ATTACHMENT 5. FINAL BIOLOGICAL OPINION FOR THE GASCO ENERGY INC. FIELD DEVELOPMENT PROJECT ENVIRONMENTAL IMPACT STATEMENT/BIOLOGICAL ASSESSMENT

United States Department of the Interior

FISH AND WILDLIFE SERVICE

UTAH FIELD OFFICE

2369 WEST ORTON CIRCLE, SUITE 50

WEST VALLEY CITY, UTAH 84119

In Reply Refer To:
FWS/R6
ES/UT
07-F-0189
6-UT-12-F-005

December 22, 2011

Memorandum

To: Field Office 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: Final Biological Opinion for the Gasco Energy Inc. Field Development Project Environmental Impact Statement/Biological Assessment.

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 our final biological opinion for impacts to the threatened *Sclerocactus wetlandicus* (Uinta Basin hookless cactus); and the endangered *Schoenocrambe suffrutescens* (shrubby reed-mustard), Colorado pikeminnow *(Ptychocheilus lucius*), razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*); and their designated critical habitat. Reference is made to your correspondence and environmental impact statement/biological assessment (EIS/BA) received by this office on October 28, 2011 in which you requested formal consultation for this project.

Impacts to the threatened *Sclerocactus brevispinus* (Pariette cactus), *Schoenocrambe argillacea* (clay reed-mustard), *Spiranthes diluvialis* (Ute's ladies tresses), and Mexican spotted owl (*Strix occidentalis lucida*) were also analyzed within the EIS/BA and we concur with your "may affect but is not likely to adversely affect" determination for these species. We reached these conclusions based on the fact that no known occupied habitat for these species is found within the propose development in the Agency's Preferred Alternative; and by the adherence to applicant committed measures and conservation measures in Appendix B within the EIS/BA.

Penstemon grahamii (Graham's beardtongue) was also discussed in the EIS/BA. We conclude that this action is not likely to jeopardize the continued existence of or adversely modify proposed critical habitat of *P. grahamii*. We reached these conclusions based on the extremely limited distribution of this species within the project area and adherence to the applicant-committed conservation measures included in Appendices B of the EIS/BA.

Consultation History

This section summarizes significant steps in the consultation process:

Colorado River Fish Recovery Program

On January 21-22, 1988, the Secretary of the Department of the Interior; the Governors of Wyoming, Colorado, and Utah; and the Administrator of the Western Area Power Administration were cosigners of a Cooperative Agreement to implement the "Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin" (Recovery Program; Service 1987). The Recovery Program has been extended until September 30, 2013. An objective of the Recovery Program is to recover the listed species while providing for new water development 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 Recovery Program, a section 7 Agreement (Agreement) and a Recovery Implementation Program Recovery Action Plan (RIPRAP) was developed. 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 (defined as being initiated prior to January 1988) projects in the Upper Basin. Procedures outlined in the Agreement are used to determine if sufficient progress is being accomplished in the recovery of the endangered fishes to enable the Recovery Program to serve as a reasonable and prudent alternative to avoid jeopardy. The RIPRAP was finalized on October 15, 1993, and has been reviewed and updated annually.

In accordance with the 1993 Agreement, we assess the impacts of projects that require section 7 consultation and determine if progress toward recovery has been sufficient for the Recovery Program to serve as the reasonable and prudent alternative. As long as the Recovery Program achieves sufficient progress, biological opinions are written to identify activities and accomplishments of the Recovery Program that support it being used as the reasonable and prudent alternative. If sufficient progress in the recovery of the endangered fishes is not achieved by the Recovery Program, additional actions from the RIPRAP are identified for the project proponent to implement in order to avoid jeopardy to the endangered fishes. For historic projects, the Recovery Program serves as the reasonable and prudent alternative as long as recovery actions are completed according to the schedule identified in the RIPRAP. For new projects, the Recovery Program and/or addition actions identified from the RIPRAP serve as the reasonable and prudent alternative so long as they are completed prior to the project being implemented.

After many years of successful implementation of the Recovery Program and Agreement, Federal action agencies anticipate recovery activities that must be included in their project planning to avoid jeopardy to listed species. Thus, our reasonable and prudent alternative is essentially part of the proposed action. The Recovery Program now serves as a conservation measure within the proposed action and in many cases minimizes adverse effects to listed species or critical habitat. The following excerpts summarize portions of the Recovery Program that address depletion impacts, section 7 consultation, and project proponent responsibilities:

"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 U.S. Fish and Wildlife Service (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 $19.21 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 Recovery Program were based on appropriate legal protection of the instream flow needs of the endangered Colorado River fishes. The Recovery Program further states:

". . . 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 [U.S. Fish and Wildlife] Service (Service) will consider these elements under section 7 consultation as offsetting project depletion impacts."

On July 8, 1997, we issued an intra-Service biological opinion determining that the depletion fee for average annual depletions of 100 acre-feet or less are no longer required because the Recovery Program has made sufficient progress to be the reasonable and prudent alternative to avoid the likelihood of jeopardy to the endangered fishes and to avoid destruction or adverse modification of their critical habitat by these small depletions. The intra-Service biological opinion has been reinitated several times since 1997 to account for additional water depletions. The most recent update occurred on June 4, 2010 and increased the cap for small water depletions to 12,000 acre-feet. This increase will allow us to continue to exempt small depletions of 100 acre-feet or less.

<u>Chronology of recent events and past consultations between the Bureau of Land Management (BLM) and US Fish and Wildlife Service (Service) with regard to this section 7 consultation:</u>

- 10/28/2011; we received a request for consultation on the EIS.
- 08/22/2011; we provided comments on the Preliminary Final EIS.
- 12/21/2010; we provided comments on the Draft EIS.
- 11/28/2007; we provided comments on Chapter 4 of the Draft EIS.
- 11/07/2007; we received a request to review the entire Draft EIS.
- 10/31/2007; we received a request to review language for *Sclerocactus wetlandicus* impacts.

- 10/25/2007; email exchange with SWCA and BLM regarding comment responses on the preliminary final EIS.

- 10/22/2007; we received an email from the BLM which stated they requested the operator to remove proposed wells in the 100 year floodplain of the Green River.

- 10/21/2007; we provided comments on Chapter 2 of the preliminary Draft EIS. We expressed concern about the lack of avoidance or conservation measures for wells in the Green River floodplain.

- 09/17/2007; we called SWCA (NEPA Contractor) to discuss impact determinations for listed species. SWCA responded with an email with their initial determinations for listed species.

- 08/13/2007; we provided comments on Chapters 3, 4 and Appendix E (Special Status Species) on the preliminary Draft EIS.

- 08/09/2007; we sent an email to BLM requesting that Gasco avoid planning well development within the 100 year floodplain of the Green River. We also provided comments on Chapters 1 and 2 of the Draft EIS.

- 08/07/2007; we attended a meeting sponsored by the Vernal Field Office BLM to discuss Chapters 3 and 4 of the preliminary Draft EIS.

- 07/31/2007; we received a request to comment on the preliminary Draft EIS.

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

Biological Opinion

I. Description of Proposed Action

Gasco Energy Inc. (Gasco) proposes to develop oil and natural gas resources within the Monument Butte-Red Wash and West Tavaputs Exploration and Development Areas. The project area is located within Uintah and Duchesne Counties, Utah, and consists of approximately 187 sections located in Township 9 South, Ranges 18 and 19 East; Township 10 South, Ranges 14 through 18 East; and Township 11 South, Ranges 14 through 19 East (See Figure 1).

Gasco operates most of the mineral lease rights underlying both the public and private lands in the project area. The project area encompasses approximately 206,826 acres, in the West Tavaputs and Monument Butte-Red Wash Reasonable Foreseeable Development Areas of the Vernal FO. It is located primarily on BLM-administered lands (177,644 acres), but also includes lands administered by the State of Utah (25,451 acres) and privately owned lands (3,731 acres). The project area includes lands within the restored boundary of the Ute Indian Reservation, but no lands administered by the Tribe or the Bureau of Indian Affairs. Targeted geologic strata lie in the Wasatch, Mesaverde, Blackhawk, Mancos, Dakota, and Green River Formations, approximately 5,000-20,000 feet below the earth's surface. It is Gasco's intent to explore and develop these potentially productive subsurface formations.

