	X		Roads crossing floodplains would be constructed at the narrowest part of the floodplain and perpendicular to the floodplain where feasible.
	X		Roads crossing floodplains would be constructed with culverts as directed by the AO.
VEGETATION/ RIPARIAN/SPECIAL STATUS PLANTS			
X			QEP would comply with Endangered Species Act regulations in order to prevent adverse impacts to federally listed, Candidate and Proposed plant species.
X	X		QEP would monitor and control noxious and invasive weeds along access road use authorizations, pipeline route authorizations, well sites, or other applicable facilities by spraying or mechanical removal. On BLM administered land, a Pesticide Use Proposal would be submitted and approved prior to the application of herbicides, pesticides or other hazardous chemicals.
X			After drilling and completion activities, QEP would initiate reclamation efforts to reduce the size of long-term well pads from the original disturbance of slightly over three acres to less than two acres. This reduction would be accomplished by reclamation of the drilling pit and revegetation of the portions of the pad that would no longer be needed for long-term operations.
X			QEP will work with AO to monitor the success of interim and final reclamation. QEP and the AO will perform regular inspections on chosen sites reclaimed two years prior. The two year gap will allow the seed to become established and give the vegetation two full growing seasons for a better measure of success. If QEP and the AO determine the reclamation has not been successful, QEP will reseed the location.
X			If a well is to be temporarily abandoned for more than 3 years, QEP will revegetate the well pad with a seed mixture approved by the BLM. If the well is brought back onto production, the minimum amount of clearing needed to conduct safe operations will be done.
X			Prior to any surface disturbance, all well pad sites and access roads in potential horseshoe milkvetch habitat would be examined by a botanist approved by the AO to determine if the species is present. These surveys would be conducted within the proper seasonal timeframe to be determined by the AO. Historically, these surveys have occurred form May to early June. If the species is present, QEP would implement appropriate avoidance or mitigation, including movement of roads, pipelines and well pads, and design modification as directed by the AO.
	X		Power washing of all construction and drilling equipment would occur prior to the equipment entering the project area from outside the Vernal Field Office area.

Operator Committed BMPs	Mitigation Measures	USFWS Conservation Measures	**Conditions of Approval for the Greater Deadman Bench Project**
	X		Over the construction, drilling and completion season, QEP will implement an intensive interim reclamation and weed control program beginning the first growing season after each segment of project completion. QEP would reseed in all portions of well pads and ROWs not utilized for the operational phase of the project, as well as any sites within the project area determined necessary by the appropriate AO. Reseeding would be accomplished using native plant species indigenous to the project area, unless otherwise directed by the AO. Post-construction seeding applications would continue as directed by the AO until determined successful.
	X		QEP would avoid placement of roads, pipelines, well pads, and ancillary facilities within 100 meters of riparian habitats. If avoidance is not feasible, then effects to riparian habitats would be minimized where possible.
	X		Uinta Basin hookless cactus (Sclerocactus glaucus (= brevispinus and wetlandicus): In order to minimize effects to the federally threatened Uinta Basin hookless cactus, the Bureau of Land Management (BLM) in coordination with the U.S. Fish and Wildlife Service (Service), developed the following avoidance and minimization measures. Integration of and adherence to these measures will help ensure the activities carried out during oil and gas development (including but not limited to drilling, production, and maintenance) are in compliance with the Endangered Species Act (ESA). The following avoidance and minimization measures should be included in the Plan of Development: 1. Pre-project habitat assessments will be completed across 100% of the project disturbance area within potential habitat[1] prior to any ground disturbing activities to determine if suitable Uinta Basin hookless cactus habitat is present. 2. Within suitable habitat[2], site inventories will be conducted to determine occupancy. Inventories: a. Must be conducted by qualified individual(s) and according to BLM and Service accepted survey protocols, b. Will be conducted in suitable and occupied[3] habitat for all areas proposed for surface disturbance prior to initiation of project activities and within the same growing season, at a time when the plant can be detected, and during appropriate flowering periods: i. *Sclerocactus brevispinus* surveys should be conducted March 15th to June 30th, unless

[1] *Potential habitat* is defined as areas which satisfy the broad criteria of the species habitat description; usually determined by preliminary, in-house assessment.

[2] *Suitable habitat* is defined as areas which contain or exhibit the specific components or constituents necessary for plant persistence; determined by field inspection and/or surveys; may or may not contain Uinta Basin hookless cactus. Habitat descriptions can be found in the U.S. Fish and Wildlife Service's 1990 Recovery Plan and Federal Register Notices for the Uinta Basin hookless cactus (http://www.fws.gov/endangered/wildlife.html).

[3] *Occupied habitat* is defined as areas currently or historically known to support Uinta Basin hookless cactus; synonymous with "known habitat."

Operator Committed BMPs	Mitigation Measures	USFWS Conservation Measures	**Conditions of Approval for the Greater Deadman Bench Project**
			extended by the BLM ii. *Sclerocactus wetlandicus* surveys can be done any time of the year, provided there is no snow cover, c. Will occur within 115' from the centerline of the proposed right-of-way for surface pipelines or roads; and within 100' from the perimeter of disturbance for the proposed well pad including the well pad, d. Will include, but not be limited to, plant species lists and habitat characteristics, and e. Will be valid until March 15th the following year for *Sclerocactus brevispinus* and one year from the survey date for *Sclerocactus wetlandicus*. 3. Design project infrastructure to minimize impacts within suitable habitat: a. Reduce well pad size to the minimum needed, without compromising safety, b. Limit new access routes created by the project, c. Roads and utilities should share common right-of-ways where possible, d. Reduce width of right-of-ways and minimize the depth of excavation needed for the road bed; where feasible, use the natural ground surface for the road within habitat, e. Place signing to limit off-road travel in sensitive areas, f. Stay on designated routes and other cleared/approved areas, and g. All disturbed areas will be re-vegetated with native species comprised of species indigenous to the area and non-native species that are not likely to invade other areas. 4. Within occupied habitat, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts to populations and to individual plants: a. Follow the above (#3) recommendations for project design within suitable habitats, b. Buffers of 100 feet minimum between the edge of the right of way (roads and surface pipelines) or surface disturbance (well pads) and plants and populations will be incorporated, c. Surface pipelines will be laid such that a 100 foot buffer exists between the edge of the right of way and the plants, use stabilizing and anchoring techniques when the pipeline crosses the habitat to ensure the pipelines don't move towards the population, d. Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc., e. Where technically and economically feasible, use directional drilling or multiple wells from the same pad, f. Designs will avoid concentrating water flows or sediments into occupied habitat,

Operator Committed BMPs	Mitigation Measures	USFWS Conservation Measures	**Conditions of Approval for the Greater Deadman Bench Project**
			g. Place produced oil, water, or condensate tanks in centralized locations, away from occupied habitat, and h. Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible. 5. Occupied Uinta Basin hookless cactus habitats within 100' of the edge of the surface pipelines' right-of-ways, 100' of the edge of the roads' right-of-ways, and 100' from the edge of the well pad shall be monitored for a period of three years after ground disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Annual reports shall be provided to the BLM and the Service. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and the Service. 6. Reinitiation of section 7 consultation with the Service will be sought immediately if any loss of plants or occupied habitat for the Uinta Basin hookless cactus is anticipated as a result of project activities. Additional site-specific measures may also be employed to avoid or minimize effects to the species. These additional measures will be developed and implemented in consultation with the U.S. Fish and Wildlife Service to ensure continued compliance with the ESA.
WILDLIFE/RAPTORS/SPECIAL STATUS SPECIES			
X			QEP would comply with Endangered Species Act regulations in order to prevent adverse impacts to federally listed, Candidate and Proposed wildlife species. QEP would also implement the following protective measures (timing and spatial stipulations) in order to prevent adverse impacts on non-listed wildlife species and habitats.

Raptor Protection Dates	
Raptor Nest	**Seasonal Buffer**
Bald eagle	January 1 – August 15
Great horned owl	February 1 – May 15
Golden eagle	February 1 – July 15
Peregrine falcon	February 1 – August 31
Ferruginous hawk	March 1 – July 15
Mexican spotted owl	March 1 – August 31
Long-eared owl	March 15 – June 15
Northern harrier, osprey, prairie falcon, red-tailed hawk, Swainson's hawk	April 1 – July 15
Burrowing owl	April 1 – August 15
Short-eared owl	April 10 – June 15
Merlin	April 15 – June 25
Northern goshawk	April 15 – August 20
American kestrel	May 1 – June 30

Operator Committed BMPs	Mitigation Measures	USFWS Conservation Measures	Conditions of Approval for the Greater Deadman Bench Project
			<table><tr><td>Cooper's hawk</td><td>May 1 – August 15</td></tr><tr><td>Turkey vulture</td><td>May 15 – August 15</td></tr><tr><td>Sharp-shinned hawk</td><td>June 20 -- August 15</td></tr><tr><td>Bald eagle winter roost areas</td><td>November 1 – March 15</td></tr><tr><td colspan="2">Source: BLM 1994. These seasonal ½ mile buffers around occupied raptor nests have been developed and successfully applied for several years with input from, and in coordination with, the Utah Division of Wildlife Resources (UDWR) and the U.S. Fish and Wildlife Service (USFWS).</td></tr></table>
X			Unless otherwise agreed to by the AO in writing, power lines shall be constructed in accordance with the standards outlined in Suggested Practices for Raptor Protection on Power Lines, (Edison Electrical Institute 1996). QEP would construct power lines in accordance with these standards or will assume the burden and expense of proving pole designs not shown in the referenced publication are "raptor safe". A raptor expert acceptable to the AO shall provide such proof.
X			The AO reserves the right to require modification or additions of power lines. QEP would make modifications to power line structures on route authorizations, should they be necessary to ensure the safety of large perching birds, without liability or expense to the Federal Government.
X			As directed by the AO, QEP would place raptor perch guards on power line poles in areas near sensitive wildlife habitat areas such as sage grouse leks and prairie dog towns.
X			QEP will not drill within the 100-year floodplain of the Green River.
X			Pits would be lined as directed by the AO in Endangered fish designated critical habitat (letter dated May 7, 2007.
X			QEP will implement a spill prevention, control and counter measure (SPCC) plan per the provisions of 40 CFR 112.
X			QEP has committed to construct a containment dike completely around those production facilities which contain fluids (I.e. production tanks, produced water tanks). These dikes would be constructed of compacted impervious subsoil, hold 110% of the capacity of the largest tank, and be independent of the back cut.
	X		Where feasible, locate well pads and facilities will be located in a manner to conceal them from raptor nests through the use of topographical or vegetative screening.
	X		Raptor nests surveys will occur on a site-specific basis in conjunction with the Application for Permit to Drill review process, and is the BLM's responsibility.
	X		Project facilities will be placed to avoid direct loss or modification of nesting and roosting habitats.
	X		Artificial nest platforms will be constructed as directed by the AO within the project area in order to mitigate any unavoidable losses of potential, natural nesting areas.
	X		QEP will encourage their field personnel to notify UDWR when animal carcasses are seen on or along roads in the project area.

Operator Committed BMPs	Mitigation Measures	USFWS Conservation Measures	**Conditions of Approval for the Greater Deadman Bench Project**
	X		No drilling will occur within ½ mile of a ferruginous hawk nest from March 1 to July 15 and no permanent structures within ¼ mile, unless topography screens the nests from construction operations.
	X		No construction and development activities will occur within ¼ mile of short-eared owl nests from April 10 to June 15; for burrowing owls the dates are April 1 to July 15.
	X		No surface disturbance will be allowed within greater sage grouse strutting and nesting habitat between March 1 and June 30.
	X		No permanent facilities will be allowed within 1,000 feet of any identified greater sage grouse strutting ground.
	X		No powerlines or electrical transmission lines will be constructed that would provide perch sites for raptors within 2 miles of sage grouse habitat.
	X	X	No construction or surface-disturbing activities would occur within ½ mile of a bald eagle roost site from November 1 through March 31. Temporary actions may occur within this ½ mile buffer outside of this seasonal restriction. If temporary actions must occur within the seasonal restriction, a qualified biologist approved the AO would monitor all project activities within ½ mile of known bald eagle roosts. Work related activities would be allowed to occur between 9:00 AM (typically after a bald eagle leaves its roost for the day) and 5:00 PM (typically before a bald eagle returns to the roost site for the evening). If bald eagles remain at the roost sites for longer hours, daytime restrictions may vary depending on the biologist's evaluation of when the eagle is at the roost.
	X	X	No permanent facilities will be placed within 0.5 miles of winter roost areas.
	X	X	Loss or disturbance to large cottonwood gallery riparian habitats would be avoided.
	X	X	Use directional drilling where technically and economically feasible to reduce disturbance and drilling in suitable roosting habitat. All areas of disturbance within riparian areas and/or adjacent uplands should be revegetated with native species, or non-native species that will not spread to adjacent habitats.
		X	All proposed actions will be conducted in a manner that will minimize harm to federally listed species through destruction of their suitable or designated critical habitats. o In addition to the applicant committed measure of not drilling within 100-year floodplains of the Green River there shall be no drilling within 100-year floodplains that are tributary to the Green River (see map 3.2.1 in the FEIS). o In areas adjacent to the 100-year floodplains, particularly in streams prone to flash floods, analyze the risk for flash floods in impact facilities, and use closed loop drilling, and pipeline burial or suspension according to Pipeline Crossing Guidance, as necessary to minimize the potential for equipment damage and resulting leaks or spills. o Within 100-year floodplains of waters not tributary to the Green River, consider using closed loop drilling and off-site production facilities to minimize the potential for equipment damage and resulting leaks or spills.

Operator Committed BMPs	Mitigation Measures	USFWS Conservation Measures	Conditions of Approval for the Greater Deadman Bench Project
		X	The following conservation measures would minimize possible impacts to black footed ferret habitat. o Place roads and well pads outside of prairie dog complexes. o If avoidance is not possible, place roads and well pads close to the colony edge, or in areas that keep surface disturbance of colonies to a minimum. o After drilling activities cease, reduce well pad size to the smallest possible size (tear-drop shape). o Keep road size (width) to a minimum. o When roads and well pads are no longer needed, reclaim disturbed areas with a suitable seed mix. This will also help control the spread of noxious weeds. o Where possible, bury power lines to reduce raptor perching/hunting sites. o Drill multiple wells from one pad where opportunities exist.
		X	In accordance with the Book Cliffs RMP Amendment, the following restrictions apply within the primary management zone for the reintroduced ferret population. o Activities involving the development or construction of temporary or permanent surface disturbances would be prohibited within 1/8 mile boundaries of known home ranges of female ferrets during the "critical" period from 1 May thru 15 July. o If a ferret is discovered at a commercial facility (e.g. Gilsonite mine, well pad, power plant), then it would be decided by the Service and UDWR if removal of the ferret was necessary and, if so, removal would be initiated within 48 hours. If the targeted animal(s0 cannot be captured within 72 hours of the commencement of trapping activities, such activities will cease and be replaced by a monitoring program to ascertain the status of the animal(s). Further attempts to remove the subject animal(s) would be based on this monitoring. o If ferrets are discovered at the site of a proposed commercial operation, then mitigation in the form of: delay of activities, movement of ferret(s), off-site prairie dog habitat development, redesign of activities, or any combination of the above would be required. The course of events chosen would be determined cooperatively by the operator, UDWR, the Service, and land management agency(ies). o Although formal Section 7 consultation would not be required, it is the intent that state and federal agencies would contact the Service and UDWR during the preliminary design of proposed projects or activities within the Primary Management Zone.
			CULTURAL RESOURCES
X			A Class III cultural resources survey, conducted by a qualified archaeologist, would be conducted over all areas proposed for surface disturbance. Class III cultural resource block surveys have been conducted in portions of the proposed development area and would be utilized where applicable.
X			If surveys identify areas with a high probability of encountering potentially significant subsurface archaeological sites, a qualified archaeologist would monitor surface disturbance during construction.
X			QEP and their contractors would inform their employees about relevant federal regulations intended to protect cultural resources.

