APPENDIX D

USFWS, SHPO, AND TRIBAL CONSULTATION CORRESPONDENCE

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Blaine Phillips/VFO/UT/BLM/DOI

01/12/2006 03:08 PM

To: Stephanie Howard/VFO/UT/BLM/DOI@BLM, Tim Faircloth/VFO/UT/BLM/DOI@BLM

cc:

bcc:

Subject: Section 106 DEIS, EOG Chapita Wells-Stagecoach letter

USHPOEOGChapitaWellsDEISConsultLtr.01-06.doc

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Vernal Field Office
170 South 500 East
Vernal, Utah 84078
(435) 781-4400 Fax: (435) 781-4410
http://www.ut.blm.gov/utah/vernal

IN REPLY REFER TO:
8141
UT-082

January 13, 2004

Mr. Wilson G Martin
Utah Division of State History
300 Rio Grande Ave.
Salt Lake City, Utah 84101-1182

Dear Mr. Wilson:

RE: Initiation of Section 106
DEIS:EOG Resources,
Chapita Wells-Stagecoach
Natural Gas Development.

Attached for Section 106 consultation, comment and coordination is a copy of "EOG Resources, inc. Chapita Wells-Stagecoach Area Natural Gas Development Draft Environmental Impact Statement. EIS number: UTU-080-2005-0010. This document is dated January, 2006. The Vernal Field Office requests written comments 45 days after the Environmental Protection Agency publishes a Notice of Availability of this DEIS in the Federal Register.

Please see Page S-1 for a summary of the existing situation and proposed action. Existing wells as of March 1, 2004 was 325 gas producing wells. 627 wells are proposed under alternative –A-. 154 wells of the total are planned to be twinned wells, where two wells will be drilled from one pad.

In Section 2.3, applicant-committed best management practices, subsection 2.3.2, Page 2-15 describes the actions which would be taken prior to surface disturbance. This section includes class III (100%) inventories of the wells pads, access roads, pipelines and other ancillary facilities as needed. Project specific Section 106 will be done for each project which is the current practice.

If the applicant committed measures are followed the Vernal Field Office recommends a No Adverse Effect determination for the DEIS area and actions as proposed.

If there are questions, concerns or problems please contact this office at your earliest possible convenience. Please contact Blaine Phillips at 435-781-4438.

Sincerely,

Tim Faircloth
Assistant Field Manager for Renewable Resources

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 AFMS	Initial	Assigned
Field Manager		
Planner		
NEPA		
Ranger		
Bus. Practices		
Renewables		✓
Operations		

BUREAU OF LAND MGMT, VERNAL, UTAH

NOV 04 '04

MINERALS		
FIRE		
ALL EMPLOYEES		

In Reply Refer To
FWS/R6
ES/UT
05-0050

November 1, 2004

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: EOG Resources Inc., Chapita Wells-Stagecoach Area Natural Gas Development Environmental Impact Statement (EIS), Number UTU-080-1310-00

The U.S. Fish and Wildlife Service (Service) has reviewed your notice received on October 12, 2004 announcing your intent to prepare an EIS on the Chapita Wells/Stagecoach Project. The purpose of the project is to develop a maximum of 627 natural gas wells. This project is estimated to permanently disturb 1,060 acres. We are providing the following comments for your consideration in your EIS.

Pursuant to the Migratory Bird Treaty Act (MBTA)(16 U.S.C. § 703), our responsibilities to States under section 6 of the Endangered Species Act of 1973 16 U.S.C. § 1535, in accordance with the provisions of the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) and the Fish and Wildlife Act of 1956 (16 U.S.C. §§ 742a – 742j), we are identifying issues that should be addressed relative to fish and wildlife resources for this project. In Section 1 of this letter we identify issues that should be addressed in the NEPA compliance document. Section 2 of this letter addresses your responsibilities under section 7 of the ESA of 1973, 16 U.S.C. § 1536.

Section 1. NEPA regulation 40 CFR § 1503.1(a)(1) states that the action agency shall obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Appendix II of the NEPA Implementation Procedures (49 Fed. Reg. 49750, December 21, 1984), notes that the Service is an agency with special expertise regarding effects from numerous environmental quality issues to endangered species and their critical habitat and to other fish and wildlife resources in general. These issues include, but are not limited to: air quality; water quality; waste disposal on land; noise; watershed protection and soil conservation; water resources development and regulation; forest, range, and vegetative resources; federal land management; and energy development activities. Our comments, in part, are intended to meet our responsibility as an agency with special expertise.

Migratory Birds:

The EIS should specifically evaluate and plan mitigation for potential project impacts to migratory birds. For example it should evaluate for such things as whether the project will further fragment habitat for species that require large habitat patches, and whether habitat enhancement efforts may minimize displacement impacts for some species. Habitat impacts for species on the Service's 2002 list of Birds of Conservation Concern (BCC) should be evaluated in project plans. The BCC List identifies those migratory and non-migratory avian species that, without additional conservation actions, may be considered candidates for listing under the ESA. In addition to those birds already identified in your letter, data from Breeding Bird Survey Routes (Jensen, Bonanza, and Willow Creek) in the vicinity of the project indicate the project area should be evaluated for the following BCC species: broad-tail hummingbird, loggerhead shrike, pinyon jay, black-throated gray warbler, Brewer's sparrow, sage sparrow, Lewis's woodpecker, and gray vireo. To help meet responsibilities under Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), the BLM should only permit activities outside breeding seasons for migratory birds, avoid and minimize temporary and long-term habitat losses, and require mitigation for unavoidable habitat losses.

The EIS should identify the amount, location, and timeframe of disturbance that could result from the proposed action. Displacement of wildlife across a large area during seasonal times, such as breeding, could prove a significant impact. If wildlife species are displaced, it is likely that the area to which they are displaced is inhabited by other wildlife or disturbed by other ongoing activities. Depending on the season; duration and location of activities; and species, displacement could lead to nest abandonment, inter and intra-specific competition, reproductive failure, and possible mortality. In addition, if there are other projects in the area, alternative sites for displaced wildlife will be increasingly limited. Cumulative effects of other projects and activities to wildlife and wildlife habitat should be taken into account in project plans.

Wetland and Riparian Areas:

The map accompanying the scoping notice did not include the White River. However, a portion of the project area lies on both sides of the White River to an extent of approximately 4 river miles, and approximately 7 miles upstream of designated critical habitat for the endangered razorback sucker. The EIS should evaluate the potential for downstream effects from the project. The document should include a watershed analysis in order to determine toxicity risk from permanent facilities, including, but not limited to pipelines, well pads, tank batteries, and reserve pits. Placement of well pads, roads, pipelines, tank batteries, and other infrastructure should avoid ephemeral washes prone to flash flood events. To reduce the risk of contaminants or their by-products reaching the White River, we recommend you implement the Utah Oil and Gas Pipeline Crossing Guidance from BLM National Science and Technology Center.

Water depletions from any portion of the Upper Colorado River drainage basin above Lake Powell are considered to jeopardize the four resident endangered fish species, and must be evaluated with regard to the criteria described in the Upper Colorado River Endangered Fish Recovery Program. The EIS should account for the amount and sources of all water use associated with the project; depletions should be specified and reported to the this office for formal section 7 consultation.

Because the project contains wetlands and/or riparian areas, we recommend measures be taken to avoid any wetland losses in accordance with Section 404 of the Clean Water Act, Executive Order 11990 (wetland protection) and Executive Order 11988 (floodplain management) as well as the goal of "no net loss of wetlands." Riparian areas are the single most productive wildlife habitat type in North America. Riparian vegetation plays an important role in protecting streams, reducing erosion and sedimentation as well as improving water quality, maintaining the water table, controlling flooding, and providing shade and cover. In view of their importance and relative scarcity, impacts to riparian areas should be avoided.

Invasive species and reclamation:

As with all projects that will create surface disturbance, there is potential for introduction and spread of invasive species. All possible measures should be taken to prevent the introduction or further proliferation of noxious species. We recommend that an inventory for invasive plant species be completed prior to construction. Detailed inventory and mapping of invasive species in and near the soil disturbance sites could identify potential problems. This project should be evaluated with regard to the potential for increased spread of invasive species. We recommend incorporating *Measures to Prevent the Spread of Noxious and Invasive Weeds During Construction Activities* (Siegel and Donaldson, 2003) to prevent introduction or spread of noxious weeds during ROW and well pad construction (Pages 4-102 and 4-103). Revegetation seed mixes should, to the extent practicable, contain native plants or non-natives that will not naturalize. Monitoring and control efforts should be implemented following construction.

Reclamation and mitigation efforts should be monitored. Monitoring protocols should include measurable performance criteria. The criteria should be met within time frames appropriate to sensitive periods in the life histories of species of concern or recovery rates of site-specific vegetation and soil types. Protocols should establish 'triggers' or thresholds that require remedial action.

Cumulative Impacts:

Cumulative impacts are those which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. Therefore, at a minimum, the EIS should analyze effects from the additional production/development associated with this project. The cumulative effects to fish and wildlife resources and their habitats from this and other projects in the area should be fully considered.

Section 2. Federal agencies have specific additional responsibilities under Section 7 of the ESA. To help you fulfill these responsibilities, we are providing an updated list of threatened (T) and endangered (E) species that may occur within the area of influence of your proposed action.

Common Name	Scientific Name	Status
UINTAH COUNTY		
Clay Reed-mustard	*Schoenocrambe argillacea*	T
Graham Beardtongue	*Penstemon grahamii*	C
Horseshoe Milkvetch	*Astragalus equisolensis*	C
Shrubby Reed-mustard	*Schoenocrambe suffrutescens*	E
Uinta Basin Hookless Cactus	*Sclerocactus glaucus*	T
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
White River Beardtongue	*Penstemon scariosus* var. *albifluvis*	C
Bonytail[4,10]	*Gila elegans*	E
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Humpback Chub[4,10]	*Gila cypha*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Mexican Spotted Owl	*Strix occidentalis lucida*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Black-footed Ferret[6]	*Mustela nigripes*	E
Canada Lynx	*Lynx canadensis*	T

[3] Wintering populations (only five known nesting pairs in Utah).
[4] Critical habitat designated in this county.
[6] Historical range.
[10] Water depletions from *any* portion of the occupied drainage basin are considered to adversely affect or adversely modify the critical habitat of the endangered fish species, and must be evaluated with regard to the criteria described in the pertinent fish recovery programs.