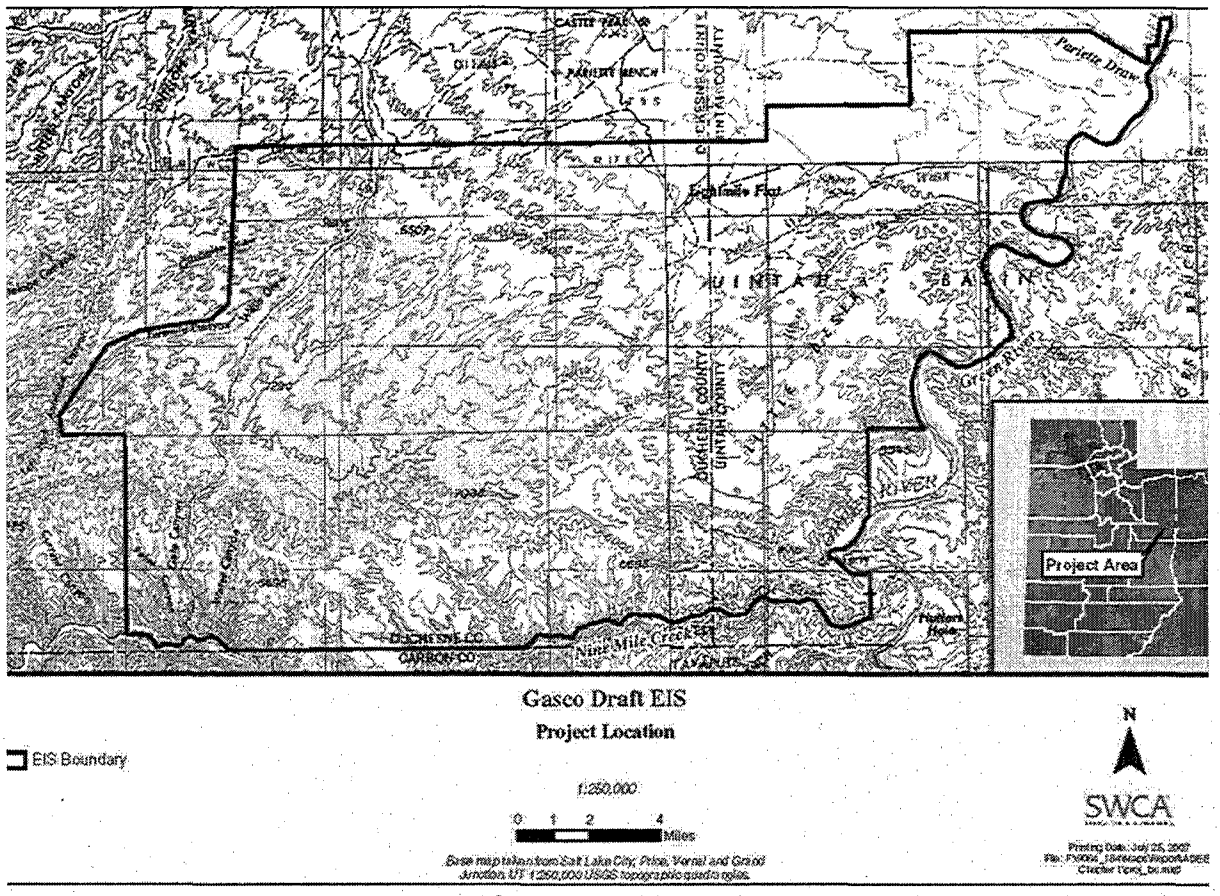

Figure 1 - Map of Gasco Field Development area from EIS/BA

The EIS analyzed six alternatives: the No Action Alternative (Alternative D); the project proponent's Proposed Action Alternative (Alternative A); a Reduced Development Alternative (Alternative B), a Full Development Alternative (Alternative C); a Reduced Development with Directional Drilling (Alternative E); and the Agency Preferred Alternative (Alternative F).
The Agency Preferred Alternative analyzes the drilling of 1,298 new wells (575 new well pads) and the associated access roads, production facilities, water treatment facility, pipelines and electrical power lines. New surface disturbance under this alternative is 3,604 acres (See Figure 2).

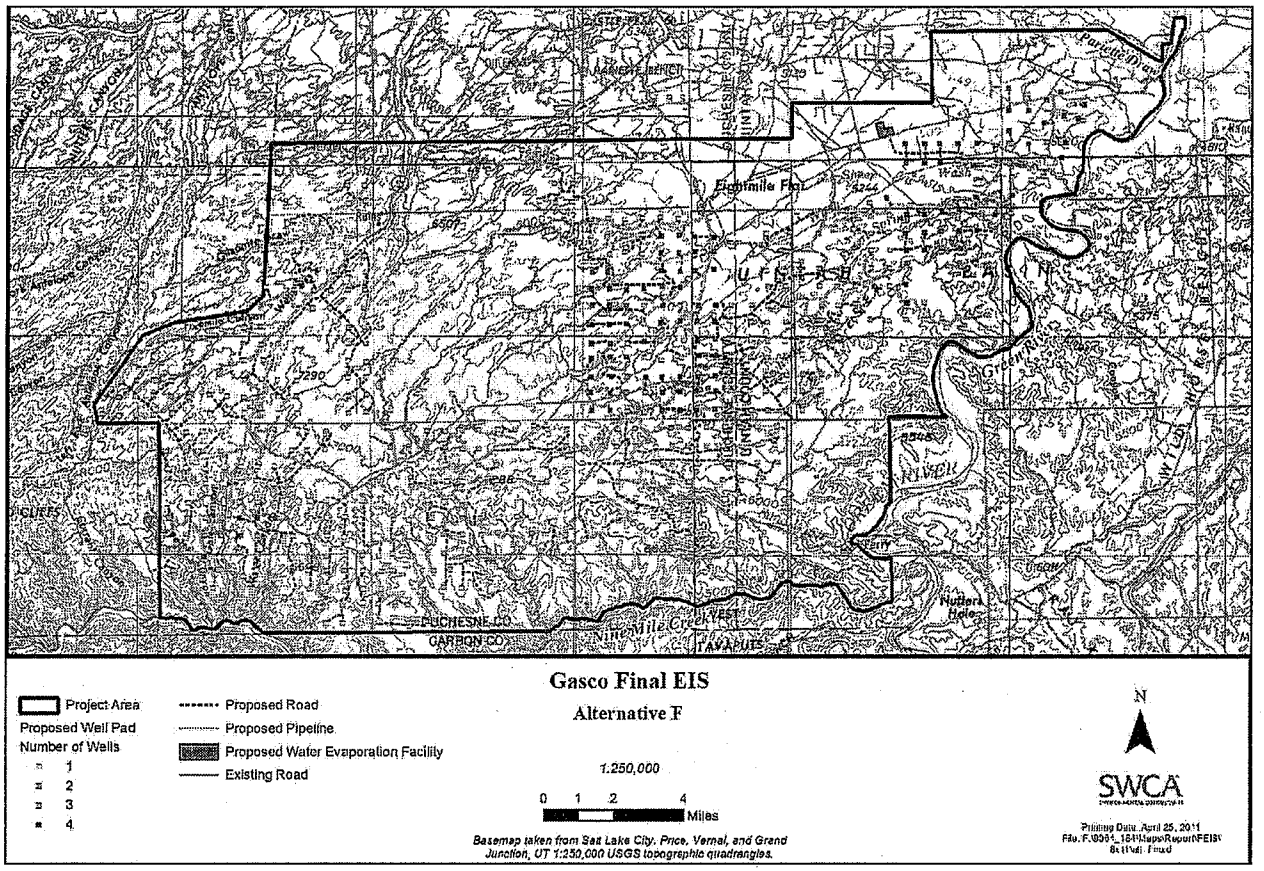

Figure 2 - Map of Agency's Preferred Alternative from EIS/BA

Gasco will construct evaporative ponds on approximately 78 acres to dispose of water from the first five years of proposed development. At the end of five years, the ponds will be evaluated to determine if they will still be needed for future use or closed and reclaimed. However, it is assumed at this time that they will remain in operation for the life of the project.

Water disposal needs above the capacity of these evaporative ponds will be accomplished through reduced drilling (to stay within what the ponds can handle) or through alternative water disposal methods, including water-flood (enhanced oil recovery) operations by other operators, subsurface injection, or other methods. The methods used will depend on the feasibility of alternative disposal methods at the end of the five year interim disposal period, as determined through negotiation with providers and other operators and analysis of disposal zones during the first five years of the drilling program.

Compressor facilities will be expanded by a total of 18,200 hp at the two existing gas plants to handle the increased production. No new compressor stations will be built.

Water for drilling will come from a Newfield pipeline supplied by a Green River well (Water Right No. 41-3530), the Myton water dock facility (Temporary Water Right Application No. 001458BWHITE), the Duchesne Valley Water Treatment Plant, recycled drilling water, and other sources. The source being used will have prior approval by the Administrative Officer (AO). The volume of water to be recycled will be dependent on the amount of drilling and completion activity in the field.

The total water requirement to support the drilling operation and completion is estimated to be approximately 3.28 acre-feet per well. Over the 15 year life of the project it is anticipated that approximately 3,865 acre-feet of water will be needed based on the 1,298 wells proposed under the Agency's Preferred Alternative. This will equate to a 258 acre-feet per year average. The applicant is proposing to use up to 94% recycled and treated water from the treatment facility but at this point we have to assume peak fresh water use will be 258 acre-feet in one year.

Gasco is currently working on several Underground Injection Control program permits for future disposal wells in the project area, in coordination with The Environmental Protection Agency. The success of these wells will not be known until permitting is completed and wells are developed and tested. However, should they prove effective, they could be a primary method of water disposal under the Agency's Preferred Alternative.

While the evaporative pond facilities will be permitted by Utah Division of Oil, Gas, and Mining (UDOGM), the BLM will evaluate the evaporative facility design during the site-specific application process. The BLM will request and consider the following site characterization information:

- Geologic data, including, but not limited to the type and thickness of unconsolidated soils;
    - Type and thickness of consolidated bedrock, if applicable;
    - Local and regional geologic structures; and
    - Any geologic hazards that may affect the design and operation of the facility.

- Hydrologic data, including, but not limited to
    - Surface water features within 2 miles;
    - Depth to shallow groundwater and major aquifers;
    - Water wells within 1 mile of the site boundary and well depth, depth to water, screened intervals, yields, and aquifer name;
    - Hydrologic properties (e.g., flow direction, flow rate, and potentiometric surface) of shallow groundwater and major aquifers;
    - Site location in relation to the floodplain of nearby surface water features;
    - Existing quality of shallow groundwater; and
    - An evaluation of the potential for impacts to nearby surface water and groundwater.

The BLM will also require the following design elements, or similar elements that will be equally effective:

- The synthetic or fabricated liner shall cover the bottom and interior sides of the pit, with the edges secured with at least a 12-inch-deep anchor trench around the pit perimeter. The anchor trench shall be designed to secure, and prevent slippage or destruction of, the liner materials.

- The foundation for the liner shall be constructed with soil having a minimum thickness of 24 inches after compaction and covering the entire bottom and interior sides of the pit. The foundation shall be constructed so that the hydraulic conductivity shall not exceed 1.0 x 10 cm/sec after testing and compaction. Compaction and permeability test results measured in the laboratory and field must be maintained by the operator and provided to BLM upon request. As

an alternative to the soil foundation, a geosynthetic clay liner may be used as a foundation. A geosynthetic clay liner is a manufactured hydraulic barrier typically consisting of bentonite clay or other very low permeability material, supported by geotextiles or geomembranes, which are held together by needling, stitching, or chemical adhesives.

The UDOGM (Utah Administrative Code R649-9 Waste Management and Disposal) regulatory requirements are as follows, and they will be met by Gasco:

- The basins shall be located on level, stable ground, and an acceptable distance away from any established or intermittent drainage.
- The basins shall not be located in a geologically and hydrologically unsuitable area, such as aquifer recharge areas, floodplains, drainage bottoms, and areas near faults.
- The basins shall have adequate storage capacity to safely contain all produced water even during those periods when evaporation rates are at a minimum.
- The basins shall be designed and constructed to prevent the entrance of surface water.
- The basins shall be designed, maintained, and operated to prevent unauthorized surface or subsurface discharge of water.
- The basins shall be fenced and maintained to prevent access by livestock, wildlife, and unauthorized personnel and if required, equipped with flagging or netting to deter entry by birds and waterfowl.
- The basin levees for produced water pits receiving volumes in excess of five barrels per day shall be constructed so that the inside grade of the levee is no steeper than 3:1 and the outside grade no steeper than 2:1. The top of the levee shall be level and of sufficient width to allow for adequate compaction.
- All approved, produced water basins not located at a well site shall be identified with a suitable sign.
- The artificial materials used in lining basins shall be impervious and resistant to weather, sunlight, hydrocarbons, aqueous acids, alkalies, salt, fungi, or other substances that might be contained in the produced water.
- If rigid materials are used, leak-proof expansion joints shall be provided, or the material shall be of sufficient thickness and strength to withstand expansion, contraction, and settling movements in the underlying earth, without cracking. If flexible materials are used, they shall be of sufficient thickness and strength to be resistant to tears and punctures.
- Lined basins constructed in relatively impermeable soils shall have an underlying gravel-filled sump and lateral system or a suitable leak-detection system.