Operator Committed BMPs	Mitigation Measures	USFWS Conservation Measures	Conditions of Approval for the Greater Deadman Bench Project
X			Equipment operators would be informed that if a site is uncovered during construction, activities in the vicinity would immediately cease and the AO would be notified.
X			Historic properties considered eligible for the National Register of Historic Places (NRHP) would be avoided or mitigated through an approved data recovery plan.
			PALEONTOLOGICAL RESOURCES
X			Based on site-specific recommendations from the BLM's AO, surveys for paleontological resources would be conducted on areas with sandstone outcrops and where bedrock excavation into sensitive formations is necessary. The survey would be conducted by a qualified paleontologist funded by QEP and would determine fossil localities and the sensitivity of the area for fossil resources. These actions would determine the necessity of having a qualified paleontologist on-site during construction.
X			If paleontological resources were uncovered during ground disturbing activities, QEP would suspend all operation that would further disturb such materials and would immediately contact BLM's AO, who would arrange for a determination of significance and, if necessary, recommend a recovery or avoidance plan.
	X		Condition 1[4] geologic units require a paleontological assessment of at least a 10 acre area around each well pad, and 100-foot corridor for each road or pipeline/power line, by a qualified and permitted paleontologist prior to ground disturbing activities. If fossils are found in the area, they are identified with their geographic location, and their stratigraphic context is recorded. If they reside directly in the path of the proposed disturbance, the fossils are collected. If a fossil site cannot be easily collected, the immediate area may be deemed off-limits to ground disturbance and the proposed access re-routed, or well-pad moved so that the sensitive area would not be disturbed. If the sedimentological units bear evidence of potential fossil resources buried within the path of disturbance, a paleontologist may be required to monitor construction in efforts to locate, preserve, and collect any fossils that might be uncovered. If a significant fossil is unearthed, the construction may be halted temporarily until it is mitigated. If a large significant site is uncovered (e.g. fossil bone bed, large associated skeleton, etc.) then construction must be postponed until the AO is contacted and a determination is made whether to move the location, or to have the fossils mitigated.

[4] A new Potential Fossil Yield Classification System replaced the Condition Classification System in October of 2007. Condition 1 areas under the Condition Classification System equates to Class 4 or Class 5 of the Potential Fossil Yield Classification System.

Operator Committed BMPs	Mitigation Measures	USFWS Conservation Measures	Conditions of Approval for the Greater Deadman Bench Project
			RECREATION/VISUAL RESOURCES
	X		To lessen the impact to the OHV recreational experience associated with the Devils Playground area, Burying all pipelines and flowlines should be considered to prevent contact with motorized cross country travel. The best placement of berms and well locations will be determined during the on-sites to avoid the risk of OHVs jumping over hills into un-seen cut faces or onto drilling or productions facilities.
X	X		Based on site-specific recommendations from the AO, surface equipment would be painted to blend in with the surroundings. Additionally, all surface equipment on a site (well pad, central tank facility, compressor station) would be painted the same color, unless otherwise specified by OSHA.
X			QEP would avoid, where feasible, the placement of facilities on hill tops or along ridge lines in visually sensitive areas classified as VRM Class III or higher. If facilities could not be relocated off ridge lines or hill tops in visually sensitive areas, QEP would consider the use of tanks with a smaller height as directed by the AO.
	X		Existing vegetation will be retained to screen facilities from the viewshed of the Old and New Bonanza Highways.
	X		Where topography permits, well pads will be positioned away from ridgelines readily visible from the Old and New Bonanza Highways to prevent "sky lining". Where feasible, shorter tanks could be considered when sky lining could not be avoided.
	X		Constructing straight access roads should be avoided. Where feasible, access roads will be constructed to follow the natural contours of the landscape.
			RANGELAND/GRAZING
X			Cattle guards would be used for fence crossings whenever practicable. If a fence must be cut, H-braces would be installed to support the existing fence and a cattle guard installed to prevent livestock movement.
	X		During the APD process, BLM would consider moving facilities up to 200 meters away from water courses, livestock corrals, BLM rain gauges, and long-term established vegetation studies. If these range facilities could not be avoided, the operators could be required to replace them.
			HEALTH AND SAFETY
X			All solid waste or trash would be transported for disposal to an approved solid waste disposal facility.
	X		QEP would include the adherence to speed limits as part of their employee training. Furthermore, QEP would include adherence to speed limits as part of their contractors' contracts.
	X		The following mitigation would be implemented if a compressor station would have to be located closer than 400 feet to an existing residence: o Increase the separation distance o Construct or use naturally-occurring obstacles in the direct path from the noise source to a receiver. However, these obstacles must be high enough to break line-of-sight between the compressor station and the residence. Obstacles can be tightly spaced wood fences (no gaps in the wood panels), concrete fences, earth berms, or naturally occurring hills.

ATTACHMENT 2

QEP May 7, 2007 letter

QUESTAR

Questar Exploration and Production Co.
1050 17th Street, Suite 500
Denver, Colorado 80265
Tel 303 672 6900

May 7, 2007

United States Department of the Interior and
Bureau of Land Management
Vernal Field Office
170 South 500 East
Vernal, UT 84078

United States Department of the Interior
Fish and Wildlife Service
Utah Field Office
2369 West Orton Circle, Suite 50
West Valley, UT 84119

Re: Greater Deadman Bench Region (GDBR)
Environmental Impact Statement (EIS)

Dear BLM and USFWS:

Questar wishes to address the concerns raised by the U.S. Fish & Wildlife Service (USFWS) regarding 6 conceptual wells along the Green River located in Sections 7 and 8 of Township 7 South, Range 21 East which are included in the Greater Deadman Bench Region EIS. Four of the conceptual wells are located on federal land and 2 are located on private land. While the scale of the maps provided makes it impossible to determine the exact location of the wells, the USFWS believes the conceptual locations may fall within the Green River floodplain. It must be emphasized that the locations of wells are conceptual based on the premise that wells would be drilled within the confines of 20-, 40-, or 80-acre spacing. Pre-drilling onsite inspections often reveal a need for a location to be moved up to 200 meters. If, at the onsite inspection, it was determined that the conceptual locations did fall within the Green River floodplain, a 200 meter move would most likely result in avoidance of the Green River floodplain.

However, to address USFWS concerns for the GDBR EIS, Questar will move the 6 conceptual wells and locate them outside the Green River floodplain.

If, in the future, Questar finds it is unable to access natural gas or oil reserves on these leases from locations outside the Green River floodplain, Questar will submit all required applications for permit to drill and/or rights-of-ways with the appropriate land management agencies and, if appropriate, will request consultations including a Stream Alteration Permit in coordination with the State of Utah, U.S. Army Corps of Engineers, and Section 7 consultation with the USFWS. Questar understands the USFWS may require a Habitat Conservation Plan that would provide mitigation to minimize impacts to candidate, threatened and endangered fish habitat, and that a possible outcome of consultations may be that the governing agencies could deny a permit to drill within the floodplain.

If you have any questions or concerns, please contact Stephanie Tomkinson at 435-828-8262.

Sincerely,

Jeff Tommerup
General Manager, Uinta Basin Division

cc: Buys & Associates, Inc.
Don Douglas, Project Manager
300 E. Mineral Ave., Suite 10
Littleton, CO 80122-2631

ATTACHMENT 3

U.S. Fish and Wildlife Service Biological Opinion

United States Department of the Interior
FISH AND WILDLIFE SERVICE
UTAH FIELD OFFICE
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UTAH 84119

Division	Initial	Assign
Field Manager	MG	
Associate/ Support Services		
Fire		
Lands & Minerals		
NEPA		
Renewables		
BUREAU OF LAND MGMT, VERNAL, UTAH		
ALL EMPLOYEES		

May 15, 2007

In Reply Refer To
FWS/R6
ES/UT
7-F-0130
6-UT-07-F-015

Memorandum

To: Field Manager, Vernal Field Office, Bureau of Land Management, Vernal, Utah

From: Utah Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service, West Valley City, Utah

Subject: Biological Opinion and Conclusion of Section 7 Consultation for Questar Exploration & Production Company's Greater Deadman Bench Oil and Gas Producing Region Project, Uintah County, Utah

In accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.), and the Interagency Cooperation Regulations (50 CFR 402), this transmits the Fish and Wildlife Service's (Service) final biological opinion for impacts to federally listed endangered species and designated critical habitat for Questar Exploration and Production Company's (QEP) Greater Deadman Bench Oil and Gas Producing Region (GDBR) Project. Reference is made to your March 27, 2007 correspondence requesting initiation of formal consultation for the subject project. Based on the information presented in the Environmental Assessment (EA) and Biological Assessment (BA) that you provided, we concur that the proposed action may adversely effect the endangered Colorado pikeminnow *(Ptychocheilus lucius)*, humpback chub (*Gila cypha*), bonytail (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*) and critical habitat.

Comments Regarding Migratory Birds

The Migratory Bird Treaty Act of 1918 (MBTA), as amended (16 U.S.C. 703 *et. seq.*), makes it unlawful to take, kill, or possess migratory birds, their parts, nests, or eggs. To help meet responsibilities under the MBTA and Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), we recommend that all open vent stack equipment, such as heater-treaters, separators, and dehydrator units, be designed and constructed to prevent birds and bats from entering or nesting in or on such units, and to the extent practical, to discourage birds from perching on the stacks. Installing cone-shaped mesh covers on all open vents is one

suggested method.

The EIS states that 43 proposed well locations are within ½ mile of a raptor nest. In order to ensure adequate protection for breeding raptors, we recommend strict adherence to the mitigation measures outlined in section 4.6.2:

- Wildlife
  - No permanent structures would be built within ½ mile of an active raptor nest unless the structures can be installed out of line of sight of the nest. If the structures can be installed out of line of sight of the nest, then no permanent structures would be built within ¼ mile of an active raptor nest.
  - Prohibit drilling within 1 mile of an active golden eagle or ferruginous hawk nest from February 1 to July 15. Prohibit drilling within 0.5 mile from other active raptor nests between April 1 and July 15.
  - Place project facilities to avoid direct loss or modification of nesting and roosting habitats.
  - Construct artificial nest platforms within the GDBR in order to mitigate any unavoidable losses of potential, natural nesting areas. Details of this measure would be negotiated with BLM wildlife biologists. The design and specifications of platforms would be studied and monitored to determine the optimal configuration and height.
  - Enhance existing nest sites within the boundaries of the project area. Details of this proposal would be negotiated with BLM wildlife biologists
- Special Status Wildlife
  - Prohibit construction and development activities within 1/4 mile of short-eared owl nests from April 1 to July 15; for burrowing owls the dates are April 15 to August 15.

The EIS states that 3 gas wells and 1 oil well disturb 19 acres of sage grouse leks (page 4-38). The following applicant and BLM committed mitigation measures are consistent with the Utah Division of Wildlife Resources'(UDWR) *Strategic Plan for Management of Sage Grouse, 2002*:

- Special Status Wildlife (4.6.2)
  - No permanent facilities would be allowed within 1,000 feet of any identified greater sage grouse strutting ground.
  - No surface disturbance would be allowed within greater sage grouse strutting and nesting habitat between March 1 and June 30.
  - No power lines or electrical transmission lines would be constructed that provide perch sites for raptors within 2 miles of sage grouse habitat (BLM 2003).
- Power lines (2.3.4)
  - As directed by the AO, QEP would place raptor perch guards on power line poles in areas near sensitive wildlife habitat areas such as sage grouse leks and prairie dog towns

To ensure leks are adequately protected, we recommend inclusion of the following additional conservation measures from the 2002 strategic plan:

1. Avoid developing roads, fences, poles, and utility lines within 1,000 feet (400 meters) of a lek.
2. Avoid human disturbances within 0.6 mile (1 km) of a lek during the breeding season (March 1 – May 31) from 1 hour before sunrise to 3 hours after sunrise.

In addition, we recommend working closely with the UDWR to ensure project related activities will not adversely impact sage grouse populations.

Section 7 Consultation under the Endangered Species Act

Based on the information provided in the March 27, 2007 EIS and BA, we concur that the GDBR project may affect, but is not likely to adversely affect, the bald eagle (*Haliaeetus leucocephalus*). Although bald eagles are not known to nest within or near the project area, winter roost and foraging habitat occurs within the GDBR. Implementation of the following applicant and BLM committed mitigation measures will help ensure project related activities do not adversely affect the bald eagle:

- Wildlife and Vegetation (2.3.3)
  - QEP would comply with Endangered Species Act (ESA) regulations in order to prevent adverse impacts to federally listed, Candidate and Proposed wildlife and plant species. QEP would also implement appropriate protective measures (e.g., timing and spatial stipulations), shown in Table 4.6-2: Raptor Protection Dates, in order to prevent adverse impacts on wildlife species and habitats.
  - QEP would construct netting, flagging, or an approved bird diversion mechanism on reserve pits as directed by the BLM's Authorized Officer (AO).
- Power Lines (2.3.4)
  - Unless otherwise agreed to by the AO in writing, power lines shall be constructed in accordance with the standards outlined in Suggested Practices for Raptor Protection on Power Lines, (Edison Electrical Institute 1996). QEP would construct power lines in accordance with these standards or will assume the burden and expense of proving pole designs not shown in the referenced publication are "raptor safe". A raptor expert acceptable to the AO shall provide such proof. The AO would require modification or additions to all power line structures on route authorizations, should they be necessary to ensure the safety of large perching birds. QEP would make such modifications and/or additions without liability or expense to the Federal Government.
- Special Status Wildlife (4.6.2.2)
  - DWR would be notified by QEP employees and contractors if big game carcasses are observed along roads and rights-of-way. It would be UDWR's responsibility to dispose of the carcasses.
  - Activities within ½ mile of winter roost areas, e.g., cottonwood galleries, will not occur during the winter roost season from November 1 to March 31.
  - No permanent facilities will be placed within 0.5 miles of winter roost areas.
  - Avoid loss or disturbance to large cottonwood gallery riparian habitats.
  - Use directional drilling where technically and economically feasible to reduce

disturbance and drilling in suitable roosting habitat. All areas of disturbance within riparian areas and/or adjacent uplands should be revegetated with native species,

Based on the information provided in the March 27, 2007 EIS and BA, we concur that the GDBR project may affect, but is not likely to adversely affect, the Uinta Basin hookless cactus (*Sclerocactus glaucus* (= var. *wetlandicus*)). The Uinta Basin hookless cactus has not been reported in the GDBR and the closest known occurrences of this cactus are west and southeast of the GDBR. Potential habitat of the Uinta Basin hookless cactus is present in the southern and west portions of the GDBR in the Uinta Geological. Implementation of the following applicant and BLM committed mitigation measures will help ensure project related activities do not adversely affect Uinta Basin hookless cactus:

- Noxious and Invasive Weeds (2.3.5)
    - QEP would monitor and control noxious and invasive weeds along access road use authorizations, pipeline route authorizations, well sites, or other applicable facilities by spraying or mechanical removal. On BLM administered land, a Pesticide Use Proposal would be submitted and approved prior to the application of herbicides, pesticides or other hazardous chemicals.
- Interim Reclamation (2.3.7)
    - After drilling and completion activities, QEP would initiate reclamation efforts to reduce the size of long-term well pads from the original disturbance of slightly over 3 acres to less than 2 acres. This reduction would be accomplished by reclamation of the drilling pit and revegetation of the portions of the pad that would no longer be needed for long-term operations.
- Construction and Operations (2.3.11)
    - QEP would install remote monitoring to measure production on gas and oil wells. At full development of the field, this monitoring would reduce trips to individual sites by pumpers to once every 3 days instead of daily trips.
- Reclaiming Temporarily Abandoned Well Pads (2.3.15)
    - If a well is to be temporarily abandoned for more than 3 years, QEP will revegetate the well pad with a seed mixture approved by the BLM. If the well is brought back into production, the minimum amount of clearing needed to conduct safe operations will be done.
- Vegetation Mitigation (4.5.2)
    - Power washing of all construction and drilling equipment would occur prior to the equipment entering the GDBR project area from outside the Vernal Field Office area.
    - Pre-project habitat assessment will be completed across 100 percent of the project disturbance area within potential habitat prior to any ground disturbing activities to determine if suitable Uinta Basin hookless cactus habitat is present.
    - Within suitable habitat, site inventories must be conducted by qualified individual(s) and according to BLM and Service accepted survey protocols.
    - Site inventories will be conducted in suitable and occupied habitat March 15 to June 30 for the *Sclerocactus brevispinus*, unless extended by the BLM.
    - *Sclerocactus wetlandicus* surveys can be done any time of the year, provided

there is no snow cover.