The proposed action should be reviewed and a determination made if the action will affect any listed species or their critical habitat. If it is determined by the Federal agency, with the written concurrence of the Service, that the action is not likely to adversely affect listed species or critical habitat, the consultation process is complete, and no further action is necessary.

Formal consultation (50 CFR 402.14) is required if the Federal agency determines that an action is "likely to adversely affect" a listed species or will result in jeopardy or adverse modification of critical habitat (50 CFR 402.02). Federal agencies should also confer with the Service on any action which is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat (50 CFR 402.10). A written request for formal consultation or conference should be submitted to the Service with a completed biological assessment and any other relevant information (50 CFR 402.12).

Candidate species have no legal protection under the Endangered Species Act (ESA). Candidate species are those species for which we have on file sufficient information to support issuance of a proposed rule to list under the ESA. Identification of candidate species can assist environmental planning efforts by providing advance notice of potential listings, allowing resource managers to alleviate threats and, thereby, possibly remove the need to list species as endangered or threatened. Even if we subsequently list this candidate species, the early notice provided here could result in fewer restrictions on activities by prompting candidate conservation measures to alleviate threats to this species.

Only a Federal agency can enter into formal Endangered Species Act (ESA) section 7 consultation with the Service. A Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment by giving written notice to the Service of such a designation. The ultimate responsibility for compliance with ESA section 7, however, remains with the Federal agency.

Your attention is also directed to section 7(d) of the ESA, as amended, which underscores the requirement that the Federal agency or the applicant shall not make any irreversible or irretrievable commitment of resources during the consultation period which, in effect, would deny the formulation or implementation of reasonable and prudent alternatives regarding their actions on any endangered or threatened species.

Please note that the peregrine falcon which occurs in all counties of Utah was removed from the federal list of endangered and threatened species per Final Rule of August 25, 1999 (64 FR 46542). Protection is still provided for this species under authority of the Migratory Bird Treaty Act (16 U.S.C. § 703-712) which makes it unlawful to take, kill, or possess migratory birds, their parts, nests, or eggs. When taking of migratory birds is determined by the applicant to be the only alternative, application for federal and state permits must be made through the appropriate authorities. For take of raptors, their nests, or eggs, Migratory Bird Permits must be obtained through the Service's Migratory Bird Permit Office in Denver at (303) 236-8171.

We recommend use of the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* which were developed in part to provide consistent application of raptor protection measures statewide and provide full compliance with environmental laws regarding raptor protection. Raptor surveys and mitigation measures are provided in the Raptor Guidelines as recommendations to ensure that proposed projects will avoid adverse impacts to raptors, including the peregrine falcon.

The following is a list of species that may occur within the project area and are managed under Conservation Agreements/Strategies. Conservation Agreements are voluntary cooperative plans among resource agencies that identify threats to a species and implement conservation measures to pro-actively conserve and protect species in decline. Threats that warrant a species listing as a sensitive species by state and federal agencies and as threatened or endangered under the ESA should be significantly reduced or eliminated through implementation of the Conservation Agreement. Project plans should be designed to meet the goals and objectives of these Conservation Agreements.

Common Name	Scientific Name
UINTAH COUNTY	
Colorado River Cutthroat Trout	*Oncorhynchus clarki pleuriticus*

If we can be of further assistance, or if you have any questions, please feel free to contact Diana Whittington of our office at (801) 975-3330 extension 128.

Sincerely,

For Henry R. Maddux
Utah Field Supervisor

cc: UDWR – SLC
BLM – SO (attn: Ron Bolander) and Vernal FO
BIA – Environmental Protection Specialist (Attn: Kim Fritz), Uintah & Ouray Agency, P.O. Box 130, Ft. Duchesne, UT 84026

47

United States Department of the Interior
Fish and Wildlife Service
Ecological Services
UTAH FIELD OFFICE
2369 West Orton Circle, Suite 50
West Valley City, Utah 84119

TELEPHONE NUMBER: **801/975-3330** FAX NUMBER: **801/975-3331**

TO: Gene Sinclair	DATE: 11-1-04	TIME: 4:30pm
FAX NUMBER: 435-781-4410		
FROM: Diana Whittington		
SUBJECT: Chapita Wells Scoping Notice		

COVERSHEET PLUS 6 PAGE(S)

COMMENTS:

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Vernal Field Office
170 South 500 East
Vernal, UT 84078
(435) 781-4400 Fax: (435) 781-4410

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
1792
UT-080

REVIEWERS	INITIAL
Botany	
Wildlife	
Renewables	[illegible] 12/27
OTHERS	

December 29, 2004

Memorandum

To: Utah Field Supervisor, Utah Field Office, Fish & Wildlife Service, Salt Lake City, Utah

From: Field Manager, Vernal Field Office, Bureau of Land Management

Subject: Initiation of Consultation and Request for List of Species Associated with EnCana's and EOG Resources' Energy Development Projects

The BLM has received two energy development proposals from the subject energy companies; the purpose of both proposals being to fully realize the companies' existing leases in the Uintah Basin. Specifically, these proposals are: 1) EnCana Oil & Gas (USA) – North Chapita Natural Gas Well Development Project, and 2) EOG Resources, Inc. – Chapita Wells/Stagecoach Area Gas Development Project. Currently both of these proposals are undergoing environmental analysis to consider the proposals and reasonable alternatives. Enclosed are project descriptions and maps for both proposals.

In accordance with the provisions of the Endangered Species Act, BLM is initiating consultation on both projects. We have reviewed the project areas relative to our records and have determined a likely list of species specific to the project areas, a copy of this list is also enclosed. This Office is requesting concurrence on this list of species.

Should you have any questions on the NEPA aspects of these projects, please contact Jean Nitschke-Sinclear (435-781-4437); relative to the consulting/conferring aspects, please contact either Tim Faircloth (435-781-4465, wildlife) or Robert Specht (435-781-4436, plants).

Thank you for your assistance.

Jay Kenagh
Acting Field Manager

Enclosures - 3
EOG Project Description & Project Map
EnCana Project Description & Project Map
List of Species

Cc: State Director, U-933
Central Files, Reading, Adm. Record – EnCana & EOG
JNit-Sin:jns:12/27/04\NEPA.EOG.FWS.Initiation.List

EOG Field Development - Threatened, Endangered and Candidate Plant Species Habitat Evaluation

SPECIES	STATUS	HABITAT	POTENTIAL for and/or OCCURRENCE
Astragalus equisolensis horseshoe milkvetch	Candidate	Duchesne River Formation soils in sagebrush, shadscale, horse brush and mixed desert shrub communities.4790-5185 ft.	None – Uinta Formation. No suitable habitat. Formations and associated soils do not occur in the analysis area.
Penstemon grahamii Graham beardtongue	Candidate	Evacuation Creek and Lower Parachute Member of the Green River Formation. Shaley knolls in sparsely vegetated desert shrub and pinyon-juniper communities. 4600-6700 ft	None – Uinta Formation. No suitable habitat. Formations and associated soils do not occur in the analysis area.
Penstemon scariosus var. *albifluvis* White River penstemon	Candidate	Evacuation Creek and Lower Parachute Creek Member of the Green River Formation on sparsely vegetated shale slopes in mixed desert shrub and pinyon-juniper communities. 5000-6000 ft	None – Uinta Formation. No suitable habitat. Formations and associated soils do not occur in the analysis area.
Schoencrambe argillacea Clay thelopody	Threatened	Book Cliffs on the contact zone between the upper Uinta and lower Green River shale formations in mixed desert shrub of Indian ricegrass and pygmy sagebrush.5000-5650 ft.	None – Uinta Formation. No suitable habitat. Formations and associated soils do not occur in the analysis area.
Schoencrambe suffrutescens Shrubby reed-mustard	Endangered	Evacuation Creek and lower Parachute Creek Members of the Green River Formation on calcareous shales in pygmy sagebrush, mountain mahogany, juniper and mixed desert shrub communities. 5400-6000 ft.	None – Uinta Formation. No suitable habitat. Formations and associated soils do not occur in the analysis area.
Sclerocactus glaucus (*Sclerocactus brevispinus*) Uinta Basin hookless cactus	Threatened	Uintah and Green River Formations. Gravelly hills and terraces on Quaternary and tertiary alluvium soils in cold desert shrub communities. 4700-6000 ft.	***POTENTIAL HABITAT*** Within Uintah Formation, Known populations occur within the project area boundary.
Spiranthes diluvialis Ute lady's tresses	Threatened	Streams, bogs and open seepages in cottonwood, salt cedar, willow and pinyon-juniper communities on the south and east slope of the Uintah Range and its tributaries, and the Green River from Browns Park to Split Mountain. Potentially in the upper reaches of streams in the Book Cliffs. 4400-6810ft.	None – No suitable habitat. Proposed projects are not within associated riparian areas.

12/04

Threatened and Endangered Animal Species Potentially Affected by EOG Resources, Inc. Proposed Field Development

Species	Status	Habitat Association	Potential for Occurrence Within the Proposed Project Area and Cumulative Effects Area
Humpback chub *Gila cypha*	FE	Endemic to the Colorado River system within deep, swift-running rivers, with canyon shaded environments.	Moderate While the project description does not address drilling in 100-year floodplains it appears on project design maps that many wells could be in the floodplains. It is unclear at this time where EOG will acquire water for the project.
Bonytail *Gila elegans*	FE	Endemic to the Colorado River system, restricted to the Green River. They use main channels of large rivers and favor swift currents.	Moderate. While the project description does not address drilling in 100-year floodplains it appears on project design maps that many wells could be in the floodplains. It is unclear at this time where EOG will acquire water for the project.
Colorado pikeminnow *Ptychocheilus lucius*	FE	Endemic to the Colorado River system. Uses large swift rivers.	Moderate. While the project description does not address drilling in 100-year floodplains it appears on project design maps that many wells could be in the floodplains. It is unclear at this time where EOG will acquire water for the project.
Razorback sucker *Xyrauchen texanus*	FE	Endemic to large rivers of the Colorado River system.	Moderate. While the project description does not address drilling in 100-year floodplains it appears on project design maps that many wells could be in the floodplains. It is unclear at this time where EOG will acquire water for the project.
Bald eagle *Haliaeetus leucocephalus*	FT	In Utah, breeding occurrences are limited to five locations within four counties (Carbon, Daggett, Grand, and Salt Lake counties). Winter habitat typically includes areas of open water, adequate food sources, and sufficient diurnal perches and night roosts.	Moderate. Bald eagles in northeastern Utah are opportunistic and will hunt on desert uplands and scavenge for road kills miles from water yet returning to roost in cottonwoods along the Green River
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	FC	Riparian obligate and usually occurs in large tracts of cottonwood/willow habitats. However, this species also has been documented in lowland deciduous woodlands, alder thickets, deserted farmlands, and orchards. Breeding season: late June through July.	Moderate. EOG leases include portions of the White River.