- Lined basins constructed in relatively permeable soils shall have a secondary liner underlying the leak detection system. This liner will be graded so as to direct leaks to the observation sump.

- Test borings shall be taken in sufficient quantity and to an adequate depth to satisfactorily define subsurface conditions and assure that the liner will be placed on a firm, stable base, and to determine the appropriate leak detection system.

The construction and operation of these facilities will meet all minimum standards in BLM Onshore Order No. 7, including the construction of fencing to exclude wildlife and unauthorized waste disposal, minimization of oil on the free water surface to a negligible amount, installation and operation of a leak detection system, and prevention of surface water ingress or discharges to surface waters or drainages. Although the ponds will not be netted to prevent entry by waterfowl due to their size, mitigation measures including gas-operated exploders, electronically produced bird distress calls, and visual deterrents such as scarecrows, flagging, lights, and balloons will be used to deter birds from utilizing the ponds as required by the AO. All headworks (which remove oil to prevent it from reaching the ponds) will be netted or enclosed to prevent entry by wildlife or birds. In addition to the installation of headworks and tanks to capture oil, absorbent booms will also be deployed to ensure that the ponds were not contaminated by oil.

Action Area

The action area is defined in 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, we define the action area to encompass all of the project area proposed for well, road, production facilities, water treatment facilities, power lines, and pipeline development including a 300 foot buffer surrounding these developments; and those portions of waterways downstream of these work areas including the Green River within and outside of the project area.

Applicant Committed Conservation Measures

Applicant committed conservation measures are actions that the action agency and applicant agree to implement to further the recovery of the species under review. The beneficial effects of conservation measures are taken into consideration for determining both jeopardy and incidental take analyses.

The applicant committed to implement the following general development and surface disturbance measures:

- No well pads will be located within any of the 100-year floodplains shown in Map 8 in the EIS/BA.

- No well pads will be located within 0.5 mile or line of sight of the Green River, whichever is less.

- No well pads will be located within 0.5 mile or line of sight of Sand Wash or Desolation Canyon, whichever is less.

- No surface disturbance will be permitted in riparian or wetland areas.

- No well pads or surface disturbance will be located below the rim of Nine Mile Canyon within the existing Nine Mile Canyon ACEC.

- Surface spacing will generally be no denser than one pad per approximately 160 acres in areas where the above provisions do not apply.

- Gasco will not develop new well pads and associated infrastructure in level 1 cactus conservation areas.[1] A map of level 1 conservation areas were sent to Gasco on November 28, 2011 (Crane, 2011).

Colorado River Endangered Fish Species

The following applicant-committed conservation measures will help minimize the impacts of the Proposed Action to the four Colorado River endangered fish species:

- For areas of fresh water collection, an infiltration gallery will be constructed in a Service-approved location. An infiltration gallery is basically a pit or trench dug within the floodplain to a depth below the water table. Water is drawn from the pit rather than from the river directly. If this is not possible, pumping will be limited within the river to off-channel locations that do not connect to the river during high spring flows.

- If water cannot be drawn using the measures above and the pump head will be located in the river channel where larval fish are known to occur, the following measures apply:
    - Avoid pumping from low-flow or no-flow areas as these habitats tend to concentrate larval fishes;
    - Avoid pumping, to the greatest extent possible, during that period of the year when larval fish may be present (see previous bullet); and
    - Avoid pumping, to the greatest extent possible, during the midnight hours (10:00 p.m. to 2:00 a.m.) as larval drift studies indicate that this is a period of greatest daily activity. Dusk is the preferred pumping time, as larval drift abundance is lowest during this time.

- Screen all pump intakes with 3/32-inch mesh material.

- Report any fish impinged on the intake screen to our office (801.975.3330) and the:
  Utah Division of Wildlife Resources
  Northeastern Region
  152 East 100 North
  Vernal, UT 84078
  Phone: (435) 781-9453

[1] Gasco may require 5 new pad locations within level 1 cactus conservation areas in the future (Decker, M. 2011. Email: *Sclerocactus* core conservation areas. The location and necessity for these wells is unknown at this time. However, if development in level 1 areas becomes necessary, Gasco will separately consult with our office on the feasibility, placement, and development of the proposed locations.

In addition, Gasco agrees to have the Upper Colorado River Recovery Program (Recovery Program) serve as a conservation measure within the proposed action. The following paragraphs further clarify the Recovery Program's role:

In determining if sufficient progress has been achieved under the Recovery Program, we consider--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, we consider support activities (funding, research, information, and education, etc.) of the Recovery 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. We evaluate progress separately for the Colorado River and Green River Subbasins; however, it gives due consideration to progress throughout the Upper Basin in evaluating progress toward recovery.

Water depletion impacts can be offset by: a) the water Project proponent's one-time contribution to the Recovery Program in the amount of $19.21 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 RIPRAP. We believe it is essential that protection of instream flows proceed expeditiously, before significant additional water depletions occur. As the project's peak annual new depletion of 258 acre-feet is below the current sufficient progress threshold of 4,500 acre-feet, Recovery Program activities will serve as the conservation measures to minimize adverse effects to the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail and destruction or adverse modification of critical habitat caused by the project's new depletion.

With respect to (a) above (i.e., depletion charge), Gasco will make a one-time payment which has been calculated by multiplying the Project's peak annual depletion (258 acre-feet) by the depletion charge in effect at the time payment is made. For Fiscal Year 2012 (October 1, 2011, to September 30, 2012), the depletion charge is $19.21 per acre-foot for the average annual depletion which equals a total payment of **$4,950** for this Project. A minimum of 10% of the total payment will be provided to the Service's designated agent, the National Fish and Wildlife Foundation (Foundation), at the time of issuance of the Federal approvals from the BLM, with the rest to be paid when construction commences. Fifty percent of the funds will be used for acquisition of water rights to meet the instream flow needs of the endangered fishes (unless otherwise recommended by the Implementation Committee); the balance will be used to support other recovery activities for the Colorado River endangered fishes. All payments should be made to the National Fish and Wildlife Foundation.

National Fish and Wildlife Foundation
1133 15th Street, NW
Suite 1100
Washington, DC 20005

Each payment will 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). A copy of the cover letter and of the check is to be sent directly to our office. The cover letter shall identify the name and address of the payer, 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 payer, 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.

Special Status Plant Species

- If populations of other threatened, endangered, or BLM sensitive plants are identified in the future, avoidance and mitigation measures will be addressed at the site-specific level during the Applicant Permit to Drill (APD) process, which may include site-specific consultation with the Service, as necessary.

Other Applicant-Committed Measures

Several applicant-committed Best Management Practices (BMPs) will be applied as necessary to reduce or minimize potentially adverse impacts to multiple environmental resources. These BMPs include the use of directional drilling, the burial of collector and transmission pipelines under or adjacent to roadways, and the centralization of water and condensate facilities.

- Directional drilling and drilling of multiple wells from single pads will occur on a limited site-specific basis where technologically and economically feasible, and as necessary to reduce or eliminate impacts to sensitive resources of particular concern identified by the AO.

- Gasco will bury pipelines within or adjacent to roadways and/or centralize water and condensate tank batteries where on-site review indicates these measures will reduce overall environmental impacts or impacts to particular sensitive resources. Resources that may be considered during on-site review of buried pipelines and centralized tanks include: visual resources, access by vehicles and the crews, wildlife resources (e.g., sage-grouse and prairie dog habitat), and other locally sensitive resources. These measures will be applied at the site-specific level and at the discretion of the AO. In addition, tank batteries will be centralized where multiple wells are drilled directionally from a single pad.

- In coordination with the AO, Gasco will implement its "Plan for Surface Reclamation and Monitoring" (Appendix G of the BA/EIS) to maximize the success of the reclamation program. If reclamation was not successful for both herbaceous and woody species, Gasco will coordinate with the AO on appropriate remedial measures. In addition, Gasco will develop and implement an AO-approved noxious weed inventory, monitoring, and control program for the project disturbance areas.

- The operator will control all noxious/invasive weeds along Rights of Ways (ROWs) for roads, pipelines, well sites, or other applicable facilities by the application of herbicides or by mechanical removal. A list of noxious weeds will be obtained from the BLM or appropriate County Extension Office.

The site-specific application of these BMPs will depend upon a number of factors, including the nature of the landscape (i.e., landforms, vegetation, and existing structures), local geology and soils, well spacing, the use of existing roads versus the need to construct new roads, and the presence of sensitive resources that may be adversely or beneficially affected by any of these BMPs. These factors will be considered at the implementation level through on-site review during the APD process. As practicable, Gasco will submit APDs in groups (of nearby wells) in order to facilitate the BLM's analysis regarding the application of these BMPs across larger areas.

II. STATUS OF THE SPECIES / CRITICAL HABITAT

The purpose of this section is to summarize the best available information regarding the current range wide status of the listed fish and plant species. Additional information regarding listed species may be obtained from the sources of information cited for these species.

Sclerocactus wetlandicus

Sclerocactus glaucus (Uinta Basin hookless cactus), which included three identified subpopulations, was listed as a threatened species in 1979 (44 FR 58870). The argument to separate *S. glaucus* into three species is supported by recent genetic studies (Porter and others 2000), common garden experiments (Welsh and others 2003), and a reevaluation of morphological characteristics (Heil and Porter, 2004). We currently recognize *S. glaucus* as three distinct species: *S. brevispinus* (Pariette cactus), *S. glaucus* (Colorado hookless cactus), and *S. wetlandicus* (Uinta Basin hookless cactus). These three species retain their threatened status (74 FR 47112, September 15, 2009).

Below we discuss the status of *Sclerocactus wetlandicus* and new biological information as it pertains to the proposed project. Additional information on this species' life history, population dynamics, status, and distribution is described in detail within the "Recovery Plan for the Uinta Basin Hookless Cactus" (Service, 1990c) and the more recent recovery outline (Service, 2010a).

Sclerocactus wetlandicus is generally found on coarse soils derived from cobble and gravel stream terrace deposits, or rocky surfaces on mesa slopes at 1,350 to 1,900 meters (4,400 to 6,200 feet) elevation (Service, 1990c; Heil and Porter, 2004). However, the habitat type for *S. wetlandicus* has expanded with recent reports of individual cacti found in atypical habitat.