- Surveys will occur within 115 feet from the centerline of the proposed right-of-way for surface pipelines or roads; and within 100 feet from the perimeter of disturbance for the proposed well pad including the well pad.
- Project infrastructure will be designed to minimize impacts within suitable habitat.
- Well pad size will be reduced to the minimum needed, without compromising safety.
- Roads and utilities should share common right-of-ways where possible.
- The width of right-of-ways will be reduced to minimize the depth of excavation needed for the road bed.
- Where feasible, the natural ground surface will be used for the road within habitat.
- Signing will be placed in sensitive areas to limit off-road travel.
- Travel will be on designated routes and other cleared/approved areas.
- All disturbed areas will be revegetated with native species indigenous to the area and non-native species that are not likely to invade other areas.
- Within occupied habitat, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts to populations and to individual plants.
- Buffers of at least 100 feet will be established between the edge of the right of way or surface disturbance (roads, surface pipelines, and well pads) and Uinta Basin hookless cactus plants.
- Surface pipelines will be laid such that a 100 foot buffer exists between the edge of the right of way and the plants, use stabilizing and anchoring techniques when the pipeline crosses the habitat to ensure the pipelines don't move towards the population.
- Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc.
- Designs will avoid concentrating water flows or sediments into occupied habitat.
- Oil, water, or condensate tanks in centralized locations will be placed away from occupied habitat.
- Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible.
- Occupied Uinta Basin hookless cactus habitats within 100' of the edge of the surface pipeline rights-of-way, 100 feet of the edge of the roads' right-of-ways, and 100 feet from the edge of the well pad shall be monitored for a period of three years after ground disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Annual reports shall be provided to the BLM and the Service. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and the Service.
- Reinitiation of section 7 consultation with the Service will be sought immediately if any loss of plants or occupied habitat for the Uinta Basin hookless cactus is anticipated as a result of project activities.

Consultation History

On February 3, 2004 we responded to your January 8, 2004 request for information for the Questar Exploration and Production (QEP) Company's Greater Deadman Bench oil and gas production region project in Uintah County, Utah.

On March 24, 2006 we provided comments on your January 2006 Draft Environmental Impact Statement on the Proposed Greater Deadman Bench Region Oil and Gas Field Development; 1792 UT080-P.

On February 2, 2007 we received your Final Environmental Impact Statement (FEIS) and Biogical Assessment (BA) for Questar Exploration and Production Company's (QEP), Greater Deadman Bench Oil and Gas Producing Region.

On April 2, 2007 we received your revised Final Environmental Impact Statement (FEIS) and Biogical Assessment (BA) for Questar Exploration and Production Company's (QEP), Greater Deadman Bench Oil and Gas Producing Region.

On May 8, 2007 we received a letter from Questar stating they will move the 6 conceptual wells and locate them outside the Green River floodplain.

A complete administrative record for this project is on file in our office.

Biological Opinion

1. Description of Proposed Action

The purpose of the project is to develop oil and gas resources within the 98,785-acre GDBR. The following activities are anticipated:

- Construction and drilling of up to 1,239 gas and oil/water injection wells
- Construction of approximately 170 miles of new access roads;
- Construction of approximately 235 miles of pipelines and flowlines
- Construction of fifteen 2,000 horsepower compressor stations
- Construction of 22 central tank facilities

Construction is anticipated to begin after the EIS Record of Decision is issued, approval of individual Applications for Permit to Drill, and approved Right-of-Way grants. It is anticipated that construction activities associated with the oil and gas field development will take 10 years and that the wells will produce for 40 years. The project area is approximately 20 miles south of Vernal, Utah. Land ownership within this area is divided among the BLM, the Utah State Institutional Trust Lands Administration (SITLA), and various private entities. No Tribal lands are within the GDBR. BLM-administered lands account for approximately 83,864 acres (85%) of surface and mineral estate lands within the GDBR. Utah SITLA lands account for approximately 11,448 acres (12%) of surface and mineral estate lands within the GDBR. The remaining 3,473

acres (3%) consist of various privately owned surface and mineral estate lands within the GDBR. QEP currently holds leases on 79% of the federal, state, and private lands within the GDBR. Long term surface disturbance associated with project activities is 4,561 acres.

The BA and EIS state that the water required for drilling and completion of the proposed wells will be approximately 108 acre-feet per year and 2,300 acre-feet per year of water will be required for water-flood operations. The resultant annual water use during the 10-year development phase would be a maximum of 2,408 acre-feet per year and would decrease to 2,300 acre-feet per year after all wells were developed. QEP has existing water rights from five Green River wells: State of Utah 49-251, 49-279, 49-280, 49-296, and 49-297. These water rights were issued August 1964 and are therefore considered as a historic depletion.

Applicant and BLM Committed Conservation Measures

The following applicant and BLM committed conservation measures will minimize the impacts of the proposed action to the four federally endangered fish species and their designated critical habitat:

- Construction and Operations (2.3.11)
  - Where directed by the AO, QEP would construct erosion control devises (riprap, bales, heavy vegetation) at culvert outlets.
  - QEP would use secondary containment (berms, metal containment rings) around chemical storage devices.
  - QEP would install remote monitoring to measure production on gas and oil wells. At full development of the field, this monitoring would reduce trips to individual sites by pumpers to once every 3 days instead of daily trips.
  - QEP has committed to line pits as directed by the Surface Management Agency.
- Endangered Fish and Designated Critical Habitat (letter from QEP dated May 7, 2007)
  - QEP will not drill within the 100-year floodplain of the Green River.
- Water Resources Mitigation (4.2.2)
  - Well pads and facility sites would be constructed to prevent overland flow of water from entering or leaving sites. This could be accomplished through the use of berms, terraces, and grading from depressions. These measures would prevent storm water from leaving the sites, and would divert storm water around the sites.
  - Well pads could be moved 200 meters according 43 CFR 3101.1-2 to avoid placement of well pads in floodplains. If well pads could not be moved out of the floodplain, the well pad should be constructed as far as possible to the edge of the designated floodplain.
  - Roads crossing floodplains would be constructed at the narrowest part of the floodplain and perpendicular to the floodplain, where feasible.
  - Roads crossing floodplains would be constructed with culverts as approved by the AO.
- Noxious and Invasive Weeds (2.3.5)
  - QEP would monitor and control noxious and invasive weeds along access road use authorizations, pipeline route authorizations, well sites, or other applicable facilities by spraying or mechanical removal. On BLM administered land, a

Pesticide Use Proposal would be submitted and approved prior to the application of herbicides, pesticides or other hazardous chemicals.

- Interim Reclamation (2.3.7)
  - After drilling and completion activities, QEP would initiate reclamation efforts to reduce the size of long-term well pads from the original disturbance of slightly over 3 acres to less than 2 acres. This reduction would be accomplished by reclamation of the drilling pit and revegetation of the portions of the pad that would no longer be needed for long-term operations.
- Reclaiming Temporarily Abandoned Well Pads (2.3.15)
  - If a well is to be temporarily abandoned for more than 3 years, QEP will revegetate the well pad with a seed mixture approved by the BLM. If the well is brought back into production, the minimum amount of clearing needed to conduct safe operations will be done.
- Vegetation Mitigation (4.5.2)
  - Power washing of all construction and drilling equipment would occur prior to the equipment entering the GDBR project area from outside the Vernal Field Office area.
- Reduced Surface Disturbance Footprint (2.3.6)
  - Planned access roads and surface disturbing activities would conform to standards outlined in the BLM and Forest Service publication: Surface Operating Standards for Oil and Gas Exploration and Development, 2006(The Gold Book).

QEP will implement a Spill Prevention, Control, and Countermeasure (SPCC) plan per the provisions of 40 CFR 112. QEP has committed to constructing a containment dike completely around those production facilities which contain fluids (i.e., production tanks, produced water tanks). These dikes would be constructed of compacted impervious subsoil; hold 110% of the capacity of the largest tank; and, be independent of the back cut. Facilities must implement the SPCC, including carrying out the spill prevention and control measures established for the type of facility or operations, such as measures for containing a spill (e.g., berms or secondary containment around tanks). In addition, facility owners or operators must conduct employee training on the contents of the SPCC Plan.

For more detailed information regarding the proposed action, please refer to BLM's March 27, 2007, *Final Environmental Impact Statement (FEIS) and Biological Assessment (BA) for Questar Exploration & Production Company's (QEP), Greater Deadman Bench Oil and Gas Producing Region.*

2. STATUS OF THE SPECIES / CRITICAL HABITAT

2.1. Colorado Pikeminnow

For detailed information regarding the species and critical habitat description, status and distribution, life history, and threats to the species, please see the U.S. Fish and Wildlife Service's July 28, 2006 memo addressed to the Vernal Field Office, BLM regarding the Programmatic Water Depletion for Oil and Gas Development.

Status of Colorado pikeminnow and Critical Habitat in the Action Area

Preliminary population estimates presented in the Recovery Goals (USFWS 2002a) for the three Colorado pikeminnow populations (Green River Subbasin, Upper Colorado River Subbasin, San Juan River Subbasin) ranged from 6,600 to 8,900 wild adults. These numbers provided a general indication of the total wild adult population size at the time the Recovery Goals were developed, however, it was also recognized that the accuracy of the estimates vary among populations.

Monitoring of Colorado pikeminnow populations is ongoing and sampling protocols and the reliability of the population estimates are being assessed by the Service and cooperating entities. A recent draft report on the status of Colorado pikeminnow in the Green River subbasin (Bestgen et al. 2005) presented population estimates for adult (>450 mm total length (TL)) and recruit-sized (400–449 mm TL) Colorado pikeminnow. The report suggests that over the study period (2001 to 2003) there was a decline in abundance of Colorado pikeminnow in the entire Green River basin from 3,304 (95 percent confidence interval, 2,900 to 3,707) fish in 2001 to 2,142 (95 percent confidence interval 1,686 to 2,598) fish in 2003, a 35% reduction. Bestgen et al. (2005) divided the Green River Basin into five main reaches: the Yampa River, the White rivers, and three reaches of the Green River. Three of these reaches are at least partially contained within the VFO: the White River, the middle Green River, and the Desolation-Gray Canyon reach of the Green River. Adult abundance estimates in the White River declined from 1,100 animals in 2000 to 407 animals in 2003 and recruit-sized estimates declined from 45 animals in 2001 to zero in 2003. In the middle Green River (Yampa River confluence to Desolation Canyon) abundance estimates for adults ranged from 1,613 animals in 2000 to 663 animals in 2003 and estimates of abundance of recruit-sized fish ranged from 103 animals in 2000 to 43 animals in 2003. Estimates for the Desolation-Gray Canyon reach of the Green River ranged from 699 adults in 2001 to 621 adults in 2003 and recruit-sized estimates ranged from 163 animals in 2001 to 152 animals in 2003. Studies indicate that significant recruitment of Colorado pikeminnow may not occur every year, but occurs in episodic intervals of several years (Osmundson and Burnham 1998).

All life stages of Colorado pikeminnow in the Green River demonstrate wide variations in abundance at seasonal, annual, or longer time scales, but reasons for shifts in abundance are poorly understood. Bestgen et al. (1998) captured drifting larvae produced from the two main spawning areas in the Green River system and found order-of-magnitude differences in abundance from year to year. They reported that low- or high-discharge years were often associated with poor reproduction but could not ascribe a specific cause-effect mechanism (Bestgen et al. 1998). In general, similar numbers of age-0 fish were found in autumn in the middle Green River, in spite of different-sized cohorts of larvae produced each summer in the Yampa River. Conversely, numbers of Colorado pikeminnow larvae produced in the lower Green River were similar among years but resulted in variable age-0 fish abundance in autumn.

In the Green River subbasin, radio-telemetry studies have shown that distribution of adults changes in late spring and early summer when most mature fish migrate to spawning areas in the lower Yampa River in Yampa Canyon and the lower Green River in Gray Canyon (Tyus and McAda 1984; Tyus 1985; Tyus 1990; Tyus 1991; Irving and Modde 2000). Those fish remain in

spawning areas for 3–8 weeks before returning to home ranges. Because adult Colorado pikeminnow converge on spawning areas from throughout the Green River system to reproduce at these two known localities, migration cues are an important part of the reproductive life history. In general, adults begin migrating in late spring or early summer. Migrations began earlier in low-flow years and later in high-flow years (Tyus and Karp 1989; Tyus 1990; Irving and Modde 2000). Migrations to the Yampa River spawning area occur coincident with, and up to 4 weeks after, peak spring runoff when water temperatures are usually 14–16 °C (Tyus 1990; Irving and Modde 2000). Rates of movement for individuals are not precisely known, but 2 individuals made the approximately 400 km migration from the White River below Taylor Draw Dam to the Yampa River spawning area in less than 2 weeks. Alteration of the natural hydrograph may alter the environmental cues triggering these spawning migrations.

High magnitude flows of infrequent occurrence are necessary to create and maintain spawning habitat. Infrequent intense flooding redistributes and creates spawning bars (O'Brien 1984). Annual lower-level flooding followed by recessional flows dissects and secondarily redistributes gravels, preparing them for spawning (Harvey et al. 1993). These studies conducted at a known spawning location in Yampa Canyon show that both processes are important for habitat maintenance and activities that reduce or re-time the annual peak or reduce the frequency of high magnitude flows are likely to reduce essential spawning habitat in amount and quality.

Similar to adults, distribution of early life stages of Colorado pikeminnow is dynamic on a seasonal basis and linked to habitat in the mainstem Green River downstream of spawning areas. After hatching and emergence from spawning substrate, larvae are dispersed downstream. A larva may drift for only a few days, but larvae occur in main channels of the Yampa and Green rivers for 3–8 weeks depending on length of the annual reproductive period (Nesler et al. 1988; Tyus and Haines 1991; Bestgen et al. 1998).

Only one primary reach of Colorado pikeminnow nursery habitat is present in the Green River system within the Vernal Field Office (VFO) and occurs within the project area: from near Jensen, Utah, downstream to the Duchesne River confluence (Tyus and Haines 1991; McAda et al. 1994a; McAda et al. 1994b; McAda et al. 1997). Larvae from the lower Yampa River are thought to mostly colonize backwaters in alluvial valley reaches between Jensen, Utah, and the Ouray National Wildlife Refuge. Most floodplain habitat along the current-day Green River is concentrated in this reach. Although the density of age-0 fish in autumn was usually higher in the lower than in the middle Green River (Tyus and Haines 1991; McAda et al. 1994a), differences in habitat quantity may have confounded abundance estimates. The reach of the Green River defined mostly by Desolation and Gray Canyons also provides nursery habitat for Colorado pikeminnow (Tyus and Haines 1991; Day et al. 1999b). These backwaters are especially important during the Colorado pikeminnow's critical first year of life.

Backwaters and physical factors that create them are vital to successful recruitment of early life stages of Colorado pikeminnow. The project area in the vicinity of the Green River lies between two priority floodplain sites, Above Brennan on BLM land and Johnson Bottom in the Ouray National Wildlife Refuge (Valdez and Nelson 2004). Occasional very high spring flows are needed to transport sediment and maintain or increase channel complexity. Sediment transport from the Little Snake River provides an estimated 60 percent of the total sediment supply to the

Green River and is important to maintain equilibrium channel morphology and ensure continued creation and maintenance of backwater nursery habitats for Colorado pikeminnow and humpback chub (Hawkins and O'Brien 2001). During high-discharge events, the elevation of sand bars increases and if high flows persist through summer, few backwaters are formed (Tyus and Haines 1991). Post-runoff low flows sculpt and erode sand bars and create complex backwater habitat critical for early life stages of all native fishes, particularly Colorado pikeminnow. Deeper, chute-channel backwaters are preferred by age-0 Colorado pikeminnow in the Green River (Tyus and Haines 1991; Day and Crosby 1997; Day et al. 1999a; Trammell and Chart 1999). Alterations to the amount and timing of flows defining the natural hydrology and sediment transport processes may inhibit the processes that create and maintain these habitats.