FE = Federally listed as endangered, FT = Federally listed as threatened, FC = Federal candidate

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Vernal Field Office
170 South 500 East
Vernal, UT 84078
(435) 781-4400 Fax: (435) 781-4410

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
8160
UT-0802

January 11, 2006

Name
Address

RE: Chapita Wells-Stagecoach Natural Gas Development EIS.

Dear :

We are seeking your Tribe's comments, concerns or recommendation regarding the following federal action by the Department of the Interior, Bureau of Land Management (BLM).

The purpose of this letter is to introduce you to the proposed action for the EOG Chapita Wells-Stagecoach Area Natural Gas Development Project draft environmental impact statement (CWSA). The project area is located in the Coyote Basin/White River areas of Uintah County, Utah. It is situated in T.8S.,R.22E.; T.9S.,R.22E.; T.9S.,R.23E and T.10S.,R.23E. This is an area of about 31872 acres in extent. The lands are administered by the United States, the State of Utah, Northern Ute Indian Tribe and Private Parties.

As of March 1, 2004 the CWSA contained 325 gas producing wells, 121 miles of roads and 115 miles of pipeline. EOG proposes to drill a total of up to 627 new gas wells. Of this number 473 will be new wells and 154 are expected to be twins drilled on existing locations. Spacing will be forty acre within the project area. The well pads would vary between two to three acres in size. The average size would be 2.5 acres (i.e. 310 X 350 Feet). A twinned well may require an additional 0.5 acres for the two wells. The reserve pit is estimated to be about 0.258 acres with average dimensions of 150 X 75 feet.

Access to the 627 wells would result in the construction of about 99.5 miles of new roads. The running surface is estimated at 18 feet with a disturbed area of 30 feet.

Pipelines would be steel gathering lines with three to four inch outside diameter (OD). These would be installed on the surface to provide transportation of the produced gas. It is estimated that about 104.5 miles of surface pipelines would be constructed. About 50% of the proposed pipelines would be installed parallel to existing and proposed access roads. Total surface disturbance is estimated to be 101 acres. A corridor of about eight feet would be needed to install the pipelines.

The DEIS outlines applicant committed best management practices. These include cultural resources, paleontological resources, threatened, endangered, and other sensitive species, raptors, erosion control and visual resources, noise and protection of the White River's 100 year flood plains.

A Class III (100%) inventory will be done for all ground disturbing actions on a project by project basis. This includes well pads, access roads, pipelines, compressor stations etc. Consultation will be done Under Section 106 of the National Historic Preservation Act of 1966 as amended. Human remains will be respectfully processed according to the Native American Graves and Repatriation Act.

In accordance with the National Environmental Policy Act, the National Historic Preservation Act of 1966 as amended, the Native American Graves Protection and Repatriation Act, American Indian Religious Freedoms Act, the Archaeological Resources Protection Act, Executive Order 13007, and the Federal Land Policy and Management Act, the Vernal Field Office of the BLM respectfully inquires as to if there are any comments, special concerns that you and your tribe may have about the protection of properties and places of traditional cultural or religious importance within the project area. If you have any questions, comments or concerns about the proposed project we would be pleased to discuss them with you. Please advise us whether there are individuals, such as traditional cultural leaders or religious practitioners, which should be contacted in regard to these matters. We also would like to know if you have any other general comments or concerns regarding the proposed project as outlined in this letter.

The potential for inadvertently discovering human remains and/or funerary objects during the implementation of the project outlined in this letter is limited. Previous inventories and discussions with Northern Ute traditional leaders have indicated a low potential for human remains in the areas to be disturbed by energy development. However, if such a discovery is made we will notify you within three days of the discovery, as per the Native American Graves Protection and Repatriation Act.

The purpose of the proposed action is to facilitate further energy development in an environmentally sensitive manner in the Uinta Basin of North Eastern Utah for the benefit of the peoples of the United States.

If you are aware of any impacts this project may have on specific places of traditional cultural or religious importance to your tribe and community, or have comments or concerns about the proposed project, please contact William Stringer, Field Office Manager at (435) 781-4400. If you are aware of places of traditional cultural or religious importance that may be impacted by the proposed project, we would be pleased to discuss them with you in person. For any concerns regarding cultural resources please contact archaeologist Blaine Phillips at (435) 781-4438. We would appreciate hearing from you within 45 days of receipt of this letter so any information, comments or concerns you may wish to bring to our attention can be addressed promptly. Please let me know if you wish additional time so that we may adjust our schedules accordingly.

We look forward to working with you to assure your concerns about places of traditional or religious importance are identified, considered, and protected during project planning and implementation.

Sincerely,

William Stringer
Vernal Field Manager

Enclosure(s)

cc:

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
Vernal Field Office
170 South 500 East
Vernal, UT 84078
(435) 781-4400 Fax: (435) 781-4410
http://www.blm.gov/utah/vernal/index.html

TAKE PRIDE IN AMERICA

SUPERVISORS	INITIAL
Field Mgr.	
Minerals	RC 1-17-06
NEPA	
Renewables	1-17 BSr

IN REPLY REFER TO:
1680
(UT-082)

January 17, 2006

Memorandum

To: Utah Field Supervisor, Ecological Services, U.S. Fish & Wildlife Service, Salt Lake City Utah

From: Field Manager

Subject: Review and initiation of Informal Consultation for the EOG Resources Inc. Chapita Wells-Stagecoach Area Natural Gas Development Draft Environmental Impact Statement UT-080-2005-0010

Enclosed is a printed copy and CD copy of the draft EOG Resources Inc. Chapita Wells-Stagecoach Area Natural Gas Development Draft Environmental Impact Statement, for your review and comments. Pursuant to Section 7 of the Endangered Species Act of 1973, and in conformance with 50 CFR 402.12, the Vernal Field Office is initiating informal consultation with the Service for this project, to minimize the effects to the threatened, endangered and candidate species the BLM has determined in Table 1 are within project area, or have impacts due to the natural gas development activities outside the project area.

Table 1: TEC Species in the EOG Project Area

Common Name	Scientific Name	Status
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
Black-footed ferret	Mustela nigripes	Endangered
Colorado Pikeminnow	*Ptychocheilus lucius*	Endangered
Humpback Chub	*Gila cypha*	Endangered
Bonytail	*Gila elegans*	Endangered
Razorback Sucker	*Xyrauchen texanus*	Endangered
Uinta Basin hookless cactus	*Sclerocactus glaucus*	Threatened
Ute lady's tresses	*Spiranthes diluvialis*	Threatened
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	Candidate

Should you have questions, or require additional information, please contact Tim Faircloth, Acting AFM Resources, at 435-781-4465.

Thank you for your assistance.

Enclosures: EOG EIS Disk and copy

Cc: State Director (U-933) w/att

Bcc: Central Files
Reading
EOG Project File

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Chairman
Hopi Tribal Council
PO Box 123
Kykotsmovi, AZ 86039

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A. Signature X Clutchell ☐ Agent ☐ Addressee

B. Received by (Printed Name) Clutchell

C. Date of Delivery JAN 17 2006

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

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4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from 7005 1820 0004 8556 1123

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1. Article Addressed to:

Councilperson
White Mesa Ute Council
PO Box 7096
White Mesa, UT 84511

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A. Signature X Annie Rabbit ☐ Agent ☐ Addressee

B. Received by (Printed Name)

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

BLANDING UT 84511 JAN 20 2006

3. Service Type
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4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from 7005 1820 0004 8556 1093

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1. Article Addressed to:

Governor
Zia Pueblo
135 Capitol Square Drive
Zia Pueblo, NM [redacted]

2. Article Numl (Transfer fro 7005 1820 0004 8556 1178

COMPLETE THIS SECTION ON DELIVERY

A. Signature X Tammy J Pino ☐ Agent ☐ Addressee

B. Received by (Printed Name) Tammy L Pino

C. Date of Delivery 1/17/06

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
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4. Restricted Delivery? (Extra Fee) ☐ Yes

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1. Article Addressed to:

Chairperson
Eastern Shoshone Business Council
PO Box 538
Ft. Washakie, WY 82514

2. Article Num (Transfer fr 7005 1820 0004 8556 1130

COMPLETE THIS SECTION ON DELIVERY

A. Signature X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name)

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

FORT WASHAKIE, WY JAN 19 2006 USPS 82514

3. Service Type
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1. Article Addressed to:

Governor
Santa Clara Pueblo
PO Box 580
Espanola, NM 87532

2. Article Number (Transfer from 7005 1820 0004 8556 1161

COMPLETE THIS SECTION ON DELIVERY

A. Signature X [signature] ☒ Agent ☐ Addressee

B. Received by (Printed Name) C. Date of Delivery 1-18-06

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
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4. Restricted Delivery? (Extra Fee) ☐ Yes

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1. Article Addressed to:

Chairperson
Southern Ute Tribal Council
PO Box 737
Ignacio, CO 81137

Article Number (Transfer from service label) 7005 1820 0004 8556 1109

COMPLETE THIS SECTION ON DELIVERY

A. Signature X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) C. Date of Delivery 1/18/06

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
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4. Restricted Delivery? (Extra Fee) ☐ Yes

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1. Article Addressed to:

Chairperson
Ute Mountain Ute Tribe
PO Box 248
Towaoc, CO 81334

2. Article Number (Transfer from service label) 7005 1820 0004 8556 1079

COMPLETE THIS SECTION ON DELIVERY

A. Signature X Buddy Lopez ☐ Agent ☐ Addressee

B. Received by (Printed Name) Buddy L Lopez

C. Date of Delivery 1-17-6

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
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4. Restricted Delivery? (Extra Fee) ☐ Yes

