United States Department of the Interior
Bureau of Land Management

Vernal Field Office
Vernal, Utah **March 2005**

Final
Biological Assessment
Castle Peak and Eightmile Flat
Oil and Gas Expansion Project
Inland Resources Inc.

FINAL
BIOLOGICAL ASSESSMENT
CASTLE PEAK AND EIGHTMILE FLAT
OIL AND GAS EXPANSION PROJECT

Prepared for

BUREAU OF LAND MANAGEMENT
Vernal, Utah

March 2005

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1.0 INTRODUCTION AND SECTION 7 SUMMARY

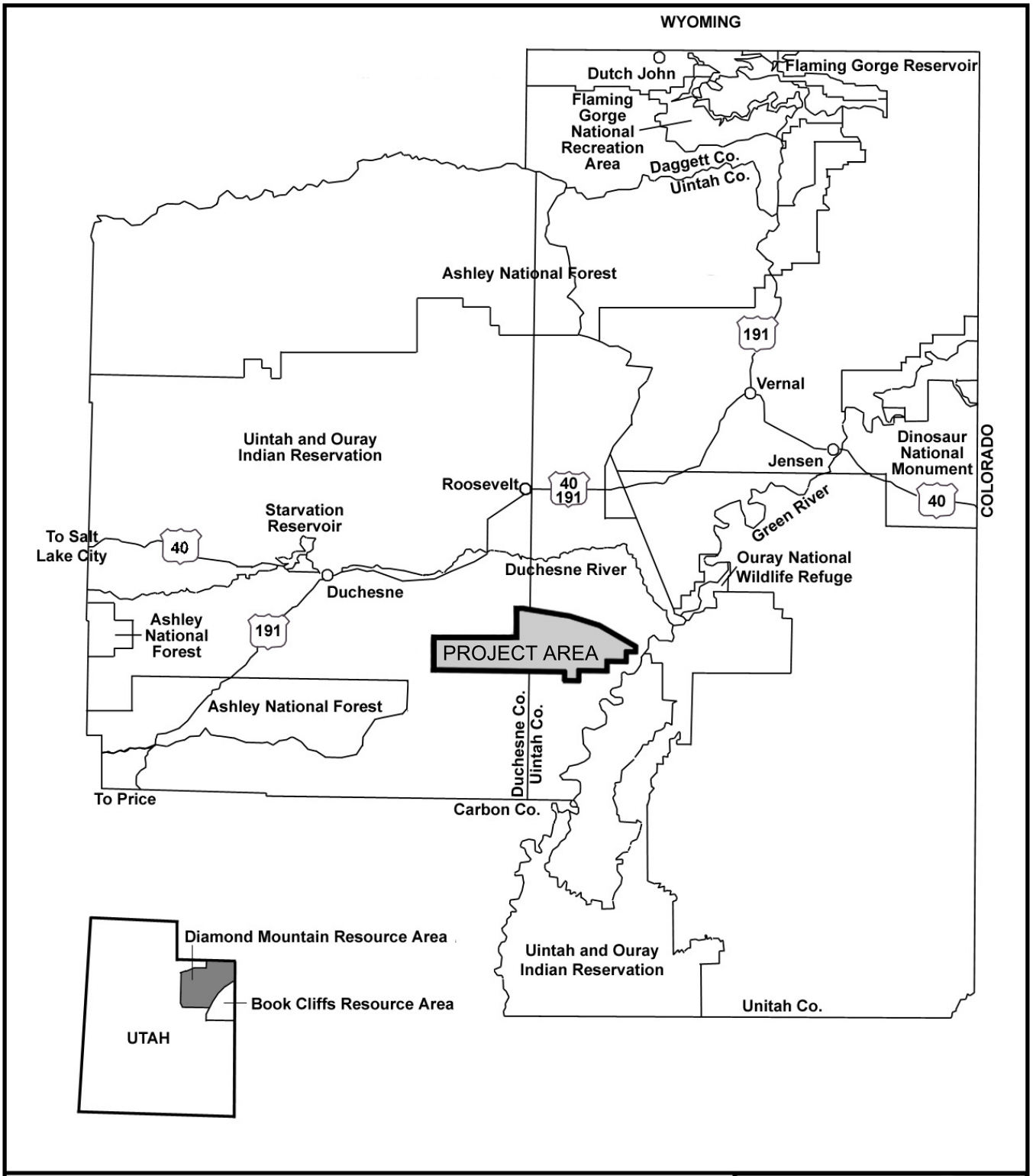
Under the development proposal filed with the U.S. Department of the Interior's Bureau of Land Management (BLM) Vernal Field Office, Inland Resources Incorporated (Inland) proposes to expand its existing waterflood oil recovery operations in the Castle Peak and Eightmile Flat area by drilling 973 new wells between 2004 and 2016. The project study area encompasses approximately 100 square miles, or approximately 64,000 acres, in the Castle Peak and Eightmile Flat area of the greater Monument Butte-Myton Bench oil and gas production region of northeastern Utah, in the Diamond Mountain Resource Area (DMRA) (**Figure 1-1**). The project study area is located approximately 30 miles southwest of Vernal, Utah, on BLM-administered lands (59,757 acres), lands administered by the State of Utah (5,777 acres), and several private landowners (41 acres). Inland operates 81 percent of the mineral lease rights underlying both the public and private lands in the project area. The remainder of the lease rights are scattered among multiple operators. Less than 1 percent of the mineral rights in the project area are not leased. The oil field development area includes approximately 1,000 existing and permitted oil wells and water-injection wells previously approved under the Wildrose Pariette Unit Waterflood Project Environmental Assessment (EA) (BLM 1996), the Monument Butte-Myton Bench Waterflood EA (BLM 1997), and various Applications for Permits to Drill (APD).

The BLM's Agency-preferred Alternative for this project is Alternative A, as described in Inland's Castle Peak and Eightmile Flat Oil and Gas Expansion Project Environmental Impact Statement (EIS) (BLM 2004). Under this alternative, the BLM would authorize the development of 922 wells in accordance with applicable DMRA Resource Management Plan (RMP) stipulations that would be applied comprehensively throughout the well field, regardless of existing lease conditions.

1.1 Consultation

Federal agencies, in consultation with the U.S. Fish and Wildlife Service (USFWS), are required to ensure that any action they authorize, fund, or carry out will not jeopardize the continued existence of a federally listed or proposed threatened or endangered species. As the federal lead agency for Inland's Castle Peak and Eightmile Flat Oil and Gas Expansion Project (Inland Project), the BLM is responsible for the Section 7 consultation process with the USFWS.

Under the informal consultation process, a request for a list of federally listed or proposed species and designated or proposed critical habitats was submitted to the USFWS in April 2002. In response to this request, species lists pertaining to project area were provided by the USFWS (Maddux 2002; Romin 2002; USFWS 2002; Whittington 2004) (see Appendix A, Agency Correspondence).



Castle Peak and Eightmile Flat Oil and Gas Expansion Project

Figure 1-1

General Location Map

Source: BLM 2002.

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In addition, agency stakeholder meetings for this project were held at the BLM State Office in Salt Lake City, Utah in May 2002. Participating agencies included USFWS, BLM, and Utah Division of Wildlife Resources (UDWR) and non-agency representatives for Inland resources and ENSR. The USFWS presented project concerns and recommendations as they relate to sensitive species and their habitat.

The USFWS was recontacted in February 2003 to confirm that the sensitive species list provided in their July 2002 communication was still current.

1.2 Analysis Summary

This BA addresses the potential impacts to 17 federally listed, federally proposed, and federal candidate species that were identified by the USFWS as occurring or potentially occurring within the proposed project area. **Table 1-1** summarizes these species and the impact determinations, given the existing information pertaining to their potential occurrence within the project region.

Impact determinations and associated proposed mitigation measures for each species considered in this BA are presented in detail in Chapter 3.0.

1.3 Committed Protection Measures

The following environmental protection measures have been committed to by Inland. These measures were presented in the BLM's environmental impact statement (EIS) being prepared for this project under the National Environmental Policy Act. Inland has committed to the protection measures identified below to reduce potential effects to sensitive species.

1.3.1 Bald Eagle

Standard raptor proofing designs as outlined in Mitigating Bird Collision with Powerlines (Avian Powerline Interaction Committee [APLIC] 1994) would be incorporated into the design of the proposed powerline to prevent collision to foraging and migrating raptors. Standard, safe designs as outlined in Suggested Practice for Raptor Protection on Powerlines (APLIC 1996) would be incorporated into the design of the proposed powerline in areas of identified avian concern to prevent electrocution of raptor species attempting to perch on the power poles and lines. These measures would include, but would not be limited to, a 60-inch separation between conductors and/or grounded hardware and recommended use of insulating materials and other applicable measures depending on line configuration.

Table 1-1
Federally Listed, Federally Proposed, and Federal Candidate Species Identified for the Project

Species	Scientific Name	Federal Status	Summary Finding
Mammals			
Black-footed ferret	*Mustela nigripes*	Endangered	May affect, not likely to adversely affect
Canada lynx	*Lynx lynx canadensis*	Threatened	No effect
Birds			
Bald eagle	*Haliaeetus leucocephalus*	Threatened	May affect, not likely to adversely affect
Yellow-billed cuckoo	*Coccyzus americanus*	Candidate	May impact
Mexican spotted owl	*Strix occidentalis lucida*	Threatened w/CH	No effect
Fish			
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered w/CH	**May affect, likely to adversely affect**
Humpback chub	*Gila cypha*	Endangered w/CH	**May affect, likely to adversely affect**
Bonytail	*Gila elegans*	Endangered w/CH	**May affect, likely to adversely affect**
Razorback sucker	*Xyrauchen texanus*	Endangered w/CH	**May affect, likely to adversely affect**
Plants			
Horsehoe milkvetch	*Astragalus equisolensis*	Candidate	No impact
Barneby ridge-cress	*Lepidium barnebyanum*	Endangered	No effect
Graham (Uintah Basin) beardtongue	*Penstemon grahamii*	Candidate	No impact
White River beardtongue	*Penstemon scariosus var. albifluvis*	Candidate	No impact
Clay reed-mustard	*Schoenocrambe argillacea*	Threatened	No effect
Shrubby reed-mustard	*Schoenocrambe suffrutescens*	Endangered	No effect
Uinta Basin hookless cactus	*Sclerocactus glaucus* (including *S. brevispirus*)	Threatened	**May affect, likely to adversely affect**
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened	No effect

No construction or surface-disturbing activities would occur within 0.5 mile of known bald eagle winter concentration areas and winter night roost sites from November 1 through March 31. Daily activities that must occur within the recommended spatial buffers at winter night roosts sites would be scheduled between 9:00 a.m. and 1 hour prior to the official sunset. These measures would be implemented on a site-by-site basis in coordination with BLM.

1.3.2 Uinta Basin Hookless Cactus

Inland would restrict new construction or surface-disturbing activities in areas previously identified by BLM as containing potential habitat for this species until notice and approval by BLM's AO. Site-specific surveys within potential cactus habitat would be conducted by a biologist approved by the BLM prior to new construction or surface-disturbing activities to avoid impacts to high quality habitat and individual plants. Surveyors would conduct their work on foot in high cactus population density areas.

1.4 Summary of Species Considered but Eliminated from Detailed Analysis for the Biological Assessment

A total of nine federally listed and federal candidates identified for the Inland project were analyzed for this BA, but were eliminated from detailed analysis based on the location of the project relative to the species' known distribution and/or habitat association.

1.4.1 Federally Endangered

1.4.1.1 Barneby Ridge-Cress

The federally endangered Barneby ridge-cress (*Lepidium barnebyanum*) is endemic to the Indian Canyon drainage and occurs on white shale outcrops of the Uintah Formation in this area (Atwood et al. 1991). Since the Proposed Action area is located outside of the known range of this species, no effect on the ridge-cress is expected from the project.

1.4.1.2 Shrubby Reed-Mustard

The federally endangered shrubby reed-mustard (*Schoenocrambe suffrutescens*) is found on calcareous shales associated with lower Parachute members of the Green River Formation in mixed desert shrub communities. Populations have been identified along the Wrinkles Road in Duchesne County and west of Willow Creek, and along Evacuation Creek. Based upon field observations made by the BLM, no suitable habitat for this species occurs in the Proposed Project area and no effect to the shrubby reed mustard is anticipated from proposed activities.

1.4.2 Federally Threatened

1.4.2.1 Canada Lynx

The Canada lynx (*Lynx lynx canadensis*) is listed as federally threatened. If extant in Utah, this species is found primarily in montane forests above 7,800 feet (Fitzgerald et al. 1994). No montane forest habitat is found within the proposed project area. Based on the lack of potentially suitable habitat for this species in the project region, the proposed project would not effect the Canada lynx.

1.4.2.2 Mexican Spotted Owl

The federally threatened Mexican spotted owl (*Strix occidentalis lucida*) is found primarily in canyons with mixed conifer forests, pine-oak woodlands, and riparian areas (USFWS 1995). The closest known occurrence of this species was in 1996 in Dinosaur National Monument, approximately 35 miles northeast of the Project Area. Based on the lack of potentially suitable habitat for this species in the project area, the project would not effect the Mexican spotted owl.

1.4.2.3 Clay Reed-Mustard

The federally threatened clay thelypody (*Schoenocrambe argillacea*) is endemic to the Bookcliffs in Uintah County and occurs on transition zone shales between the lower Uintah and upper Green River Formations (Atwood et al. 1991). The northernmost occurrence of this species identified to date is east of the Green River in the Brown Canyon area. The known range for this federally threatened species is outside of the proposed Project Area and as a result, no effect to the clay reed-mustard from the project is anticipated.

1.4.2.4 Ute Ladies'-Tresses Orchid

The Ute ladies'-tresses orchid (*Spiranthes diluvialis*) is a federally threatened species found in wet meadow, stream, bog, and wetland areas associated with cottonwood, saltcedar, willow, and piñon-juniper communities (Atwood et al. 1991). Marginal habitat may be found in the Pariette Wetlands; however, water quality in this area is too alkaline to support this species. No effect to the Ute ladies'-tresses orchid is expected from the Proposed Action due to the lack of potentially suitable habitat in the project area.

1.4.3 Candidate Species

1.4.3.1 Horseshoe Milkvetch

The horseshoe milkvetch (*Astragalus equisolensis*) is a federal candidate species generally found on soils associated with the Duchesne Formation in piñon-juniper and desert shrub communities (Atwood et al. 1991). Based on field observations made by the BLM, no suitable habitat for this species is found in the Proposed Action area and it is anticipated that the Proposed Action would have no effect on the horseshoe milkvetch.

1.4.3.2 Graham Beardtongue

The Graham beardtongue (*Penstemon grahamii*) is a federal candidate species known to occur in Duchesne and Uintah Counties on shaley talus knolls in sparsely vegetated desert shrub and piñon-juniper communities (Atwood et al. 1991). This species is closely allayed with shales associated with the Parachute Member of the Green River Formation. The closest known population is found approximately 20 miles east of the project area near Mormon Gap. Based on field observations made by the BLM in the area, no suitable habitat occurs in the Proposed Action area, and therefore, it is anticipated that the Proposed Action would have no effect on the Graham beardtongue.