Past research indicated that certain discharge levels may optimize backwater habitat availability below Jensen for age-0 Colorado pikeminnow (Pucherelli et al. 1990; Tyus and Haines 1991; Tyus and Karp 1991). However, many geomorphic processes are dynamic over time and driven by the level of spring flows, the frequency of large floods, and post-peak discharge levels (Bell et al. 1998; Rakowski and Schmidt 1999). Consequently, flows to achieve optimum backwater availability may be different each year and dependent upon year-to-year bar topography (Rakowski and Schmidt 1999).

Muth et al. (2000) summarized flow and temperature needs of Colorado pikeminnow in the Green River subbasin as:

> "...Colorado pikeminnow are widespread in the system, occurring in both the main stem and tributaries. The Green River downstream of its confluence with the Yampa River supports the largest population of adults and nearly all larval and juvenile rearing areas; thus, this portion of the system is critical for sustaining Colorado pikeminnow populations. Reproduction of Colorado pikeminnow occurred in all years studied, and the current abundance of adults is comparatively high.
>
> However, the abundance of larval and age-0 stages is highly variable among years and is currently low compared to the abundance observed in the late 1980s. Recruitment has been low or nonexistent in some reaches and years.
>
> Habitat requirements of Colorado pikeminnow vary by season and life stage. In spring, adults utilize warmer off-channel and floodplain habitats for feeding and resting. Declining flow, increasing water temperature, photoperiod, and perhaps other factors in early summer provide cues for reproduction. Declining flow in summer also removes fine sediments from spawning substrates, and increases in water temperature also aid gonadal maturation. Reproduction begins when water temperatures reach 16–22°C. After hatching and swim-up, larvae drift downstream and occupy channel-margin backwaters. The potential for cold shock to Colorado pikeminnow larvae drifting from the Yampa River and into the Green River in summer could be eliminated or reduced if warmer water was provided in Reach 1 (Flaming Gorge Dam to the Yampa River confluence). Warm water also promotes fast growth of Colorado pikeminnow, which reduces effects of size-dependent regulatory processes such as predation. This warmer water also may provide conditions suitable for spawning in Lodore Canyon of Reach 1 and would enhance growth of early life stages in nursery habitats (e.g., backwaters) throughout Reach 2 (Yampa River to the White River confluence). Low, relatively stable base flows create warm, food-rich backwaters that are thought to promote enhanced growth and survival of

early life stages through autumn and winter. Similarly, low, relatively stable winter flows may enhance overwinter survival by reducing disruption of ice cover and habitat.

In-channel habitats used by Colorado pikeminnow are formed and maintained by spring peak flows that rework existing sediment deposits, scour vegetation from deposits, and create new habitats. The magnitudes of these flows were highly variable prior to flow regulation, and this variability appears to be important for maintaining high-quality habitats. In-channel habitats preferred by young Colorado pikeminnow are relatively deep (mean, 0.3 m) chute-channel backwaters. High peak flows maintain these habitats by periodically removing accumulated sediments and rebuilding the deposits that provide the structure for formation of backwaters after flows recede."

River reaches (including the 100-year floodplain) that make up critical habitat for Colorado pikeminnow within the project area (59 FR 13374) include:

Utah, Uintah, Carbon, Grand, Emery, Wayne, and San Juan Counties; and Colorado, Moffat County. The Green River and its 100-year floodplain from the confluence with the Yampa River in T. 7 N., R. 103 W., section 28 (6th Principal Meridian) to the confluence with the Colorado River in T. 30 S., R. 19 E., section 7 (Salt Lake Meridian).

All primary constituent elements (water, physical habitat, and biological environment) have been affected throughout designated critical habitat on the Green River and could be further influenced through implementation of the proposed action. To date, water quantity and quality have been affected by flow regulation and land management practices (water depletion), which has resulted in increased concentrations of contaminants (most notably selenium). Physical habitat (spring adult staging areas (floodplain), spawning and nursery habitats) has been affected through flow regulation, land management practices (diking), and encroachment of nonnative vegetation (primarily tamarisk). The biological environment has been altered primarily due to the introduction of numerous species of nonnative fish disrupting the natural balance of competition and predation. All constituent elements of designated Colorado pikeminnow critical habitat along the Green River will be considered in our analysis of the effects of the proposed action.

2.2. Razorback Sucker

For detailed information regarding the species and critical habitat description, status and distribution, life history, and threats to the species, please see the U.S. Fish and Wildlife Service's July 28, 2006 memo addressed to the Vernal Field Office, BLM regarding the Programmatic Water Depletion for Oil and Gas Development.

Status of Razorback Sucker and Critical Habitat in the Action Area

The largest concentration of razorback suckers in the Upper Basin exists in low-gradient flat-water reaches of the middle Green River between and including the lower few miles of the Duchesne River and the Yampa River (Tyus 1987; Tyus and Karp 1990; Muth 1995; Modde and

Wick 1997; Muth et al. 2000). This area includes the greatest expanse of floodplain habitat in the Upper Colorado River Basin, between Pariette Draw at river mile (RM) 238 and the Escalante Ranch at RM 310 (Irving and Burdick 1995).

Lanigan and Tyus (1989) used a demographically closed model with capture-recapture data collected from 1980 to 1988 and estimated that the middle Green River population consisted of about 1,000 adults (mean, 948; 95 percent confidence interval, 758–1,138). Based on a demographically open model and capture-recapture data collected from 1980 to 1992, Modde et al. (1996) estimated the number of adults in the middle Green River population at about 500 fish (mean, 524; 95 percent confidence interval, 351–696). That population had a relatively constant length frequency distribution among years (most frequent modes were in the 505–515 mm-TL interval) and an estimated annual survival rate of 71 percent. The most recent estimate of wild razorback sucker in the middle Green River was approximately 100, based on data collected in 1998 and 1999 (Bestgen et al. 2002).

The lower Yampa River provides adult habitat, spawning habitat, and potential nursery areas occur downstream in the Green River (USFWS 1998a). Modde and Smith (1995) reported that adult razorback suckers were collected between RM 13 and RM 0.1 of the Yampa River. They also reported only one juvenile razorback sucker has been collected in the Yampa River. The single fish (389 mm) was collected at RM 39 in June 1994. The Green River from the confluence with the Yampa River to Sand Wash has the largest existing riverine population of razorback sucker (Lanigan and Tyus 1989; Modde et al. 1996). Razorback suckers are rarely found upstream as far as the confluence with the Little Snake River (McAda and Wydoski 1980; Lanigan and Tyus 1989). Tyus and Karp (1990) located concentrations of ripe razorback suckers at the mouth of the Yampa River during the spring in 1987-1989. Ripe fish were captured in runs associated with bars of cobble, gravel, and sand substrates in water averaging 0.63 m deep and mean velocity of 0.74 m/s.

Razorback suckers are permanent residents of the Green River below its confluence with the Yampa River and are reliant on in-channel habitat for spawning and flooded off-channel habitats for several aspects of their life history. In turn, these habitats are created and maintained by the natural hydrology and sediment transport provided by the Yampa River.

Spring migrations by adult razorback suckers were associated with spawning in historic accounts (Jordan 1891; Hubbs and Miller 1953; Sigler and Miller 1963; Vanicek 1967) and a variety of local and long-distance movements and habitat-use patterns have been subsequently documented. Spawning migrations (one-way movements of 30.4–106.0 km) observed by Tyus and Karp (1990) included movements between the Ouray and Jensen areas of the Green River and between the Jensen area and the lower Yampa River. Initial movement of adult razorback suckers to spawning sites was influenced primarily by increases in river discharge and secondarily by increases in water temperature (Tyus and Karp 1990; Modde and Wick 1997; Modde and Irving 1998). Flow and temperature cues may serve to effectively congregate razorback suckers at spawning sites, thus increasing reproductive efficiency and success. Reduction in spring peak flows may hinder the ability of razorback suckers to form spawning aggregations, because spawning cues are reduced (Modde and Irving 1998).

Captures of ripe fish and radio-telemetry of adults in spring and early summer were used to locate razorback sucker spawning areas in the middle Green River. McAda and Wydoski (1980) found a spawning aggregation of 14 ripe fish (2 females and 12 males) over a cobble bar at the mouth of the Yampa River during a 2-week period in early to mid-May 1975. These fish were collected from water about 1 m deep with a velocity of about 1 m/s and temperatures ranging from 7 to 16°C (mean 12°C). Tyus (1987) captured ripe razorback suckers in three reaches: 1) Island and Echo parks of the Green River in Dinosaur National Monument, including the lower mile of the Yampa River; 2) the Jensen area of the Green River from Ashley Creek (RM 299) to Split Mountain Canyon (RM 319); and 3) the Ouray area of the Green River, including the lower few miles of the Duchesne River.

Substantial numbers of razorback sucker adults have been found in flooded off-channel habitats in the vicinity of mid-channel spawning bars shortly before or after spawning. Tyus (1987) located concentrations of ripe fish associated with warm floodplain habitats and in shallow eddies near the mouths of tributary streams. Similarly, Holden and Crist (1981) reported capture of 56 adult razorback suckers in the Ashley Creek-Jensen area of the middle Green River from 1978 to 1980, and about 19 percent of all ripe or tuberculate razorback suckers collected during 1981–1989 ($N = 57$) were from flooded lowlands (e.g., Old Charlie Wash and Stewart Lake Drain) and tributary mouths (e.g., Duchesne River and Ashley Creek) (Tyus and Karp 1990). Radio-telemetry and capture-recapture data compiled by Modde and Wick (1997) and Modde and Irving (1998) demonstrated that most razorback sucker adults in the middle Green River moved into flooded environments (e.g., floodplain habitats and tributary mouths) soon after spawning. Tyus and Karp (1990, 1991) and Modde and Wick (1997) suggested that use of warmer, more productive flooded habitats by adult razorback suckers during the breeding season is related to temperature preferences (23–25°C; Bulkley and Pimental 1983) and abundance of appropriate foods (Jonez and Sumner 1954; Vanicek 1967; Marsh 1987; Mabey and Shiozawa 1993; Wolz and Shiozawa 1995; Modde 1997; Wydoski and Wick 1998). Twelve ripe razorback suckers were caught in Old Charlie Wash during late May–early June 1986, presumably due to the abundant food in the wetland (Tyus and Karp 1991). Reduced spring flooding caused by lower regulated river discharges, channelization, and levee construction has restricted access to floodplain habitats used by adult razorback suckers for temperature conditioning, feeding, and resting (Tyus and Karp 1990; Modde 1997; Modde and Wick 1997; Wydoski and Wick 1998). The fact that these fish actively seek out this habitat suggests that the conditioning it provides them is important to their continued successful reproduction.

Razorback sucker larvae were collected each year in the Green River during 1992–1996. Over 99 percent (N = 1,735) of the larvae caught in the middle Green River during spring and early summer were from reaches including, and downstream of, the presumed spawning area near the Escalante Ranch (Muth et al. 1998). Based on the few larvae ($N = 6$) recorded from collections in the Echo Park reach in 1993, 1994, and 1996, reproduction by razorback suckers at the lower Yampa River spawning site appeared minimal, but sampling efforts in the two reaches immediately downstream of that site were comparatively low (Muth et al. 1998). Mean catch per unit effort (CPUE) was highly variable among years and river reaches but it is unclear whether this was a true measure of population abundance or was biased by differences in sampling efficiency (Muth et al. 1998). Numbers of razorback sucker larvae captured per year ranged from 20 in 1992 to 1,217 in 1994 for the middle Green River and from 5 in 1995 to 222 in 1996

for the lower Green River.

Collections in the lower Green River during 1993–1996 produced the first ever captures of razorback sucker larvae from this section of river. In the lower Labyrinth-upper Stillwater Canyon reach, 363 razorback suckers were caught; all from flooded side canyons, washes, backwaters, and side channels. Razorback sucker larvae were collected in the Echo Park area of the Green River in 1993, 1994, 1996, indicating successful spawning in the lower Yampa River (Muth et al. 1998).

Historically, floodplain habitats inundated and connected to the main channel by overbank flooding during spring-runoff discharges would have been available as nursery areas for young razorback suckers in the Green River. Tyus and Karp (1990) associated low recruitment with reductions in floodplain inundation since 1962 (closure of Flaming Gorge Dam), and Modde et al. (1996) associated years of high spring discharge and floodplain inundation in the middle Green River (1983, 1984, and 1986) with subsequent suspected recruitment of young adult razorback suckers. These floodplain habitats are essential for the survival and recruitment of larval fish. Relatively high zooplankton densities in these warm, productive habitats are necessary to provide adequate zooplankton densities for larval food. Loss or degradation of these productive floodplain habitats probably represents one of the most important factors limiting recruitment in this species (Wydoski and Wick 1998). The importance of these habitats is further underscored by the relationship between larval growth and mortality due to non-native predators (Bestgen et al. 1997). Predation by adult red shiners on larvae of native catostomids in flooded and backwater habitats of the Yampa, Green, or Colorado Rivers was documented by Ruppert et al.(1993) and Muth and Wick (1997). Water depletions and changes in timing of flows may reduce the quantity and availability of floodplain habitat, thus reducing larval growth and recruitment.

Muth et al. (2000) summarized flow and temperature needs of razorback sucker in the Green River subbasin as:

> "Current levels of recruitment of young razorback suckers are not sufficient to sustain populations in the Green River system; wild stocks are composed primarily of older individuals that continue to decline in abundance. Lack of adequate recruitment has been attributed to extremely low survival of larvae and juveniles. Reproduction by razorback suckers in the Green River was documented through captures of larvae each year during 1992-1996, but mortality of larvae was apparently high, possibly as a result of low growth rates and the effect of small body size on competition and the risk of predation. Only six juveniles have been collected from Green River backwaters since 1990, but 73 juveniles were collected from the Old Charlie Wash managed wetland in Reach 2 during 1995/1996.
>
> Floodplain areas inundated and temporarily connected to the main channel by spring peak flows appear to be important habitats for all life stages of razorback sucker, and the seasonal timing of razorback sucker reproduction suggests an adaptation for utilizing these habitats. However, the frequency, magnitude, and duration of seasonal overbank

> flooding in the Green River have been substantially reduced since closure of Flaming Gorge Dam. Restoring access to these warm and productive habitats, which are most abundant in Reach 2 within the Ouray NWR area, would provide the growth and conditioning environments that appear crucial for recovery of self-sustaining razorback sucker populations. In addition, lower, more stable flows during winter may reduce flooding of low-velocity habitats and reduce the breakup of ice cover in overwintering areas and may enhance survival of adults.
>
> Spring peak flows must be of sufficient magnitude to inundate floodplain habitats and timed to occur when razorback sucker larvae are available for transport into these flooded areas. Overbank flows of sufficient duration would provide quality nursery environments and may enhance the growth and survival of young fish. Because at least some young razorback suckers entrained in more permanent ponded (depression) sections of floodplains may survive through subsequent winters, spring inundation will need to be repeated at sufficiently frequent intervals to provide access back into the main channel."

Members of the Green River Team have identified Split Mountain to Desolation Canyon as the most important reach for razorback sucker in the Green River Subbasin based on recent captures of larval and juvenile razorback sucker (Gutermuth et al. 1994; Muth and Wick 1997; Valdez and Nelson 2004). The project area in the vicinity of the Green River lies between two priority floodplain sites, Above Brennan on BLM land and Johnson Bottom in the Ouray National Wildlife Refuge (Valdez and Nelson 2004).

River reaches (including the 100-year floodplain) that make up critical habitat for Colorado razorback sucker within the project area (59 FR 13374) include:

> Utah, Uintah County; and Colorado, Moffat County. The Green River and its 100-year floodplain from the confluence with the Yampa River in T. 7 N., R. 103 W., section 28 (6th Principal Meridian) to Sand Wash in T. 11 S., R. 18 E., section 20 (6th Principal Meridian).