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1. Article Addressed to:

Chairperson
Confederated Tribes of the Goshute Reservation
PO Box 6104
Ibapah, UT 84034

2. Article Number (Transfer from service label) 7005 1820 0004 8556 1086

COMPLETE THIS SECTION ON DELIVERY

A. Signature X J Ward ☐ Agent ☐ Addressee

B. Received by (Printed Name) J. Ward

C. Date of Delivery 1-17-06

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☒ No

3. Service Type
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☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

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1. Article Addressed to:

Governor
Laguna Pueblo
PO Box 194
Laguna, NM 87026

2. Article Number (Transfer from serv 7005 1820 0004 8556 1154

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COMPLETE THIS SECTION ON DELIVERY

A. Signature X Kathleen Dailey ☐ Agent ☐ Addressee

B. Received by (Printed Name) Kathleen Dailey

C. Date of Delivery 1-17-06

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
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4. Restricted Delivery? (Extra Fee) ☐ Yes

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Sent To LAGUNA PUEBLO
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- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

President
Navajo Nation
PO Box 9000
Window Rock, AZ 86515

2. Article Number (Transfer from ser 7005 1820 0004 8556 1147

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COMPLETE THIS SECTION ON DELIVERY

A. Signature X [illegible signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) [illegible]

C. Date of Delivery 1/17/06

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☒ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

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1. Article Addressed to:

Chairperson
Ute Indian Tribe
PO Box 190
Ft. Duchesne, UT 84026

2. Article Number (Transfer from se 7005 1820 0004 8556 1116

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COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Rod Graver ☐ Agent ☐ Addressee

B. Received by (Printed Name) Rod Graver

C. Date of Delivery 30-1-14

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
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☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

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

July 10, 2007

In Reply Refer To
FWS/R6
ES/UT
07-F-0167 / 06-FA-0237
6-UT-07-F-021

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: EOG Resources, Inc. Chapita Wells-Stagecoach Area Natural Gas Development Project (EIS #UTU-080-2005-0010) Section 7 Consultation and Final Biological Opinion

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 EOG Resources, Inc. (EOG) proposed Chapita Wells-Stagecoach Area (CWSA) Natural Gas Development Project. Reference is made to your letter dated June 4, 2007 requesting initiation of consultation for the subject project. Based on the information presented in the environmental impact statement (EIS) and the biological assessment (BA) (#UTU-080-2005-0010); and additional applicant committed conservation measures EOG Resources Inc. agreed to in a letter dated July 2, 2007, I concur that the proposed action may adversely affect the endangered Colorado pikeminnow *(Ptychocheilus lucius)*, humpback chub (*Gila cypha*), bonytail (*Gila elegans*), and razorback sucker (*Xyrauchen texanus*) and critical habitat.

Based on the information provided in the EIS and BA, I concur that the proposed project may affect, but is not likely to adversely affect, the bald eagle (*Haliaeetus leucocephalus*), Uinta Basin hookless cactus (*Sclerocactus wetlandicus*), and Ute ladies'-tresses (*Spiranthes diluvialis*). Our concurrence is based, in part, on the applicant committed environmental protection measures designed to avoid or minimize negative effects to biotic and abiotic resources in the project area during project related activities.

Consultation History

On January 20, 2006, we received EOG's CWSA Natural Gas Development Draft EIS requesting comments.

On February 22, 2006, we received an amendment to EOG's CWSA Natural Gas Development Draft EIS. The amendment was a may intended to replace Figure 2-1.

On March 7, 2006, we provided recommendations for protective measures for threatened and endangered species, migratory birds, and floodplains.

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

Biological Opinion

I. DESCRIPTION OF PROPOSED ACTION

The purpose of the project is to fully develop natural gas resources in the Chapita Wells – Stagecoach Area (CWSA). EOG proposes to drill a total of up to 627 new gas wells, construct approximately 99.5 miles of new roads, construct approximately 104.5 miles of pipelines, and use approximately 263 acre-feet of water per year during drilling and completion operations. Of the planned wells, 473 will be drilled from new well pad locations and 154 are expected to be twins drilled from existing well pad locations. The project area is approximately 31,872 acres within Township 8S Range 22E, Township 9S Range 22E, Township 9S Range 23E, and Township 10S Range 23E in Uintah County, Utah. A total of 1,735 acres of direct surface disturbance are expected as a result of the proposed action. This equates to roughly 5% of the project area.

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:

1. EOG will not drill new wells in the White River corridor that would result in new well pads and roads. The White River corridor is defined as the line of sight from the centerline, up to ½ mile, along both sides of the White River.
2. EOG will not drill from new or existing well pads located within the 100-year floodplain of the White River corridor (letter to our office from EOG dated July 2, 2007).
3. To avoid fish entrainment, water should be pumped from an off-channel location wherever feasible – one that does not connect to the river during high spring flows. The infiltration gallery, if used, will be constructed in a BLM and Service approved location.
4. If the pump head is located in the river channel where larval fish are known to occur, the following measures apply:
    a. the pump will not be situated in a low-flow or no-flow area as these habitats tend to concentrate larval fishes;
    b. the amount of pumping will be limited, to the greatest extent possible, during that period of the year when larval fish may be present (see above); and
    c. the amount of pumping will be limited, to the greatest extent possible; during the

pre-dawn hours as larval drift studies indicate that this is a period of greatest daily activity.

5. All pump intakes will be screened with ¼" mesh material.
6. Any fish impinged on the intake screen would be reported to the Service (801.975.3330) and the Utah Division of Wildlife Resources:

   Northeastern Region
   152 East 100 North, Vernal, UT 84078
   Phone: (435) 781-9453

7. EOG will implement a Spill Prevention, Control, and Countermeasure (SPCC) plan per the provisions of 40 CFR 112. To satisfy the EPA's SPCC requirements, if oil storage facilities or tanks were constructed, EOG will utilize secondary containment structures of sufficient capacity to contain, at a minimum, the entire contents of the largest tank.

For more detailed information regarding the proposed action, please refer to BLM's May 2007 *Final Environmental Impact Statement (FEIS) and Biological Assessment (BA) for EOG Resources Inc. Chapita Wells-Stagecoach Area Natural Gas Development; EIS No. UTU-080-2005-0010.*

II. STATUS OF THE SPECIES / CRITICAL HABITAT

A. 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): 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. 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:

Colorado: Rio Blanco County; and Utah: Uintah County. The White River and its 100-year flood plain from Rio Blanco Lake Dam in T.1N., R.96W., sec. 6 (6th Principal Meridian) to the confluence with the Green River in T.9S., R.20E., sec. 4 (Salt Lake Meridian).

All primary constituent elements (water, physical habitat, and biological environment) have been affected throughout designated critical habitat 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 will be considered in our analysis of the effects of the proposed action.

B. 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).

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

C. 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.

D. 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.

<u>Status of Bonytail in the Action Area</u>

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.

III. 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.

A. 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.

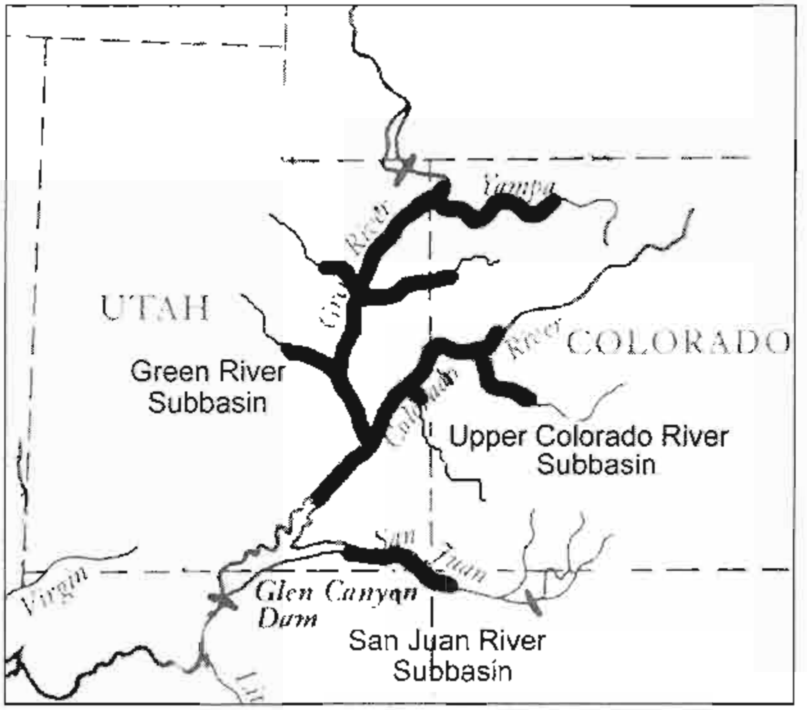

Figure 1. Colorado pikeminnow populations (Service 2002a).

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 White River, abundance estimates for adults ranged from 1,100 animals in 2000 (95% confidence interval, 762 to 1653) to 407 animals in 2003 (95% confidence interval, 300 to 573). This decline constituted 63% of the population (Bestgen et al. 2005). 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.

B. 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.

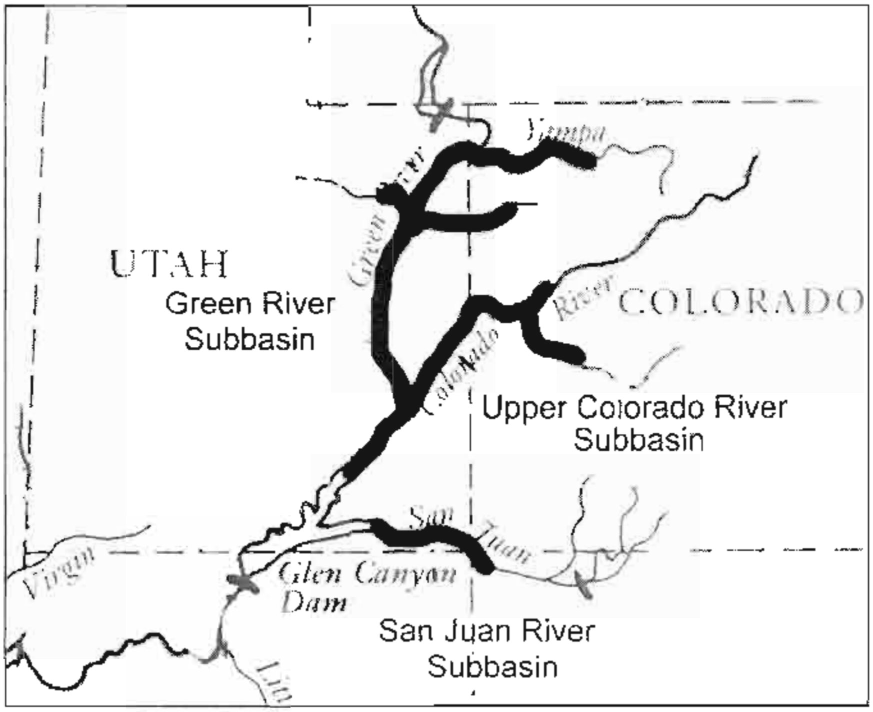

Figure 2. Razorback sucker populations (Service 2002b).