1.4.3.3 White River Beardtongue

The White River beardtongue (*Penstemon scariosus* var. *albifluvis*) is a federal candidate species found on sparsely vegetated shale slopes on the Green River Formation. A population located on the Green River Formation southeast of Bonanza and east of the Proposed Action area is the closest site identified to date. Based on field observations made by the BLM in the area, no suitable habitat occurs for this species in the Proposed Action area, and no effect on the White River beardtongue is anticipated.

1.5 Literature Cited

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2.0 GENERAL PROJECT DESCRIPTION

Under the Agency-preferred Alternative (Alternative A, in the EIS), Inland would drill 922 new wells at a rate of 70 to 130 wells per year (5 to 11 wells per month) until the resource base is fully developed (**Figure 2-1**). The wells would be drilled on an approximately 40-acre spacing pattern to recover oil and gas reserves from the Green River Formation at depths of 4,500 to 6,500 feet. Inland would drill approximately 50 percent of the wells as producing wells and 50 percent as production wells that would be converted to water-injection wells. To increase the crude oil recovery rate from this field, Inland would inject water under pressure into the oil-bearing formation to force out a greater quantity of oil than would be produced with conventional pumping. Water for the project would be obtained from existing Water District contracts and from various oil and water bearing reservoirs within the Green River Formation underlying the oil field. At it peak water usage, the project would require approximately 1,400 acre-feet per year.

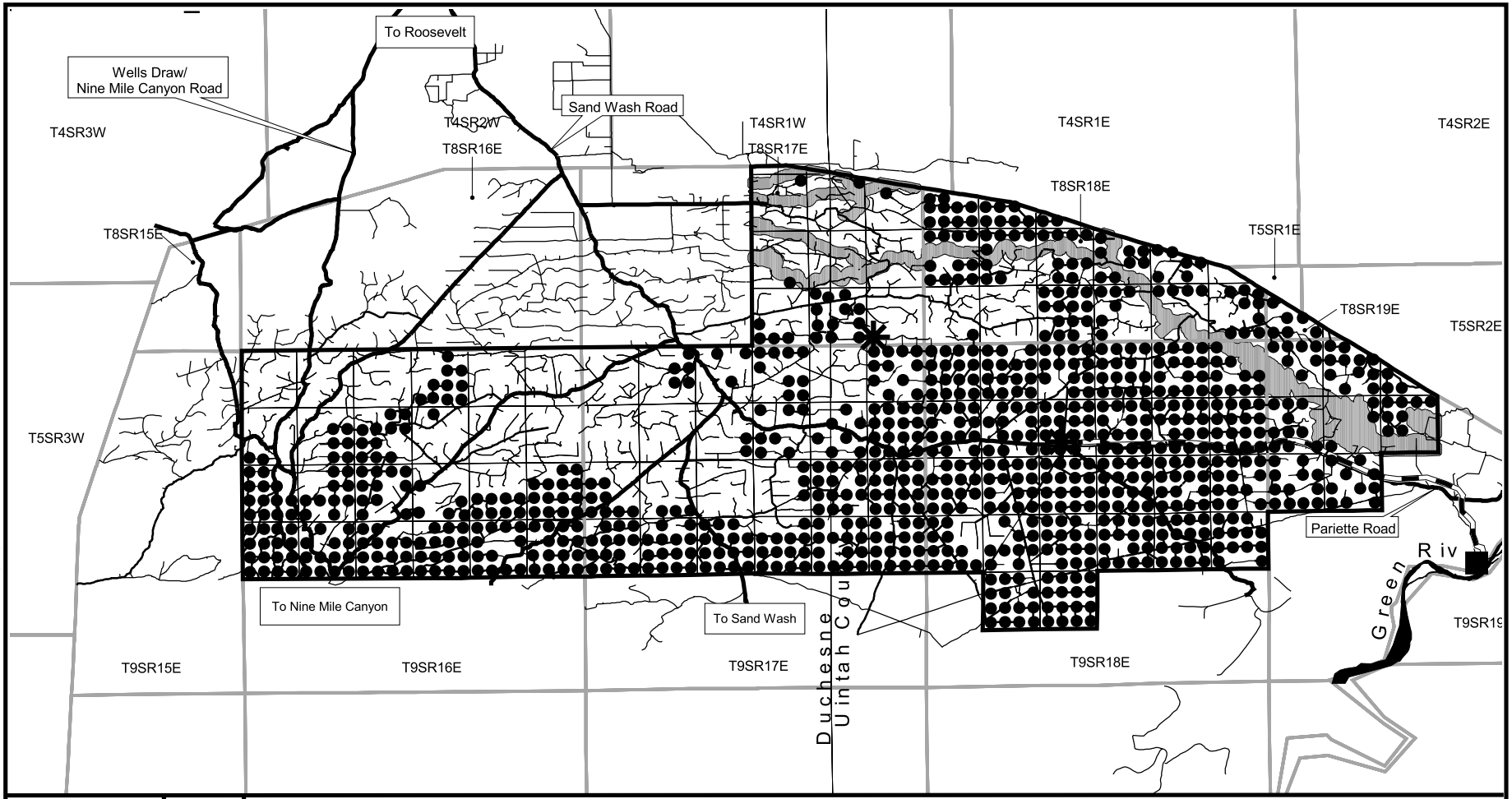
Other project-related activities would include the construction and operation of roads, gas pipelines, well pads (with pumping units and oil storage tanks), and water pipelines. Inland also proposes to construct a new water filtration/injection plant with injection capacities of 2,500 to 4,000 barrels of water per day (bpd).

Produced oil from new wells would be transported from 400-barrel well site storage tanks by tanker truck to refineries near Salt Lake City, Utah. Produced gas would either be used onsite or transported via pipeline to one of Inland's existing compression facilities. Produced water would either be trucked to one of several existing Inland water injection plants or the proposed plant, where it would be filtered and mixed with culinary fresh water before being re-injected into the oil reservoir via a water-pipeline and well injection system, or it would be taken offsite to disposal facilities located in the region.

The preferred alternative would extend oil and gas operations in the area until approximately 2022.

2.1 Well Pad Activities

Inland proposes to drill wells at the maximum rate of 130 per year or about 11 wells per month until the resource base is fully developed. (Note: these numbers are used for analysis purposes only and are based on assumptions made on how development in the project area would proceed. The location and final number of wells in the proposed well development area would be dictated by where recoverable oil and gas reserves are intercepted. Development of additional wells would trigger supplemental analysis of impacts). The monthly rate of drilling would range from 5 to 11 wells per month. The total number of wells drilled would depend largely on factors out



Legend:

- Alternative A well locations
- Proposed filtration/ injection facility location
- Proposed pumping facility
- Proposed water line
- Riparian setback zone
- Collector roads
- Local roads
- Minor roads

Note: Riparian/wetland areas based on aerial photos.
Source: Inland 2003.

N

0 1 2 Miles

Scale 1:175,000

Castle Peak and Eightmile Flat Oil and Gas Expansion Project

Figure 2-1
Alternative A
Project Area Map

of the Company's control such as geology, economic factors, and lease restrictions. The reasonably foreseeable full development model indicates that approximately 922 wells would be drilled and approximately 3,582 acres would be disturbed in the project area. At the expected drilling pace, development drilling is expected to occur over a span of approximately 7 years.

The wells would be drilled on a 40-acre spacing pattern to recover oil and gas reserves from the Green River Formation at depths of 4,500 to 6,500 feet. This 40-acre pattern is the Utah Department of Natural Resources, Division of Oil, Gas and Mining's (UDOGM) approved spacing pattern. Expected initial production would be approximately 80 bpd of oil per well. Of all wells drilled, it is estimated that about 4 percent would likely be non-productive or dry holes that would be abandoned. No seismic exploration activities would be conducted as part of this alternative.

2.1.1 Well Permitting and Identifying Well Pad Locations

2.1.1.1 Well Permitting Requirements

Prior to well development, wells must be permitted by the BLM as part of the requirements set forth by the Onshore Oil and Gas Order No. 1, "Approval of Operations on Onshore Federal and Indian Oil and Gas Leases," issued under 43 CFR 3164 (BLM 1983). This process includes two procedural options for obtaining approval to drill a well. When operators decide to drill a well, they must submit either a Notice of Staking (NOS) or an APD. No surface activity can be conducted until the well is approved by the BLM under one of the two procedural options.

As a standard part of the APD process, Inland would schedule an on-site inspection of each new well site, to be attended by the BLM and UDOGM AO, as appropriate. The objective of the on-site inspection would be to review the location and its related access driveway for considerations of topography, topsoil/subsoil stockpiles, natural drainage and erosion control, flora, fauna, and habitat, historical and cultural resources, and any other surface issues that may become apparent during the on-site Inspection. Whenever it is deemed appropriate by the BLM and UDOGM AO, this inspection also would be attended by specialists in the fields of archaeology, paleontology, biology, botany, and/or other experts as may be appropriate to the particular site. Based upon this site review, the proposed location may be modified to avoid sensitive resource effects.

2.1.1.2 Identifying Well Locations

One well is proposed to be placed in the center of every 1/16 section (40-acre parcel) in the project area. This spacing is based on well placement patterns approved by the State. In theory, this could result in 16 wells being drilled in each section where recoverable reserves are located.

Figure 2-1 identifies the currently proposed locations of wells in the project area, based on the "one well in the center of every 40 acres" spacing scenario.

Restrictions on surface disturbing activities have been outlined by BLM in the DMRA RMP. Existing surface disturbing restrictions contained in the DMRA RMP were reviewed to determine the applicability of the restrictions to each potential 40-acre spaced well pad location in the project area. These restrictions indicate where placement of well pads would not be allowed unless or until Inland and the BLM arrive at an acceptable plan for mitigation of anticipated impacts.

Of the 922 potential well locations identified in **Figure 2-1**, a portion may require mitigation or may need to be relocated to avoid restrictions. Additional wells could be eliminated from development because their locations could not be adjusted or mitigated to avoid unallowable surface restrictions. These potential well pad locations could only have been developed with an exception from the BLM. Actual well pad locations would be determined during the APD process based on field surveys to determine if any site-specific resource conflicts could occur.

2.1.2 Well Development Schedule

A typical oil well in the Myton Bench-Monument Butte Oilfield would take approximately 6 to 8 days to drill and another 5 to 7 days to complete. The typical sequence of well development events would be as follows: access road and well pad construction; drilling; fracturing; well completion and testing, installing production equipment, and the gas gathering pipeline; reclamation of the reserve pit; and waterline placement. Depending upon the season in which the well activities are started, it may take up to 30 days between the time production begins and recontouring and reseeding of the reserve pit.

2.1.3 Transportation Plan and Requirements

Workers, material, and equipment would be transported to the project area via Highway 40 and county and BLM roads in the project area. Peak light-duty vehicle (i.e., passenger vehicles and pickup trucks) traffic would occur during drilling and fracturing when each well being drilled could contribute up to 10 vehicles daily on area roads. Peak heavy vehicle traffic would be associated with fracturing when an average of 15 heavy vehicles per well would travel on area roads daily.

Current daily numbers of passenger and tanker trucks on study area roads include 70 passenger trucks, 4 water tankers, and 15 oil tankers. A new well would generate tanker traffic at a frequency of roughly 1 trip every 2 days initially, slowing to once every 4 to 6 days within 6 months. A maximum of 448 new production wells are expected to be up and running consecutively during peak operations levels.

Under the Agency-preferred Alternative, additional roads must be constructed to access proposed well pad locations. BLM's current road classification system identifies three types of roads that could be built in the project area. These would include collector roads, local roads, and individual well access roads (resource roads). Average construction disturbance widths for each of these road types would be 45 feet, 33 feet, and 25 feet, respectively. Collector roads normally connect with or are extensions of a public road system. They provide access to larger blocks of land and require application of the BLM's highest road standards. Average subgrade width would be 28 feet. The majority of collector roads that would be used under this alternative are currently in place (see **Figure 2-1**).

Local roads usually provide the internal access network within an oil field. These minimum volume roads would normally have a subgrade width of 24 feet. The majority of local roads to be used in the project area also have been previously constructed and should require limited modifications.

Individual well access roads or resource roads provide entry to well pad sites and are estimated as having average lengths of approximately 0.25 mile. Resource roads would have a subgrade width of approximately 16 to 18 feet.

Upon receiving approval to drill a proposed well, Inland would move construction equipment over existing roads to the point where access road construction would begin. Access road construction must conform to the standards set forth by the BLM. Where possible, new roads would be located along existing access roads and trails in order to minimize surface disturbance. The existing road network within the project area would provide the primary access routes to the new well sites. Existing roads built for farm and ranch access, recreation, oil and gas development, and mining would be used. For purposes of analysis, it was assumed that new roads would be located in a 55-foot-wide utility corridor that also would contain waterlines, gas lines and other utilities.

2.1.3.1 Access Road Construction and Maintenance

Standard cut and fill construction methods and construction equipment, such as crawler tractors, graders, and scrapers, would be used to construct new roads. All access road construction would be in accordance with a Transportation Plan and a road design plan approved by the BLM. The road design plan would include BLM road construction standards.

Following approval of the road design plan and APD, the road ROW would be staked in accordance with the road design plan and the ROW would be cleared of vegetation. The length of the well access roads was estimated at 0.25 mile for resource roads connecting the pad to the nearest established road. The road would typically take 1 to 3 days to construct. Generally, the

shortest feasible route would be selected to reduce the haul distance and construction costs. Environmental factors or the surface landowner's wishes may dictate a longer route.

In rough terrain, a construction technique known as side casting (using the material taken from the cut portion of the road to construct the fill portion) would be used; slightly less than one half of the road bed is placed on a cut area and the remainder is placed on a fill area. Soil texture, steepness of the topography, and moisture conditions may dictate whether the well access road would be surfaced with gravel. Generally gravel is only used in select sections and not for the entire road length. Gravel used in new road construction would be obtained from Inland's shale pit located in Section 24, Township 4 South (T4S), Range 2 West (R2W). An average of 350 yards of gravel is currently used per month or about 50 yards for every 15 wells drilled. A similar amount is expected to be used under the Agency-preferred Alternative.

Once road construction is complete, damage to adjacent areas from erosion or other construction-related causes would be repaired. Repair activities would include filling gullies and repairing incidental damage. Immediately prior to reseeding, crusted surfaces would be scarified at right angles to the slope plane. All areas incidentally disturbed in the course of construction or maintenance would be revegetated with a seed mix approved by the BLM.

Access roads would be maintained by Inland throughout the life of the project. This would include, but not be limited to maintenance of culverts, side slopes, road and pad surfaces, and drainage channels affected by runoff from roads or pads.

2.1.3.2 Access Road Abandonment

Unless it can be demonstrated that a need exists that cannot be achieved using other roads, all well access, local, and collector roads would be reclaimed upon abandonment of the project. Roads abandoned following termination of the project or during reclamation of a dry hole would be ripped and recontoured back to approximate pre-construction contours and topsoil stockpiled during road construction would be evenly spread over the disturbed surfaces. Barriers or signs would be installed to discourage vehicular use on abandoned roads. The road surface would be seeded using a seed mix approved by the BLM. Culverts would be removed and disturbed areas would be monitored until an acceptable level of revegetation, as determined by the BLM, is achieved.

2.1.4 Well Pad Design and Construction

No construction or surface disturbing activities would occur on any well site or well access road until such activity has been specifically approved by the BLM and UDOGM, as appropriate; as

proposed in the site-specific APD; and as modified by the BLM and UDOGM, as appropriate, in the Conditions of Approval (COA). All new construction of roads and well sites would conform to standards set forth in the BLM/U.S. Forest Service (USFS) publication Surface Operating Standards for Oil and Gas Exploration and Development (1989). Underground injection of water would be monitored by UDOGM. On-site inspections of each drilling location made by the BLM may result in additional conditions of approval.