All primary constituent elements (water, physical habitat, and biological environment) have been affected throughout designated critical habitat on the Green River and could be further influenced through implementation of the proposed action. To date, water quantity and quality has been affected by flow regulation and land management practices (irrigated agriculture), which has resulted in increased concentrations of contaminants (most notably selenium). Physical habitat (spring adult staging areas (floodplain), spawning and nursery habitats) has been affected through flow regulation, land management practices (diking), and encroachment of nonnative vegetation (primarily tamarisk). The biological environment has been altered primarily due to the introduction of numerous species of nonnative fish disrupting the natural balance of competition and predation. All constituent elements of designated razorback sucker critical habitat will be considered in our analysis of the effects of the proposed action.

2.3. Humpback Chub

For detailed information regarding the species and critical habitat description, status and distribution, life history, and threats to the species, please see the U.S. Fish and Wildlife Service's July 28, 2006 memo addressed to the Vernal Field Office, BLM regarding the Programmatic Water Depletion for Oil and Gas Development.

Status of Humpback Chub in the Action Area

Monitoring humpback chub populations is ongoing and sampling protocols and reliability of population estimates are being assessed by the Service and cooperating entities. The humpback chub recovery goals (USFWS 2002c) provided the following preliminary population estimates for adults in the six populations:

Black Rocks, Colorado River, Colorado -- 900–1,500
Westwater Canyon, Colorado River, Utah -- 2,000–5,000
Yampa Canyon, Yampa River, Colorado -- 400–600
Desolation/Gray Canyons, Green River, Utah -- 1,500
Cataract Canyon, Colorado River, Utah -- 500
Grand Canyon, Colorado River and Little Colorado River, Arizona -- 2,000–4,700

Low numbers of humpback chub have been captured in Whirlpool Canyon and Split Mountain Canyon on the Green River in Dinosaur National Monument; however, these fish were considered part of the Yampa River population in the Recovery Goals (USFWS 2002c), and not separate populations.

Tyus and Karp (1991) found that in the Yampa and Green rivers in Dinosaur National Monument, humpback chubs spawn during spring and early summer following peak flows at water temperatures of about 20°C. They estimated that the spawning period for humpback chub ranges from May into July, with spawning occurring earlier in low-flow years and later in high-flow years; spawning was thought to occur only during a 4–5 week period (Karp and Tyus 1990). Tyus and Karp (1989) reported that humpback chubs occupy and spawn in and near shoreline eddy habitats and that spring peak flows were important for reproductive success because availability of these habitats is greatest during spring runoff.

High spring flows that simulate the magnitude and timing of the natural hydrograph provide a number of benefits to humpback chubs in the Yampa and Green rivers. Bankfull and overbank flows provide allochthonous energy input to the system in the form of terrestrial organic matter and insects that are utilized as food. High spring flows clean spawning substrates of fine sediments and provides physical cues for spawning. High flows also form large recirculating eddies used by adult fish. High spring flows (50 percent exceedance or greater) have been implicated in limiting the abundance and reproduction of some nonnative fish species under certain conditions (Chart and Lentsch 1999a, 1999b) and have been correlated with increased recruitment of humpback chubs (Chart and Lentsch 1999b).

Muth et al. (2000) summarized flow and temperature needs of humpback chub in the Green

River subbasin as:

> "...The habitat requirements of the humpback chub are incompletely understood. It is known that fish spawn on the descending limb of the spring hydrograph at temperatures greater than 17°C. Rather than migrate, adults congregate in near-shore eddies during spring and spawn locally. They are believed to be broadcast spawners over gravel and cobble substrates. Young humpback chubs typically use low-velocity shoreline habitats, including eddies and backwaters, that are more prevalent under base-flow conditions. After reaching approximately 40-50 mm TL, juveniles move into deeper and higher-velocity habitats in the main channel.
>
> Increased recruitment of humpback chubs in Desolation and Gray Canyons was correlated with moderate to high water years from 1982 to 1986 and in 1993 and 1995. Long, warm growing seasons, which stimulate fish growth, and a low abundance of competing and predatory nonnative fishes also have been implicated as potential factors that increase the survival of young humpback chubs.
>
> High spring flows increase the availability of the large eddy habitats utilized by adult fish. High spring flows also maintain the complex shoreline habitats that are used as nursery habitat by young fish during subsequent base flows. Low-velocity nursery habitats that are used by young fish are warmer and more productive at low base flows."

Critical habitat for humpback chub has not been designated within the project area.

2.4. Bonytail

For detailed information regarding the species and critical habitat description, status and distribution, life history, and threats to the species, please see the U.S. Fish and Wildlife Service's July 28, 2006 memo addressed to the Vernal Field Office, BLM regarding the Programmatic Water Depletion for Oil and Gas Development.

Status of Bonytail in the Action Area

Bonytail were extirpated between Flaming Gorge Dam and the Yampa River, primarily because of rotenone poisoning and cold-water releases from the dam (USFWS 2002c). Surveys from 1964 to 1966 found large numbers of bonytail in the Green River in Dinosaur National Monument downstream of the Yampa River confluence (Vanicek and Kramer 1969). Surveys from 1967 to 1973 found far fewer bonytail (Holden and Stalnaker 1975). Few bonytail have been captured after this period, and the last recorded capture in the Green River was in 1985 (USFWS 2002d). Bonytail are so rare that it is currently not possible to conduct population estimates. A stocking program is being implemented to reestablish populations in the upper Colorado River basin.

In the Green River, Vanicek (1967) reported that bonytails were generally found in pools and eddies in the absence of, although occasionally adjacent to, strong current and at varying depths generally over silt and silt-boulder substrates. Adult bonytail captured in Cataract, Desolation, and Gray Canyons were sympatric with humpback chub in shoreline eddies among emergent boulders and cobble, and adjacent to swift current (Valdez 1990). The diet of the bonytail is presumed similar to that of the humpback chub (USFWS 2002d).

Between 1998 and 2003, the number of bonytail stocked in the Green River subbasin was 189,438 fish, with the majority of the fish being juveniles at the time of stocking.

Although sufficient information on physical processes that affect bonytail habitats was not available to recommend specific flow and temperature regimes in the Green River to benefit this species, Muth et al. (2000) concluded that flow and temperature recommendations made for Colorado pikeminnow, razorback sucker, and humpback chub would presumably benefit bonytail and would not limit their its future recovery potential.

Critical habitat for bonytail has not been designated within the project area.

3. ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed State or Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation process. The action area is defined at 50 CFR 402 to mean "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action". For the purposes of this consultation, the action area has been defined to include those areas downstream or upstream of the pipeline crossing that are affected by the proposed action, regardless of land ownership.

3.1. Colorado Pikeminnow

Preliminary population estimates presented in the Recovery Goals (Service 2002a) for the three Colorado pikeminnow populations ranged from approximately 6,600 to 8,900 wild adults: Green River Subbasin, 6,000–8,000 (Nesler 2000; Service 2002a); Upper Colorado River Subbasin, 600–900 (Nesler 2000; Osmundson 2002 [includes some subadults]); and San Juan River Subbasin, 19–50 (Holden 1999; Service 2002a). These numbers provided a general indication of the total wild adult population size at the time the Recovery Goals were developed, however, it was also recognized that the accuracy of the estimates vary among populations. Monitoring of Colorado pikeminnow populations is ongoing, and sampling protocols and the reliability of the population estimates are being assessed by the Service and cooperating entities.

The Green River Subbasin is the only population that occurs within the VFO and is likely to be affected by the propose action (Figure 4). Therefore, only this population is discussed further.

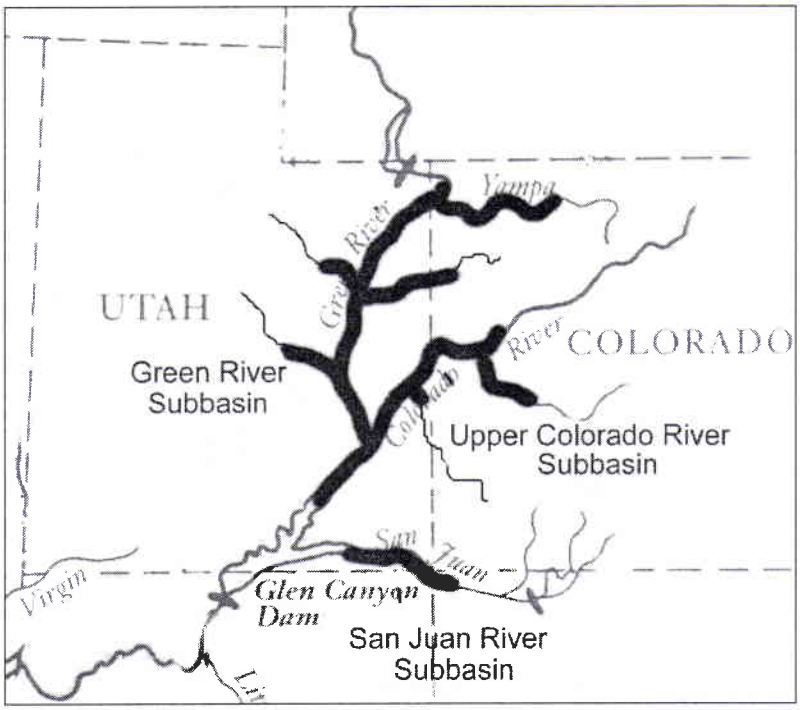

Figure 1. Colorado pikeminnow populations (Service 2002a).

For the period 1986–1997, the catch of adult Colorado pikeminnow per hour of electrofishing in the Green River steadily increased (McAda *et al.* 1998). Catch rates from the 1986–1988 period to the 1996–1997 period increased by three-fold from about 0.8 fish/hour to about 2.5 fish/hour. Relative condition of adult Colorado pikeminnow in the Green River declined between these two time periods, suggesting that the population was at or near carrying capacity under existing conditions. Recently, small adult Colorado pikeminnow have moved into the Price River, where they were not reported from surveys in the 1970's (Cavalli 1999), and also suggesting dispersal as a result of carrying capacity (Service 2002a).

Estimates of Colorado pikeminnow (includes some subadults) in the uppermost 98 km (upstream of Westwater Canyon) increased from 205 in 1991 to 332 in 1994 and 435 in 1998 (Osmundson and Burnham 1998; Osmundson 1999), an increase of 112% during the 8-year period. Relative condition of adult Colorado pikeminnow in this upper reach remained constant during 1991–1994 but declined significantly with higher numbers in 1998 (Osmundson 1999), suggesting that carrying capacity had been reached or exceeded at about 435 Colorado pikeminnow, or about 4 fish/km (Service 2002a).

A recent report on the status of Colorado pikeminnow in the Green River subbasin (Bestgen *et al.* 2005) presented population estimates for adult (>450 mm total length (TL)) and recruit-sized (400–449 mm TL) Colorado pikeminnow. The report suggests that over the study period (2001 to 2003) there was a decline in abundance of Colorado pikeminnow in the Green River subbasin from 3,338 (95 percent confidence interval, 2815 to 3861) animals in 2001 to 2,324 (95 percent confidence interval 1395 to 3252) animals in 2003. In the middle Green River (Yampa River confluence to Desolation Canyon) abundance estimates for adults ranged from 1,629 animals in 2000 to 747 animals in 2003 and estimates of abundance of recruit-sized fish ranged from 103

animals in 2000 to 50 animals in 2003. Studies indicate that significant recruitment of Colorado pikeminnow may not occur every year, but occurs in episodic intervals of several years (Osmundson and Burnham 1998).

Currently, two primary reaches of Colorado pikeminnow nursery habitat are present in the Green River system. The upper one occurs from near Jensen, Utah, downstream to the Duchesne River confluence. The lower one occurs from near Green River, Utah, downstream to the Colorado River confluence (Tyus and Haines 1991; McAda *et al.* 1994a; McAda *et al.* 1994b; McAda *et al.* 1997). Larvae from the lower Yampa River are thought to mostly colonize backwaters in alluvial valley reaches between Jensen, Utah, and the Ouray National Wildlife Refuge. Most floodplain habitat along the current-day Green River is concentrated in this reach. Although the density of age-0 fish in autumn was usually higher in the lower than in the middle Green River (Tyus and Haines 1991; McAda *et al.* 1994a), differences in habitat quantity may have confounded abundance estimates. These backwaters are especially important during the Colorado pikeminnow's critical first year of life.

Major declines in Colorado pikeminnow populations occurred during the dam-building era of the 1930s through the 1960s. Behnke and Benson (1983) summarized the decline of the natural ecosystem, pointing out that dams, impoundments, and water use practices drastically modified the river's natural hydrology and channel characteristics throughout the Colorado River Basin. Dams on the mainstem broke the natural continuum of the river ecosystem into a series of disjunct segments, blocking native fish migrations, reducing temperatures downstream of dams, creating lacustrine habitat, and providing conditions that allowed competitive and predatory nonnative fishes to thrive both within the impounded reservoirs and in the modified river segments that connect them. The highly modified flow regime in the lower basin coupled with the introduction of nonnative fishes decimated populations of native fish.

The primary threats to Colorado pikeminnow are stream flow regulation and habitat modification; competition with and predation by nonnative fishes; and pesticides and pollutants (Service 2002a). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. These impairments are described in further detail below.

Threats from pesticides and pollutants include accidental spills of petroleum products and hazardous materials; discharge of pollutants from uranium mill tailings; and high selenium concentration in the water and food chain (Service 2002a). Accidental spills of hazardous material into critical habitat can cause immediate mortality when lethal toxicity levels are exceeded. Pollutants from uranium mill tailings cause high levels of ammonia that exceed water quality standards. High selenium levels may adversely affect reproduction and recruitment (Hamilton and Wiedmeyer 1990; Stephens *et al.* 1992; Hamilton and Waddell 1994; Hamilton *et al.* 1996; Stephens and Waddell 1998; Osmundson *et al.* 2000).

Management actions identified in the recovery goals for Colorado pikeminnow (Service 2002a) to minimize or remove threats to the species included:

- provide and legally protect habitat (including flow regimes necessary to restore and maintain required environmental conditions) necessary to provide adequate habitat and sufficient range for all life stages to support recovered populations;
- provide passage over barriers within occupied habitat to allow adequate movement and, potentially, range expansion;
- investigate options for providing appropriate water temperatures in the Gunnison River;
- minimize entrainment of subadults and adults in diversion canals;
- ensure adequate protection from overutilization;
- ensure adequate protection from diseases and parasites;
- regulate nonnative fish releases and escapement into the main river, floodplain, and tributaries;
- control problematic nonnative fishes as needed;
- minimize the risk of hazardous-materials spills in critical habitat; and
- remediate water-quality problems.

Programs were established to recover the endangered Colorado River fish in the Green and Colorado River sub-basins (the Upper Colorado River Endangered Fish Recovery Program; established in 1988) and in the San Juan River sub-basin (the San Juan River Recovery Implementation Program; established in 1995), while allowing for continued water development under state and federal water law. Program sponsors include federal and state agencies, water users, and environmental groups. These programs are designed to offset impacts to the endangered fish stemming from historic and future water depletions. To date, recovery efforts have focused on:

- Providing instream flows through the development of flow recommendations for important reaches of occupied habitat; flows are then provided through the re-operation of mainstem reservoirs or through lease and purchase of water rights;
- Controlling non-native fish populations, primarily via mechanical removal;
- Restoring habitats through the construction of fish passage structures at instream barriers and installing screens at the head of irrigation canals to reduce entrainment of native fishes;
- Developing genetically viable refuge populations in hatcheries and then using hatchery reared stocks to augment wild populations where necessary;
- Working with cooperating state agencies to minimize the conflicts between native fish recovery and sportfish management;
- Monitoring populations in the wild to determine the effectiveness of the aforementioned recovery actions; and
- Sharing information about the endangered fish and the recovery efforts through an information and education program.

3.2. Razorback Sucker

In Utah, the razorback sucker currently occupies parts of the Green River Subbasin (Green River, Yampa River, White River, and Duchesne River), the Upper Colorado River Subbasin (Upper

Colorado River), and the San Juan River Subbasin (San Juan River) (Service 2002b; 54 FR 54967; 54 FR 13374; Figure 5). The Green River Subbasin is the only population that is likely to be affected by the proposed action. Therefore, further discussions regarding this species will be limited to this population.