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). Within the White River, razorback suckers are found in low numbers from the confluence with the Green River upstream to Taylor Draw Dam (Service 2002b).

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.

C. 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

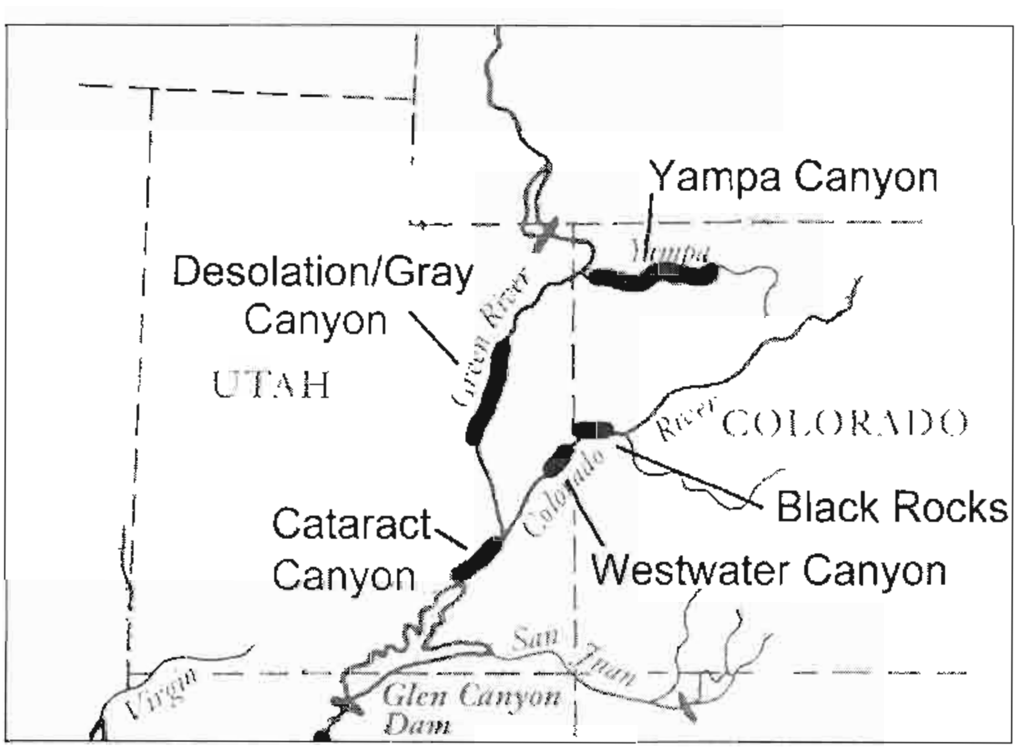

Figure 3. Humpback chub populations (Service 2002c).

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.

D. 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.

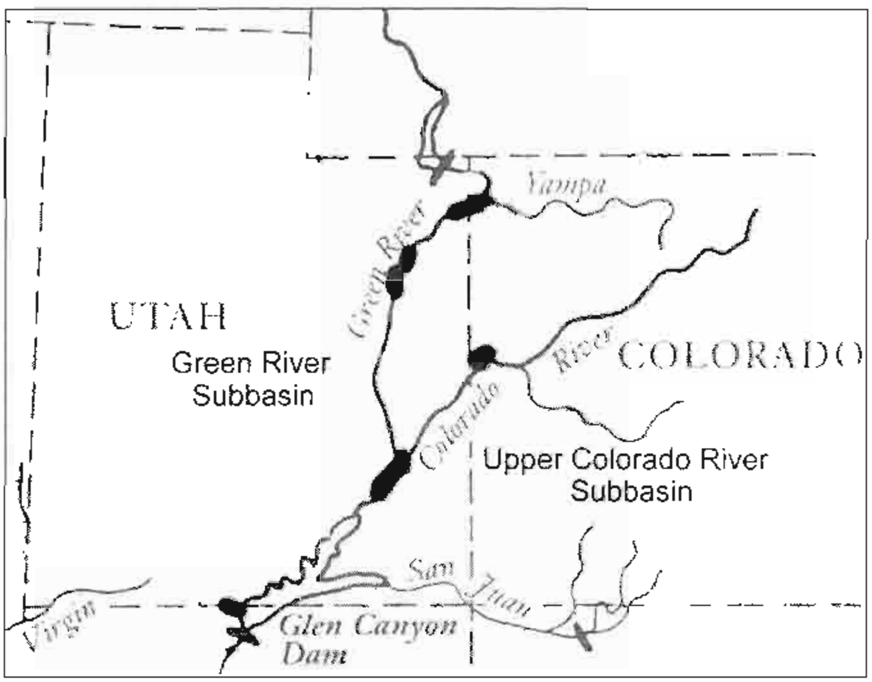

Figure 4. Bonytail populations (Service 2002d).

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:

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E. Existing Disturbance

Within the Chapita Wells-Stagecoach Project Area, there are a total of 997 well locations according to the Utah Division of Oil, Gas and Mining Database accessed via the internet on July 9, 2007. The well status of these locations are as follows: 21 are new permits (APDs) net yet approved; 209 have approved permits (APDs) but are not yet spudded; 58 have been spudded (drilling commenced) but not yet completed; 571 are producing; 31 are abandoned locations; 61 have been plugged and abandoned; 1 had a returned permit (APD) not approved; and 45 were shut-in. Of these, 4 producing wells occur within the 100-year floodplain of the White River.

IV. 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.

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

Designated critical habitat for Colorado pikeminnow exists within the White River and its 100-year floodplain within the project area. 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).

EOG has committed to not drill wells within the 100-year floodplain of the White River corridor. There is potential for fish larvae to become entrained on intake valves while the applicant is withdrawing water directly out of the Green River. 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 CWSA. Accumulations of contaminants in floodplain areas of the Green and White Rivers could result in lethal and/or sublethal impacts to larval and juvenile endangered fish. 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
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

NRC Report #	Incident Date	Incident Cause	Description Of Incident	Material
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
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

NRC Report #	Incident Date	Incident Cause	Description Of Incident	Material
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
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

NRC Report #	Incident Date	Incident Cause	Description Of Incident	Material
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 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 and White Rivers are large rivers 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 downstream, which provide cover and a food source, for overwinter survival and rearing areas.

Since EOG has agreed to not drill within the 100-year floodplain of the White 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 White 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 1,843 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.

Water used for drilling and completion purposes would be obtained from the White or Green Rivers as a result of existing water rights with the State of Utah; commercial water source wells; recycled water from drilling and completion operations; or from the City of Vernal, Utah. Typical commercial water supply sources include the Ouray Brine Plant at Ouray, Utah, and the Target Trucking water source in the SWSW Section 35, T9S/R22E, Uintah County, Utah (State Water Right #49-1501).

V. 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.

A. 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.

VI. 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.

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

Because water depletions from the Upper Colorado River Basin are a major factor in the decline of the endangered fishes (Colorado pikeminnow, bonytail, humpback chub, and razorback sucker), the Service determined that any depletion will jeopardize their continued existence and will likely contribute to the destruction or adverse modification of their critical habitat (USDI, Fish and Wildlife Service, Region 6 Memorandum, dated July 8, 1997). To address depletion issues, the Department of the Interior; the states of Wyoming, Colorado and Utah; and the Western Area Power Administration established the Recovery Implementation Program for Endangered Fish Species in 1988. The Recovery Program acts as the reasonable and prudent alternative to avoid jeopardy to the endangered fishes by depletions from the Upper Colorado River Basin.

Reasonable and Prudent Alternative

On January 21-22, 1988, the Secretary of the Interior; 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 (U.S. Fish and Wildlife Service 1987). The purpose of the Implementation Program is to address water depletion impacts and recovery needs of the Colorado pikeminnow, humpback chub, and bonytail while allowing for future use of Colorado River water in compliance with State water laws, interstate compacts, and the Act. In 1991, the razorback sucker was added to the endangered species list and to the Implementation Program. Critical habitat was designated on March 24, 1994, for all four listed endangered fishes (59 F.R. 13374). Activities and accomplishments under the Implementation Program are intended to provide the reasonable and prudent alternatives for any new projects which cause water depletions and for all existing or past impacts related to historic projects in the Upper Colorado River Basin.

In order to further define and clarify processes outlined in sections 4.1.5, 4.1.6, and 5.3.4 of the Implementation Program, a section 7 agreement and Implementation Program Action Plan was developed (U.S. Fish and Wildlife Service 1993). The agreement establishes a framework for conducting all future section 7 consultations on depletion impacts related to new projects and all impacts associated with historic projects in the Upper Basin. The Implementation Program Action Plan was finalized on October 15, 1993, and has been reviewed and updated annually.

In accordance with the section 7 agreement, the Service annually assesses the impacts of projects and determines if progress toward recovery has been sufficient for the Implementation Program to continue serving as a reasonable and prudent alternative to avoid jeopardy to the listed fish species. If sufficient progress is being achieved, biological opinions are written to identify activities and accomplishments of the Implementation Program that support it as a reasonable and prudent alternative. If sufficient progress towards the recovery of the endangered fishes has not been achieved by the Implementation Program, actions from the Implementation Program Action Plan are identified which must be completed to avoid jeopardy to the fishes. For historic projects, these actions serve as the reasonable and prudent alternative as long as they are completed according to the schedule identified in the Implementation Program Action Plan. For new projects, these actions serve as the reasonable and prudent alternative as long as they are completed before the impact of the project occurs. The proposed Chapita Wells-Stagecoach Area Natural Gas Development project is considered a new project.