The information provided on well pad construction in this section is taken from the construction standards manual ("The Gold Book") published jointly by the BLM and USFS (1989). Well pad construction would generally take about 3 to 4 days to complete for each site.

Once the location for an individual well pad is determined following site-specific NEPA analysis and permit approvals are received, the well site location would be surveyed and staked. Construction of well pads would typically begin with stripping topsoil and stockpiling it. All soil material suitable for plant growth would be removed from areas to be disturbed and stockpiled in a designated area, usually adjacent to the pad. Soil stockpiles would be maintained for future use in backfilling the reserve pit and rehabilitating the location. Depending on the amount of cut and fill required to level each site, these stockpiles would occupy approximately 0.05 acre.

Sites on flat terrain would typically require minimal earthwork including the removal of topsoil and vegetation. Drilling sites on ridge tops and hillsides would be constructed using cut and fill techniques. The majority of the excess cut material would be stockpiled in an area that would allow it to be easily recovered for rehabilitation.

The types of equipment used to construct the pad would include bulldozers (track-mounted and rubber-tired), scrapers, and road graders. Equipment would be transported to the construction area by semi-trailer trucks over public and private roads.

Well site construction would consist of leveling a rectangular pad in native sand/soil/rock materials. No non-native gravel, concrete, or other foreign materials would be brought in for use in construction of the well pads. The well pad would be constructed so that the drilling rig sits on solid ground and not on fill and would occupy approximately 1.2 acres. This would ensure that the foundation of the drilling derrick would be on solid ground and would prevent it from leaning or toppling due to settling of uncompacted soil.

In addition to the drilling platform, a rectangular reserve pit would be constructed. Reserve pits would be used to store process water, drilling fluid, and drill cuttings. Generally, the reserve pit would be approximately 0.07 acre. If possible, pits would be constructed on cut material and not fill. If constructed on fill, there is a high potential for leakage. In some instances, removals of

bedrocks through pulverizing may be required to construct the pit. Depending on specific site conditions, the state or BLM may require that pits be lined with suitable plastic material to prevent leakage of pit fluids into shallow aquifers. Pits may be divided into compartments separated by berms for the proper management of derived waste (e.g., drill cuttings, mud, water flows).

2.1.5 Drilling Operations

Drilling activities on a well site would begin as soon as practicable after the pad and access roads have been constructed. A drilling rig and associated equipment would be moved to the location and erected. Moving a drilling rig requires moving 10 to 25 truck loads (some over legal weight, height, and width) of equipment over public highways and private roads. The derrick, when erected, could be as much as 110 feet high, but derrick heights vary depending on the depth and weight capacity of the rig.

Drilling operations would be conducted in compliance with Federal Oil and Gas Onshore Order #2 and other applicable Onshore Orders, all UDOGM rules and regulations, and all applicable local rules and regulations.

The drilling operation would be conducted in two phases. The first phase would utilize a small drilling rig (similar in type to a water well drilling rig) to drill to a depth of approximately 300 feet or 50 feet below any freshwater aquifers encountered. The BLM would be notified within 24 hours if any aquifers are encountered.

This surface hole would be cased with steel casing and cemented in place entirely from about 300 feet to the surface. This surface casing would serve the dual purpose of providing protection for any freshwater aquifers present and, as a safety feature, to contain any abnormal pressure that may be encountered while drilling deeper. The BLM would be notified in advance of running surface casing and cement in order to witness these operations, if so desired. This part of the drilling operation would normally take 2 to 3 days to complete.

Following the surface-hole rig, a larger drilling rig (depth rated to 7,000 feet minimum) would be mobilized to drill the remainder of the hole to a Total Depth (TD) of about 6,500 feet. Prior to drilling below the surface casing, a Blowout Preventer (BOP) would be installed on the surface casing and both the BOP and surface casing would be tested for pressure integrity. The BOP and related equipment will meet the minimum requirements of Onshore Oil and Gas Order No. 2, and the BLM would be notified in advance of all pressure tests in order to witness these tests if so desired.

The drillers may run a downhole mud motor to increase penetration rate. The rig would pump fresh water as a circulating fluid to drive the mud motor, cool the drill bit, and remove cuttings from the wellbore. In order to achieve borehole stability and minimize possible damage to the hydrocarbon producing formations, a potassium chloride substitute and commercial clay stabilizer may be added to the drilling fluid. Also, polyacrylamide polymer may be added to the drilling fluid to provide adequate viscosity to carry the drill cuttings out of the wellbore. From time to time, other materials may be added to the fluid system, such as sawdust, natural fibers, or paper flakes, to reduce downhole fluid losses. No potassium chloride, chromates, nor any hazardous materials would be mixed in the drilling fluid.

Water for drilling would be hauled to the rig storage tanks or transported by surface pipeline from water filtration/injection facilities in the area. During drilling operations, water would continually be transported to the rig location. Water demand may vary depending on the specific subsurface conditions that are encountered during the drilling of the well.

A water recycling system would be employed to continuously process the drilling fluid as it exits the wellbore, discharging the cuttings and other solid components to the reserve pit, and returning clear water back to the drilling rig's steel tanks. This process would not only recycle water, but would reclaim the chemicals in solution as well, thus minimizing the use and related transportation for both commodities. By utilizing this system, the total water requirement to support the drilling operation would be reduced to about 2,500 barrels of water per well down from the typical 5,000 barrels per well (1 barrel = 42 gallons). About 60 percent of this total could be reclaimed for reuse and transferred to subsequent wells. Of the remainder, about 10 percent would be used in mixing cement, another 10 percent would be lost downhole, and roughly 20 percent would be lost due to evaporation and percolation from the reserve pit. The USEPA has determined that all additives in this drilling fluid system meet requirements for discharge into the environment in compliance with General NPDES Permit No. CA0110516.

The primary purpose of the reserve pit would be to receive the drill cuttings from the wellbore (mainly shale, sand, and miscellaneous rock minerals). A secondary purpose of the reserve pit would be to contain drilling fluids carried over with the cuttings, and fluids that are periodically discharged from the rig's steel tanks (usually to flush out cuttings that have settled in the tanks). No hazardous substances would be placed in this pit. Inland does not plan to utilize synthetic pit liners in this drilling program. The BLM would determine on a case-by-case basis if unlined pits are acceptable, or if site-specific conditions indicate that a synthetic liner in the fluid reserve pit is appropriate.

Upon drilling the hole to TD, a series of geophysical logging tools would be run in the well to evaluate the potential hydrocarbon resource. If the evaluation concludes that adequate

hydrocarbons are present and recoverable, then steel production casing would be run and cemented in place in accordance with the well design, as approved by the BLM in the APD and any applicable COA's. The casing and cementing program would be designed to isolate and protect the various formations encountered in the wellbore and to prohibit pressure communication or fluid migration between zones. The average time to drill a hole is 6 to 8 days.

2.1.6 Completion Operations

After the production casing is cemented into place, the drilling rig would be moved off-site and a smaller rig (called a workover rig or pulling unit) would be set in place over the hole. Completion rigs are generally 100 feet in height. After time is given for the cement to cure, an interval coinciding with the producing zone would be perforated. Perforating would be accomplished through the use of bullet-like projectiles or, more commonly, with shaped-charges. Perforating would cut holes through the casing and to several feet into the formation. After the zone is perforated, the holes would be cleaned out using a fluid flush treatment, which commonly consists of an acid solution. The acid helps remove invaded drilling mud and pulverized rock particles created by perforating.

Generally, most hydrocarbon wells require stimulation beyond cleanup of the perforations to enhance the transmissibility of oil. Additional stimulation would be accomplished through hydraulic fracturing of the producing zone using a slurry of sand suspended in a viscous fluid (gelled water). The slurry would be pumped into the producing formation with sufficient hydraulic horsepower to fracture the rock formation. The sand would serve as a proppant to keep the created fracture open, thereby allowing reservoir fluids to move more readily into the well. The fluids from the fracturing would be recovered (swabbed back) and the proppant would be left in the fractures.

After stimulation is complete, production tubing would be run into the well and anchored to the inside of the production string by the use of a production packer. The packer would not only anchor the tubing but also would prevent fluid from entering the annular space between the casing and tubing. At the surface, equipment would be installed on the casing to control pressure and the flow of the production stream to processing equipment.

Although certain chemical components of fracturing fluids require handling as hazardous materials, these fluids would at all times be confined to storage tanks while on site, with any excess used in other completion operations or transported to a licensed commercial disposal facility.

The typical completion operation would use about 1,500 barrels of water and would normally take 5 to 7 days to perform.

2.1.7 Production and Maintenance Operations

If the well is successfully drilled and completed as a producing oil well, then a pumping unit and tank battery would be constructed on-site. These facilities would be placed on a portion of the well pad and would not disturb any additional surface area.

The pumping unit would be powered by an internal combustion engine that would be fueled by natural gas produced in association with crude oil development. In some limited cases, however, an electric engine may be used. Hospital mufflers would be installed on these electric engines to reduce noise levels. The pumping unit would lift fluid from the well and deliver it to the tank battery via flowlines constructed on the surface, not buried. The tank battery would normally consist of a heater-treater to heat and separate oil, gas and water, two 400-barrel capacity oil stock tanks, a single 200-barrel water storage tank, and a meter run for recording gas sales volumes. An Inland representative would visit each well as needed to gauge production and provide maintenance service on the surface equipment. It is estimated that this would require one visit per well per week.

Following the drilling and initial completion operations, a portion of the pad plus the reserve pit no longer would be needed. These areas would be promptly recontoured, reseeded, and returned to natural conditions.

Assuming that approximately 4 percent of the 922 wells proposed to be drilled could be non-productive or dry holes, approximately 38 dry wells located throughout the project area would be reclaimed immediately after construction is complete. If a well is deemed a dry hole, it would be plugged and abandoned (P&A) as per applicable regulations, and the entire well location and its access driveway would be promptly reclaimed and returned to natural conditions.

In accordance with BLM requirements, all surface equipment would be painted Desert Tan to blend in with the surroundings. Also per BLM requirements, Inland would prepare and submit a schematic site security diagram of the tank battery. All site security regulations as specified in Onshore Oil and Gas Order No. 3 would be adhered to.

The crude oil produced from the Green River reservoir sands is high in paraffin content, with a pour point of 104 degrees Fahrenheit (°F) below which the oil solidifies. Consequently, the flowlines and storage tanks would have a closed loop trace system that would circulate heated ethylene glycol solution (antifreeze) in order to maintain the crude oil in a fluid state.

Crude oil would be sold directly from the stock tanks. The purchaser would remove the oil via tanker trucks that would carry from 160 up to 300 barrels at a time. On average, a new well would produce at an initial rate of about 80 bpd of oil, declining within the first 6 months to about half its initial rate. After the first 6 months, productivity would continue to decline, but at a much slower rate. Later, as the well responds to the waterflood, (see Section 2.3, Waterflood Activities) the decline would reverse and production would begin increasing, returning to near its initial rate temporarily, before beginning a decline once again.

Produced natural gas would be utilized as the main fuel source to run the pumping unit and to fire the heater-treater and trace system. In limited cases, electric power, transmission lines, and transformers would be needed.

Maintenance or workover operations would be required every 14 to 18 months on average to repair worn downhole equipment, to sustain existing production rates, or to rework the well to enhance its productivity. Completion rigs, which are typically 100 feet in height, would perform workovers and would typically take 1 to 2 days to complete routine repairs and 5 to 10 days for any rework operations. It is assumed that workover operations would occur once a year at each operating well location.

As produced water accumulates at the well sites, it would be transported either to an existing or newly proposed water filtration/injection plant (see Section 2.3, Waterflood Activities) for reinjection or to a licensed commercial disposal facility for disposal. Approximately 2,156 barrels or 90,552 gallons of process water is currently produced per day in the field by Inland's wells. Approximately 96 percent of this water is reinjected or used in drilling. The remaining approximately 3,622 gallons of water produced per day is disposed of at offsite facilities in the region. The entire volume of water produced daily can not all be reinjected due to state regulations limiting the pressure that water can be reinjected at into the field. In essence, water is produced faster than it can be reinjected. It is assumed that a proportionately similar amount of water would be produced per day under the Agency-preferred Alternative and would be managed in a fashion similar to that described above.

2.1.8 Closure and Reclamation

Prior to abandonment of any well, location, access drive or other facility, Inland would file with the BLM a Form 4: Notice of Intent to Abandon, detailing the proposed P&A procedures. Upon BLM approval, well bores would be plugged with cement as necessary to prevent fluid or pressure migration, and to protect mineral and/or water resources. Wellheads would be removed, both the surface casing and production casing would be cut off below ground level, and an appropriate dry hole marker would be set in compliance with federal and state regulations.

All surface equipment, including tank battery, pumping unit, heater-treater, and aboveground flow lines and gas system pipelines would be removed from the site. Underground pipelines would be purged and retired in place.

The well pad and access road would be reclaimed as per BLM requirements. As a minimum, this shall include recontouring the surface to its original appearance and redistributing the topsoil to blend the site in with its natural surroundings. All surface disturbance would then be planted with a seed mixture of native grass, forb, and shrub species, as per the BLM's specifications.

2.2 Gas Pipeline Activities

Excess gas production above that required as generator fuel would be sold. Sales gas gathering lines and fuel gas distribution lines for the new development would be integrated into the existing gas pipeline network. It is anticipated that new lines would be laid aboveground in utility corridors that also would include access roads and waterlines. The sales lines would normally be 3-inch to 6-inch-diameter poly-pipe, whereas the fuel gas distribution lines would be 2-inch or 4-inch-diameter poly-pipe. It is anticipated that approximately 18,207 cubic feet per day of gas would be produced at each operating well and that 4,202 cubic feet per day would be used at the well site to operate the generators.

Sales gas would be run to the existing North Monument Butte (SE/SW Section 25 T8S R16E), Ashley (NE/NE Section 14 T9S R15E), or Odekirk Springs (SW/SW Section 36 T8S R17E) compression facilities. Gas would be transported from the compression facilities via high-pressure steel pipelines to the existing Questar transportation and sales pipeline, which would deliver it to consumers along the Wasatch Front (Salt Lake City and the surrounding area).

2.2.1 Design and Construction

The design, materials, construction, operation, maintenance, and abandonment of the gas gathering system pipelines would be in accordance with American Petroleum Institute (API) 1104 and safe and proven engineering practices. Typically, the gathering and distribution lines would be installed adjacent to existing roads. In most cases, pipelines would be installed aboveground in a 50-foot-wide permanent utility ROW, part of which would overlap the adjacent road. In order to minimize surface disturbance, gas lines would be laid on the surface rather than buried. Since burying of the pipe would be limited to road crossings, minimal surface disturbance would occur.

Gathering lines would be pressure tested. Testing would comply with applicable American National Standards Institute (ANSI) standards. All leaks that are found would be repaired.

Hydrostatic test water would be collected and disposed of in accordance with appropriate state and federal regulations. Hydrostatic test water would be obtained from the Inland's permitted Johnson Water District water source. If test water is surface discharged, Inland would submit a notice of intent to the State for coverage under the general NPDES permit for temporary discharge of hydrostatic test water.