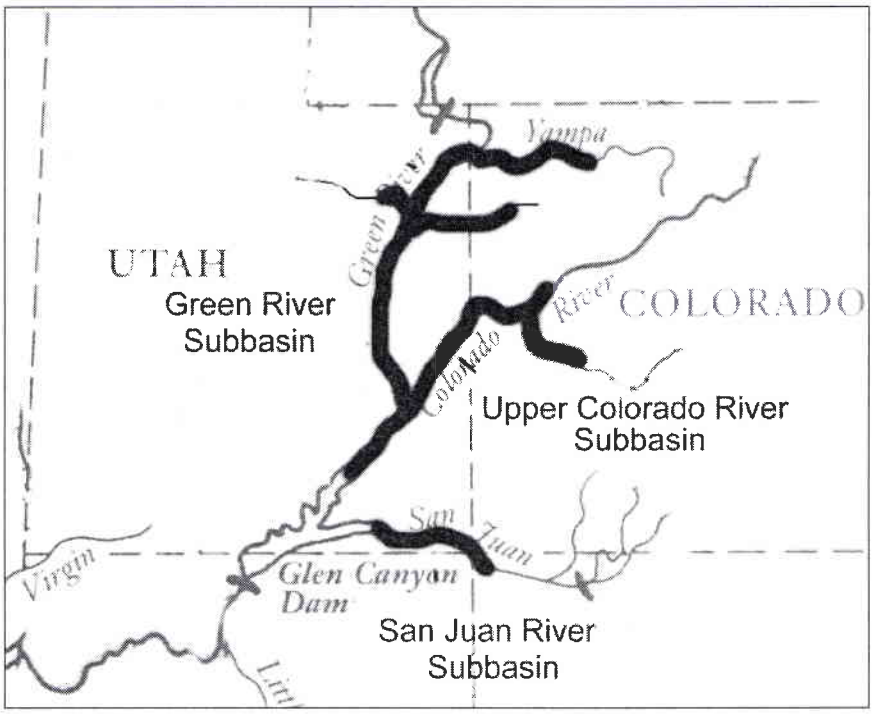

Figure 2. Razorback sucker populations (Service 2002b).

The largest concentration of razorback suckers in the Upper Basin exists in low-gradient flat-water reaches of the middle Green River between and including the lower few miles of the Duchesne River and the Yampa River (Tyus 1987; Tyus and Karp 1990; Muth 1995; Modde and Wick 1997; Muth *et al.* 2000). This area includes the greatest expanse of floodplain habitat in the Upper Colorado River Basin, between Pariette Draw at river mile (RM) 238 and the Escalante Ranch at RM 310 (Irving and Burdick 1995). Known spawning sites are located in the lower Yampa River and in the Green River near Escalante Ranch between river km 492 and 501 (distance upstream from Colorado River confluence), but other, less-used sites are probable (Tyus and Karp 1990; Modde and Wick 1997; Modde and Irving 1998).

Lanigan and Tyus (1989) used a demographically closed model with capture-recapture data collected from 1980 to 1988 and estimated that the middle Green River population consisted of about 1,000 adults (mean, 948; 95 percent confidence interval, 758–1,138). Based on a demographically open model and capture-recapture data collected from 1980 to 1992, Modde *et al.* (1996) estimated the number of adults in the middle Green River population at about 500 fish (mean, 524; 95 percent confidence interval, 351–696). That population had a relatively constant length frequency distribution among years (most frequent modes were in the 505–515 mm-TL interval) and an estimated annual survival rate of 71 percent. Bestgen *et al.* (2002) estimated the current population of wild razorback sucker in the middle Green River to be about 100, based on data collected in 1998 and 1999.

The Green River from the confluence with the Yampa River to Sand Wash has the largest existing riverine population of razorback sucker (Lanigan and Tyus 1989; Modde *et al.* 1996). Razorback suckers are permanent residents of the Green River below its confluence with the Yampa River and are reliant on in-channel habitat for spawning and flooded off-channel habitats for several aspects of their life history. In turn, these habitats are created and maintained by the natural hydrology and sediment transport provided by the Yampa River.

Spring migrations by adult razorback suckers were associated with spawning in historic accounts (Jordan 1891; Hubbs and Miller 1953; Sigler and Miller 1963; Vanicek 1967) and a variety of local and long-distance movements and habitat-use patterns have been subsequently documented. Spawning migrations (one-way movements of 30.4–106.0 km) observed by Tyus and Karp (1990) included movements between the Ouray and Jensen areas of the Green River and between the Jensen area and the lower Yampa River. Initial movement of adult razorback suckers to spawning sites was influenced primarily by increases in river discharge and secondarily by increases in water temperature (Tyus and Karp 1990; Modde and Wick 1997; Modde and Irving 1998). Flow and temperature cues may serve to effectively congregate razorback suckers at spawning sites, thus increasing reproductive efficiency and success. Reduction in spring peak flows may hinder the ability of razorback suckers to form spawning aggregations, because spawning cues are reduced (Modde and Irving 1998).

Captures of ripe fish and radio-telemetry of adults in spring and early summer were used to locate razorback sucker spawning areas in the middle Green River. McAda and Wydoski (1980) found a spawning aggregation of 14 ripe fish (2 females and 12 males) over a cobble bar at the mouth of the Yampa River during a 2-week period in early to mid-May 1975. These fish were collected from water about 1 m deep with a velocity of about 1 m/s and temperatures ranging from 7 to 16°C (mean, 12°C). Tyus (1987) captured ripe razorback suckers in three reaches: 1) Island and Echo parks of the Green River in Dinosaur National Monument, including the lower mile of the Yampa River; 2) the Jensen area of the Green River from Ashley Creek (RM 299) to Split Mountain Canyon (RM 319); and 3) the Ouray area of the Green River, including the lower few miles of the Duchesne River. The Jensen area contributed 73 percent of the 60 ripe razorback suckers caught over coarse sand substrates or in the vicinity of gravel and cobble bars in those 3 reaches during spring 1981, 1984, and 1986.

Substantial numbers of razorback sucker adults have been found in flooded off-channel habitats in the vicinity of mid-channel spawning bars shortly before or after spawning. Tyus (1987) located concentrations of ripe fish associated with warm floodplain habitats and in shallow eddies near the mouths of tributary streams. Similarly, Holden and Crist (1981) reported capture of 56 adult razorback suckers in the Ashley Creek-Jensen area of the middle Green River from 1978 to 1980, and about 19 percent of all ripe or tuberculate razorback suckers collected during 1981–1989 ($N = 57$) were from flooded lowlands (e.g., Old Charlie Wash and Stewart Lake Drain) and tributary mouths (e.g., Duchesne River and Ashley Creek) (Tyus and Karp 1990). Radio-telemetry and capture-recapture data compiled by Modde and Wick (1997) and Modde and Irving (1998) demonstrated that most razorback sucker adults in the middle Green River moved into flooded environments (e.g., floodplain habitats and tributary mouths) soon after spawning. Tyus and Karp (1990, 1991) and Modde and Wick (1997) suggested that use of warmer, more productive flooded habitats by adult razorback suckers during the breeding season

is related to temperature preferences (23–25°C; Bulkley and Pimental 1983) and abundance of appropriate foods (Jonez and Sumner 1954; Vanicek 1967; Marsh 1987; Mabey and Shiozawa 1993; Wolz and Shiozawa 1995; Modde 1997; Wydoski and Wick 1998). Twelve ripe razorback suckers were caught in Old Charlie Wash during late May–early June 1986, presumably due to the abundant food in the wetland (Tyus and Karp 1991). Eight adult razorback suckers collected from Old Charlie Wash in late summer 1995 entered the wetland when it was connected to the river during peak spring flows (Modde 1996). Reduced spring flooding caused by lower regulated river discharges, channelization, and levee construction has restricted access to floodplain habitats used by adult razorback suckers for temperature conditioning, feeding, and resting (Tyus and Karp 1990; Modde 1997; Modde and Wick 1997; Wydoski and Wick 1998). The fact that these fish actively seek out this habitat suggests that the conditioning it provides them is important to their continued successful reproduction.

Razorback sucker larvae were collected each year in the Green River during 1992–1996. Over 99 percent (N = 1,735) of the larvae caught in the middle Green River during spring and early summer were from reaches including, and downstream of, the presumed spawning area near the Escalante Ranch (Muth *et al.* 1998). Based on the few larvae ($N = 6$) recorded from collections in the Echo Park reach in 1993, 1994, and 1996, reproduction by razorback suckers at the lower Yampa River spawning site appeared minimal, but sampling efforts in the two reaches immediately downstream of that site were comparatively low (Muth *et al.* 1998). Mean catch per unit effort (CPUE) was highly variable among years and river reaches but it is unclear whether this was a true measure of population abundance or was biased by differences in sampling efficiency (Muth *et al.* 1998). Numbers of razorback sucker larvae captured per year ranged from 20 in 1992 to 1,217 in 1994 for the middle Green River and from 5 in 1995 to 222 in 1996 for the lower Green River.

Historically, floodplain habitats inundated and connected to the main channel by over-bank flooding during spring-runoff discharges would have been available as nursery areas for young razorback suckers in the Green River. Tyus and Karp (1990) associated low recruitment with reductions in floodplain inundation since 1962 (closure of Flaming Gorge Dam), and Modde *et al.* (1996) associated years of high spring discharge and floodplain inundation in the middle Green River (1983, 1984, and 1986) with subsequent suspected recruitment of young adult razorback suckers. These floodplain habitats are essential for the survival and recruitment of larval fish. Relatively high zooplankton densities in these warm, productive habitats are necessary to provide adequate zooplankton densities for larval food. Loss or degradation of these productive floodplain habitats probably represents one of the most important factors limiting recruitment in this species (Wydoski and Wick 1998). The importance of these habitats is further underscored by the relationship between larval growth and mortality due to non-native predators (Bestgen *et al.* 1997). Predation by adult red shiners on larvae of native catostomids in flooded and backwater habitats of the Yampa, Green, or Colorado Rivers was documented by Ruppert *et al.*(1993) and Muth and Wick (1997).

A marked decline in populations of razorback suckers can be attributed to construction of dams and reservoirs, introduction of nonnative fishes, and removal of large quantities of water from the Colorado River system. Dams on the mainstem Colorado River and its major tributaries have segmented the river system, blocked migration routes, and changed river habitat into lake habitat.

Dams also have drastically altered flows, temperatures, and channel geomorphology. These changes have modified habitats in many areas so that they are no longer suitable for breeding, feeding, or sheltering. Major changes in species composition have occurred due to the introduction of numerous nonnative fishes, many of which have thrived due to human-induced changes to the natural riverine system. These nonnative fishes prey upon and compete with razorback suckers.

The primary threats to razorback sucker are stream flow regulation and habitat modification; competition with and predation by nonnative fishes; and pesticides and pollutants (Service 2002b). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering.

Management actions identified in the recovery goals for razorback sucker (Service 2002b) to minimize or remove threats to the species included:

- provide and legally protect habitat (including flow regimes necessary to restore and maintain required environmental conditions) necessary to provide adequate habitat and sufficient range for all life stages to support recovered populations;
- provide passage over barriers within occupied habitat to allow unimpeded movement and, potentially, range expansion;
- investigate options for providing appropriate water temperatures in the Gunnison River;
- minimize entrainment of subadults and adults in diversion/out-take structures;
- ensure adequate protection from overutilization;
- ensure adequate protection from diseases and parasites;
- regulate nonnative fish releases and escapement into the main river, floodplain, and tributaries;
- control problematic nonnative fishes as needed;
- minimize the risk of hazardous-materials spills in critical habitat;
- remediate water-quality problems; and
- minimize the threat of hybridization with white sucker.

Programs were established to recover the endangered Colorado River fish in the Green and Colorado River sub-basins (the Upper Colorado River Endangered Fish Recovery Program; established in 1988) and in the San Juan River sub-basin (the San Juan River Recovery Implementation Program; established in 1995), while allowing for continued water development under state and federal water law. Program sponsors include federal and state agencies, water users, and environmental groups. These programs are designed to offset impacts to the endangered fish stemming from historic and future water depletions. To date, recovery efforts have focused on:

- Providing instream flows through the development of flow recommendations for important reaches of occupied habitat; flows are then provided through the re-operation of mainstem reservoirs or through lease and purchase of water rights.
- Controlling non-native fish populations, primarily via mechanical removal.

- Restoring habitats through the construction of fish passage structures at instream barriers and installing screens at the head of irrigation canals to reduce entrainment of native fishes.
- Developing genetically viable refuge populations in hatcheries and then using hatchery reared stocks to augment wild populations where necessary.
- Working with cooperating state agencies to minimize the conflicts between native fish recovery and sportfish management.
- Monitoring populations in the wild to determine the effectiveness of the aforementioned recovery actions.
- Sharing information about the endangered fish and the recovery efforts through an information and education program.

3.3. Humpback Chub

Six self-sustaining populations of humpback chub are known to exist, three of which are in Utah (Service 2002c; Figure 6):

- Westwater Canyon, Colorado River, Utah – 2,900-6,500
- Desolation/Gray Canyons, Green River, Utah -- 1,500
- Cataract Canyon, Colorado River, Utah – 500

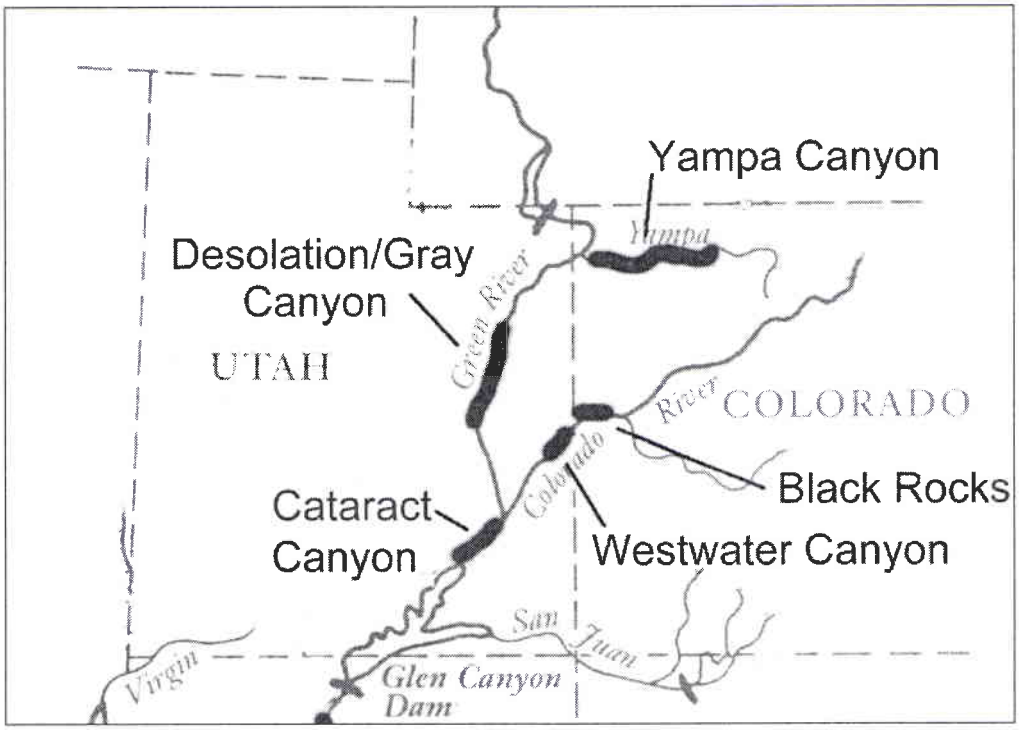

Figure 3. Humpback chub populations (Service 2002c).

Desolation/Gray Canyon is the only population within the VFO and has the potential to be affected by the proposed action.

Each population consists of a discrete group of fish, geographically separated from the other populations, but with some exchange of individuals. Monitoring humpback chub populations is ongoing and sampling protocols and reliability of population estimates are being assessed by the Service and cooperating entities. The Utah Division of Wildlife Resources has monitored the fish community in Desolation and Gray Canyons since 1989 and has consistently reported captures of age-0, juvenile, and adult *Gila,* including humpback chub, indicating a reproducing population (Chart and Lentsch 1999b).