The Service considers water development projects as two groups; small projects with average annual depletions below 4,500 acre-feet and larger projects with average annual depletions above 4,500 acre-feet. If the Service has determined that the Implementation Program had made "sufficient progress" towards recovery of the listed fishes, small projects below the 4,500 acre-foot threshold may go forward by paying only a one-time depletion charge of $17.24 per acre-foot (adjusted annually for inflation) to support the Implementation Program and recovery of the endangered fishes. The Implementation Program then serves as the reasonable and prudent alternative to offset the likelihood of jeopardy. For large projects (over 4,500 acre-feet average annual depletions) it is necessary to determine, in addition to the depletion charge, if the

Implementation Program had made "sufficient progress" towards recovery to allow the Implementation Program to serve as the reasonable and prudent alternative.

In determining if sufficient progress has been achieved, the Service considers (a) actions which result in a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction; (b) status of fish populations; (c) adequacy of flows; and (d) magnitude of the project impact. In addition, the Service considers support activities (funding, research, information, and education, etc.) of the Implementation Program if they help achieve a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction. The Service evaluates progress separately for the Colorado River and the Green River sub-basins; however, it gives due consideration to progress throughout the Upper Basin in evaluating progress towards recovery.

In the annual reviews of the Implementation Program Action Plan in 1993, 1994, and 1995, and 2001, and because of the section 7 agreement, the Service determined sufficient progress towards recovery had occurred to allow projects under 4,500 acre-feet (both historic and new) to proceed without the need to identify specific Action Plan elements as reasonable and prudent alternatives The Service has determined, based on the analysis of the hydrological and biological information that currently exists, that if Implementation Program participants, in cooperation with responsible Federal agencies, agree to carry out all the following elements then these actions will avoid the likelihood of jeopardizing the continued existence of endangered fishes and avoid destruction or adverse modification of critical habitats by the proposed Project. It is the responsibility of all parties participating in the Implementation Program to ensure that all elements of this reasonable and prudent alternative are completed and/or implemented consistent with Implementation Program schedules and prior to the occurrence of Project impacts.

The following excerpts are pertinent to the consultation because they summarize portions of the Implementation Program that address depletion impacts, section 7 consultation, and project proponent responsibilities (USFWS 1987):

"All future Section 7 consultations completed after approval and implementation of this program (establishment of the Implementation Committee, provision of congressional funding, and initiation of the elements) will result in a one-time contribution to be paid to the Service by water project proponents in the amount of $10.00 per acre-foot based on the average annual depletion of the project . . . . This figure will be adjusted annually for inflation [the current figure is $17.24 per acre-foot] . . . . Concurrently with the completion of the Federal action which initiated the consultation, e.g., . . . issuance of a 404 permit, 10 percent of the total contribution will be provided. The balance . . . will be . . . due at the time the construction commences . . . ."

It is important to note that these provisions of the Implementation Program were based on appropriate legal protection of the instream flow needs of the endangered Colorado River fishes. The Implementation Program further states (USFWS 1987):

". . . it is necessary to protect and manage sufficient habitat to support self-sustaining populations of these species. One way to accomplish this is to provide long term protection of the habitat by acquiring or appropriating water rights to ensure instream flows . . . . Since this program sets in place a mechanism and a commitment to assure that the instream flows are protected under State law, the Service will consider these elements under Section 7 consultation as offsetting project depletion impacts."

Thus, the Service has determined that water depletion impacts, which the Service has consistently maintained are likely to jeopardize the listed fishes, can be offset by (a) the water project proponent's one-time contribution to the Recovery Implementation Program in the amount of $17.24 per acre-foot of the project's average annual depletion, (b) appropriate legal protection of instream flows pursuant to State law, and (c) accomplishment of activities necessary to recover the endangered fishes as specified under the Recovery Implementation Program Recovery Action Plan and identified below. The Service believes it is essential that protection of instream flows proceed expeditiously, before significant additional water depletions occur.

With respect to (a) above (i.e., depletion charge), the applicant will make a one-time payment which has been calculated by multiplying the project's average annual depletion of 263 acre-feet by the depletion charge in effect at the time payment is made. For Fiscal Year 2007 (October 1, 2006, to September 30, 2007), the depletion charge is $17.24 per acre-foot for the average annual depletion which equals a total payment of $4,534.12 for this project. The Service will notify the applicant of any change in the depletion charge by September 1 of each year. Ten percent of the total contribution, $453.41, or total payment, will be provided to the Service's designated agent, the National Fish and Wildlife Foundation (Foundation), upon the effective date of the permit. The balance will be due at the time construction commences. All payments should be made to the Foundation at the following address:

National Fish and Wildlife Foundation
Attention: Rebecca Kramer
28 2nd St.; 6th Floor
San Francisco, CA 94105

To ensure tracking of payments and compliance with the commitments (e.g., the depletion fee) in this biological opinion, BLM shall notify the Service when: 1) the ROD has been signed, and 3) the date construction commences.

Payment is to be accompanied by a cover letter that identifies the project and biological opinion that requires the payment, the amount of payment enclosed, check number, and any special conditions identified in the biological opinion relative to disbursement or use of the funds (there are none in this instance). The cover letter also shall identify the name and address of the payor, the name and address of the Federal agency responsible for authorizing the project, and the address of the Service office issuing the biological opinion. This information will be used by the Foundation to notify the payor, the lead Federal agency, and the Service that payment has been received. The Foundation is to send notices of receipt to these entities within 5 working days of its receipt of payment.

VII. 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.

A. Amount or Extent of Take

The Service has developed the following incidental take statement based on the premise that the applicant committed conservation measures will be implemented. The Service anticipates that take will be comprised of two forms: contamination and water depletions.

The Service anticipates that all age classes of Colorado pikeminnow, humpback chub, razorback sucker, and bonytail could be taken from within the Upper Colorado River Basin 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 White River.

Age-0 Colorado pikeminnow, Age-0 humpback chub, Age-0 razorback sucker, and Age-0 bonytail could be taken in low velocity shoreline habitats within the Green River as result of this proposed action. The Service considers Age-0 to be $\leq$ 40 mm Total Length. The incidental take is expected to be in the form of harm (death or injury) due to entrainment from pumps taking water directly out of the Green River. No take of older life stages resulting from water withdrawal directly out of surface waters is anticipated, based on data that indicate larger fish would be more capable of avoiding entrainment as well as the applicant committed measure of screening the pump intake. Low velocity habitats are used preferentially by early life stages of the endangered species, and less so by older / larger fish.

The Service anticipates incidental take of the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker will be difficult to detect for the following reasons: the larval fish are so small that they could enter the tank without being observed; and incidental take of actual species numbers may be difficult to detect because finding a dead or impaired specimen is unlikely. For the above reasons, the actual take levels of individual fish are unquantifiable. Take is authorized for the average annual withdrawal of 263 acre-feet.

B. 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 when the reasonable and prudent alternative is implemented.

Because the applicant BLM has committed to the following conservation measures, we are not providing Reasonable and Prudent Measures (RPMs) nor Terms and Conditions (TOCs) at this time. The following measures have been deemed sufficient to minimize take resulting from water withdrawals directly out of occupied water sources:

1. EOG would not drill new wells in the White River corridor that would result in new well pads and roads. The White River corridor is defined as the line of sight from the centerline, up to ½ mile, along both sides of the White River.
2. EOG will not drill from new or existing well pads located within the 100-year floodplain of the White River corridor (letter to our office from EOG dated July 2, 2007).
3. To avoid entrainment, water should be pumped from an off-channel location whenever feasible – one that does not connect to the river during high spring flows. The infiltration gallery will be constructed in a BLM and Service approved location.
4. If the pump head is located in the river channel where larval fish are known to occur, the following measures apply:
    d. the pump will not be situated in a low-flow or no-flow area as these habitats tend to concentrate larval fishes;
    e. the amount of pumping will be limited, to the greatest extent possible, during that period of the year when larval fish may be present (see above); and
    f. the amount of pumping will be limited, to the greatest extent possible; during the pre-dawn hours as larval drift studies indicate that this is a period of greatest daily activity.
5. All pump intakes will be screened with ¼" mesh material.
6. Any fish impinged on the intake screen will be reported to the Service (801.975.3330)

and the Utah Division of Wildlife Resources:

Northeastern Region
152 East 100 North, Vernal, UT 84078
Phone: (435) 781-9453

7. EOG will implement a Spill Prevention, Control, and Countermeasure (SPCC) plan per the provisions of 40 CFR 112. To satisfy the EPA's SPCC requirements, if oil storage facilities or tanks were constructed, they would utilize secondary containment structures of sufficient capacity to contain, at a minimum, the entire contents of the largest tank.

VIII. REPORTING REQUIREMENTS

Actual water depletions must be reported to the Service on an annual basis

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.

IX. 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 average annual water withdrawals out of the Upper Colorado River Drainage System exceed the estimated 263 acre-feet by more than 10%;; (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.

We appreciate the efforts BLM and EOG have made to work with the Service to protect threatened and endangered species. 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.

X. LITERATURE CITED

Behnke, R.J., and D.E. Benson. 1983. Endangered and threatened fishes of the Upper Colorado River Basin. Ext. Serv. Bull. 503A, Colorado State University, Fort Collins. 38 pp.

Bestgen, K.R., D.W. Beyers, G.B. Haines, and J.A. Rice. 1997. Recruitment models for Colorado squawfish: tools for evaluating relative importance of natural and managed processes. Final Report of Colorado State University Larval Fish Laboratory to U.S. National Park Service Cooperative Parks Unit and U.S. Geological Survey Midcontinent Ecological Science Center, Fort Collins, Colorado.

Bestgen, K.R., G.B. Haines, R. Brunson, T. Chart, M. Trammell, R.T. Muth, G. Birchell, K. Christopherson, and J.M. Bundy. 2002. Status of wild razorback sucker in the Green River basin, Utah and Colorado, determined from basinwide monitoring and other sampling programs. Final Report of Larval Fish Laboratory, Colorado State University, Fort Collins, Colo., to Upper Colorado River Endangered Fish Recovery Program, Denver, Colo.