2.2.2 Operation, Maintenance, Closure, and Reclamation

Pipelines would be operated and maintained in compliance with applicable federal, industry, and ANSI standards. Inspections would be conducted on a weekly basis, and all observed damage would be repaired within a reasonable time frame.

At or near the end of the economic life of a producing well, all poly-pipe associated with the gas line would be collected and removed from the location. Since limited surface disturbance is anticipated as part of gas line operations, no reclamation should be required.

2.3 Waterflood Activities

To increase the ultimate recovery of the hydrocarbon resource, Inland would implement waterflooding soon after new wells are drilled. Such waterflooding has proven successful within the Greater Monument Butte Field as part of the Green River Formation Waterflood Demonstration Project performed under Contract No. DE-FC22-93BC14958 by the DOE, Lomax Exploration, and Inland. The waterflood would consist of pumping water into various isolated Green River Formation oil reservoirs to repressurize and displace the oil more efficiently than primary depletion alone. It is expected that a portion of all of the currently existing wells and proposed wells drilled by Inland or others within the project study area would be used in waterflood projects for enhanced oil recovery. The individual injection wells would, if possible, be set up on an inverted five spot pattern (i.e., every other well would be a water injection well). This injection pattern conforms to other successful patterns used on existing projects in the area.

2.3.1 Design and Construction

2.3.1.1 Waterflooding Infrastructure and Operations

Inland's expanded waterflood operations would include two new water filtration/injection plants with injection capacities ranging from 2,500 to 4,000 bpd of water each. The proposed sites for the new filtration/injection facilities are located in the SW/SW of Section 36, T8S, R17E and NW/SW of Section 9, T9S, R18E.

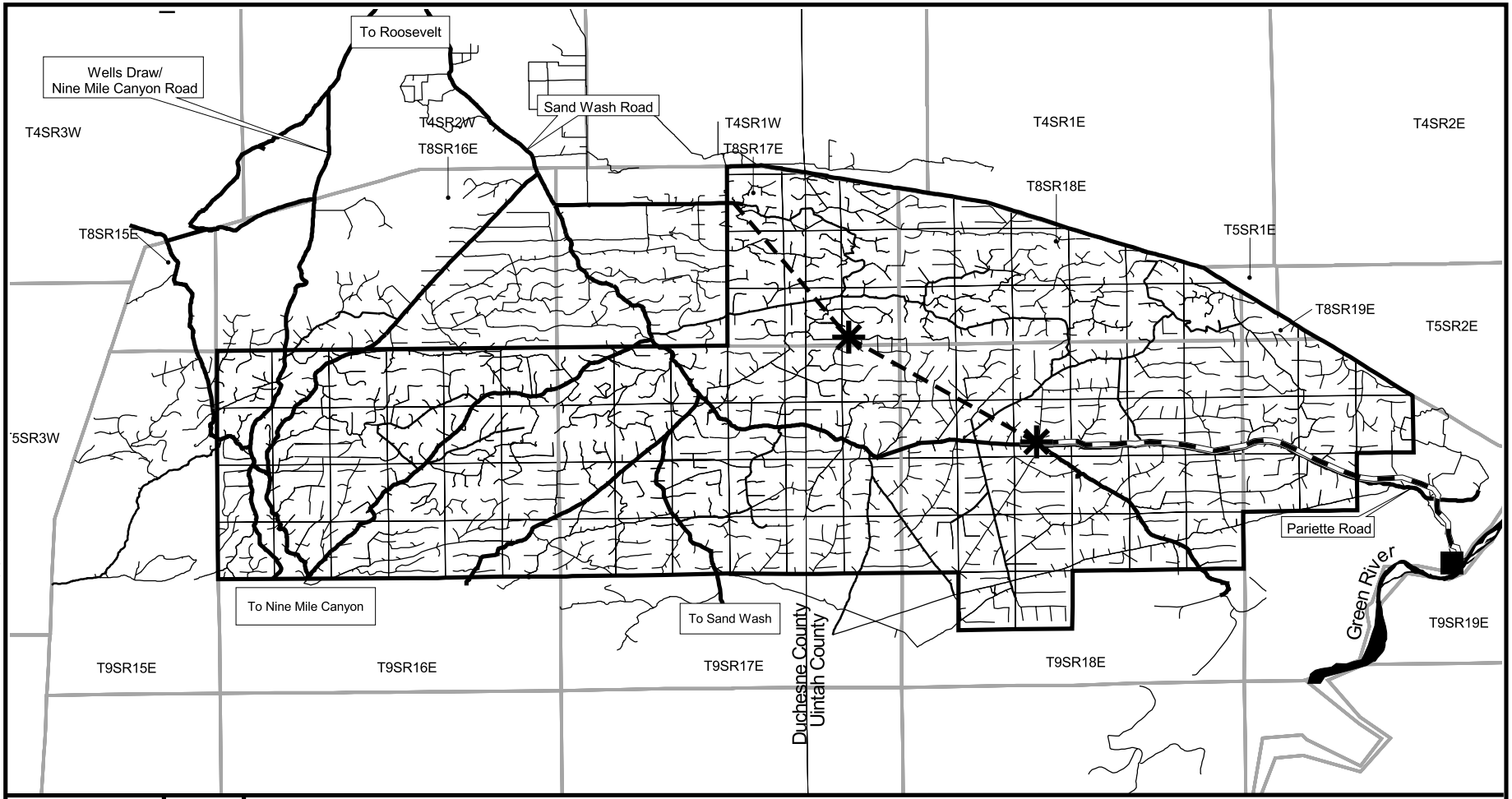
The new water filtration/injection plants each would require approximately 3 acres, including a 0.25-mile-long access road for the proposed location of the plants is illustrated in **Figure 2-2**. An approximately 6.9-mile-long, 12-kV powerline would be installed between an existing powerline (SW of Section 22, T8S, R17E) and the proposed filtration/injection facilities (**Figure 2-2**). The powerline would be constructed in a 30-foot-wide permanent ROW. Powerline construction access would be via existing roads, as available, the proposed road system to the well sites, or overland travel (preferably along the ROW). No temporary or permanent access roads would be required for powerline construction. Forty-foot-tall, wooden, Class 5 poles would be used for the powerline installation. Standard raptor proof design features for the prevention of raptor collision and electrocution would be installed on all poles and structures, as appropriate. Permanent surface disturbance associated with the pole locations would total less than 1 acre.

2.3.2 Operation and Maintenance

The estimated new water requirements for the expanded waterflood operations under the Proposed Action would range up to 60,000 bpd. This water requirement would be met from three sources: 1) existing contracts with the JWD totaling about 30,000 bpd of water; 2) water produced from the underground oil- and water-bearing Green River Formation; and 3) development of a water pumping facility to pump up to 30,000 bpd from the Green River alluvial aquifer under leases obtained from the Duchesne County Water Conservancy District (DCWCD). DCWCD currently has water rights in Flaming Gorge Reservoir via rights delegated back to the State of Utah by the U.S. Bureau of Reclamation (BOR). As a result, DCWCD has the authority to lease water from the Green River alluvial aquifer to Inland at the proposed withdrawal point (Anderson 2003).

The existing pipeline connecting the wellfield with the existing JWD source would not require modification. To obtain water from the Green River alluvial aquifer, 3 to 5 new water wells, a pump station, and a new underground water pipeline would be constructed. The location of the water wells and pump station are illustrated in **Figure 2-3**; the water pipeline route is illustrated in **Figure 2-4**.

The water collection wells would be connected to the centralized pump station via underground waterlines (**Figure 2-5**). The wells would be developed using conventional drilling methods. Each well would extend to a depth of approximately 100 feet below the surface. Each of the well holes would be equipped with steel casing between 10 to 14 inches in diameter. This casing would include sections of stainless steel screening that would allow groundwater to move from the surrounding alluvial aquifer into the casing. The screen openings typically would be no larger than 0.100 inch. Each well casing would contain a submersible pump and electric cable. The pump would be connected to a 6- to 8-inch pipe, known as a carrier pipe, which would convey the



Legend:

- Proposed power line
- Proposed filtration/ injection facility location
- Proposed pumping facility
- Proposed water line
- Collector roads
- Local roads
- Minor roads

N

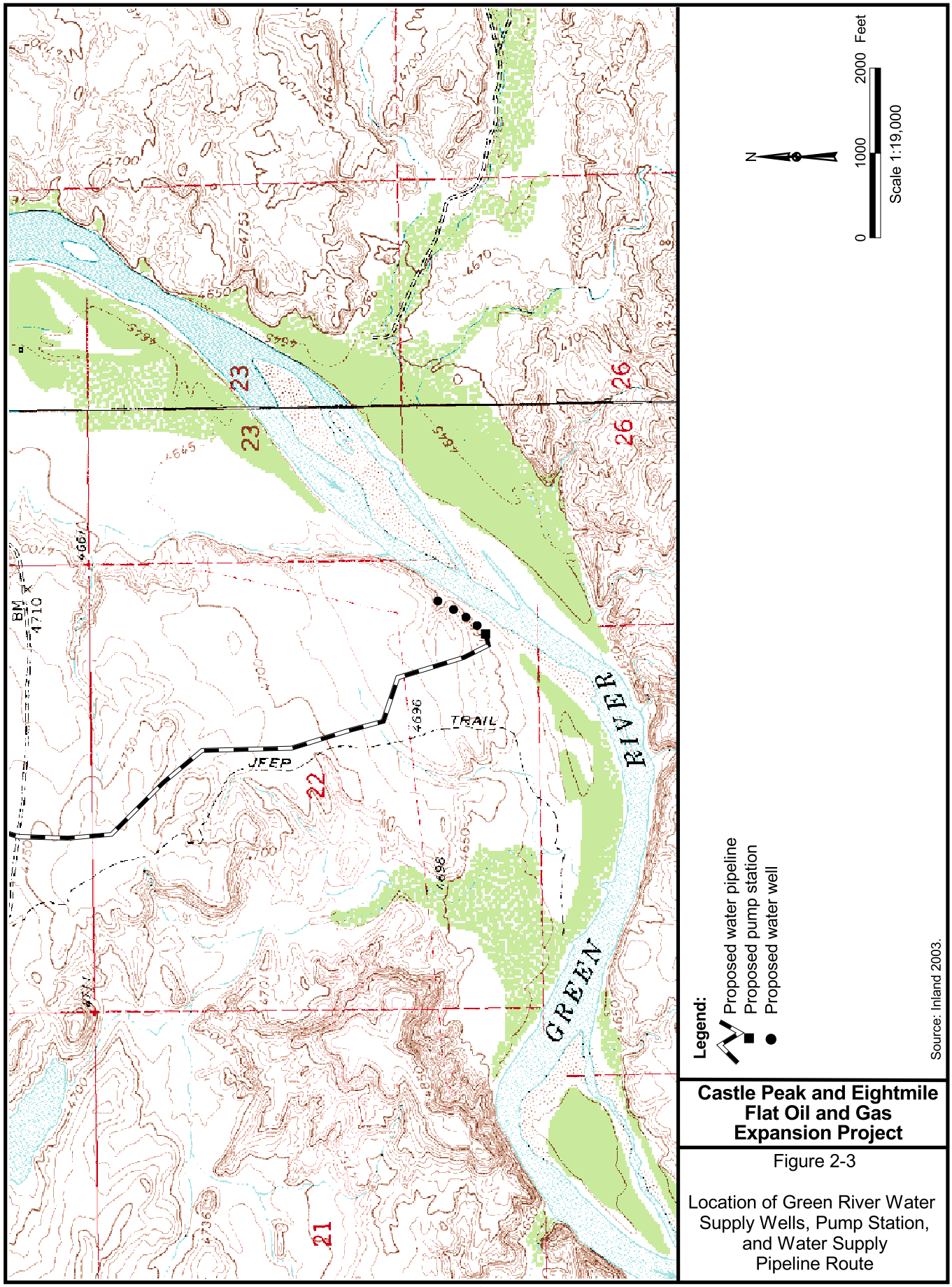
0 1 2 Miles

Note: Proposed power line will tie into an existing power line in SW, Section 22, T8S, R17E

Source: Inland 2003.