Tyus and Karp (1991) found that in the Yampa and Green rivers in Dinosaur National Monument, humpback chubs spawn during spring and early summer following peak flows at water temperatures of about 20°C. They estimated that the spawning period for humpback chub ranges from May into July, with spawning occurring earlier in low-flow years and later in high-flow years; spawning was thought to occur only during a 4–5 week period (Karp and Tyus 1990). Similar to the Yampa and Green rivers, peak hatch of *Gila* larvae in Westwater Canyon on the Colorado River appears to occur on the descending limb of the hydrograph following spring runoff at maximum daily water temperatures of approximately 20 to 21°C (Chart and Lentsch 1999a). Tyus and Karp (1989) reported that humpback chubs occupy and spawn in and near shoreline eddy habitats and that spring peak flows were important for reproductive success because availability of these habitats is greatest during spring runoff.

High spring flows that simulate the magnitude and timing of the natural hydrograph provide a number of benefits to humpback chubs in the Yampa and Green Rivers. Bankfull and overbank flows provide allochthonous energy input to the system in the form of terrestrial organic matter and insects that are utilized as food. High spring flows clean spawning substrates of fine sediments and provides physical cues for spawning. High flows also form large recirculating eddies used by adult fish. High spring flows (50 percent exceedance or greater) have been implicated in limiting the abundance and reproduction of some nonnative fish species under certain conditions (Chart and Lentsch 1999a, 1999b) and have been correlated with increased recruitment of humpback chubs (Chart and Lentsch 1999b).

Although historic data are limited, the apparent range-wide decline in humpback chubs is likely due to a combination of factors including alteration of river habitats by reservoir inundation, changes in stream discharge and temperature, competition with and predation by introduced fish species, and other factors such as changes in food resources resulting from stream alterations (Service 1990).

The primary threats to humpback chub are stream flow regulation and habitat modification; competition with and predation by nonnative fishes; parasitism; hybridization with other native *Gila* species; and pesticides and pollutants (Service 2002c). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering.

Hybridization with roundtail chub (*Gila robusta*) and bonytail, where they occur with humpback chub, is recognized as a threat to humpback chub. A larger proportion of roundtail chub have been found in Black Rocks and Westwater Canyon during low flow years (Kaeding *et al.* 1990;

Chart and Lentsch 2000), which increase the chances for hybridization.

Management actions identified in the recovery goals for humpback chub (Service 2002c) to minimize or remove threats to the species included:

- provide and legally protect habitat (including flow regimes necessary to restore and maintain required environmental conditions) necessary to provide adequate habitat and sufficient range for all life stages to support recovered populations,
- investigate the role of the mainstem Colorado River in maintaining the Grand Canyon population,
- investigate the anticipated effects of and options for providing warmer water temperatures in the mainstem Colorado River through Grand Canyon,
- ensure adequate protection from overutilization,
- ensure adequate protection from diseases and parasites,
- regulate nonnative fish releases and escapement into the main river, floodplain, and tributaries,
- control problematic nonnative fishes as needed,
- minimize the risk of increased hybridization among *Gila* spp., and
- minimize the risk of hazardous-materials spills in critical habitat.

Programs were established to recover the endangered Colorado River fish in the Green and Colorado River sub-basins (the Upper Colorado River Endangered Fish Recovery Program; established in 1988) and in the San Juan River sub-basin (the San Juan River Recovery Implementation Program; established in 1995), while allowing for continued water development under state and federal water law. Program sponsors include federal and state agencies, water users, and environmental groups. These programs are designed to offset impacts to the endangered fish stemming from historic and future water depletions. To date, recovery efforts have focused on:

- Providing instream flows through the development of flow recommendations for important reaches of occupied habitat; flows are then provided through the re-operation of mainstem reservoirs or through lease and purchase of water rights.
- Controlling non-native fish populations, primarily via mechanical removal.
- Restoring habitats through the construction of fish passage structures at instream barriers and installing screens at the head of irrigation canals to reduce entrainment of native fishes.
- Developing genetically viable refuge populations in hatcheries and then using hatchery reared stocks to augment wild populations where necessary.
- Working with cooperating state agencies to minimize the conflicts between native fish recovery and sportfish management.
- Monitoring populations in the wild to determine the effectiveness of the aforementioned recovery actions.
- Sharing information about the endangered fish and the recovery efforts through an information and education program.

3.4. Bonytail

Bonytail were once widespread in the large rivers of the Colorado River Basin (Cope and Yarrow 1875; Jordan 1891; Gilbert and Scofield 1898; Kirsch 1889; Chamberlain 1904). The species experienced a dramatic, but poorly documented, decline starting in about 1950, following construction of mainstem dams, introduction of nonnative fishes, poor land-use practices, and degraded water quality (Miller 1961; Ono *et al.* 1983).

Bonytail were extirpated between Flaming Gorge Dam and the Yampa River, primarily because of rotenone poisoning and cold-water releases from the dam (Service 2002d). Surveys from 1964 to 1966 found large numbers of bonytail in the Green River in Dinosaur National Monument downstream of the Yampa River confluence (Vanicek and Kramer 1969). Surveys from 1967 to 1973 found far fewer bonytail (Holden and Stalnaker 1975). Few bonytail have been captured after this period, and the last recorded capture in the Green River was in 1985 (Service 2002d). Figure 7 shows the population locations, however bonytail are so rare that it is currently not possible to conduct population estimates. A stocking program is being implemented to reestablish populations in the upper Colorado River basin.

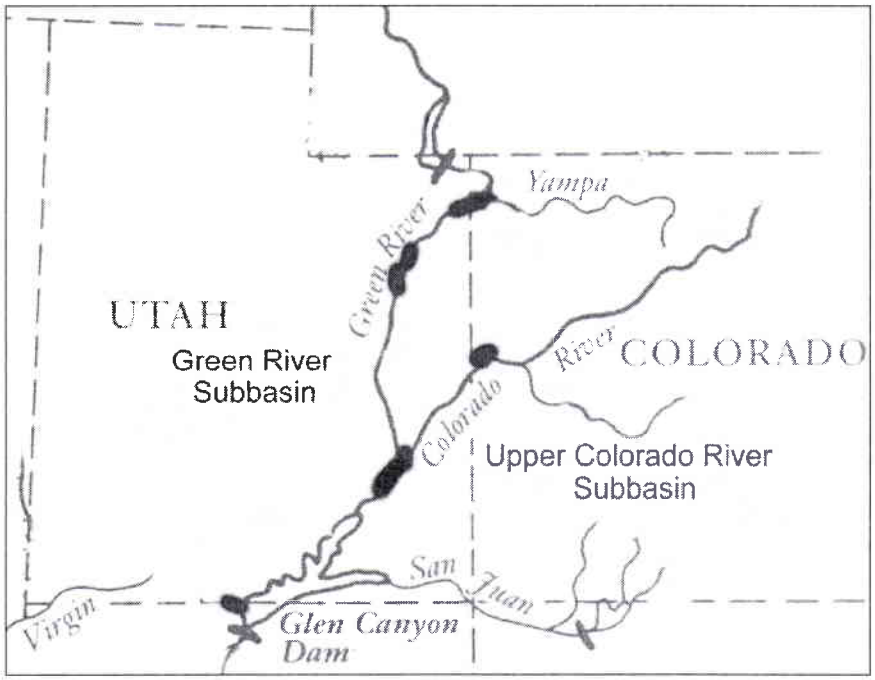

Figure 4. Bonytail populations (Service 2002d).

In the Green River, Vanicek (1967) reported that bonytails were generally found in pools and eddies in the absence of, although occasionally adjacent to, strong current and at varying depths generally over silt and silt-boulder substrates. Adult bonytail captured in Cataract, Desolation, and Gray Canyons were sympatric with humpback chub in shoreline eddies among emergent boulders and cobble, and adjacent to swift current (Valdez 1990). The diets of bonytail are presumed similar to that of the humpback chub (Service 2002d).

Between 1998 and 2003, the number of bonytail stocked in the Green River subbasin was

189,438 fish, with majority of the fish being juveniles at the time of stocking.

The Service designated seven reaches of the Colorado River system as critical habitat for the bonytail (59 FR 13374). This represents approximately 14 percent of the historical habitat of the species. Critical habitat for bonytail includes canyon reaches of the Yampa, Green and Colorado rivers. Yampa Canyon has not been affected by stream flow regulation like Split Mountain, Desolation, and Gray canyons on the Green River. However, Yampa Canyon has recently been invaded by high numbers of smallmouth bass changing the biological environment of critical habitat. There is no designated critical habitat within the project area.

The primary threats to bonytail are stream flow regulation and habitat modification; competition with and predation by nonnative fishes; hybridization with other native *Gila* species; and pesticides and pollutants (Service 2002d). The existing habitat, altered by these threats, has been modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering.

Management actions identified in the recovery goals for bonytail (Service 2002d) to minimize or remove threats to the species included:

- provide and legally protect habitat (including flow regimes necessary to restore and maintain required environmental conditions) necessary to provide adequate habitat and sufficient range for all life stages to support recovered populations;
- provide passage over barriers within occupied habitat to allow unimpeded movement and, potentially, range expansion;
- investigate options for providing appropriate water temperatures in the Gunnison River;
- minimize entrainment of subadults and adults at diversion/out-take structures;
- investigate habitat requirements for all life stages and provide those habitats;
- ensure adequate protection from overutilization;
- ensure adequate protection from diseases and parasites;
- regulate nonnative fish releases and escapement into the main river, floodplain, and tributaries;
- control problematic nonnative fishes as needed;
- minimize the risk of increased hybridization among *Gila* spp.;
- minimize the risk of hazardous-materials spills in critical habitat; and
- remediate water-quality problems.

Programs were established to recover the endangered Colorado River fish in the Green and Colorado River sub-basins (the Upper Colorado River Endangered Fish Recovery Program; established in 1988) and in the San Juan River sub-basin (the San Juan River Recovery Implementation Program; established in 1995), while allowing for continued water development under state and federal water law. Program sponsors include federal and state agencies, water users, and environmental groups. These programs are designed to offset impacts to the endangered fish stemming from historic and future water depletions. To date, recovery efforts have focused on:

- Providing instream flows through the development of flow recommendations for important reaches of occupied habitat; flows are then provided through the re-operation of mainstem reservoirs or through lease and purchase of water rights.
- Controlling non-native fish populations, primarily via mechanical removal.
- Restoring habitats through the construction of fish passage structures at instream barriers and installing screens at the head of irrigation canals to reduce entrainment of native fishes.
- Developing genetically viable refuge populations in hatcheries and then using hatchery reared stocks to augment wild populations where necessary.
- Working with cooperating state agencies to minimize the conflicts between native fish recovery and sportfish management.
- Monitoring populations in the wild to determine the effectiveness of the aforementioned recovery actions.
- Sharing information about the endangered fish and the recovery efforts through an information and education program.

4. EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

4.1. Colorado Pikeminnow, Razorback Sucker, Humpback Chub, and Bonytail

Designated critical habitat for Colorado pikeminnow and razorback sucker exists within the Green River and its 100-year floodplain within the project area. Only one primary reach of Colorado pikeminnow nursery habitat is present in the Green River system within the Vernal Field Office (VFO) and occurs within the project area: from near Jensen, Utah, downstream to the Duchesne River confluence (Tyus and Haines 1991; McAda et al. 1994a; McAda et al. 1994b; McAda et al. 1997). In addition, members of the Green River Team have identified Split Mountain to Desolation Canyon as the most important reach for razorback sucker in the Green River Subbasin based on recent captures of larval and juvenile razorback sucker (Gutermuth et al. 1994; Muth and Wick 1997; Valdez and Nelson 2004).

The project area in the vicinity of the Green River lies between two priority floodplain sites, Above Brennan on BLM land is upstream of the project area and Johnson Bottom in the Ouray National Wildlife Refuge (ONWR) is downstream (Valdez and Nelson 2004). The project area also borders lands owned and managed by ONWR. Approximately 61% of the total floodplain area within the Split Mountain to Desolation Canyon reach is located in the ONWR (Valdez and Nelson 2004). Five of the 16 priority floodplain sites identified in the Green River Subbasin Floodplain Management Plan are owned or managed by ONWR (Valdez and Nelson 2004). In

addition, two floodplain sites within the refuge have been identified in the Green river Subbasin Floodplain Management Plan as restoration sites: (1) Leota Ponds, and (2) Johnson Bottom. Some restoration has already taken place at these sites, including levee breaches and installation of water control gates and fish kettles by the Recovery Program, and removal or breaches of internal dikes by ONWR (Valdez and Nelson 2004).

Flooded bottomlands and backwater areas are important habitat for the endangered fish because they provide nutrient input and juvenile rearing habitat within the river system (Welcomme 1979). Many fishes have developed migratory strategies that allow them to utilize inundated areas as spawning, nursery, and foraging areas (Lowe-McConnell 1975; Welcomme 1979).

According to the conceptual locations of potential well pads, 22 well pads and associated roads and pipelines could be constructed within seven floodplains within the GDBR: Green River, east and west branch of Kennedy Wash, Red Wash, Antelope Draw, Baeser Wash, and an unnamed wash leading to the Green River on the west side of the GDBR. QEP has committed to not drilling wells within the Green River floodplain; therefore there are potentially 16 wells, based on conceptual locations, which may be drilled in 100-year floodplains. Based on applicant committed measures, direct impacts to the fish and their designated critical habitat should be avoided. Indirect impacts include potentially exposing fish species to contaminants from accidental spills/leaks of pipelines or productions facilities and altering habitat quality and quantity through water depletions out of the Upper Colorado River Basin.

Accidental spills of hydrocarbon products would have the potential to affect ground water and potential surface waters if the spills would occur when flow would be occurring in the washes of the GDBR. Accumulations of contaminants in floodplain areas of the Green River could result in lethal and/or sublethal impacts to larval and juvenile pikeminnow and razorbacks. While applicant-committed measures may reduce the chance for spills or leaks of contaminants, accidental releases can and do still occur (Table 1). A review of the National Response Center's Incident Report since 1990 provides instances of accidental releases to the environment from oil and natural gas drilling related activities.

Table 1: Oil and Gas Field Incident Reports in Uintah County, Utah, National Response Center, January 1990 – April 2007.