Bestgen, K.R., J.A. Hawkins, G.C. White, K. Christopherson, M. Hudson, M. Fuller, D.C.Kitcheyan, R. Brunson, P. Badame, G.B.Haines, J. Jackson, C.D. Walford, T.A. Sorensen, and T.B. Williams. 2005. Population Status of Colorado pikeminnow in the Green River Basin, Utah and Colorado. Final Report to the Colorado River Recovery Implementation Program, Project Numbers 22i and 22j. Larval Fish Laboratory Contribution 140; Colorado State University, Fort Collins, Colorado.

Chart, T.E., and L. D. Lentsch. 1999a. Flow effects on humpback chub (*Gila cypha*) in Westwater Canyon. Final Report of Utah Division of Wildlife Resources to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Chart, T.E., and L.D. Lentsch. 1999b. Reproduction and recruitment of *Gila* spp. and Colorado pikeminnow (*Ptychocheilus lucius*) in the middle Green River 1992–1996. Final Report to the Recovery Program for the Endangered Fishes in the Upper Colorado River Basin, Project Number 39. Utah Division of Wildlife Resources, Moab and Salt Lake City.

Chart, T. E., and L. D. Lentsch. 2000. Reproduction and recruitment of *Gila* spp. and Colorado pikeminnow (*Ptychocheilus lucius*) in the middle Green River 1992- 1996. Report C *in* Flaming Gorge Studies: reproduction and recruitment of *Gila* spp. and Colorado pikeminnow (*Ptychocheilus lucius*) in the middle Green River. Final Report of Utah Division of Wildlife Resources to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Day, K.S., K.D. Christopherson, and C. Crosby. 1999a. An assessment of young-of-the-year Colorado pikeminnow (*Ptychocheilus lucius*) use of backwater habitats in the Green River, Utah. Report B *in* Flaming Gorge Studies: assessment of Colorado pikeminnow nursery habitat in the Green River. Final Report of Utah Division of Wildlife Resources to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Day, K.S., K.D. Christopherson, and C. Crosby. 1999b. Backwater use by young-of-year chub (*Gila* spp.) and Colorado pikeminnow in Desolation and Gray canyons of the Green River, Utah. Report B *in* Flaming Gorge Studies: reproduction and recruitment of *Gila* spp. and Colorado pikeminnow (*Ptychocheilus lucius*) in the middle Green River. Final

Finger, T.R. and E.M. Stewart. 1987. Responses of fishes to flooding regime in lowland hardwood wetlands. Pages 86-92 *in* W.J. Matthews and D.C. Heins. Community and evolutionary ecology of North American stream fishes. Univ. of Oklahoma Press, Norman. 310 pp.

Gutermuth, F. B., L. D. Lentsch, and K. R. Bestgen. 1994. Collection of age-0 Razorback Suckers (*Xyrauchen texanus*) in the Lower Green River, Utah. Southwestern Nat., 39 (4).

Hamilton, S.J., and B. Waddell. 1994. Selenium in eggs and milt of razorback sucker (*Xyrauchen texanus*) in the middle Green River, Utah. Archives of Environmental Contamination and Toxicology 27:195-201.

Hamilton, S.J., and R.H. Wiedmeyer. 1990. Bioaccumulation of a mixture of boron, molybdenum, and selenium in chinook salmon. Transactions of the American Fisheries Society 119:500–510.

Hamilton, S.J., K.J. Buhl, F.A. Bullard, and S.F. McDonald. 1996. Evaluation of toxicity to larval razorback sucker of selenium-laden food organisms from Ouray NWR on the Green River, Utah. Final Report to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Harvey, M.D., R.A. Mussetter, and E.J. Wick. 1993. Physical process-biological response model for spawning habitat formation for the endangered Colorado squawfish. Rivers 4:114-131.

Holden, P.B., and L.W. Crist. 1981. Documentation of changes in the macroinvertebrate and fish populations in the Green River due to inlet modification of Flaming Gorge Dam. Final Report PR-16-5 of Bio/West, Inc., Logan, Utah, to U.S. Fish and Wildlife Service, Salt Lake City, Utah.

Holden, P.B., and C.B. Stalnaker. 1970. Systematic studies of the cyprinid genus Gila in the Upper Colorado River Basin. Copeia 1970(3):409-420.

Holden, P.B., and C.B. Stalnaker. 1975. Distribution and abundance of mainstream fishes of the middle and Upper Colorado River Basins, 1967-1973. Transactions of the American Fisheries Society 104(2):217-231.

Hubbs, C.L., and R.R. Miller. 1953. Hybridization in nature between the fish genera *Catostomus* and *Xyrauchen*. Papers of the Michigan Academy of Arts, Science and Letters 38:207-233.

Irving, D., and B.D. Burdick. 1995. Reconnaissance inventory and prioritization of existing and potential bottomlands in the upper Colorado River basin, 1993–1994. Final Report to the Recovery Program for the Endangered Fishes of the Upper Colorado River. U.S. Fish and Wildlife Service, Vernal, Utah and Grand Junction, Colorado.

Irving, D., and T. Modde. 2000. Home-range fidelity and use of historical habitat by adult Colorado squawfish (*Ptychocheilus lucius*) in the White River, Colorado and Utah. Western North American Naturalist 60:16-25.

Jonez, A., and R.C. Sumner. 1954. Lakes Mead and Mohave investigations: a comparative study of an established reservoir as related to a newly created impoundment. Final Report. Federal Aid Wildlife Restoration (Dingell-Johnson) Project F-l-R, Nevada Game and Fish Commission, Carson City.

Jordan, D.S. 1891. Report of explorations in Colorado and Utah during the summer of 1889 with an account of the fishes found in each of the river basins examined. Bulletin of the United States Fish Commission 9:24.

Kaeding, L.R., B.D. Burdick, P.A. Schrader, and C.W. McAda. 1990. Temporal and spatial relations between the spawning of humpback chub and roundtail chub in the upper

Colorado River. Trans. Am. Fish Soc. 119:135-144.

Karp, C.A., and Tyus, H.M. 1990. Humpback chub (*Gila cypha*) in the Yampa and Green Rivers, Dinosaur National Monument, with observations on roundtail chub (*G. robusta*) and other sympatric fishes. Great Basin Naturalist 50:257-264.

Lanigan, S.H., and H.M. Tyus. 1989. Population size and status of the razorback sucker in the Green River basin, Utah and Colorado. North American Journal of Fisheries Management 9:1.

Lowe-McConnell, R.H. 1975. Fish communities in tropical waters. Longman, New York.

Mabey, L. W., and D. K. Shiozawa. 1993. Planktonic and benthic microcrustaceans from floodplain and river habitats of the Ouray Refuge on the Green River, Utah. Department of Zoology, Brigham Young University, Provo, Utah.

Marsh, P.C. 1985. Effect of Incubation Temperature on Survival of Embryos of Native Colorado River Fishes. Southwestern Naturalist 30(1):129-140.

Marsh, P.C. 1987. Food of adult razorback sucker in Lake Mohave, Arizona-Nevada. Transactions of the American Fisheries Society 116:117-119.

Marsh, P.C. 1993. Draft biological assessment on the impact of the Basin and Range Geoscientific Experiment (BARGE) on federally listed fish species in Lake Mead, Arizona and Nevada. Arizona State University, Center for Environmental Studies, Tempe, Arizona.

McAda, C.W., and R.S. Wydoski. 1980. The razorback sucker, Xyrauchen texanus, in the Upper Colorado River Basin, 1974-76. U.S. Fish and Wildlife Service Technical Paper 99. 50 pp.

McAda, C.W., J.W. Bates, J.S. Cranney, T.E. Chart, W.R. Elmblad, and T.P. Nesler. 1994a. Interagency Standardized Monitoring Program: summary of results, 1986-1992. Final Report to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

McAda, C.W., J.W. Bates, J.S. Cranney, T.E. Chart, M.A. Trammel, and W.R. Elmblad. 1994b. Interagency Standardized Monitoring Program: summary of results, 1993. Annual Report to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

McAda, C.W., W.R. Elmblad, K.S. Day, M.A. Trammel, and T.E. Chart. 1997. Interagency Standardized Monitoring Program: summary of results, 1996. Annual Report to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

McAda, C.W., W.R. Elmblad, K.S. Day, M.A. Trammell, and T.E. Chart. 1998. Interagency Standardized Monitoring Program: Summary of Results, 1997. Annual Report to the Recovery Program for the Endangered Fishes of the Upper Colorado River, Project Number 22, U.S. Fish and Wildlife Service, Denver, Colorado.

Miller, R.R. 1961. Man and the changing fish fauna of the American Southwest. Papers of the Michigan Academy of Science, Arts, and Letters 46:365-404.

Modde, T. 1996. Juvenile razorback sucker (Xyrauchen texanus) in a managed wetland adjacent to the Green River. Great Basin Naturalist 56:375-376.

Modde, T. 1997. Fish use of Old Charlie Wash: an assessment of floodplain wetland importance to razorback sucker management and recovery. Final report of U.S. Fish and Wildlife Service, Vernal, Utah, to Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Modde, T., and D.B. Irving. 1998. Use of multiple spawning sites and seasonal movement by razorback sucker in the middle Green River, Utah. North American Journal of Fisheries Management 18:318-326.

Modde, T., and E.J. Wick. 1997. Investigations of razorback sucker distribution movements and habitats used during spring in the Green River, Utah. Final Report of U.S. Fish and Wildlife Service, Vernal, Utah, to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Modde, T., K.P. Burnham, and E.J. Wick. 1996. Population status of the razorback sucker in the middle Green River. Conservation Biology 10:110–119.

Muth, R.T. 1995. Conceptual-framework document for development of a standardized monitoring program for basin-wide evaluation of restoration activities for razorback sucker in the Green and Upper Colorado River systems. Colorado State University Larval Fish Laboratory final report to the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin, Denver, Colorado.