Sclerocactus wetlandicus is an outcrossing species, meaning individual plants require pollen from the flower of a different plant to produce viable seed (Tepedino and others 2010). Flowers of *S. wetlandicus* typically open in mid-day and close late in the afternoon for three to five days (Tepedino et al., 2010). A broad assemblage of native, ground-nesting bees, mostly from the family Halictidae (Tepedino et al., 2010), pollinate *S. wetlandicus*. These bees can travel from 0.4 to 1 km between plants (Tepedino, 2010). Other insects, including ants and beetles, may also pollinate *S. wetlandicus* (Service, 1990c). Limiting the amount of fragmentation and disturbance within the habitats of *S. wetlandicus* is important to maintain adequate pollinator habitats and healthy cactus populations.

About four to five weeks after flowering, the fruits of *Sclerocactus wetlandicus* reach maturity, each containing approximately 20 seeds (Tepedino et al., 2010). The fruits open and fall away, leaving the seeds on the apex of the plant where they are washed to the ground and dispersed by rain (Tepedino et al., 2010). The life history and population dynamics of these species are poorly known, but they are thought to be long-lived perennials, usually flowering after 3 or 4 years.

In 2010, we developed a potential habitat polygon for *Sclerocactus wetlandicus* to better assess possible impacts to the species within its range. Although both *Sclerocactus* species' populations can be found outside of these areas, they tend to occur in greater numbers and at higher densities within the polygons. This polygon is updated annually and was last updated in March 2011 (Service and BLM, 2011).

The total area of potential habitat for *Sclerocactus wetlandicus* is currently 442,000 acres and includes federal, tribal, state, and private lands. Our most current geographic data for *S. wetlandicus* includes over 18,400 points representing approximately 40,528 individual cacti. These numbers include living and dead plants, but do not include hybrids of *S. wetlandicus* and *S. brevispinus* which occur outside of the action area where these two species overlap. Based on recent survey data (BLM and Service, 2011) and extrapolation to unsurveyed, suitable habitat, we predict the total count for *S. wetlandicus* to be at least 50,000.

We do not have population trend data for *Sclerocactus wetlandicus*. However, as described below, the high levels of energy development result in the loss and fragmentation of habitat for these species. Thus, we conclude it is likely that this species and its available habitat are declining.

Habitat loss associated with energy development is a major threat to this species across its known range. To estimate the approximate amount of surface disturbance currently existing within the potential habitat polygon for *Sclerocactus wetlandicus*, we used GIS data from UDOGM that show approximately 5,161 oil and gas well locations within the *S. wetlandicus* potential habitat polygon *Sclerocactus* (UDOGM, 2011). We estimate 5 acres of surface disturbance for each well, which includes associated roads and pipelines. Thus, we calculated that over 25,800 acres of habitat within the *Sclerocactus* potential habitat polygon are disturbed by energy development. This equates to existing direct surface disturbances within approximately six percent of the *S. wetlandicus* potential habitat polygon. Approximately two-thirds of the potential habitat polygon for *S. wetlandicus* is leased for oil and gas development. At least 15,000 wells are planned for development in the Uinta Basin in upcoming years, and thus the amount of surface disturbance across *Sclerocactus* habitat can be expected to increase substantially.

There are two levels at which oil and gas development impact *Sclerocactus wetlandicus*: 1) on a localized level within the immediate proximity of known cactus locations, and 2) on a broader landscape scale.

The section 7 consultation process has been relatively effective at minimizing impacts on the localized level. Loss of individual plants and direct impacts are minimized through the incorporation of mitigation measures through the consultation process. For example, oil and gas development currently must maintain a 300-foot buffer between rights-of-way or surface disturbance and listed plants on federally-managed lands to stay at an informal level. However, exceptions to this 300-foot buffer are allowed with the additional commitment to continue to monitor plants that fall within the buffer. As a

result, at least 320 wells are now located within 300 feet of all known cactus locations (UDOGM, 2011). Some of these well locations are historical or were developed without section 7 consultation because they were thought to occur outside of the range of the species. We do not have an accurate way to estimate how many cacti were lost or disturbed from development of these wells.

On a broader landscape scale, the section 7 consultation process has been less effective at minimizing impacts to *Sclerocactus wetlandicus* because: individual consultations are minimally effective at mitigating landscape-scale cumulative impacts, recent research indicates that a 300-foot buffer may not be sufficient to protect gene flow between individuals of the *Sclerocactus* species, and the scientific literature indicates that the impacts of roads and other surface disturbances can extend far beyond 300 feet. Through section 7 consultations, individual projects on a case-by-case basis—even large energy field development EISs—have not been likely to jeopardize the continued existence of *S. wetlandicus* because of commitments to mitigation measures. As a result, hundreds of energy development projects have been approved across the landscape of the Uinta Basin. As a result, habitat fragmentation, fugitive dust, invasive species, and hydrologic changes have increased across the landscape. In the foreseeable future these disturbances are likely to reach a level at which recovery of *S. wetlandicus* will be appreciably reduced.

Recent research indicates that a 300-foot buffer between energy development and *Sclerocactus* plants may not be sufficient to protect pollinators and thus preserve gene flow between sub-populations. Connectivity between sub-populations is important because *Sclerocactus* species are out-crossing and require pollen from another plant's flower to produce viable seed (Tepedino et al., 2010). Thus, maintaining pollinator habitat and pollinator populations is important for survival and recovery of *Sclerocactus* species. The commonest *Sclerocactus* flower visitors are Halictinae bees (a subfamily of bees that pollinate *Sclerocactus*) that can travel from 400 meters to 1,000 meters (Tepedino et al., 2010). These bees also use other native plants besides *Sclerocactus* species as food sources, and protecting overall native plant diversity is important to protect *Sclerocactus* pollinators (Tepedino et al., 2010). Finally, protecting bee nests is critical (Tepedino et al., 2010), but we do not currently have a reliable way to identify bee nests in the field. Although it does not appear the *S. wetlandicus* is pollinator-limited (Tepedino et al., 2010), we should strive to institute protections for *S. wetlandicus* pollinators before this becomes the case.

The scientific literature continues to support the idea that effects from roads and other disturbances can extend far beyond 300 feet (see, for example, (Walker and Everett, 1987; Myers-Smith and others 2006; Farmer, 1993). This research has been available for many years, even when we established the 300-foot buffer with federal land management agencies. These studies are not specific to the Uinta Basin, so we were conservative in our estimate of the minimum buffer needed to avoid jeopardizing survival and recovery of *Sclerocactus* species. At the time we thought that data from long-term population monitoring of *Sclerocactus* conducted by the BLM and three-year monitoring required for projects within 300-feet of plants would give us information specific to our species and ecosystem that we could use to refine buffers, if necessary. Unfortunately, inadequate study design (from the three-year monitoring) and incomplete results (from the long-term population monitoring) have not allowed us to draw any conclusions regarding what minimum buffer is sufficient to protect *Sclerocactus* species across their known ranges. Our previous knowledge of surface disturbance literature combined with new information regarding pollinators (from Tepedino et al., 2010) has made it imperative to implement more restrictive protective measures for *S. wetlandicus*.

We intend to limit additional surface disturbance in core population areas until we receive conclusive data regarding development impacts on *Sclerocactus wetlandicus*, thus ensuring we act before a threshold is irreversibly crossed. To better define core populations we developed core conservation areas and management recommendations (see Figure 3 for core conservation areas within the action area). We established two levels of core conservation areas based on pollinator travel distance and designed the areas to provide habitat connectivity between populations and individuals. Because we do not know the complete distribution of *S. wetlandicus*, the core areas are centered on the densest known areas of *Sclerocactus*. The distances we used to develop core conservation areas were based on travel distances of common bee species that visit *Sclerocactus* plants. These Halictine bees are in the small and medium size range and travel approximately 400 meters to 1,000 meters between plants and nests (Tepedino et al., 2010). Level 1 polygons were developed using a 400-meter buffer around plants to allow for pollinator travel and include the densest concentrations of cactus locations and the most restrictive management recommendations. Level 2 polygons were developed using a 1,000-meter buffer around plants while incorporating less-dense cactus areas and less restrictive management recommendations.

Substantial energy development already exists within the core areas. In other draft recovery plans for plants in similar ecosystems, we recommend no disturbance within occupied habitat and no more than 10 percent cumulative disturbance within suitable habitat. Because we have little occupied habitat that remains undisturbed and suitable habitat for *Sclerocactus* species has been difficult to define, we set our disturbance cap across the core conservation areas between zero and 10 percent, at 5 percent. This will allow a low to moderate level of disturbance in areas with dense cactus populations while limiting disturbance until we can obtain more definitive data showing impacts of disturbance to *Sclerocactus* species. On average, we estimate approximately 7 percent of the land surface contained within level 1 and level 2 core conservation polygons is already disturbed by energy development. This disturbance exceeds the 5 percent we recommend in the core areas, indicating a need to focus on reclamation efforts wherever and whenever possible.

These conservation areas were listed as a recovery objective in the original Recovery Plan (Service, 1990c) for *Sclerocactus glaucus*, which included *S. wetlandicus* at the time:

> "Four … populations must be on lands with formal management designations which would provide long term, undisturbed habitat for *S. glaucus*."

This idea was carried forward into the more recent recovery outline (Service, 2010a) for *Sclerocactus wetlandicus*:

> "Identify sites in urgent need of habitat protection, set protection priorities, and implement protective measures. In the long run, land management agencies should establish formal land management designations to provide for long-term protection of important populations and habitat."

We are developing a new recovery plan for both *Sclerocactus brevispinus* and *S. wetlandicus*, which will include finalized core conservation areas and management prescriptions. We developed the core conservation areas prior to completion of the recovery plan due to several upcoming energy field development projects that had the potential to preclude recovery options for *Sclerocactus* species.

Schoenocrambe suffrutescens

Schoenocrambe suffrutescens (shrubby reed-mustard) occurs in the Uinta Basin in Duchesne and Uintah counties. This member of the mustard family is a perennial, shrubby herb that produces yellow flowers that bloom from May through June. *S. suffrutescens* grows along semi-barren, white-shale layers of the Green River Formation (Evacuation Creek Member), where it is found in xeric, shallow, fine-textured soils intermixed with shale fragments and formerly overlain by clastic tuffaceous building stones (Service, 1994). It occurs in mixed desert shrub and pinyon-juniper communities at elevations ranging from 5,400 to 6,000 feet.