NRC Report #	Incident Date	Incident Cause	Description Of Incident	Material
833362	4/25/07	Operator error	40 barrel release of oil condensate that occurred when an operator left a valve open on an oil condensate storage tank.	Other oil (oil condensate)
825038	1/15/07	Other	Truck hit an embankment causing a spill of 1500 gallons of hydrochloric acid.	Hydrochloric acid
823824	1/15/07	Transport accident	The caller stated that a tractor trailer rolled over on a county road.	Hydrochloric acid

NRC Report #	Incident Date	Incident Cause	Description Of Incident	Material
816559	10/30/06	Equipment failure	Caller stated there was a spill of materials from an above ground tank onto tribal land due to a hole in a hose.	Oil: crude and water
810514	9/3/06	Other	Negligent actions of the drilling company.	Unknown oil
763891	6/29/05	Equipment failure	The material released from a 10 inch pipeline due to equipment failure (rupture).	Condensate
762951	6/20/05	Unknown	Sheen on the water next to tank battery in a flood area.	Unknown oil
732421	8/19/04	Flood	A flash flood event filled a containment pit at a well site and displaced 120 gallons of crude oil which was carried away by the flood waters into rabbit gulch.	Oil: crude
645912	5/23/03	Other	A car hit a 2" riser from a pipeline resulting in the discharge of product onto tribal land (wetland) and 10 barrel(s) impacted private land.	Oil condensate mix
620605	7/9/02	Equipment failure	The material released from a storage tank due to an equipment failure.	Oil, misc: turbine
615767	7/5/02	Unknown	Release of natural gas from pipeline due to unknown causes.	Natural gas
605881	5/22/02	Unknown	Fire due to a natural gas release.	Natural gas
601206	4/29/02	Other	Release of material from both the storage tank and wash area.	Waste oil / Other oil (heavy industrial oil)
596956	3/16/02	Unknown	Pipe line release.	Produced water / Oil: crude
582671	10/10/01	Equipment failure	Release of (oil & gas liquids) condensate from pressurized storage tank into the air and onto the land.	Liquid & gas condensate
572780	7/10/01	Other	Release from a pipeline of a mixture of water and condensate, due to a leak caused by a backhoe.	(water & condensate mixture
546434	10/26/00	Unknown	The material was released from an oil well surface pit due to a carry over.	Oil: crude
517004	1/14/00	Transport accident	Pump truck overturned into a creek / ruptured radiator caused release of ethylene glycol	Ethylene glycol

NRC Report #	Incident Date	Incident Cause	Description Of Incident	Material
500357	9/24/99	Equipment failure	Frac tank / while transferring material from mud pit to tank, tank cratered causing release	Oil based mud
463735	11/12/98	Equipment failure	High level shut off alarm was not working	Oil: crude / Produced water
394116	7/2/97	Unknown	Oil producing well/leak at well head due to unknown cause	Oil: crude
368596	11/22/96	Equipment failure	Injection line/external corrosion	Injection water
304587	8/19/95	Equipment failure	Storage tank/pipe failed	Hydraulic oil
297650	6/28/95	Equipment failure	Tank/collapsed	2% kcl water
294604	6/7/95	Unknown	Drilling reserve pit //breech on the pit wall	Water and drilling mud
292602	5/23/95	Equipment failure	Pipeline pump//gasket blew out on discharge side of pump	Produced water
284890	3/27/95	Equipment failure	Gasket on flowline failed causing materials to release	Produced water
284835	3/27/95	Other	Ruptured line//excessive pressure on line	Water
283936	3/20/95	Equipment failure	A trace line on a well/corrosion	Ethylene glycol
278042	1/30/95	Equipment failure	Trace system//material released due to a corroded line	Ethylene glycol
275570	1/7/95	Equipment failure	Line heater tank (supply tank) - overflowed as a result of rupturing of coils within heater	Ethylene glycol (10 per cent conc.)
273730	12/18/94	Operator error	Storage tank/the drain valve was accidentally left open	Oil: crude
271688	12/2/94	Equipment failure	Regulator failed allowing ethylene glycol to released via flare onto ground	Ethylene glycol
270997	11/26/94	Equipment failure	Trace line next to a flow line on a producing field	Ethylene glycol
270762	11/23/94	Equipment failure	Natural buttes gas plant //ethylene glycol pump broke seal	Ethylene glycol
238178	5/5/94	Equipment failure	A 3 inch pipeline ruptured due to fatigue	Produced water
214864	1/2/94	Equipment failure	Trace system/leaked due to internal corrosion	Ethylene glycol

NRC Report #	Incident Date	Incident Cause	Description Of Incident	Material
199934	9/25/93	Equipment failure	A treater had a rupture disk blow out	Oil: crude
152703	1/9/93	Equipment failure	Exchanger / broken fitting	Ethylene glycol
119681	5/29/92	Equipment failure	Ethylene glycol heater/internal corrosion on coils	Ethylene glycol,60% water mix
116062	4/29/92	Equipment failure	Well head/ pressure blew a packer rubber	Oil: crude / Produced water
100367	12/12/91	Unknown	Compressor/failure due to unknown cause	Natural gas
97207	11/19/91	Equipment failure	Compressor/ flare gas controller malfunction	Natural gas
95830	11/10/91	Equipment failure	Gathering line / rupture	Oil: crude
94970	11/3/91	Equipment failure	Flow line / ruptured	Oil: crude
89698	9/24/91	Equipment failure	4" gathering line / external corrosion	Oil: crude
88938	9/14/91	Other	Drilling well/ black water flowing to river	Formation water
88026	9/8/91	Equipment failure	Compressor / failed and caused a flare	Natural gas
86198	8/28/91	Equipment failure	Failed compressor valve	Natural gas 370 million cubic feet
85996	8/22/91	Equipment failure	Compressor pipeline / mechanical failure.	Natural gas

Spill incidences reviewed in Utah include corrosion and leakage of surface and buried pipelines, broken well rods, valve and gasket failures, wellhead pressure buildups, shutoff alarm malfunctions, leakage of trace systems, loss of formation water to the surface during drilling, and vehicular related traffic accidents. Releases have included crude oil, natural gas, hydrochloric acid, condensate, salt water, ethylene glycol, and produced water in various quantities.

Releases of harmful agents into floodplain habitats could result in significant adverse impacts to the endangered fish and their designated critical habitat. One of the constituent elements of the designated critical habitat for the razorback sucker and Colorado pikeminnow is contaminant-free water. Any release of contaminants into the floodplain would result in degradation of critical habitat and could result in take of individual fish, including downstream impacts to larvae and juveniles.

The Green River is a large river with high dilution factors. However, contaminants are likely to

accumulate in backwater/depressional areas that have reduced dilution and less flushing capacity (Woodward et al. 1985). Colorado pikeminnow and razorback sucker use these sites, which provide cover and a food source, for overwinter survival and rearing areas.

Since QEP has agreed to not drill within the 100-year floodplain of the Green River, the highest risk for contamination is from leaks/spills at the drilling rigs, gas wellheads, and pipelines at upland sites or sites in floodplains that are tributary to the Green River. Accidental spills/leaks during drilling operations within floodplain habitats could occur. Although drilling would not occur during flooding, unexpected encounters with brine or other substances could cause releases that could flow into the river channel. Substance releases could result in lethal or sublethal effects to the endangered fishes.

As defined in 50 CFR 402.02, interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. There are no known interrelated or interdependent actions associated with this project.

Water depletion associated with this project is approximately 2,408 acre-feet. Water depletions from the Upper Colorado River Drainage System, along with a number of other factors, have resulted in such drastic reductions in the populations of the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker that the Service has listed these species as endangered and has implemented programs to prevent them from becoming extinct.

Water depletions reduce the ability of the river to create and maintain the primary constituent elements that define critical habitats. Food supply, predation, and competition are important elements of the biological environment. Food supply is a function of nutrient supply and productivity, which could be limited by reduction of high spring flows brought about by water depletions. Predation and competition from nonnative fish species have been identified as factors in the decline of the endangered fishes. Water depletions contribute to alterations in flow regimes that favor nonnative fishes.

QEP has existing water rights from five Green River wells: State of Utah 49-251, 49-279, 49-280, 49-296, and 49-297. These water rights were issued August 1964 and are therefore considered as a historic depletion.

5. Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Declines in the abundance or range of many special status species have been attributed to various human activities on federal, state, and private lands, such as human population expansion and associated infrastructure development; construction and operation of dams along major waterways; water retention, diversion, or dewatering of springs, wetlands, or streams; recreation,

including off-road vehicle activity; expansion of agricultural or grazing activities, including alteration or clearing of native habitats for domestic animals or crops; and introductions of non-native plant, wildlife, or fish or other aquatic species, which can alter native habitats or out-compete or prey upon native species. Many of these activities are expected to continue on state and private lands within the range of the various federally protected wildlife, fish, and plant species, and could contribute to cumulative effects to the species within the action area of the Proposed Actions. Species with small population sizes, endemic locations, or slow reproductive rates, or species that primarily occur on non-federal lands where landholders may not participate in recovery efforts, would be generally be highly susceptible to cumulative effects.

5.1. Colorado Pikeminnow, Razorback Sucker, Humpback Chub, and Bonytail

Reasonably foreseeable future activities that may affect river-related resources in the area include oil and gas exploration and development, fire management, irrigation, recreational activities, Central Utah Project, Colorado River Salinity Control Project, and activities associated with the Upper Colorado River Endangered Fish Recovery Program. Implementation of these projects affects the environment including but not limited to water quality, water rights, socioeconomic and wildlife resources.

Cumulative effects to this species would include the following types of impacts:

- Changes in land use patterns that would further fragment, modify, or destroy potential spawning sites or designated critical habitat;
- Shoreline recreational activities and encroachment of human development that would remove upland or riparian/wetland vegetation and potentially degrade water quality;
- Competition with, and predation by, exotic fish species introduced by anglers or other sources.

6. CONCLUSION

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including the resource protection measures that were incorporated into the project design.

6.1. Colorado Pikeminnow, Razorback Sucker, Humpback Chub, and Bonytail

After reviewing the current status of the Colorado River fish; the environmental baseline for the action area and the direct, indirect, and cumulative effects of the proposed action, it is the Service's biological opinion that Questar's Exploration and Production Company's Greater Deadman Bench Oil and Gas Producing Region project, as proposed, will not jeopardize the continued existence of the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker and is not likely to result in the destruction or adverse modification of critical habitat.

We base this conclusion on the following:

- The applicant and BLM committed conservation measures as described in BLM's March 27, 2007, *Final Environmental Impact Statement (FEIS) and Biological Assessment (BA)*

for Questar Exploration & Production Company's (QEP), Greater Deadman Bench Oil and Gas Producing Region and highlighted in Section 1, Description of the Proposed Action.

- There will be no drilling within the 100-year floodplain of the Green River.

To address depletion issues, on January 21-22, 1988, the Secretary of the Interior; the Governors of Wyoming, Colorado, and Utah; and the Administrator of the Western Area Power Administration were cosigners of a Cooperative Agreement to implement the "Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin" (USFWS 1987). Activities and accomplishments under the Recovery Program are intended to provide the reasonable and prudent alternatives which avoid the likelihood of jeopardy to the continued existence of the endangered Colorado River fishes and to avoid the likely destruction or adverse modification of critical habitat in Section 7 consultations on all impacts (except the discharge of pollutants such as trace elements, heavy metals, and pesticides) associated with historic water projects in the Upper Basin. Depletion charges or other measures will not be required from historic projects which undergo Section 7 consultation in the future.

7. INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR § 17.3). Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the BLM so that they become binding conditions of any grant or permit issued for the exemption in section 7(o)(2) to apply. BLM has a continuing duty to regulate the activity covered by this incidental take statement. If BLM (1) fails to assume and implement the terms and conditions or (2) fails to require the permittee to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, either BLM or the permittee must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR § 402.14(i)(3)]

The Service has developed the following incidental take statement based on the premise that the

applicant committed conservation measures will be implemented.

7.1. Amount or Extent of Take

The Service anticipates that all age classes of Colorado pikeminnow, humpback chub, razorback sucker, and bonytail could be taken from within the Green River as result of this proposed action. The incidental take is expected to be in the form of harm (death or injury) due to accidental contamination from leaks/spills during project related activities at upland sites or sites in floodplains that are tributary to the Green River. The Service anticipates incidental take of the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker will be difficult to detect for the following reasons: numbers may be difficult to detect because finding a dead or impaired specimen is unlikely. For the above reason, the actual take levels of individual fish are unquantifiable.

7.2. Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

We are providing the following Reasonable and Prudent Measures (RPMs) and Terms and Conditions to minimize overall take. Implementation of these RPMs and Terms and Conditions during project planning will also expedite site-specific section 7 consultation.

7.3. Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measure is necessary and appropriate to minimize impacts of incidental take of the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail:

1. Conduct all proposed actions in a manner that will minimize harm to federally listed species through destruction of their suitable or designated critical habitats.

7.4. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, BLM must comply with the following terms and conditions (TOCs), which implement the reasonable and prudent measure described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following TOCs are assumed to include all previously listed applicant-committed environmental protection measures, but in some cases include more restrictive or more detailed measures.

For Reasonable and Prudent Measure #1:

1. In addition to the applicant committed measure of not drilling within 100-year floodplain of the Green River, there shall be no drilling within 100-year floodplains that are tributary to the Green River.

2. In areas adjacent to 100-year floodplains, particularly in systems prone to flash floods, analyze the risk for flash floods to impact facilities, and use closed loop drilling, and pipeline burial or suspension according to Pipeline Crossing Guidance, as necessary to minimize the potential for equipment damage and resulting leaks or spills.

3. Within 100-year floodplains of waters not tributary to the Green River, consider using closed loop drilling and off site production facilities to minimize the potential for equipment damage and resulting leaks or spills.

The Service believes that an unquantifiable amount of incidental take of Colorado pikeminnow, razorback sucker, humpback chub, and bonytail will occur in the form of harm and harassment as a result of the proposed actions. The reasonable and prudent measure, with its implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed actions.

8. Reporting Requirements

The incidental take statement provided in this biological opinion satisfies the requirements of the Endangered Species Act of 1973, as amended. This statement does not constitute an authorization for take of listed migratory birds under the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, or any other Federal statute.

Upon locating dead, injured, or sick listed species, immediate notification must be made to the Service's Salt Lake City Field Office at (801) 975-3330 and the Service's Division of Law Enforcement, Ogden, Utah, at (801) 625-5570. Pertinent information including the date, time, location, and possible cause of injury or mortality of each species shall be recorded and provided to the Service. Instructions for proper care, handling, transport, and disposition of such specimens will be issued by the Service's Division of Law Enforcement. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state.

9. Section 7 Conference under the Endangered Species Act

The project area contains a 10(j) population of black-footed ferret, and for the purposes of Section 7 Consultation, 10(j) populations are treated as "proposed" under the Act.

The UDWR has mapped a large colony of white-tailed prairie dogs within the GDBR boundary, the Bohemian Bottom Complex, which is not included in the EIS's description of white-tailed prairie dogs or black-footed ferrets. This complex is located in Sections 13-17, 20-22, and 27-28 of T7S R21E and is included in the black-footed ferret management area as depicted in the 2007 *Northeastern Region Black-Footed Ferret Management Plan* (Plan). We recommend including the following conservation measures from the Plan in order to minimize possible impacts to

ferret habitat:

1. Place roads and well pads outside prairie dog complexes.
2. If avoidance is not possible, place roads and well pads close to colony edge or in areas that keep surface disturbance of colonies to a minimum.
3. After drilling activities cease, reduce well pad size to the smallest possible size (tear-drop shape).
4. Keep road size (width) to a minimum.
5. When roads/well pads are no longer needed, reclaim disturbed areas with suitable seed mix. This will also help control the spread of noxious weeds.
6. Where possible, bury power lines to reduce raptor perching/hunting sites.
7. Drill multiple wells from one pad where opportunities exist.

In addition, the Plan acknowledges the measures incorporated into an amendment to the Book Cliffs Resource Management Plan that applies restrictions to activities within the primary management zone. The additional measures contained within the amendment include:

1. Activities involving the development or construction of temporary or permanent surface disturbances would be prohibited within 1/8 mile boundaries of known home ranges of female ferrets during the "critical" period from 1 May thru 15 July.
2. If a ferret is discovered at a commercial facility (e.g. Gilsonite mine, well pad, power plant), it would then be decided by the Service and UDWR, if removal of the ferret was necessary and, if so, removal would be initiated within 48 hours. If the targeted animal(s) cannot be captured within 72 hours of the commencement of trapping activities, such activities will cease and be replaced by a monitoring program to ascertain the status of the animal(s). Further attempts to remove the subject animal(s) would be based on this monitoring.
3. If ferrets are discovered at the site of a proposed commercial operation, then mitigation in the form of: delay of activities, movement of ferret(s), off-site prairie dog habitat development, redesign of activities, or any combination of the above would be required. The course of events chosen would be determined cooperatively by the operator, UDWR, the Service, and land management agency(ies).
4. Although formal Section 7 consultation would not be required, it is the intent that state and federal agencies would contact the Service and UDWR during the preliminary design of proposed projects or activities within the Primary Management Zone.

We recommend adherence to the above measures when project activities are within the black-footed ferret management area and the primary management zone.

After reviewing the current status of the black-footed ferret, the environmental baseline for the action area, the effects of the proposed project and the cumulative effects, it is the Service's biological opinion that the GDBR project is not likely to jeopardize the continued existence of the black-footed ferret, and is not likely to destroy or adversely modify designated critical habitat. No critical habitat has been designated for this species; therefore, none will be affected.

10. Reinitiation - Closing Statement

This concludes formal consultation on the action outlined in your request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If we can be of further assistance or if you have any questions, please feel free to contact Bekee Megown of our office at (801)975-3330 extension 146.

Sincerely,

Larry Crist
Utah Field Supervisor

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