Muth, R.T., L.W. Crist, K.E. LaGory, J.W. Hayse, K.R. Bestgen, T.P. Ryan, J.K. Lyons, and R.A. Valdez. 2000. Flow and temperature recommendations for endangered fishes in the Green River downstream of Flaming Gorge Dam. Final Report to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Muth, R.T., G.B. Haines, S.M. Meismer, E.J. Wick, T.E. Chart, D.E. Chart, D.E. Snyder, and J.M. Bundy. 1998. Reproduction and early life history of razorback sucker in the Green River, Utah and Colorado, 19921996. Final Report of Colorado State University Larval Fish Laboratory to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Nesler, T.P., K. Christopherson, J.M. Hudson, C.W. McAda, F. Pfeifer, and T.E. Czapla. 2003. An integrated stocking plan for razorback sucker, bonytail, and Colorado pikeminnow for the Upper Colorado River Endangered Fish Recovery Program. Addendum to State Stocking Plans.

Osmundson, D. B. 2002. Verification of stocked razorback sucker reproduction in the Gunnison River via annual collections of larvae. Annual report to the Recovery Program for the Endangered Fishes of the Upper Colorado River, Project Number 121. U.S. Fish and Wildlife Service, Grand Junction, Colorado.

Osmundson, D.B., and K.P. Burnham. 1998. Status and trends of the endangered Colorado squawfish in the upper Colorado River. Transactions of the American Fisheries Society 127:957-970.

Osmundson, D.B., P. Nelson, K. Fenton, and D.W. Ryden. 1995. Relationships between flow and rare fish habitat in the "15-Mile Reach" of the upper Colorado River. Final Report. U.S. Fish and Wildlife Service, Grand Junction, Colorado.

Osmundson, D. B., R. J. Ryel, and T. E. Mourning. 1997. Growth and survival of Colorado squawfish in the Upper Colorado River. Transaction of the American Fisheries Society 126:687-698.

Osmundson, B.C., T.W. May, and D.B. Osmundson. 2000. Selenium concentrations in the Colorado pikeminnow (*Ptychocheilus lucius*): relationship with flows in the upper Colorado River. Archives of Environmental Contamination and Toxicology 38:479–485.

Ruppert, J.B., R.T. Muth, and T.P. Nesler. 1993. Predation on fish larvae by adult red shiner, Yampa and Green Rivers, Colorado. Southwestern Naturalist 38:397-399.

Sigler, W.F., and R.R. Miller. 1963. Fishes of Utah. Utah Department of Fish and Game, Salt Lake City. 203 pp.

Stephens, D.W. and B. Waddell. 1998. Selenium sources and effects on biota in the Green River Basin of Wyoming, Colorado, Utah, *in* Frankenberger, W.T., Jr., and Engberg.

R.A., eds., Environmental chemistry of selenium: New York, Marcel Dekker, p. 183-204.

Stephens, D.W., B. Waddell, and J.B. Miller. 1992. Detailed study of selenium and selected elements in water, bottom sediment, and biota associated with irrigation drainage in the middle Green River Basin, Utah, 1988-90. U.S. Geological Survey Water Resources Invest. Report No. 92-4084.

Trammell, M. A., and T. E. Chart. 1999. Colorado pikeminnow young-of-the-year habitat use, Green River, Utah, 1992-1996. Report C *in* Flaming Gorge Studies: Assessment of Colorado pikeminnow nursery habitat in the Green River. Final Report of Utah Division of Wildlife Resources to Upper Colorado River Endangered Fish Recovery Program, Denver, Colorado.

Tyus, H.M. 1985. Homing behavior noted for Colorado squawfish. Copeia 1985: 213-215.

Tyus, H.M. 1987. Distribution, reproduction, and habitat use of the razorback sucker in the Green River, Utah, 1979-1986. Transactions of the American Fisheries Society 116:111-116.

Tyus, H.M. 1990. Potamodromy and reproduction of Colorado squawfish Ptychocheilus lucius. Transactions of the American Fisheries Society 119:1,035-1,047.

Tyus, H.M. 1991. Movement and Habitat Use of Young Colorado Squawfish in the Green River, Utah. Journal of Freshwater Ecology. 6(1):43-51.

Tyus, H.M., and G.B. Haines. 1991. Distribution, habitat use, and growth of age-0 Colorado squawfish in the Green River basin, Colorado and Utah. Transactions of the American Fisheries Society 119:1035-1047.

Tyus, H.M., and C.A. Karp. 1989. Habitat Use and Streamflow Needs of Rare and Endangered Fishes, Yampa River, Colorado. U.S. Fish and Wildlife Service, Biology Report 89(14). 27 pp.

Tyus, H.M., and C.A. Karp. 1990. Spawning and movements of razorback sucker, *Xyrauchen texanus*, in the Green River Basin of Colorado and Utah. Southwestern Naturalist 35:427-433.

Tyus, H.M., and C.A. Karp. 1991. Habitat use and streamflow needs of rare and endangered fishes in the Green River, Utah. Final Report. Flaming Gorge Studies Program. U.S. Fish and Wildlife Service, Colorado River Fish Project, Vernal Utah.

Tyus, H.M., and C.W. McAda. 1984. Migration, movements and habitat preferences of Colorado squawfish, Ptychocheilus lucius, in the Green, White, and Yampa Rivers, Colorado and Utah. Southwestern Naturalist 29:289-299.

U.S. Fish and Wildlife Service. 1990. Humpback chub recovery plan, 2nd revision. Report of Colorado River Fishes Recovery Team to U.S. Fish and Wildlife Service, Region 6, Denver, Colorado.

U.S. Fish and Wildlife Service. 1994. Endangered and threatened wildlife and plants: Determination of critical habitat for four Colorado River endangered fishes; final rule. Federal Register 59(54):13374-13400.

U.S. Fish and Wildlife Service. 2002a. Colorado pikeminnow (Ptychocheilus lucius) Recovery Goals: amendment and supplement to the Colorado Pikeminnow Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

U.S. Fish and Wildlife Service. 2002b. Razorback sucker (Xyrauchen texanus) Recovery Goals: amendment and supplement to the Razorback Sucker Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

U.S. Fish and Wildlife Service. 2002c. Humpback chub (Gila Cypha) Recovery Goals: amendment and supplement to the Humpback Chub Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

U.S. Fish and Wildlife Service. 2002d. Bonytail (Gila elegans) Recovery Goals: amendment and supplement to the Bonytail Recovery Plan. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6), Denver, Colorado.

U.S. Fish and Wildlife Service. 2003. Section 7 Consultation, Sufficient Progress and Historic Projects Agreement and Recovery Action Plan (RIPRAP). Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin. United States Department of Interior, Fish and Wildlife Service, Region 6, Denver, Colorado.

Valdez, R.A. 1990. The endangered fish of Cataract Canyon. Final Report of Bio/West, Inc., Logan, Utah, to U.S. Bureau of Reclamation, Salt Lake City, Utah.

Valdez, R.A. and P. Nelson. 2004. Green River Subbasin Floodplain Management Plan. Upper Colorado River Endangered Fish Recovery Program, Project Number C-6, Denver, CO.

Vanicek, C.D. 1967. Ecological studies of native Green River fishes below Flaming Gorge dam, 1964-1966. Ph.D. Dissertation. Utah State University. 124 pp.

Vanicek, C.D., and R.H. Kramer. 1969. Life history of the Colorado squawfish Ptychocheilus lucius and the Colorado chub Gila robusta in the Green River in Dinosaur National Monument, 1964-1966. Transactions of the American Fisheries Society 98(2):193.

Welcomme, R.L. 1979. Fisheries ecology of floodplain rivers. Longman, New York. 315 pp.

Wolz, E.R., and D.K. Shiozawa. 1995. Soft sediment benthic macroinvertebrate communities of the Green River at the Ouray National Wildlife Refuge, Uintah County, Utah. Great Basin Naturalist 55:213-224.

Wydoski, R.S. and E.J. Wick. 1998. Ecological Value of Floodplain Habitats to Razorback Suckers in the Upper Colorado River Basin. Upper Colorado River Basin Recovery Program, Denver, Colorado.

APPENDIX E

CWSA RECLAMATION PLAN

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APPENDIX E - CWSA RECLAMATION PLAN

Plans for Interim and Final Reclamation of the Surface

Producing Locations:

Topsoil shall be stripped and saved to provide for sufficient quantities to be respread to depth of at least four (4) to six (6) inches (or more if readily available on-site) over the disturbed areas to be reclaimed. Topsoil shall be stockpiled separately from subsoil materials. Topsoil salvaged from the reserve pit shall be stockpiled separately near the reserve pit. Topsoil to be stored for more than one year:

- Shall be windrowed, where possible, to a depth of three (3) to four (4) feet at the specified location determined on-site.
- Immediately after windrowing the topsoil, the approved seed mixture as determined by the AO, will be broadcast seeded. After seeding, the stockpile will be "walked" with a dozer to cover seed.

If straw or hay mulch is used, the straw and hay must be certified to be weed-free and the documentation submitted to the AO prior to usage.

- Immediately upon well completion, the location and surrounding area will be cleared of all unused tubing, materials, trash, and debris not required for production.
- If a synthetic, nylon reinforced liner is used, the excess liner will be cut off and removed and the remaining liner will be torn and perforated while backfilling the reserve pit. Alternatively, the pit will be pumped dry, the liner folded into the pit, and the pit backfilled.
- Before any dirt work associated with location reclamation takes place, the reserve pit shall be as dry as possible. Any debris in it will be removed. Other waste and spoil materials will be disposed of immediately upon completion of operations.
- The reserve pit and that portion of the location not needed for production facilities/operations will be recontoured to approximate natural contours. EOG intends to reclaim reserve pits according to the requirements specified in Onshore Order #1. This will be completed by backfilling and crowning the pit to prevent water from standing. The seed mixture as determined by the AO will be drilled immediately after the pit is reclaimed. If the seed mixture is broadcasted, the area seeded will be 'walked" with a dozer, dragged with a harrow; or, other implement to cover the seed. If factors outside of EOG's control (such as adverse weather conditions) occur, or if continuing activity on a particular well pad is anticipated (such as drilling a twin well), EOG will consult with the AO regarding the timing of interim reclamation.

Dry Holes/Abandoned Locations:

On lands administered by the BLM, abandoned well sites, roads, and other disturbed areas will be restored as near as practical to their original condition. Where applicable, these conditions may include the re-establishment of vegetation as specified.

All disturbed surfaces will be recontoured to approximate natural contours, with reclamation of the well pad and access road to be performed as soon as practical after final abandonment. Reseeding operations will be performed after completion of other reclamation operations.

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