Schoenocrambe suffrutescens occurs in seven known populations with an estimated total of 3,000 individuals (Service, 2010b). Small population size is a concern because five of the seven populations are estimated at fewer than 250 individuals (Service, 2010b). Winter sheep grazing is currently the principal use activity within the range of this species, and in one population some plants were grazed and uprooted (Shupp and Lewis, 2011). *S. suffrutescens* requires pollen from another individual to produce seed, and at some sites this species may be pollinator limited (Shupp and Lewis, 2011).

Colorado River Fishes

The Colorado pikeminnow and humpback chub were listed as endangered on March 11, 1967 (32 FR 4001); the bonytail was listed as endangered on April 23, 1980 (45 FR 27710); and the razorback sucker was listed as endangered on October 23, 1991 (56 FR 54957). Critical habitat was designated for all four fish species on March 21, 1994 (59 FR 13374). Species descriptions, critical habitat information, life history, population dynamics, and the species status, distribution, and recovery goals are described in detail within their respective Recovery Plans and amendments (Service, 1990a; Service, 1990b; Service, 1991a; Service, 1991b; Service, 1997; Service, 2002a; Service, 2002b; Service, 2002d; Service, 2002c). The Colorado pikeminnow razorback sucker, bonytail and humpback have designated critical habitat within the Green River in Uintah County and within the action area.

III. ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as follows:

- 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.

Status of the Species within the Action Area

Sclerocactus wetlandicus

In coordination with the BLM, we delineated a potential habitat polygon for *Sclerocactus wetlandicus* to better assess possible impacts to the species within its range. Although *S. wetlandicus* populations can be found outside of these areas, they tend to be more isolated and occur in low densities. Based on the potential habitat polygon, we estimate the total area of potential habitat for *S. wetlandicus* across its range is 442,205 acres. The BLM's BA/EIS identifies approximately 98,417 acres (~39 percent) of potential habitat for *S. wetlandicus* in the action area under the Agency's Preferred Alternative which is very close to our estimate (approx. 100,427 acres). Of these individuals, approximately 89,917 acres (~38 percent) of this habitat is on BLM land. The remaining 8,500 acres of potential habitat occur on private and state lands.

We estimate approximately 50,000 *Sclerocactus wetlandicus* rangewide. Within the action area 6,750 locations representing at least 11,000 individuals (approximately 22 percent of the total estimated population) were identified through various survey efforts (BLM and Service, 2011).
The action area contains portions of the Lower Pariette, Middle Green, Lower Green, and Upper Nine Mile *Sclerocactus* core conservation areas. The Upper Nine Mile and Middle Green core conservation areas are likely to receive the most development and, thus, impacts associated with this project.

We do not have population trend data for *S. wetlandicus*. However, as described below, high levels of energy development results in the loss and fragmentation of habitat for this species. Thus, we conclude that it is likely that this species and its available habitat are declining.

Schoenocrambe suffrutescens

One of the seven known shrubby reed-mustard populations occurs on 1,449 acres in the Badland Cliffs in the southwestern portion of the project area (Service, 2010b). There are 992 known *Schoenocrambe suffrutescens* individuals within the Vernal FO, 236 of which are located within the project area depicted in Figure 1 (BLM and Service, 2011).

Colorado River Endangered Fishes

All four endangered Colorado River fish species are found in the Green River. Additional detail of these populations is discussed below:

One of three Colorado pikeminnow populations, the Green River subbasin population, will be affected by this project. This population was estimated at 6,000 to 8,000 adults (Nesler and others 2003; Service, 1991a; Service, 2002b) and was determined to be declining in 2001-2003 (Bestgen and others 2005)..

The Green River subbasin population of razorback sucker is likely to be impacted by this action, and this population is estimated at 500 to 1,000 fish (Modde and others 1996; Lanigan and Tyus, 1989). The Green River from the confluence with the Yampa River to Sand Wash has the largest existing riverine population of razorback sucker (Modde et al., 1996; Lanigan and Tyus, 1989).

The Desolation/Gray Canyon population of humpback chub is likely to be impacted by this action, and this population is currently estimated at 1,500 fish (Service, 2002c). Each population of humpback chub consists of a discrete group of fish, geographically separated from the other populations, but with some exchange of individuals. The fish community in Desolation and Gray Canyons includes age-0, juvenile, and adult *Gila,* including humpback chub, indicating a reproducing population (Chart and others 1999).

Bonytail were once widespread in the Colorado River Basin (Chamberlain, 1904). 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). However, few bonytail were captured after 1973, and the last recorded capture in the Green River was in 1985 (Service, 2002a). Following this decline, large numbers of bonytail were stocked in the Green River Basin between 1998 and 2009. In 2009, biologists working on the Green River in the Uintah Basin, Utah, captured in excess of 40 bonytail stocked more than a year earlier, indicating some success of recent stocking activities(Service, 2010c).

Factors Affecting the Species within the Action Area

Sclerocactus wetlandicus

The action area incorporates at least three other highly-developed existing oil and gas fields, most of which are included in the larger Gasco development area. In the BA/EIS, the BLM estimated approximately 550 wells and associated infrastructure are already developed across the action area, with approximately 1,402 acres of surface disturbance. Available GIS data indicate that this number could be closer to 800 wells (UDOGM, 2011). Some of these wells are plugged and abandoned, shut-in, or the location was abandoned, but they may be reopened for future development. Some of the well sites share pads so the actual number of well pads within the action area is approximately 763. Within the action area approximately 550 *Scleorocatus* individuals are within 300 feet of these existing developments.

Within the potential habitat polygon, 371 of these wells are drilled from 309 pads (UDOGM, 2011; Service and BLM, 2011). Because we do not know how much land is disturbed within the action area, we estimate that each well disturbs approximately 5 acres of habitat for the well pad and associated infrastructure (for example, roads and pipelines). Given these 309 pads across *S. wetlandicus* potential habitat, at least 1,545 acres of land, or ~1.5 percent of the potential habitat polygon in the action area, are disturbed across all landowners.

Within the core conservation areas, substantial disturbance exists within the Middle Green and Lower Pariette areas (**Table 1**). Negligable disturbance exists within the Upper Nine Mile and Lower Green conservation areas where they overlap the action area.

Table 1. Estimated existing disturbance in core conservation areas where they overlap the action area. Level 2 core conservation areas are inclusive of level 1 areas.

	Core Conservation Areas							
	Upper Nine Mile		Lower Green		Middle Green		Lower Pariette	
Within action area:	**Level 1**	**Level 2**	**Level 1**	**Level 2**	**Level 1**	**Level 2**	**Level 1**	**Level 2**
percent of core area	100%	100%	13%	13%	89%	79%	9%	16%
estimated number of well pads in core area	1	10	0	0	48	122	10	31
estimated acres surface disturbance in core area	5	50	0	0	240	610	50	155
estimated percent surface disturbance in core area	0%	1%	0%	0%	4%	4%	8%	7%

Sclerocactus wetlandicus is experiencing direct and indirect impacts from existing oil and gas development. Direct and indirect impacts include increased mortality, increased illegal collection, habitat fragmentation, further introduction and spread of invasive species, the possible loss of pollinators, increased fugitive dust, and increased erosion. We expect all of these impacts—discussed in detail below—will increase with the proposed action.

Mortality occurs when a cactus is accidentally kicked, stepped on, or driven over by humans. As roads and pipelines increase within occupied habitat, the chance for accidental loss increases. Other factors, such as livestock grazing, may exacerbate this situation by focusing impacts within the remaining interspaces between roads and wells, leading to further accidental loss.

Illegal collection of *Sclerocactus wetlandicus* historically was one of the primary threats to the conservation and recovery of this species (BLM, 2008a). The increase in the number of access roads within and near occupied habitats will allow greater access to rare plant populations. This potentially could increase illegal collection of the species.

Habitat fragmentation occurs as a result of the increased number of access roads, pipeline and other utility ROWs, and long-term surface disturbance from well pads and associated facilities. The anthropogenic fragmentation of plant habitats can decrease species density (Mustajarvi and others 2001) and result in isolated, smaller populations that are more prone to extinction (Forman and Alexander, 1998). Decreased species density has the potential to adversely impact pollination and reproductive success of *Sclerocactus wetlandicus* (Mustajarvi et al., 2001). Increased habitat fragmentation from roads can also act as a barrier to plant pollination and seed dispersal (Bhattacharya and others 2003; Ness, 2004).

Noxious and invasive plant species directly compete for resources with native species such as *Sclerocactus wetlandicus* and alter habitat making it more difficult for the species to survive and thrive. Seeds from invasive species are often carried by vehicles and spread via vehicle-caused air turbulence (Forman and Alexander, 1998). Within the project area, noxious and invasive species are often present

in the soil seed bank, and once an area is disturbed, these species can quickly establish. In addition, competition from noxious and invasive species can further reduce special status species' population size. Invasive plants spread more easily when other land uses such as livestock grazing are concentrated within the remaining interspaces between roads and wells. The cumulative pressures of energy development and grazing can lead to more invasive plants in *Sclerocactus wetlandicus* habitat.

The spread of noxious and invasive plants may change species composition within native plant communities. This may lead to increased livestock grazing on native grasses and shrubs that act as "nurse" plants for immature cacti. Nurse plants create an environment that is more favorable for successful establishment of immature cacti by providing shade, moisture, and protection from trampling.

Pollinators and their nesting sites are directly disturbed by oil and gas activities. Additionally, habitat alteration from invasive species can alter pollinator composition in the area, thereby possibly reducing the effectiveness of pollination within the native community. All of these connected actions reduce the ability of *Sclerocactus wetlandicus* to thrive within its native habitat.

Surface disturbances can lead to increased dust, erosion and storm water runoff that could impact *Sclerocactus wetlandicus*. Construction activities, increased access roads, and increased vehicular traffic within and near occupied habitats will lead to increases in fugitive dust and particulates. Dust accumulation is higher near roads, with fugitive dust depositing up to 984 feet from the source (Everett, 1980). Dust accumulation may adversely impact photosynthesis, respiration, transpiration, water use efficiency, leaf conductance, growth rate, gas exchange, and growth (Everett, 1980; Thompson and others 1984; Sharifi and others 1997; Trombulak and Frissell, 2000; Hobbs, 2001; Farmer, 1993). Erosion and runoff, though natural events, can have direct impacts to cacti from burying to direct removal of individuals. Erosion and runoff can be altered by human activities—for example, vegetation removal and alteration of stream courses—making these events more catastrophic. These augmented events can lead to greater damage to native ecosystems through additional scour and burial of soils and plants. Increases in dust, erosion, and storm water runoff interact cumulatively with other negative effects to further fragment and disturb *S. wetlandicus* populations.