Castle Peak and Eightmile Flat Oil and Gas Expansion Project

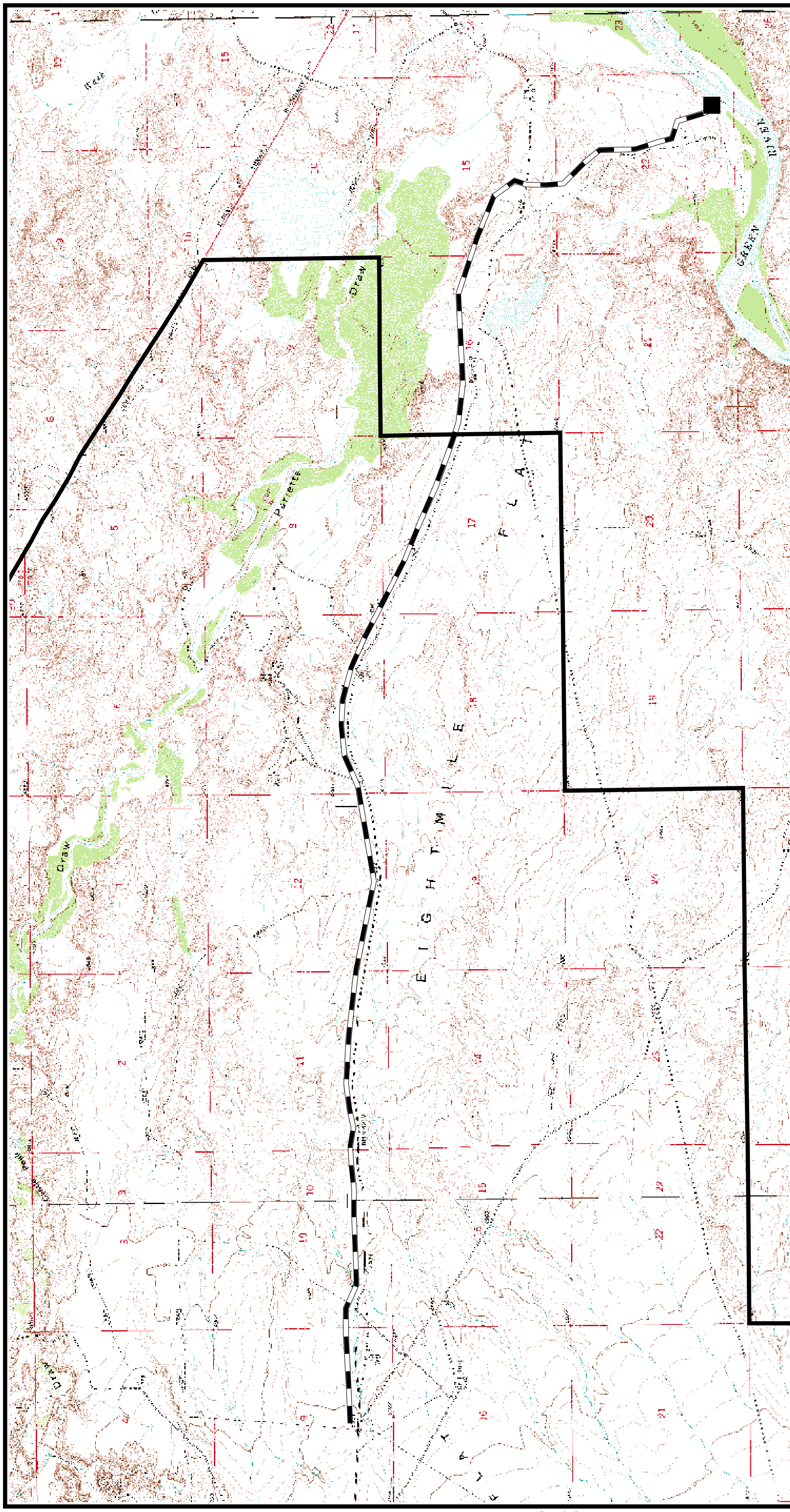
Figure 2-2
Proposed Power Line



Castle Peak and Eightmile Flat Oil and Gas Expansion Project

Figure 2-3

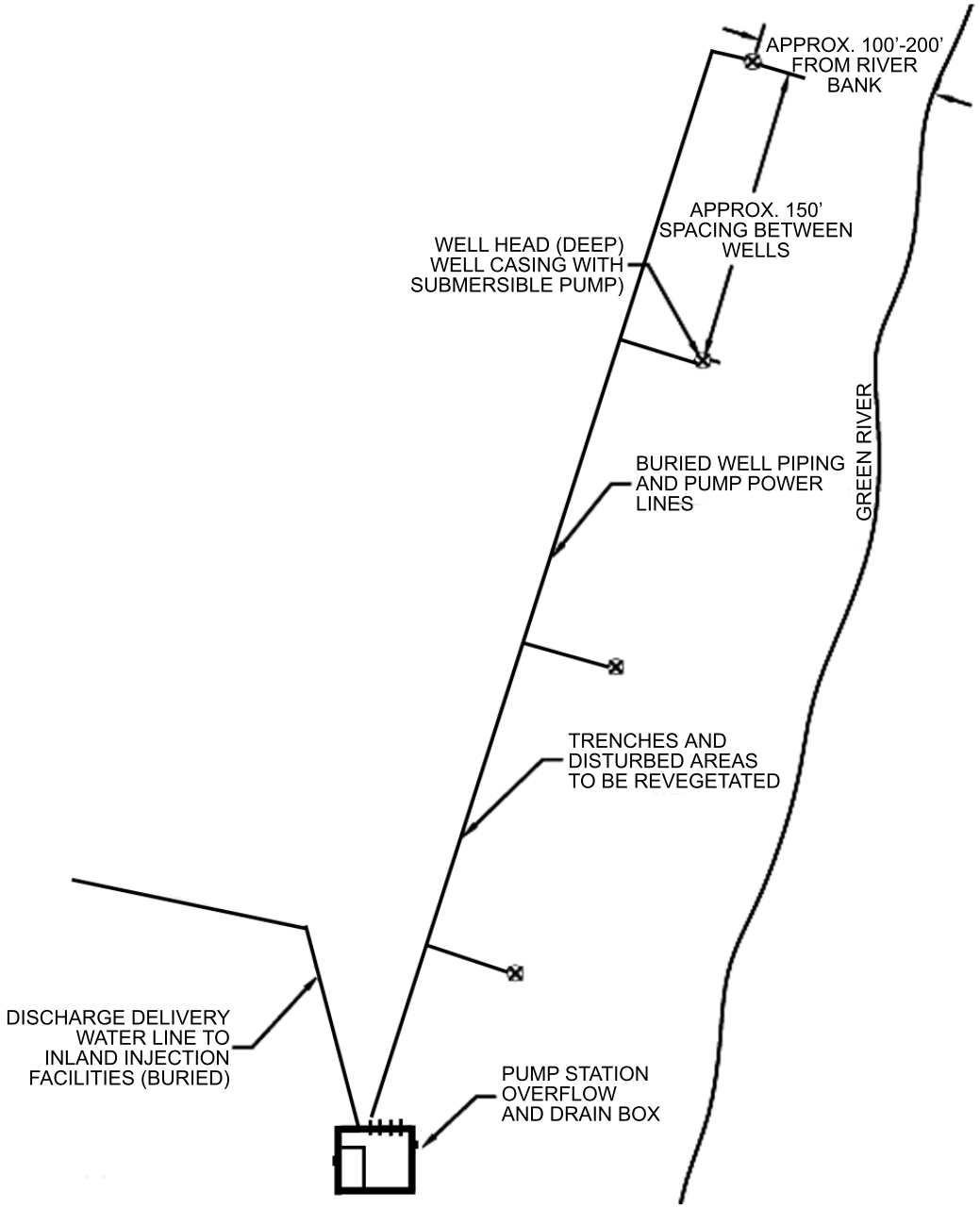
Location of Green River Water Supply Wells, Pump Station, and Water Supply Pipeline Route



Castle Peak and Eightmile Flat Oil and Gas Expansion Project

Figure 2-4

Water Supply Pipeline from the Green River to the Castle Peak and Eightmile Flat Field Development Area



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Castle Peak and Eightmile Flat Oil and Gas Expansion Project

Figure 2-5

Conceptual Water Well and Pump Station Layout

Source: Inland 2003.

pumped water from the well to the centralized pump facility. All piping would be placed underground.

The surface portion of each well would consist of the well casing, which would terminate 12 inches below the ground surface. The top of the casing would be capped with a bolt down lid. A manhole structure (**Figure 2-6**) and manhole lid also may be placed around the well casing with the lid flush to the ground surface. The area adjacent to and surrounding the manhole would be graded to the top of the manhole and seeded with a native seed mix to blend with the surrounding areas.

The centralized water pumping facility would be used to collect water from the wells and to pump water from the source to the injection facilities located west of the pump station. Power for the facility would be provided by a natural gas-fired generator installed in the pump station building. The pumping facility would be located on private land on the west side of the Green River (**Figure 2-3**) and adjacent to, but above the 100-year floodplain. The water pumping station would include a 40-foot-long by 40-foot-wide parking lot and a building approximately 30 feet long by 25 feet wide with walls approximately 10 feet high. The parking lot would be graded and graveled. The building would be constructed of either cinder block or metal siding finished in an earth tone. The roof on the building would be pitched, of metal construction, and also would be finished in an earth tone. Trees and shrubs would be planted along the sides of the building facing the Green River so that the building would not be seen from the Green River corridor.

The building would house booster pumps and the collection well discharge water. The discharge water either would be pumped into a wet well (cistern) located underneath the building or piped directly to the booster pumps for distribution via a pipeline to the wellfield. Depending on the quality of the water received from the collection wells, an in-line filter may be installed on the distribution lines. An overflow/drain collector box also would be installed at the pumping station that would divert excess water from the station into a nearby ephemeral channel draining directly into the Green River.

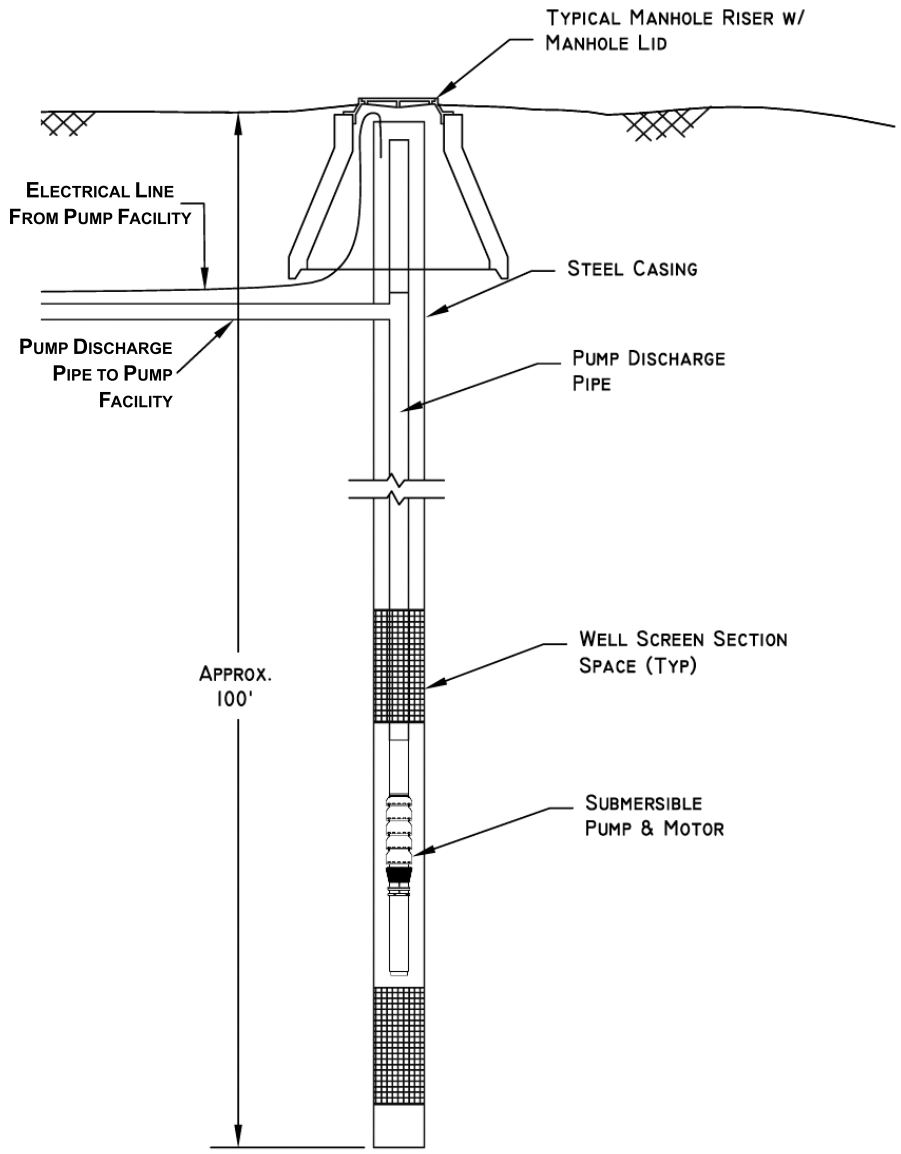
The 12-inch steel waterline would be buried approximately 4 to 5 feet deep within a 50-foot-wide construction ROW that would follow the alignment illustrated in **Figure 2-4**. The waterline would interconnect with the easternmost proposed filtration/injection facility (**Figure 2-2**), from which water subsequently would be routed to the wellfield for injection.

Assuming a maximum water use rate of 4.8 acre-feet per year per injection well, water demand at full build out would be 2,213 acre-feet per year. Of this volume, approximately 132 acre-feet per year would be produced water that would be treated for reinjection and a combined 2,081 acre-feet per year would be provided from the JWD or Green River alluvial aquifer. Due to the long-term uncertainties about the availability of water from JWD, Inland may need to obtain a

large portion or all of the required 2,081 acre feet per year of raw water from the Green River alluvial aquifer.

2.3.3 Closure and Reclamation

Closure and reclamation of reinjection wells would be the same as that described for production wells in Section 2.1.8, Closure and Reclamation.



Castle Peak and Eightmile Flat Oil and Gas Expansion Project

Figure 2-6

Conceptual Well Detail

Source: Inland 2003.

3.0 SPECIES EVALUATION

The following impact analyses for the sensitive plant and animal species identified by the USFWS for the project area focus on possible direct and indirect effects to species from oil and gas field expansion activities. The impact analyses incorporate the environmental protection measures committed to by Inland. These measures are summarized in Section 1.3, Committed Protection Measures.

The cumulative impact analysis for this BA focused on the potential incremental impacts to these species of special concern, relative to past projects (e.g., other oil and gas field projects) and reasonably foreseeable projects within the project area as shown in **Figure 2-1**, unless otherwise indicated.

3.1 Federally Endangered

3.1.1 Black-footed Ferret

3.1.1.1 Natural History and Habitat Association

The black-footed ferret (*Mustela nigripes*) is federally and state-listed as endangered by the USFWS and UDWR. No designated critical habitat for this species occurs in the vicinity of the proposed project. In 1999, the black-footed ferret was reintroduced as a nonessential experimental population (NEP) to Coyote Basin, Uintah County, approximately 35 miles east of the proposed project. Under Section 10(j) of the Endangered Species Act (ESA), the designation of NEP allows for considerable flexibility in managing reintroduced populations of endangered species including a reduction in regulatory restrictions. Consequently, for the purposes of Section 7 of Endangered Species Act, NEP species (i.e., black-footed ferret) are treated as federally proposed species (FR 63 52824).

Black-footed ferrets are primarily nocturnal, solitary carnivores that are obligate associates of prairie dogs (Oldemeyer et al. 1993). Over 90 percent of the its diet is comprised of prairie dogs, and ferrets use prairie dog burrows as their sole source of shelter (Oldemeyer et al. 1993). Therefore, black-footed ferrets may occur where prairie dog densities and distributions are relatively high. Black-footed ferrets have been reported to breed from March to May (USFWS 1988). The gestation period ranges from 41 to 45 days, with as many as 5 young born in late May and early June. The kits remain underground until late June or early July; upon emerging, they may accompany the female during the nocturnal foraging. Male ferrets are not active in rearing the young and live a solitary life except during the breeding season. Ferrets are most commonly observed in late summer or early fall (Hillman and Carpenter 1980).

Historically, the range of the black-footed ferret coincided closely with that of the prairie dog (*Cynomys* spp.) throughout the Great Plains and Rocky Mountain states of the U.S. and two Canadian Provinces (Clark 1989). The black-footed ferret was considered extinct by the middle of this century until it was documented in South Dakota in August 1964 (Hillman 1968; Henderson et al. 1969; Fortenbery 1972; Linder et al. 1972) and again in 1981 near Meeteetse, Wyoming (USFWS 1988). However, the South Dakota population subsequently disappeared and the Wyoming animals declined to only a few remaining individuals. Consequently, these animals were captured and provided the basis for the ongoing captive-breeding program (USFWS 1988). Beyond the captive animals located in breeding facilities around the United States, no wild black-footed ferrets are currently known to occur outside of reintroduced populations in Montana, South Dakota, Wyoming, Colorado, Arizona, and Utah. However, remnant ferret populations may exist in portions of its former range (Hillman and Carpenter 1980).

3.1.1.2 Potential Presence in the Project Area

Between 1966 and 1989, several unconfirmed black-footed ferret sightings or sign were reported from at least 45 localities in San Juan, Grand, Emery, Carbon, Uintah, Duchesne, and Rich counties, Utah (UDWR 1998). Although most of these reports are regarded as reputable accounts, no physical evidence (i.e., photographs or animal remains) of wild ferrets other than a few photographs of potential tracks and diggings of the species have been documented in these counties (UDWR 1998).

Relative to the project, two white-tailed prairie dog complexes have been identified as occurring within the Myton Bench project study area. These include the Wells Draw prairie dog complex and the Eight Mile Flat prairie dog complex. The Wells Draw complex (approximately 1,961) acres in size) occurs within the cumulative effects area in the northwestern portion of the project study area. The Eight Mile Flat complex occurs in the eastern portion of the project area and extends into the cumulative effects area located south of the Myton Bench project study area. The Eightmile Flat complex was evaluated for relative size (acreage) and activity levels in 2001 and 2003, respectively. In 2001, this complex was estimated to be approximately 7,759 acres in size which is substantially smaller than the 16,600 acre complex that was mapped in the 1980s. This complex also has experienced a reduction in activity levels since the mid-1980s, based on a 2003 habitat assessment of the Eightmile Flat complex. Reductions in complex size and activity levels are attributed primarily to disease and below average precipitation. Prairie dog colonies in the project region have been severely depleted by plague and drought conditions.

Summer night spotlight surveys and winter diurnal surveys for black-footed ferrets were conducted in the Eight Mile Flat prairie dog complex by the BLM between 1985 and 1986. No

evidence of black-footed ferrets (i.e., animal sightings, scat, diggings, or tracks) was found during these surveys (Phelan and Viert. 1986).

The Eightmile Flat complex is one of five prairie dog sites that have been identified as potential black-footed ferret reintroduction sites within the DMRA (BLM 1993, 1994). Currently, this site provides the best opportunity for successful reintroduction, based on available information. However, a study to determine which of the five sites would be selected for ferret reintroduction has not been completed (Faircloth 2002).

The nearest black-footed ferret population occurs at the Coyote Basin reintroduction area, approximately 35 miles east of the project area in Uintah County. However, dispersal by this species to the Eightmile Flat complex would not be anticipated, based on both geographical and biological factors that separate Coyote Basin from the project area including two river crossings (White and Green Rivers) and miles of unsuitable habitat for the ferret.

3.1.1.3 Impact Evaluation

Impacts to potential black-footed ferret habitat from the Agency-preferred Alternative would result in the incremental long-term loss of approximately 495 acres of the Eight Mile Flat complex and increased habitat fragmentation within the complex area. As discussed above, wild populations of black-footed ferrets are not known to exist outside of reintroduced populations in the western U.S. Consequently, the probability of black-footed ferrets occupying an active prairie dog colony within the project area is extremely low. However, if ferrets were present within the project area during development and production activities, direct impacts could result in the loss of individuals from the compaction and crushing of prairie dog burrows potentially occupied by black-footed ferrets. Indirect impacts would result in increased noise and human presence.

According to the USFWS' *1989 Black-footed Ferret Survey Guidelines*, clearance surveys for ferrets are required within active white-tailed prairie dog colonies or complexes that exceed 200 acres in size and meet or exceed burrow densities of at least 8 burrows per acre (20 burrows per hectare (USFWS 1989). **To prevent potential direct or indirect impacts to the black-footed ferret from project activities, Inland will coordinate with the USFWS and BLM to determine whether black-footed ferret surveys would be warranted prior to project activities within prairie dog colonies, in accordance with the USFWS' 1989 guidelines for the black-footed ferret. This decision will be based on relative size and density of the affected prairie dog colonies, activity status (active or inactive), colony location relative to disturbance areas, and current agency policy. If black-footed ferrets were documented, additional measures would be developed to protect individual ferrets and its habitat, in coordination with the USFWS.**

As stated above, the Eight Mile Flat potential ferret habitat area has been selected as the best of five potential black-footed ferret reintroduction sites within the DMRA. In order to protect this habitat for future ferret reintroduction or until studies have been completed within the five potential ferret reintroduction areas within the DMRA, the DMRA RMP stipulates that the Eightmile Flat area will be protected from any activities that would render potential black-footed ferret habitat unsuitable for future reintroduction (BLM 1994). This includes limiting total cumulative disturbance in the potential reintroduction area to less than 10 percent of the total acreage of the complex (7,759 acres). Oil and gas development from the Agency-preferred Alternative would disturb approximately 495 acres of the Eightmile Flat prairie dog complex. The total cumulative surface disturbance to the Eightmile Flat complex from other surface disturbance activities (approximately 90 acres) and the Agency-preferred Alternative would be approximately 8 percent, which is below the 10 percent of new disturbance allowed by the DMRA RMP.

3.1.1.4 Cumulative Impacts

As discussed above, approximately 90 acres of existing disturbance, mainly with other energy development activities, has occurred within the Eightmile Flat prairie dog complex. An additional 495 acres of disturbance from the development of well pads and roads are anticipated under the Agency-preferred Alternative, for a total proposed cumulative disturbance of approximately 585 acres or approximately 8 percent of the Eightmile Flat prairie dog complex.

Approximately 232 acres or 12 percent of the Wells Draw prairie dog complex within the Myton Bench Study Area has either been disturbed or has been permitted to be disturbed within the Cumulative Effects area. No direct impacts to this complex would occur as a result of the Agency-preferred Alternative.

No future non-federal actions (state, Tribal, local, or private and other entities) that are reasonably certain to occur in the Monument Butte-Red Wash Development Area have been identified for the Inland Project (see Chapter 5.0, Cumulative Impacts, in the EIS).

3.1.1.5 Mitigation Measures

Diamond Mountain RMP stipulations that would be implemented to further minimize potential impacts to this species are presented below.

1. Maintain the 16,600 acres of potentially suitable habitat in Eightmile Flat (one of five potential reintroduction areas) (inclusive of the portion in the Pariette Wetlands ACEC) by avoiding any activities that will render potential black-footed ferret habitat unsuitable for future reintroduction until habitat studies at all five sites are completed. (Note: based on the 2001

mapping of the Eightmile Flat area, this complex or colony has been severely reduced. The current size of the complex or colony is approximately 7,759 acres in size.) However, should Eightmile Flat area be selected, the pre-release guidelines, as identified in the DMRA RMP would be continued. Should the Eightmile Flat are not be selected, the protective actions imposed will be withdrawn. Following actual reintroduction, the site will be managed in accordance within the site-specific plan developed for the reintroduction.

2. Authorize no action is suitable habitat for threatened and endangered species if it would jeopardize the continued existence of the species or result in severe modification of the habitat. However, it may be possible to permit activities within the mapped area if a site-specific inventory shows that suitable habitat for threatened and endangered species would be adversely affected.

3. Surface-disturbing activities will be limited to a maximum of a cumulative total of 10 percent within the Eightmile Flat potential ferret habitat area based upon requirements stipulated in the Diamond Mountain Resource Area RMP.

4. Surface-disturbing activities will avoid potential ferret habitat. If activities cannot be avoided, they will cross in areas of low prairie dog density (<10 burrows/acre), cross at the shortest distance through the prairie dog habitat, or disturb sites not currently being used by prairie dogs. This guidance will not apply to maintenance and operation of existing facilities.

5. Powerlines will avoid potential ferret habitat. If this is not possible, they will be buried or designed to preclude raptors from using them as hunting perches.

6. If ferrets leave the reintroduction area (i.e., Coyote Basin and other future reintroduction sites within the DMRA), all protective stipulations that applied to the reintroduction area will not apply. It would be the USFWS' responsibility to trap and return the ferrets to the reintroduction area.

3.1.1.6 Determination

Effect on Critical Habitat. No critical habitat has been identified for this species.

Effect on the Species. The BLM has determined that the Agency-preferred Alternative may effect, but is not likely to adversely affect, the black-footed ferret. This determination is based on the low potential for occurrence by this species within the project area and the mitigation measures that have been developed for this species and its habitat.

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3.1.2 Colorado Pikeminnow

3.1.2.1 Natural History and Habitat Association

Habitat requirements for the Colorado pikeminnow (*Ptychocheilus lucius*) depend upon the life stage and time of year. Young-of-year and juveniles prefer shallow backwaters, while adults prefer pools, eddies, and deep runs (Miller et al. 1982). Adults seem to prefer depths of about 2 to 7 feet, velocities of 0 to 0.2 feet per second, and boulder/silt substrates (Valdez et al. 1982). Juveniles and young-of-year usually are found over silt or sand bottoms with minimal current (Tyus et al. 1982). During peak runoff in the spring and early summer, fish usually move into backwater areas of flooded riparian zones to avoid swift velocities, feed, and prepare for the upcoming spawning period (Valdez and Wick 1983). As adults mature, they become highly mobile during the spawning period, which occurs after peak runoff from mid-June to mid-August. Larvae drift downstream from spawning sites beginning in late June and continue until late August.

3.1.2.2 Potential Presence in the Project Area

The distribution of the Colorado pikeminnow presently is limited to the Upper Colorado River Basin, where it is found in the mainstem portions of the Colorado River and its major tributaries. The section of the Green River downstream of Jensen (approximately 24 miles upstream from the confluence with Pariette Wash) is used by migrating adults, juveniles, and drifting larvae (Modde 1997). From Jensen (River Mile [RM] 302) downstream to Sand Wash (RM 216) (approximately 12 miles downstream of the confluence with Pariette Wash), the river is used by drifting larvae between late June and mid-August. Downstream currents carry larvae into

backwater areas, which are used as rearing habitat. The closest spawning site that is a source of drifting larvae is located upstream in the Yampa River Canyon. Adults are found at scattered locations below Jensen in relatively low numbers. Recent sampling in 1997 reported a total of 29 late juvenile or adult Colorado pikeminnow from RM 300 to 319 (Brunson et al. 1998). Critical habitat has been designated for this species on the Green River and its 100-year floodplain from the confluence with the Yampa River (upstream of the confluence with Pariette Wash) to the confluence with the Colorado River (USFWS 1994).

3.1.2.3 Impact Evaluation

Installation of the proposed water wells and water pipeline would result in less than 1 acre of disturbance within the 100-year floodplain of the Green River in designated critical habitat for the Colorado pikeminnow. Construction techniques would be designed to minimize potential increased sedimentation during future high water events. Any increase in sedimentation would be considered extremely small in comparison to background sediment levels in the river. Reclamation of the temporary disturbance area would restore the function of the critical habitat at the disturbance site.

Based on a soil erosion analysis, overall project-related disturbance only would contribute minimally to background sediment yields, and sediment transport from the majority of the project area (with the exception of the disturbance associated with approximately 50 wells in the extreme southeastern portion of the project area) would be trapped upstream of the Pariette wetlands. As a result, it is anticipated that any related effects on sediment loads would be very minor, temporary, and localized in nature.

The risk of impacts to water quality and the humpback chub as a result of an accidental oil, fuel, or chemical spill from vehicles or well pad sites would be minimal as: 1) any spilled oil would solidify at ambient temperatures and would not penetrate the soil or channel sediments; 2) an extreme flood event (100-year frequency) that would encompass the entire 100-year floodplain could erode well pad embankments, but equipment damage and release of any stored products on the pad would be unlikely due to the relatively small predicted maximum flood volumes; and 3) implementation of the project's Spill Prevention, Control, and Countermeasure Plan would reduce the potential for spills and would limit potential effects from spills that occur in the Proposed Action area. In addition, poor quality production water either would be reinjected or transported off-site to an approved evaporation facility.

Well pads located in the floodplain during a major flood event could potentially damage surface equipment, resulting in the release of crude oil that could be transported downstream to perennial stream reaches. The expected toxicity effects to fish and wildlife in the event of a crude oil spill are

expected to be low because: 1) spilled oil would solidify at temperatures less than 95°F; 2) acutely toxic hydrocarbons (benzene, ethylbenzene, toluene, xylenes) are very low, and represent a low risk of acute toxicity to fish; and 3) the waxy crude would not easily stick to fur and feathers. However, because the crude is waxy, it would float in a flood and could be dispersed downstream, resulting in widespread, low-level contamination.

Most producing wells in the Inland project area would be associated with small-diameter poly pipes carrying natural gas and natural gas condensate. If these pipeline were to leak or rupture, there would be a possibility that condensate could drain into nearby washes and perennial stream bottoms. These channels could carry spilled natural gas condensate into lower Pariette Wash and into the Green River.

A risk assessment was conducted to evaluated the potential for toxic effects to fish within the Green River (Appendix B, Spill Risk Assessment Information). The assessment concluded that spills that would drain into upper Pariette Draw or Sheep Wash pose negligible risks to Green River fish due to the presence of detention and desiltation dams and ponds. These dams would prevent condensate from reaching the Green River before the condensate evaporated. In contrast, dams would not retain spills in lower Pariette Draw and its tributaries. The chance of a spill capable of reaching the Green River when threatened and endangered fish were present would be moderately low (once in 900 years). If such an event were to occur, acutely toxic concentrations potentially could occur in backwater areas in the immediate vicinity of the spill or at the stormwater's confluence with the Green River. However, this portion of the Green River is used as a rearing area for threatened and endangered species during high flows when dilution effects would be the greatest. In the mainstem of the Green River, a spill event would be unlikely to cause widespread adverse effects to aquatic biota since the conservatively estimated concentrations in the Green River did not exceed toxic thresholds. Thus, the likelihood of adverse effects to special status species within the Green River would be low.

In total, approximately 2,081 acre-feet per year (2.9 cfs) would be required for the waterflood program. A portion of the water (1,848 acre-feet per year potentially available) could be acquired from the Johnson Water System as described in Chapter 2.0. The source of this water is the Duchesne River system, via Starvation Reservoir. As the water was purchased prior to the implementation of the Endangered Fishes Recovery Implementation Program (Recovery Program), no depletion fee was assessed at the time of purchase. Inland has continued to use the contracted water since 1989, and no additional water has been purchased for this proposal. Therefore, as the purchase and use of the water from Starvation Reservoir was approved before the federal agencies began implementing the Recovery Program, the agencies continue to consider the use of this water source as non-depleting to the Green River system.

Due to the long-term uncertainties about JWD water, a large portion or all of the 2,081 acre-feet per year (approximately 2.9 cubic feet per second [cfs]) of water would be withdrawn from the alluvial aquifer of the Green River for waterflood activities (Franson Noble Engineering 2003a). 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), which is tributary to the Green River upstream of the proposed project area, the recorded minimum daily stream flow at the proposed withdrawal point is above 1,000 cfs (Franson Noble Engineering 2003b). As a result, water withdrawal from the alluvial aquifer would represent a loss of approximately 0.2 percent of the recorded minimum stream flow. This withdrawal would result in long-term (life of the project) effects on habitat for the Colorado pikeminnow in the Green River.

The Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River **(Recovery Plan) was established in 1988 to mitigate for water depletion impacts to federally listed fish species. To ensure the survival and recovery of listed fish species, water users are required to make a payment to the Recovery Program. The payment is required if any single incremental withdrawal exceeds 100 acre-feet (annual average). The current depletion fee (through September 1988) is $15.93/acre-foot. The fee would be applied to the annual average depletion from the Green River aquifer.**

3.1.2.4 Cumulative Impacts

Water depletions, surface disturbance, and potential water quality effects have occurred in the Monument Butte-Red Wash Development Area and associated portion of the Green River due to past and present actions. As part of the Agency-preferred Alternative, a maximum annual average depletion of 2,081 acre-feet per year could be withdrawn from the Green River alluvium and affect habitat for the Colorado pikeminnow. In addition, temporary surface disturbance in the 100-year floodplain of the Green River would affect less than 1 acre of critical habitat for this species. Surface disturbance and gas well development in Pariette Draw could result in minor sediment increases and a slight risk in spills or leaks of chemicals. However, no future non-federal actions (state, Tribal, local, or private entities) that are reasonably certain to occur in the Monument Butte-Red Wash Development Area have been identified for the Inland Project (see Chapter 5.0, Cumulative Impacts in the EIS).

3.1.2.5 Mitigation Measures

Diamond Mountain RMP stipulations that would be implemented to further minimize potential impacts to this species are presented below.

1. Allow new surface-disturbing activities on critical soils on about 75,000 acres within level 3 lands only if watershed values are maintained (the Pariette Wetlands ACEC has been designated as level 3 for critical watershed and soils).

2. Upgrade maintenance of existing BLM roads, close and rehabilitate roads no longer necessary, maintain or increase vegetation cover or construction of erosion control structures where possible to reduce critical erosion conditions. Construct new roads to standards that will maintain or improve watershed conditions.