Schoenocrambe suffrutescens

Surface disturbance associated with historical alteration of habitats, existing and planned oil and gas development, and small population size are the primary threats to *Schoenocrambe suffrutescens* in the project area. At this time there are 763 known well developments (past or present) within the project area depicted in Figure 1. Based on this figure it is estimated that 3,815 acres of land are disturbed within the project area. No wells are currently located within 300 feet of known *S. suffrutescens* locations, although Bad Land Cliffs road, a well-used dirt road, passes within 300 feet of at least 24 individual plants.

Surface disturbances can lead to increased dust, erosion and storm water runoff that could impact *Schoenocrambe suffrutescens*. Construction activities, increased access roads, and increased vehicular traffic within and near occupied habitats will lead to increases in fugitive dust and particulates, with the same impacts listed above under *Sclerocactus wetlandicus*. Erosion and runoff, though natural events, can have direct impacts to *S. suffrutescens* from burying to direct removal of individuals. Erosion and runoff can be altered by human activities—for example, vegetation removal and alteration of stream

courses—making these events more catastrophic. These augmented events can lead to greater damage to native ecosystems through additional scour and burial of soils and plants. Increases in dust, erosion, and storm water runoff interact cumulatively with other negative effects to further fragment and disturb *S. suffrutescens* populations.

Colorado River Endangered Fishes

The primary factors affecting the four endangered Colorado River fish are stream flow regulation and habitat modification; competition with and predation by nonnative fishes; and pesticides and pollutants (Service, 2002a; Service, 2002b; Service, 2002c; Service, 2002d). The existing habitat, altered by these threats, is modified to the extent that it impairs essential behavior patterns, such as breeding, feeding, and sheltering. The primary impacts from oil and gas development, which may lead to the factors listed above, are water depletion and degradation of water quality through sediments and pollutants released to waterways close to or within critical habitat.

IV. EFFECTS OF THE ACTION

The 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.

Gasco is proposing to develop up to 1,298 new wells with ancillary roads, facilities and pipelines. Under the Agency's Preferred Alternative it is estimated that an additional 3,604 acres will be disturbed through these construction activities. These activities will add approximately 1.5 percent more disturbance to the action area. The EIS/BA stated that current and historic long term disturbance within the project area depicted in Figure 1 is approximately 19,800 acres. These activities will result in a cumulative disturbance of 11 percent of the action area.

Sclerocactus wetlandicus

The BA/EIS states that 98,417 acres of potential habitat for *Sclerocactus wetlandicus* is within the project area which is very close to our estimates. The Agency's Preferred Alternative will result in the direct surface disturbance of 499 acres of potential habitat, or 0.1%, of total available potential habitat within the project area. Under this alternative, 21,581 acres, or approximately 5 percent, of the cactus's potential habitat falls within 300 feet of existing and proposed roads, pipelines, and well pads. There are approximately 575 individuals within 300 feet of these planned developments (BLM and Service, 2011).

These plants will be avoided to the extent possible through the applicant-committed measures described for *Sclerocactus wetlandicus* contained in Appendix B of the BA/EIS (Attachment 1). Work areas outside of the potential habitat polygon will be evaluated by the BLM AO for suitable habitat, and surveys will be conducted if necessary. Nevertheless, individual plants could be within 300 feet of a work area under the Agency's Preferred Alternative. The total estimate of plants that may be directly

affected (if all possible plants were impacted) represents about 1% of the total estimated population of 50,000 individuals.

We expect the impacts to *Sclerocactus wetlandicus* from the proposed action to be further decreased by applicant-committed conservation measures in core conservation areas. Within level 1 core conservation areas, the applicant committed to not develop additional wells (see previous discussion on page 10), and any additional drilling will occur only from existing well pads. This means some surface disturbance may occur within level 1 core areas to expand well pads to accommodate additional surface well locations. However, this type of disturbance is typically minimal and will not create the same level of impacts associated with a new well pad location. For example, virtually no additional habitat fragmentation will occur with well pad expansion. Thus, we expect minimal additional disturbance from the proposed action. Well pad expansion will also not exceed the recommended 5 percent surface disturbance threshold for level 1 core conservation areas. The sole exception to the recommended surface disturbance threshold is in the Lower Pariette level 1 core conservation area, where development already exceeds 8 percent. However, the proposed action does not include any additional wells within this level 1 area.

Within level 2 core conservation areas, the proposed action follows our recommendation of no more than 5 percent surface disturbance at any given time. This is equivalent to roughly 4 to 6 wells per section, or approximately160-acre surface well pad spacing. The proposed action includes additional well pad development at this spacing (Table 2).

Table 2. Existing and proposed development in level 2 core conservation areas that overlap with action area.

	Upper Nine Mile	Lower Green	Middle Green	Lower Pariette
Number of existing well pads	10	0	122	31
Existing surface disturbance, percent (acres)	1% (50)	0% (0)	4% (610)	7% (155)
Estimated number of additional well pads from proposed action	32	0	47*	0
Maximum additional surface disturbance from proposed action, percent (acres)	2% (160)	0% (0)	2% (235)*	0% (0)
Estimated total surface disturbance (existing + proposed action)	3%	0%	6%*	7%

*We expect that these numbers are an overestimate of the additional disturbance expected from the proposed action because many of the proposed wells will be drilled from existing well pads. We do not have sufficient information available to more accurately predict the expected surface disturbance within the Middle Green level 2 core conservation area.

Indirect impacts will occur along approximately 92 miles of new roads within potential habitat under the Agency's Preferred Alternative. Deposition of wind-blown soil onto *Sclerocactus wetlandicus* individuals during construction and use of these roads will negatively impact the cactus through reduced photosynthesis (BLM, 2008b). The expanded road network and surface disturbance from project-related construction will increase sediment delivery to the small ephemeral drainages and areas of overland flow associated with *S. wetlandicus*. *S. wetlandicus* is not tolerant of heavy sedimentation (BLM, 2008b), and increased sedimentation will increase the risk of mortality or stress to an unspecified number of *S. wetlandicus* located near disturbed areas.

Additional indirect impacts to *Sclerocactus wetlandicus* include an increased risk of crushing by off-road vehicles due to an expanded road network in the project area, impacts from herbicides used to control invasive plants in the project area, and possible reductions in pollination or seed dispersal due to a larger road network and resulting habitat fragmentation and dust. Because *S. wetlandicus* requires insect pollinators for successful reproduction (Tepedino et al., 2010), impacts to pollinator nesting and foraging habitats will negatively affect the cactus by reducing the diversity and abundance of pollinators

and, thereby, the plant's ability to successfully reproduce. The expanded road network also will increase the risk of illegal collecting of the *S. wetlandicus*.

Although the conservation measures described in the BA/EIS and Appendix B of the BA/EIS will minimize the impacts of the action to *Sclerocactus wetlandicus*, increased habitat fragmentation and habitat loss, pollinator disturbance, changes in erosion and water runoff, and increased weed invasion cannot be entirely avoided. These disturbances will continue to negatively impact *S. wetlandicus* throughout the project area.

Schoenocrambe suffrutescens

The EIS/BA states that *Schoenocrambe suffrutescens* is known to occur within 1,449-acres of the action area. Approximately 32 acres (2.5%) of this habitat will be disturbed under the Agency's Preferred Alternative. No development will occur within 300-feet of known *Schoenocrambe suffrutescens* individuals. The applicant-committed measures described in Appendix B of the BA/EIS will reduce direct impacts to occupied habitat or to individual plants (see attachment 1). Assessments to identify suitable *Schoenocrambe suffrutescens* habitat will be completed in 100% of proposed disturbance areas. Where suitable habitat occurs, site inventories will be conducted to determine if the species is present.

The EIS/BA also states indirect and dispersed direct impacts such as an increased risk of weeds will likely occur over 271 acres (18.7%) of the potential habitat for *Schoenocrambe suffrutescens*. Applicant-committed measures to inventory and treat noxious weeds along all project-related disturbance areas and control dust (via gravelling roads or water) will reduce these risks. However, because this alternative will disturb suitable habitat and increase the risk of noxious weeds that could render this habitat unsuitable, it is likely to reduce the suitable habitat available to the species' in the action area.

Colorado River Endangered Fishes

This project will adversely affect Colorado pikeminnow, razorback sucker, bonytail, and humpback chub by reducing the amount of water in the river system upon which they depend by up to 258 acre-feet/year. The effects to all four species primarily result from the effects of the water depletion upon their habitats. The amount of water removed by the proposed action is below the current sufficient progress threshold of 4,500 acre-feet. However, the cumulative effect of water depletions, including from this action, adversely affects the four listed fish by further reducing the amount of water available to them, increasing the likelihood of water quality issues, increasing their vulnerability to predation, and reducing their breeding opportunities by shrinking the amount of breeding habitat within their range. Water depletions also reduce the ability of the river to create and maintain the primary constituent elements that define critical habitats.

Development of oil and gas wells requires water for both well drilling and completion. Approximately 3.28 acre-feet of treated, recycled water and fresh water will be consumed during drilling and completion of each well. Assuming a drilling rate of approximately 120 wells per year, 3,865 acre-feet of water will be consumed over the lifetime of the project. Peak withdrawals of approximately 258 acre-feet of water will be drawn from sources that feed the Green River in any given year. This equates to approximately 0.7 cfs of withdrawal (assuming that water use occurs evenly over 240 days per year), or

as low as 288 acre-feet over the lifetime of the project. A 0.7 cfs withdrawal will represent a loss of approximately 0.07% of the approximately 1,000 cfs recorded minimum stream flow of the Green River within the action area (based on stream flow records since 1992 for the Green River (as measured at Jensen, Utah) and the White River (as measured at Watson, Utah). This flow reduction will be considered a long-term (life of the project) impact in terms of reductions in habitat for listed fish species in the Green River.

There is a greater potential for impacts from pollutants, if a pipeline, well pit, or other source were to inadvertently release contaminated fluids into waterways at points near the Green and White Rivers. Through direct or indirect discharge, these pollutants could reach the Green River and negatively impact water quality to the point of affecting native fish populations. Direct impacts will result from a discharge from a pipeline or well pit reaching the Green River in its original form or within a single release event. Indirect effects occur when discharges are released to the ground and are later released to the river after being carried by an erosion event or carried by rain or snowmelt runoff. As more well and pipeline development occurs in the project area the chance of pollutants reaching the Green River increases, thus increasing the potential of harm to native fish populations.

Approximately 744 pipeline crossings (61.9 miles) of intermittent/ephemeral drainages that are tributary to the Green River will be required, though no wells, roads, or pipelines are proposed within the 100-year floodplain for the Green River. In addition, no wells or pipelines are proposed within 100-year floodplains of Green River tributaries within 5 miles of the river.

While applicant-committed measures will reduce the chance for spills or leaks of contaminants, accidental releases can and do still occur. According to the National Response Center, there have been at least 219 spills and releases within Carbon, Duchesne, and Uintah Counties from January 1991 through August, 2011 due to oil and gas development and related activities affecting water, land and air.

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 four Colorado River fish is contaminant-free water. Any release of contaminants into the floodplain will result in degradation of critical habitat and could result in take of individual fish, including downstream impacts to larvae and juveniles.

The Green River is a large river with variable dilution factors based on seasonal flows. However, contaminants are likely to accumulate in backwater/depressional areas that have reduced dilution and less flushing capacity (Woodward and others 1985). Colorado pikeminnow and razorback sucker use these sites downstream, which provide cover and a food source, for overwinter survival and rearing areas. The Agency's Preferred Alternative includes applicant committed measures to minimize and reduce the potential for contaminants to be released into the natural systems. However, oil and gas related accidents can be severe and have serious consequences to fish and wildlife resources.

Although most incidents are relatively small in size, large scale spills do occur. If large-scale breaks occur in sensitive resource areas, the results can be catastrophic to fish and wildlife resources. The effects of smaller leaks that may cause chronic, sub-lethal effects to fish populations may be more prevalent. While the oil and gas industry has a wide variety of methods available to detect substantial leaks or integrity breeches, the technology for detection of small "pinhole" leaks is not as advanced. This creates a significant problem in that the current available methodology may allow small leaks to go undetected for extended periods of time often evading detection until they are manifested on the surface sediments or water.

Sublethal exposure of fish to contaminants can result in altered behavior and impede necessary life functions such as growth, habitat selection, competition, predator avoidance, feeding, and reproduction (Laurence, 1972; Little and others 1985; Lemly and Smith, 1987; Little and others 1993; Brown and others 1987). Changes in heart and respiratory rates; gill hyperplasia; enlarged liver; reduced growth; fin erosion; impaired endocrine system; a variety of biochemical, blood, and cellular changes; and behavioral responses may also result. Behavioral and physiological changes generally occur at lower toxicant concentrations than that which cause mortality (Little and Finger, 1990). Early life stages of fish are generally more sensitive to environmental contaminants than juveniles or adults (Mayer and Ellersieck, 1986).

Disruption of behavioral functions can result in population declines or changes in year-class strength if enough individuals are affected (Little et al., 1993). Links between behavioral alterations and population level effects in the natural environment have been limited to documentation of avoidance responses. More research is needed to determine population-level responses to the effects of environmental contaminants on aquatic communities.

Fish may avoid or be attracted to certain contaminants and this response varies widely with species, habitat conditions, and chemical constituents. While avoidance may provide short-term protection by minimizing exposure, the fish are displaced from preferred habitats into less desirable or already occupied areas (Atchinson and others 1987). Free-ranging fish have been documented to avoid oil-contaminated water and gas-supersaturated water (Gray, 1990).

Contaminant studies associated with oil and gas drilling activities have been conducted in the San Juan River to assess potential impacts to endangered fish species. Concentrations of hydrocarbons in sediments, surface water, and pore water were low; however compounds which have been found to be toxic to aquatic organisms and to have the potential for photo-activation were present. Aquatic organisms exposed to certain hydrocarbons (flouranthene, anthracene, pyrene, and chrysene) and simultaneously or subsequently exposed to sunlight or other sources of ultraviolet radiation exhibit much greater adverse effects, including deterioration of body tissues, than organisms exposed to hydrocarbons alone. In the presence of ultraviolet light, all the hydrocarbons, except chrysene, were acutely toxic to the fish in the 4 to 15 μg/l range. Historical studies of hydrocarbon toxicity did not involve UV light. Increased hydrocarbon toxicity associated with photo-activation elevates concerns regarding environmental hazards of oil and gas developments (Wilson and others 1995; Service, 1995).

The severity of the impacts from larger spills will be dependent on the time of year, the river flows, presence of endangered fish, and the volume of the contaminant plume. Immediate effects of small

leaks to fish populations will be difficult to ascertain but will likely become evident in future reproductive or growth issues.

The applicant-committed measures including the use of shutoff valves (where applicable to protect streams at pipeline crossing from contamination and reduce accidental discharge) and the burial of pipelines at least 3 feet below all crossings and in conformance with hydrological design practices, the risk of a pipeline spill reaching toxic concentrations in areas used by Colorado River endangered fish will be reduced.

Under the Agency's Preferred Alternative, no pipelines are proposed in the Green River floodplain. The 61.9 miles of pipelines crossing floodplains within 5 miles of the Green River will still carry a risk of incidents occurring over the 30-year production phase. However, spill attenuation through the applicant-committed measures will reduce the risk of a spill reaching the Green River.

The Agency Preferred Alternative will result in the disturbance of approximately 21 acres of water-erosive soils. Based on soil erosion and sediment yield analyses, project-related disturbance will increase the Green River's sediment load by approximately 47,817 tons/year, or 0.01%. However, in some areas soils are high in selenium, boron, and other potentially toxic components. The effects of sediment derived from such soils on Colorado River endangered fish are poorly understood, but are generally thought to be harmful at unknown concentrations (Buhl and others 2000). Thus, increases in sediments containing boron or selenium could affect all of the special status fishes. However, soils containing these constituents are naturally occurring and natural contributors of sediment to the Green River. Because the Agency Preferred Alternative will lead to an approximately 0.01% increase to the Green River's total sediment load, the impacts to Green River fish from these heavy elements are anticipated to be low.

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 ESA.

Declines in the abundance or range of many special status species are attributable 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 various federally protected wildlife, fish, and plant species, and could contribute to cumulative effects to the species within the action area. Species with small population sizes, endemic locations, or slow reproductive rates will generally be more susceptible to cumulative effects.

Sclerocactus wetlandicus

Non-federal activities have the potential to cumulatively affect *Sclerocactus wetlandicus*, as a significant portion of this species' range occurs on state, private, and tribal lands without federal mineral leases or federal surface rights. Quantified data on the future extent of these activities are difficult to obtain, but we must assume, for the purposes of this assessment, that some level of these activities are reasonably certain to occur, particularly energy and mineral exploration and development, livestock grazing, stone collecting, off-highway vehicle use, and illegal collecting.

Our data show approximately 255 individual *Sclerocactus wetlandicus* located on lands with no federal nexus, or about 2.5 percent of the known individual *S. wetlandicus* within the action area (approximately 11,000 plants) and 0.5 percent of the total estimated population of *S. wetlandicus*. This number is an underestimate of the number of individuals on non-federal lands, as surveys are not always required or conducted on private, state, and tribal lands. We assume that applicant-committed conservation measures will occur across the project area regardless of land ownership. We expect very few, if any, cacti will be lost accidentally, although *S. wetlandicus* individuals on non-federal lands will still be negatively impacted by landscape-scale factors (habitat fragmentation, increased dust, and so on) due to cumulative impacts in the action area. However, the percent of *S. wetlandicus* individuals that will be impacted is a small percentage of the total estimated *S. wetlandicus* population, 0.5 percent.

Schoenocrambe suffrutescens

All known individuals are on federal lands within the project area, so we do not expect additional cumulative impacts to this species from non-federal actions.

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 factors and wildlife resources.

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

- Changes in land use patterns that will further fragment, modify, or destroy potential spawning sites or designated critical habitat;
- Shoreline recreational activities and encroachment of human development that will 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;
- Additional water depletions to the Upper Colorado River Basin.

VI. CONCLUSION

After reviewing the current status of *Sclerocactus wetlandicus, Schoenocrambe suffrutescens* and the four federal endangered fishes of the Upper Colorado River Basin, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that this project, as described in this biological opinion, is not likely to jeopardize the continued existence of *S. wetlandicus, S. suffrutescens,* or the four endangered fishes. The proposed project is also not likely to destroy or adversely modify designated critical habitat. We base our conclusion on the following:

- Although approximately 20 percent of the known population of *Sclerocactus wetlandicus* occurs in the action area, we expect minimal additional surface disturbance because approximately 56 percent of the proposed new wells will be drilled from existing well pads. The remaining wells, 44 percent, will be developed on new well pads (and thus new surface disturbance), but none of these well pads will be in level 1 core conservation areas. Within level 2 conservation areas, new surface disturbance will contribute 2 percent to total surface disturbance, and well pad development will generally be no denser than 4 wells per section. Thus, the new well development is within the conservation thresholds we established for the core conservation areas. Additionally, the BLM's commitment to adaptive management of core conservation areas will help minimize and mitigate additional negative impacts from the 79 proposed new well pads in level 2 core conservation areas.

- Although approximately 20 percent of the known population of *Schoenocrambe suffrutescens* occurs in the action area, applicant-committed conservation measures to avoid surface disturbance within 300 feet of *S. suffrutescens* plants will minimize negative impacts to this species.

- Applicant committed conservation measures and mitigation measures previously stated in this biological opinion that will minimize direct impacts to listed species.

- The existence of the Upper Colorado River Endangered Fish Recovery Program and the sufficient progress of recovery activities to date.

We recognize that the person who depletes and the amount of water they deplete may vary from year to year. Consequently, water users assume the risk that the future development of senior water rights, including Tribal water rights, may result in shortages of water to junior users. Nothing in this biological opinion precludes any new depletion that results from the exercise of senior water rights within the project area.

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 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 to Gasco for the exemption in section 7(o)(2) to apply. The BLM has a continuing duty to regulate the activity covered by this incidental take statement. If the BLM (1) fails to assume and implement the terms and conditions or (2) fails to require Gasco 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 Gasco must report the progress of the action and its impact on the species to us as specified in the incidental take statement. [50 CFR § 402.14(i)(3)]

We have developed the following incidental take statement based on the premise that the applicant-committed conservation measures will be implemented.

AMOUNT OR EXTENT OF TAKE ANTICIPATED

We anticipate 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. 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 of project area streams and washes that are tributaries to the Green River.

Based on surveys conducted by UDWR and the Service of listed fish per river mile from 2006 through 2008, we estimate at least 27 Colorado pikeminnow, humpback chub, razorback sucker, and bonytail could be present within 0.5 river miles downstream of the confluence of project area washes and the Green River (Bestgen et al. 2010). We believe the current design of the structure of the project will minimize impacts to fish occurring in this area. Based on the above information and applicant committed conservation measures, we authorize: a total combined take of 10% (3 fish) of individuals for Colorado pikeminnow, humpback chub, razorback sucker, and bonytail occurring within 0.5 river miles downstream of the confluence of project area washes and the Green River; take of habitat not to exceed 0.5 river miles from the confluence of project area washes at the Green River; and all take in the form of harm that will occur from the removal of 258 acre-feet of water per year during the first 5 years with a peak depletion of 258 acre-feet.