3. Produced water from oil and gas wells will continue to be disposed of by authorized methods that could include injection, removal to non-federal disposal pits, or on-lease disposal pits.

4. Reduce sediment and salinity production on important watershed and critical soils through intensive management and construction measures to reduce water degradation of the Green River.

5. Reduce sediment and salinity production on important watershed and critical soils through intensive management and construction measures to reduce water degradation of the Green River.

6. All proposed actions on public lands will be analyzed for their potential to release hazardous materials into the environment. Appropriate stipulations will be incorporated into the permitting document to ensure prevention of hazardous incidents.

3.1.2.6 Determination

Effect on Critical Habitat. The BLM has determined that the Proposed Action may affect, and is likely to adversely affect, the Colorado pikeminnow. Water depletions may affect the critical habitat reach downstream of the project area on the Green River in the Upper Colorado River Basin. Construction of the water well and water pipeline may affect critical habitat within the 100-year floodplain of the Green River.

Effect on the Species. The BLM has determined that the Proposed Action may affect, and is likely to adversely affect, the Colorado pikeminnnow. The water withdrawal proposed from the Green River alluvial aquifer for waterflood activities would result in a long-term (life of the project) depletion within the Upper Colorado River Basin (Green River downstream of the project area), which may affect the species. No direct effects to spawning Colorado pikeminnow as a result of project construction have been identified based on the project location in relation to identified spawning areas. Based on the soil erosion analysis, no effects to the species have been identified

as a result of sediment transport. In addition, no effect to this species from contaminants (e.g., gas, oil, fuel, or chemicals) have been determined based on the rapid volatilization of gas in the event of a leak, the general lack of perennial surface flow in area drainages and distance from proposed gas gathering lines to the Green River, the characteristics of the oil (solidifies at ambient temperatures), and implementation of the project's SPCC Plan.

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3.1.3 Humpback Chub

3.1.3.1 Natural History and Habitat Association

The humpback chub (*Gila cypha*) primarily is found in river canyons, where they utilize a variety of habitats. In general, adults prefer deep pools (approximately 25 to 65 feet deep), eddies, and upwells near boulders, steep dropoff cliff faces, and sand/gravel bars near boulders (CDOW 1981). Young-of-year usually are found in backwaters and quiet pockets of water on rock benches or among steep rock walls (Valdez and Clemmer 1982). Juveniles occur in backwaters, eddies, and runs with low velocities and sand, silt, or boulder substrates (Valdez et al. 1982). Spawning occurs in May through July after the peak spring flows at water temperatures ranging from approximately 50 to 68 degrees Fahrenheit.

3.1.3.2 Potential Presence in the Project Area

The humpback chub is found in scattered populations in canyon reaches of the Colorado, Green, and Yampa rivers. The species is considered to be extremely rare in the Green River near Jensen (approximately 24 miles upstream from the confluence with Pariette Wash). During monitoring studies conducted in the river from 1986 to 1997, only three individuals were captured (Brunson et al. 1998). Small populations occur in Desolation and Gray canyons, located more than 16 miles downstream of the proposed project area. Designated critical habitat for the humpback chub within the 100-year floodplain of the Green River downstream of the project area includes the reach from Sumners Amphitheater to Swasey's Rapid (Desolation and Gray Canyons) (USFWS 1994).

3.1.3.3 Impact Evaluation

Temporary disturbance to the Green River floodplain would occur from the construction of 3 to 5 water wells and one water pipeline. Surface disturbance within the 100-year floodplain of the Green River would total less than 1 acre for these facilities. The pipeline and wells would be

buried so no surface features would remain after construction. Construction activities could result in localized soil disturbance above the normal river water level. This portion of the Green River floodplain is not part of critical habitat for humpback chub.

No impacts would occur for humpback chub or their habitat in the Green River relative to potential increased sediment loading from all surface disturbance activities. Based on a soil erosion analysis, project-related disturbance areas only would contribute minimally to background sediment yields, and sediment transport from the majority of the project area (with the exception of the disturbance associated with approximately 50 wells in the extreme southeastern portion of the project area) would be trapped upstream of the Pariette wetlands. As a result, it is anticipated that any related effects on sediment loads would be very minor, temporary, and localized in nature.

Potential impacts to the humpback chub and its habitat relative to accidental spills, production water, and water withdrawal would parallel those described for the Colorado pikeminnow.

The Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River **(Recovery Plan) was established in 1988 to mitigate for water depletion impacts to federally listed fish species. To ensure the survival and recovery of listed fish species, water users are required to make a payment to the Recovery Program. The payment is required if any single incremental withdrawal exceeds 100 acre-feet (annual average). The current depletion fee is $15.93/acre-foot. The fee would be applied to the annual average depletion from the Green River aquifer.**

3.1.3.4 Cumulative Impacts

Water depletions, surface disturbance, and potential water quality effects have occurred in the Monument Butte-Red Wash Development Area and associated portion of the Green River due to past and present actions. As part of the Agency-preferred Alternative, a maximum annual average depletion of 2,081 acre-feet per year could be withdrawn from the Green River alluvium and affect habitat for the humpback chub. In addition, surface disturbance in the 100-year floodplain of the Green River and Pariette Draw and well development could result in minor sediment increases and a slight risk in spills or leaks of chemicals. However, no future non-federal actions (state, Tribal, local, or private entities) that are reasonably certain to occur in the Monument Butte-Red Wash Development Area have been identified for the Inland Project (see Chapter 5.0, Cumulative Impacts, in the Draft EIS).

3.1.3.5 Mitigation Measures

Protection measures for the humpback chub would be the same as listed for the Colorado pikeminnow.

3.1.3.6 Determination

Effect on Critical Habitat. The BLM has determined that the Proposed Action may affect, and is likely to adversely affect, the humpback chub. Water depletions may affect the critical habitat reach downstream of the project area on the Green River in the Upper Colorado River Basin.

Effect on the Species. The BLM has determined that the Proposed Action may affect, and is likely to adversely affect, the humpback chub. The water withdrawal proposed from the Green River alluvial aquifer for waterflood activities would result in a long-term (life of the project) depletion within the Upper Colorado River Basin (Green River downstream of the project area), which may affect the species. No direct effects to the humpback chub as a result of project construction have been identified based on the project location in relation to occupied critical habitat and the soil erosion analysis. In addition, no effect to this species from contaminants (e.g., gas, oil, fuel, or chemicals) have been determined based on the rapid volatilization of gas in the event of a leak, the general lack of perennial surface flow in area drainages and distance from proposed gas gathering lines to the Green River, the characteristics of the oil (solidifies at ambient temperatures), and implementation of the project's SPCC Plan.

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3.1.4 Bonytail

3.1.4.1 Natural History and Habitat Association

The general types of habitat used by the bonytail (*Gila elegans*) include mainstem river and impoundments on the Colorado River. Collection sites for this species in the Upper Colorado River Basin were characterized as deep pools and eddies with slow or fast currents (Kaeding et al. 1986). Substrates at the collection sites consisted of silt, silt-boulder, and boulders (Vanicek and Kramer 1969). Limited information is available concerning spawning requirements for this species. It is assumed that spawning occurs in June or July, based on studies in the Green River.

3.1.4.2 Potential Presence in the Project Area

The bonytail is considered to be the rarest of the four federally endangered fish species. Since intensive sampling was initiated in 1977, only a few individuals have been collected in the Upper Colorado River Basin. The only recent records of bonytail in the Green River resulted from sampling in Gray Canyon, where one individual was collected from 1982 to 1985 and several bonytail observed in 1980 and 1981 (Tyus et al. 1982; Tyus et al. 1987). No bonytail have been collected during monitoring in the Green River from 1986 to 1997 (McAda et al. 1994, 1996, 1997). Designated critical habitat for the bonytail within the 100-year floodplain of the Green River downstream of the project area includes the reach from Sumners Amphitheater to Swasey's Rapid (Desolation and Gray Canyons) (USFWS 1994).

3.1.4.3 Impact Evaluation

Potential impacts to the bonytail and its designated critical habitat would parallel those described for the Colorado pikeminnow.

3.1.4.4 Cumulative Impacts

Cumulative impacts on bonytail would be the same as discussed for the Colorado pikeminnow.

3.1.4.5 Mitigation Measures

Protection measures for bonytail would be the same as listed for the Colorado pikeminnow.

3.1.4.6 Determination

Effect on Critical Habitat. The BLM has determined that the Proposed Action may affect, and is likely to adversely affect, the bonytail. Water depletions may affect the critical habitat reach downstream of the project area on the Green River in the Upper Colorado River Basin.

Effect on the Species. The BLM has determined that the Proposed Action may affect, and is likely to adversely affect, the bonytail. The water withdrawal proposed from the Green River alluvial aquifer for waterflood activities would result in a long-term (life of the project) depletion within the Upper Colorado River Basin (Green River downstream of the project area), which may affect the species. No direct effects to the bonytail as a result of project construction have been identified based on the project location in relation to critical habitat and the soil erosion analysis. In addition, no effect to this species from contaminants (e.g., gas, oil, fuel, or chemicals) have been determined based on the rapid volatilization of gas in the event of a leak, the general lack of perennial surface flow in area drainages and distance from proposed gas gathering lines to the Green River, the characteristics of the oil (solidifies at ambient temperatures), and implementation of the project's SPCC Plan.

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3.1.5 Razorback Sucker

3.1.5.1 Natural History and Habitat Association

Habitat requirements for the razorback sucker (*Xyrauchen texanus*) include both riverine and reservoir environments. General habitats used by adults include eddies, pools, and backwaters during the non-breeding period (July through March) (Maddux et al. 1993). Osmundson and Kaeding (1991) summarized seasonal habitat use as follows: pools and eddies from November through April, runs and pools from July through October, runs and backwaters in May, and backwaters and flooded gravel pits during June. Juveniles seem to prefer shallow water and minimal flow in backwaters, tributary mouths, off-channel impoundments, and lateral canals (Maddux et al. 1993). The spawning period for razorback suckers in the Upper Colorado River Basin usually occurs in April through mid-June. However, limited spawning has been documented for this species in the Upper Colorado River Basin.

3.1.5.2 Potential Presence in the Project Area

The razorback sucker is found at scattered locations in the Green River, Yampa River, Colorado River, Gunnison River, and lower San Juan River. Within the Green River drainage, larvae, juveniles, and adult razorback sucker occur from Jensen downstream to the confluence with the Colorado River. Adults and juveniles have been collected at scattered locations downstream of Jensen, particularly in the segment between Split Mountain Canyon and Sand Wash (Modde 1997). The number of adult razorback sucker collected in the Jensen reach (RM 300-319) has ranged from two to four individuals per year from 1991-1997 (McAda et al. 1996, 1997; Brunson et al. 1998). Even though limited spawning has been documented for this species, juvenile razorback sucker rarely have been collected. The lack of survival through the early life stages has been attributed to low food availability, transport from the system, and predation (Minckley et al. 1991, as cited in Modde et al. 1996). Floodplain areas such as Stewart Lake and the Ouray National Wildlife Refuge are considered important rearing and refuge areas during high flow periods (Modde 1996). Designated critical habitat for the razorback sucker is located on the Green River and its 100-year floodplain from the confluence with the Yampa River (upstream of the confluence with Pariette Wash) to the confluence with the Colorado River (USFWS 1994).

3.1.5.3 Impact Evaluation

Potential impacts to the razorback sucker would parallel those described for the Colorado pikeminnow.

3.1.5.4 Cumulative Impacts

Cumulative impacts on razorback sucker would be the same as discussed for the Colorado pikeminnow.

3.1.5.5 Mitigation Measures

Protection measures for the razorback stucker would be the same as listed for the Colorado pikeminnow.

3.1.5.6 Determination

Effect on Critical Habitat. The BLM has determined that the Proposed Action may affect, and is likely to adversely affect, the razorback sucker. Water depletions may affect the critical habitat reach downstream of the project area on the Green River in the Upper Colorado River Basin. Construction of the water well and water pipeline may affect critical habitat within the 100-year floodplain of the Green River.

Effect on the Species. The BLM has determined that the Proposed Action may affect, and is likely to adversely affect, the razorback sucker. The water withdrawal proposed from the Green River alluvial aquifer for waterflood activities would result in a long-term (life of the project) depletion within the Upper Colorado River Basin (Green River downstream of the project area), which may affect the species. Based on the soil erosion analysis, no effects to the species have been identified as a result of sediment transport. In addition, no effect to this species from contaminants (e.g., gas, oil, fuel, or chemicals) have been determined based on the rapid volatilization of gas in the event of a leak, the general lack of perennial surface flow in area drainages and distance from proposed gas gathering lines to the Green River, the characteristics of the oil (solidifies at ambient temperatures), and implementation of the project's SPCC Plan.

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3.2 Federally Threatened

3.2.1 Bald Eagle

3.2.1.1 Natural History and Habitat Association

The bald eagle (*Haliaeetus leucocephalus*) was downlisted to federally threatened on July 12, 1995, and the USFWS has proposed to delist the bald eagle in the lower 48 states (64 FR 36453). The bald eagle is state-listed as threatened in Utah. Bald eagles also are protected under the Bald Eagle Protection Act of June 8, 1940, as amended, and the Migratory Bird Treaty Act of July 3, 1918, as amended June 20, 1936, in all states, including Alaska.

Nests are usually located in multi-storied trees; optimum nesting habitat includes proximity to open water that provides an adequate food source, large nest trees with sturdy branches at sufficient height, and stand heterogeneity. Only four bald eagle nests have been documented in Utah (Messmer 1998). These nest sites occur in Carbon, Grand, and Salt Lake counties (UDWR 1998). No bald eagle nest sites have been identified in the project region. As a result, it is extremely unlikely that bald eagles would nest within the project region.

Bald eagles migrate from breeding areas between September and December and generally winter as far north as open water and food are available. In Utah, eagles typically arrive on their wintering grounds in November and depart in April or May. Wintering eagles may roost individually or they may gather in large aggregations and share communal roosts and diurnal perches that may be used for successive years (USFWS 1982). Roost sites are often located near open water, but also use a variety of drier foraging habitats from mid-elevation canyons to low elevation valleys and deserts (UDWR 1998). Roosts typically consist of large trees that have large horizontal limbs and open branches that allow for an unobstructed view of the surrounding area and provide an open flight path to and from the site. Food availability is probably the single most important factor influencing winter eagle distribution and abundance. In Utah, the major prey species of the bald eagle appear to be waterfowl, fish, small mammals, and carrion (Messmer 1998).

Perches are an essential element in bald eagles' selection of foraging areas, since they are necessary for hunting and resting. Perch sites are typically in open view of potential food sources and are generally within 160 feet of water. However, Grubb and Kennedy (1982) suggests that specific perch sites are oriented to provide for a number of activities including: a good view of the adjacent water and surrounding area; maximum exposure to the sun; and maximum benefit to topography and diurnal wind currents for flight. Perches also offer protection from predators and a degree of protection from inclement weather.

3.2.1.2 Potential Presence in the Project Area

As stated above, no known bald eagle nest sites occur within the project region. Consequently potential occurrence within the project area would be limited to migrating and wintering eagles. The Pariette Ponds provide a seasonal winter concentration area for more than 30 bald eagles annually. These eagles roost on cliffs and ridge tops and feed primarily on carp, but also may forage within upland habitats within the project area. Wintering bald eagles also occur annually along the Green River.