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal, reduction or possession of federally listed plants; the malicious damage of such plants on areas under

Federal jurisdiction; the destruction of federally listed plants on non-Federal areas in violation of States law or regulation; or in the course of any violation of a State criminal trespass law.

EFFECT OF THE TAKE

In the accompanying biological opinion, we 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.

REASONABLE AND PRUDENT MEASURES

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

1. Conduct all proposed actions in a manner that will minimize all impacts to listed endangered fish species and their designated critical habitat

TERMS AND CONDITIONS

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

The following terms and conditions are assumed to include all previously listed applicant-committed environmental protection measures, but in some cases include more restrictive or more detailed measures. Conservation measures include implementing the Recovery Program (and relevant RIPRAP measures).

For Reasonable and Prudent Measure #1:

1. To ensure proper tracking of water depletions from the Upper Colorado River System, Gasco will notify the BLM and our office as to what water resources will be used for the project as they are designated, and the amounts that will be withdrawn from each one.

2. Coordinate with our office regarding design and placement of any structures that may need to be placed in washes or 100-year floodplains of tributaries to the Green River.

3. Appropriate erosion control and revegetation measures will be employed. In areas with unstable soils where seeding alone may not adequately control erosion, grading will be used to minimize slopes and water bars will be installed on disturbed slopes. Erosion control efforts will be monitored by the operator and necessary modifications will be made to control erosion.

VIII. REPORTING REQUIREMENTS

In order to be exempt from the prohibitions of section 9 of the Act, the BLM must comply with all Recovery Program activities and the monitoring proposed below.

The implementing regulations for incidental take require that Federal agencies must report the progress of the action and its impact on the species (50 CFR 402.14(i)). To meet this mandate, the BLM will monitor and report the progress of their action as follows:

1. The BLM is required to submit to our office an annual report of water depletions associated with oil and gas development, including the following information:

    - Project name and/or applicant name
    - Permit number and/or special use authorization
    - General location and legal description
    - Depletion amount in acre-feet
    - Timing of depletion
    - Identify if new or historic depletion[2]
    - Sub-total water depletion (acre-feet) for each applicant
    - Total depletion for the entire year in acre-feet
    - Total number of APDs approved
    - Total number of wells spudded

Reports shall be due to our office on a yearly basis by October 31. The address for the Utah Fish and Wildlife Service Field Office is:

2369 West Orton Circle, Suite 50
West Valley City, Utah 84119

Any annual monitoring reports for impacts on listed species associated with the proposed actions must be submitted to us and the BLM by January 31 each year following monitoring.

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 in handling dead specimens to preserve biological material in the best possible state.

[2] It is important to include information on whether each depletion is new or historic (occurring prior to January 1988), because we addresses new and historic depletions differently under the new section 7 agreement of March 11, 1993. Historic depletions, regardless of size, do not pay a depletion fee.

IX. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The applicant-committed measures and proposed mitigation measures address most of the impacts associated with water withdrawals from the Green River, other impacts to waterways, and impacts to *Sclerocactus wetlandicus* and *Schoenocrambe suffrutescens*. However, to ensure that Federal agencies can meet their requirements under Section 7(a)(1) and work toward recovery of listed species, we recommend the following measures in addition to applicant-committed conservation measures. The conservation recommendations below for *Sclerocactus wetlandicus* and *Schoenocrambe suffrutescens* were adapted from the recent recovery outline.

Because the Recovery Program is already working toward recovery of the four Colorado River fish species, the conservation recommendations below are specific to this project and will help further the goals of the Recovery Program.

Sclerocactus wetlandicus

Surveys and Monitoring

- Completion of a comprehensive survey throughout *Sclerocactus wetlandicus'* range, including areas that are not likely to be disturbed. Survey results will provide an accurate population estimate and allow us to refine core population areas so we can more effectively protect the species. This effort will require evaluation of habitat components likely to support *S. wetlandicus*.

- More accurately delineate the range and morphology of *Sclerocactus wetlandicus* and potential varieties, especially in relationship to *S. brevispinus* and particularly in the hybrid zone.

- Locate possible connectivity corridors between *Sclerocactus* populations to better refine core conservation areas.

- All Federal agencies and land-owners—including the BIA, Ute Tribe, Bureau of Land Management (BLM) and our office—should work together to implement and fund the range-wide monitoring program for *Sclerocactus wetlandicus*. These data will improve our understanding of trends and allow us to adopt more effective conservation measures if cacti are being adversely impacted despite current conservation measures.

Threats Abatement

- Identify cacti sites in urgent need of habitat protection, set protection priorities, and implement protective measures and special management considerations. For example, the BLM, BIA, Ute

Tribe, and our office should work together to finalize core conservation areas where surface disturbance will be limited in order to preserve intact populations of cacti and open, unoccupied habitat.

- Oil and gas leasing and other mineral extraction activities should avoid occupied sites and other important habitat when possible.

- Implement standard conservation measures to minimize future project and use impacts. For example, proposed projects should use existing surface disturbance and rights-of-way to minimize additional surface disturbance and habitat fragmentation.

- Coordinate with land management agencies, project proponents, and other partners early in the planning process to limit direct and indirect impacts of planned activities.

- Install livestock exclosures for protection and monitoring purposes in locations that will not be prone to illegal collection.

- Prevent the collection of *Sclerocactus wetlandicus* plants from natural populations. With respect to this project, Gasco employees should notify us or the BLM immediately if they observe suspicious behavior—such as non-federal or non-project-related personnel looking for plants—in areas with known cactus locations.

- For infrastructure (typically, a pipeline) that crosses through occupied cactus habitat, applicants should ensure that future maintenance activities will not impact cacti. This can be accomplished by some or all of the following:
    - Notify maintenance crews when they will be working in a sensitive cactus area and provide them with GPS information or maps of areas to avoid,
    - Have a botanist on site prior to and during maintenance activities to flag cacti or avoidance areas and remove the flags immediately after work has completed, and
    - Install protective fencing (e.g., silt fencing) around cacti that are downslope or downwind of surface-disturbing maintenance activities during maintenance, and remove the fencing immediately work is completed.

- We recommend Gasco apply the same conservation measures that they practice on federal lands across all of their project areas that contain *S. wetlandicus* habitat.

Research

- Continue research into *Sclerocactus wetlandicus* life history and ecology, including soil requirements and pollinators.

- Study population dynamics and conduct a population viability analysis.
- Encourage investigations that project *Sclerocactus wetlandicus'* vulnerability and response to climate change.

- Coordinate with *Sclerocactus* genetic and taxonomic experts to resolve the genetics of *S. wetlandicus* outlier populations and the boundaries between *S. brevispinus*, *S. wetlandicus*, and *S. parviflorus*.

- Establish effective, science-based reclamation techniques for disturbed habitat.

- Improve our understanding of livestock and native (e.g., rodent) grazing impacts.

- Monitor *Moneilema semipunctatum* (cactus borer beetle) infestations, and study the relationship of episodic infestations with drought and other environmental factors.

- Monitor changes in invasive species prevalence and impacts on *Sclerocactus wetlandicus*. Additionally, continue to explore approaches to minimize the risk posed by invasives and associated remediation actions.

Schoenocrambe suffrutescens

Surveys and Monitoring

- Conduct range-wide, comprehensive surveys for *Schoenocrambe suffrutescens* within the next year, especially in the Gray Knolls area on tribal land. These data should be used to define and delineate populations, and to help revise the Recovery Plan.

- Continue to collect data from at least a portion of monitoring plots established in the Little Canyon Unit biological opinion (65411-2006-F-0309), even past the need for the disturbance study, to be able to answer basic demographic questions and to monitor reproduction.

Research

- The previous geological nomenclature that was commonly used to identify potential *Schoenocrambe suffrutescens* habitat was discarded (Weiss 1990), thus complicating an already difficult search for this species. We need to accurately characterize parent material, soil, and landscape characteristics for *S. suffrutescens*. This research would allow us to more accurately identify unoccupied but potentially important habitat, areas for focused surveys and reintroduction, and areas where oil and gas development are unlikely to harm the species.

- *Schoenocrambe suffrutescens* should be reintroduced to new areas of suitable but unoccupied habitat near existing populations. Potential sites should be chosen using information provided by currently ongoing research to characterize parent material, soil, and landscape characteristics for this species.

- Studies to quantify the effects of dust, invasive species, and disturbance from continued energy development—initiated in 2009—should be continued until we have enough data to draw conclusions.

- Seeds should continue to be collected to include this species in the Center for Plant Conservation collection. Seeds should also be tested for viability and longevity.

Threats Abatement

- Nearly 40 percent of the mapped *Schoenocrambe suffrutescens* populations occur on non-Federal lands. We (the BLM and Service) should continue to work with the Uintah and Ouray Indian Reservation, SITLA, and private landowners to survey and conserve *S. suffrutescens* habitat and increase outreach efforts.

- On Federal lands, we should continue to avoid development in *Schoenocrambe suffrutescens* populations and suitable, unoccupied habitat as much as possible, unless research becomes available to indicate that *S. suffrutescens* is unaffected by development. We should ensure that developers follow established conservation measures when disturbance occurs and that habitat fragmentation is reduced as much as possible.

- Using research collected on soil characteristics and response to disturbance, we should identify and establish core conservation areas in minimally-disturbed habitat (both occupied and unoccupied) for long-term protection of *S. suffrutescens*.

Four Colorado River Fish Species

Threats Abatement

- Machinery should be fueled outside of all stream channels to prevent spillage into waterways;

Research

- We recommend that the project applicant work with our office to identify and fund contaminant studies related to oil and gas development in the Uinta Basin and its potential effects on aquatic environments. These studies may include but are not limited to:
    - determining presence of polyaromatic hydrocarbons (PAHs) in the system;
    - analyzing fish tissue for presence of mercury; and
    - examining reclaimed reserve pits and their potential to contaminate surrounding soils.

For us to stay informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

X. 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 was 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 258 acre-feet by more than 10 percent; (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 your commitment in the conservation of endangered species. If the project changes or it is later determined that the project affects listed species differently than identified above; it may become necessary to reinitiate section 7 consultation. If you require further assistance or have any questions, please contact Jessi Brunson at (435) 781-4448 or Scott Ackerman, at (435) 781-4437.

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