3.2.1.3 Impact Evaluation

Construction

No known bald eagle nest sites occur within the project region. Consequently, no direct or indirect impacts to nesting bald eagles would be anticipated from project activities.

As stated above, the Pariette Ponds located in the eastern portion of the project area and the Green River corridor provide a seasonal concentration area for wintering eagles. Direct impacts to migrating and wintering bald eagles would include the incremental long-term disturbance of approximately 3,582 acres of upland and riparian foraging habitat, including 73 acres of riparian habitat/wetland habitat within Pariette Draw. In addition, less than 5 acres of riparian habitat would be disturbed from the construction of 3 to 5 new water wells within the 100-year floodplain of the Green River. Indirect effects from human presence, dispersal of noxious and invasive weeds, and dust effects associated with unpaved road traffic would further reduce habitat quality and perhaps eagle use for approximately 16,000 acres in the field development area. In addition, since noise generated by pumpjacks would exceed 45 dBA, a general threshold for wildlife avoidance, noise related impacts could further reduce foraging activities throughout the development area, assuming that pumpjacks are not equipped with mufflers. Collectively, these effects would result in overall reductions in habitat quality for foraging and roosting eagles, until development activities are complete and native vegetation has become reestablished.

As part of Inlands applicant-committed environmental protection measures to prevent potential impacts to roosting bald eagles within the project area, no construction or surface-disturbing activities will occur within 0.5 mile of winter concentration areas and winter night roost sites from November 1 through March 31. Daily activities that must occur within the recommended spatial buffers at winter night roost sites will be scheduled to occur between 9:00 am and 1 hour prior to official sunset. These measures will be implemented on a site-by-site basis, as necessary, in coordination with the BLM.

In addition, Inland has committed to incorporating standard raptor proofing designs as outlined in Mitigating Bird Collision with Powerlines (Avian Powerline Interaction Committee [APLIC] 1994) into the design of the distribution powerlines to prevent collision to foraging and migrating raptors, including bald eagles. Standard, safe designs as outlined in Suggested Practice for Raptor Protection on Powerlines (APLIC 1996) also would be incorporated into the design of the distribution powerlines in areas of identified avian concern to prevent electrocution of raptor species attempting to perch on the power poles and lines. These measures would include, but would not be limited to, a 60-inch separation between conductors and/or grounded hardware and recommended use of insulating materials and other applicable measures depending on line configuration.

Risk Assessment

Accidental releases of hazardous materials could occur during the construction and operation of the well field. Risk to bald eagles and other wildlife from an accidental crude oil, fuel, or chemical spill from vehicles or spills that occur during construction would pose a minimal threat to bald eagles due to the implementation of the SPCC Plan. The plan would minimize the chance of a spill and, if a spill were to occur, implementation of the SPCC Plan would minimize a spill's impacts to the environment.

During operation, natural gas, condensate, and crude oil could accidentally be released from storage tanks at well pad sites or gathering pipelines. The risks associated with accidental release of crude oil and natural gas condensate are discussed below.

Crude Oil. Inland's crude oil is a paraffinic crude, composed of over 90 percent paraffins and cycloparaffins. The physical characteristics of Inland's crude oil make it unlikely that significant environmental contamination would occur. Compared to other crude oils, Inland's crude oil is very waxy. Inland's crude oil has a pour point of over 95°F.[1] Consequently, at most ambient temperatures, crude oil spilled from holding tanks would solidify in the immediate area of a spill.

Inland's crude oil would have limited ability to penetrate into soil horizons due to its tendency to solidify. Therefore, soil impacts from a spill would be limited to the immediate area around the spill. Inland's SPCC Plan would address cleanup of oil at well pads to minimize further environmental contamination.

If released into water, Inland's crude oil would solidify due to its pour point and the waxy mass would tend to float due to its specific gravity. Most constituents within the crude are not very water-soluble. While Inland's crude oil consists primarily of paraffins and cycloalkanes, it is the aromatic fraction of the crude oil that poses concern for potential toxicity for aquatic organisms. Compared to paraffins and cycloparaffins, low molecular weight aromatics (i.e., benzene, toluene, ethylbenzene, xylenes [BTEX compounds] and naphthalenes) are more soluble in water and more acutely toxic to aquatic organisms. Since Inland's crude contains less than 0.01% BTEX compounds and less than 0.01% naphthalenes and given the oils propensity to solidify at ambient water temperatures, acute toxicity to aquatic biota is unlikely to be a hazard. Heavier molecular weight aromatics, such as polycyclic aromatic hydrocarbons [PAHs], include some potentially carcinogenic compounds. Since Inland's crude oil would contain these compounds, there is the potential for long-term, chronic effects to aquatic organisms if the crude oil was to reach waterbodies and was not cleaned up in a timely fashion. Consequently, it is recommended that mitigation measures be implemented to reduce the chance of any spilled product reaching a waterbody. If a spill were to occur, Inland would be responsible for cleanup to existing state standards for water and soils.

To evaluate risk to wildlife, the chance of exposure and, if exposed, the likelihood of adverse effects was assessed. While an extreme flood event (100-year frequency) that encompassed the entire 100-year floodplain could erode well pad embankments, damage to equipment and release of stored products on the pad would be unlikely due to the relatively small predicted maximum flood volumes. As described above, in the event that crude oil from the well pads was released, the spilled crude oil would quickly solidify at ambient air temperatures and the solidify crude oil would tend to remain in place. However, floodwaters could transport the spilled crude oil downstream to perennial stream reaches, resulting in low-level contamination at downstream locations. The waxy crude oil would float but would not laterally disperse across the water's surface like less viscous crude oils. Since the material would generally have limited dispersal properties and, even when contacting water, the crude oil would solidify and would not spread laterally across the water's surface nor does it easily stick to fur and feathers of wildlife, direct exposure of bald eagle would not be anticipated. Since the crude oil would not cause a fish kill (due to low water solubility and low concentrations of BTEX compounds), indirect exposure of scavenging bald eagles to the crude oil via ingestion of contaminated prey is not anticipated. Therefore, the risk of impacts to bald eagles from crude oil exposure would be minimal.

[1] Pour point is the temperature, plus 5 degrees, at which the oil in a beaker does not respond to tipping, i.e., it cannot be poured.

Condensate. Most producing wells in the Inland project area would be associated with small-diameter plastic pipes carrying natural gas and natural gas condensate. If these pipelines were to leak or rupture, natural gas would be released into the atmosphere and natural gas condensate would be released into the environment. Natural gas would immediately dissipate in the atmosphere. Natural gas condensate is composed of low-weight hydrocarbons that tend to evaporate quickly (less than 8 hours). More than 80 percent of Inland's condensate consists of compounds that would immediately gasify upon release (e.g., propane, butane). The remaining fraction consists primarily of pentane. From a toxicological standpoint, these compounds have low toxicity; they are primarily asphixiants (not an issue in an outdoor environment). In most cases, condensate released into upland areas would evaporate quickly with negligible environmental impacts. However, there would be a possibility that condensate could drain into nearby washes and perennial stream bottoms. These channels could carry spilled natural gas condensate into Pariette Wash and into the Green River.

Pariette Draw is composed of two portions: Upper and Lower Pariette Draw. Although Upper Pariette Draw historically contained fish which were maintained by irrigation return water, agricultural practices in the area have changed and the upper Pariette Draw is typically dry. Precipitation within the Upper Pariette Draw drains into detention and desiltation ponds. These ponds take about a week to fill and are designed to retain waters for at least one day. Condensate spills into Upper Pariette Draw would not caused adverse impacts to fish (direct impacts) and bald eagles (indirect impacts) because 1) no fish inhabit upper Pariette Draw and 2) the condensate would largely evaporate while being retained by the detention dam.

If a spill were to occur within the lower Pariette Draw and if condensate were to reach perennial waters, concentrations could be sufficient to cause fish mortality. The frequency of a condensate release that could reach the lower Pariette Draw at sufficient concentrations to cause acute toxicity to aquatic biota within Pariette Draw was estimated to be once in 90 years under the Proposed Action. If a spill occurred in lower Pariette Draw and was transported to the Green River, the concentration of the condensate would be at least 10 times lower than the acute toxicity thresholds, so the possibility of adverse effects to aquatic biota in the Green River would be very low.

In the unlikely event that natural gas condensate was released into the lower Pariette Wash or Green River and caused acute mortality of aquatic biota, the dead or ill fish could potentially attract scavenging eagles, if present. Since eagles are present in the area primarily during the winter, the cumulative probability of the spill into lower Pariette Draw of sufficient size to cause fish mortality and to subsequently attract wintering bald eagles would be expected once in 180 years. While direct mortality of eagles from the ingestion of contaminated prey from such an event would

be unlikely, eagles that ingest large numbers of contaminated prey could become temporarily stressed, disoriented, or ill, which could increase their susceptibility to predation. Given the infrequency of a fish kill within Lower Pariette Draw and low to moderate oral toxicity hazard to bald eagle, potential impacts to bald eagles from natural gas condensate are low.

3.2.1.4 Cumulative Impacts

Wintering bald eagle roosting habitat (large cottonwood trees) occurs along the Green River corridor over a distance of 20 miles between Ouray and the head of Desolation Canyon. Reduction in the amount of surface disturbance and implementation of riparian setback mitigation would reduce direct habitat disturbance to potential roosting and foraging habitat and prevent the loss of individual cottonwood trees in Pariette Draw. It also would reduce disturbance to foraging areas along the Green River corridor. Wintering bald eagles in Pariette Draw and along the Green River would be protected by limiting well servicing to daylight hours in the vicinity of known winter roosts. Collision and electrocution hazard for eagles would be avoided by implementing raptor protection measures in transmission line design in the Castle Peak and Eightmile Flat project area.

Approximately 25,644 acres of potential foraging habitat for the bald eagle has been or will be disturbed from Past, Present, and Reasonably Foreseeable Future Projects in the Monument Butte-Red Wash Development Area. In addition, approximately 3,582 acres of foraging habitat including 78 acres of riparian habitat would be disturbed under the Agency-preferred Alternative for a total proposed cumulative total disturbance of approximately 29,226 acres of habitat. However, no future non-federal actions (state, Tribal, local, or private and other entities) that are reasonably certain to occur in the Monument Butte-Red Wash Development Area have been identified for the Inland Project (see Chapter 5.0, Cumulative Impacts, in the EIS).

3.2.1.5 Mitigation Measures

Diamond Mountain RMP stipulations that would be implemented to further minimize potential impacts to this species are presented below:

1. Avoid or mitigate the impact of surface-disturbing activities on riparian-wetland areas. Riparian habitat will be protected by limiting surface-disturbing activities to established ROW corridors and crossings and by restricting grazing.

2. Allow new surface-disturbing activities within 330 feet of riparian zones only when it can be shown that there are no practical alternatives, that long-term impacts are fully mitigated, or that the construction is an enhancement to the riparian area.

3. Keep construction of all new stream crossings to a minimum. Culverted stream crossings will be designed and constructed to allow fish passage. All stream crossings will be designed and constructed to keep impacts to riparian and aquatic habitat to a minimum.

4. Manage vegetation (in the Pariette Wetlands ACEC) to attain the ecological state that would most benefit riparian and watershed values, and manage vegetation in the remaining areas in a way which results in the highest vegetation species diversity to meet the special status plant species, wildlife, and recreation values.

5. Roads, except County and State ROWs, may be permanently or seasonally closed where human/wildlife conflicts exist or are expected, or when roads are no longer necessary.

6. Construct or modify all power lines to prevent electrocution of raptors.

7. Authorize no action in suitable habitat for threatened and endangered species if it would jeopardize the continued existence of the species or result in severe modification of the habitat. However, it may be possible to permit activities within the mapped area if a site-specific inventory shows that suitable habitat for threatened and endangered species would not be adversely affected.

3.2.1.6 Determination

Effect on Critical Habitat. No effect. No critical habitat has been identified in the Project Area.

Effect on the Species. The BLM has determined that the Agency-preferred Alternative may affect, but is not likely to adversely affect, the bald eagle. This determination is based on applicant-committed protection measures that have been developed for roosting bald eagles that could occur within 0.5 mile of the project area. This determination also is based on applicant-committed protection measures that have been developed to prevent collision and electrocution of bald eagles that could occur within the project area. Although the project would result in the incremental long-term loss of potentially suitable upland foraging habitat for bald eagles, the Agency-preferred Alternative is not likely to adversely affect foraging bald eagles, based on the amount of existing upland habitat within the project region. This alternative would not affect nesting bald eagles, based on the lack of historic or current bald eagle nest sites in the project region. Potential affects from the release of hazardous materials (e.g., crude oil and condensate) would be extremely low and is not likely to adversely affect foraging bald eagles.

3.2.1.7 Literature Cited

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3.2.2 Uinta Basin Hookless Cactus

3.2.2.1 Natural History and Habitat Association

The Uinta Basin hookless cactus (*Sclerocactus glaucus*) is a relatively small, solitary, ovoid cactus with spine clusters borne on short protuberances along the ribs. The central spines number one to four and are approximately 1 to 1.5 inches long. Blooming generally occurs in May and June. Flowers are pink to lavender, and approximately 1 to 2 inches in diameter as well as length (Utah Threatened, Endangered, and Sensitive Plant Field Guide 1991). This cactus can exhibit a wide range of physical characteristics, including significant variability in spine length, which has led to considerable discussion on the taxonomic integrity of this species.

The Uinta Basin hookless cactus generally occurs on cobbley, gravelly, or rocky surfaces on river terrace deposits above floodplains between 4,500 and 5,900 feet elevation. The plant usually is associated with gravelly soils, but it also grows in sandstone, shale, and clay soils (CNPS 1989). In an effort to better correlate soil associations with cactus populations, known cactus locations in the project area were overlain with regional soils information using GIS. Based upon this evaluation, it was determined that the Unita Basin hookless cactus is generally found on three soils associations in the Castle Peak and Eightmile Flat Oil and Gas Expansion Project area. These associations include: Badland-Rock Outcrop Complex; Motto-Rock Outcrop Complex, 2 to

25 percent slopes; and Muff Gravelly Sandy Loam, 2 to 8 percent slopes (see **Figure 3-1**, Potential Uinta Basin Hookless Cactus Habitat). The Motto-Rock Outcrop Complex had the largest number of occurrences (48 percent), followed by the Muff Gravelly Sandy Loam Complex (44 percent) (ENSR 2005).

GIS evaluation of slope and aspect for the known populations did not establish specific trends; cactus populations were found on a variety of exposures but may be more abundant on south facing exposures and on slopes up to about 30 percent grade (USFWS 1990; Spackman et al. 1997). Associated vegetative communities include desert scrub dominated by shadscale (*Atriplex* sp.), snakeweed (*Gutierrezia* sp.), Mormon tea (*Ephedra* sp.), milkvetch (*Astragalus* sp.), galleta grass (*Hilaria jamesii*), black sage (*Artemisia nova*) and Indian ricegrass (*Achnatherum hymenoides*).

Observations by BLM biologists in the Pariette Wash area indicate that populations and suitable habitat are scattered in naturally occurring mosaics. Population density and the frequency of occurrence are highly variable. Some populations have comparatively dense population cores; however, the cactus is not abundant enough to be considered a dominant in the vegetative landscape. Gaps of many acres may occur between existing sub-populations.

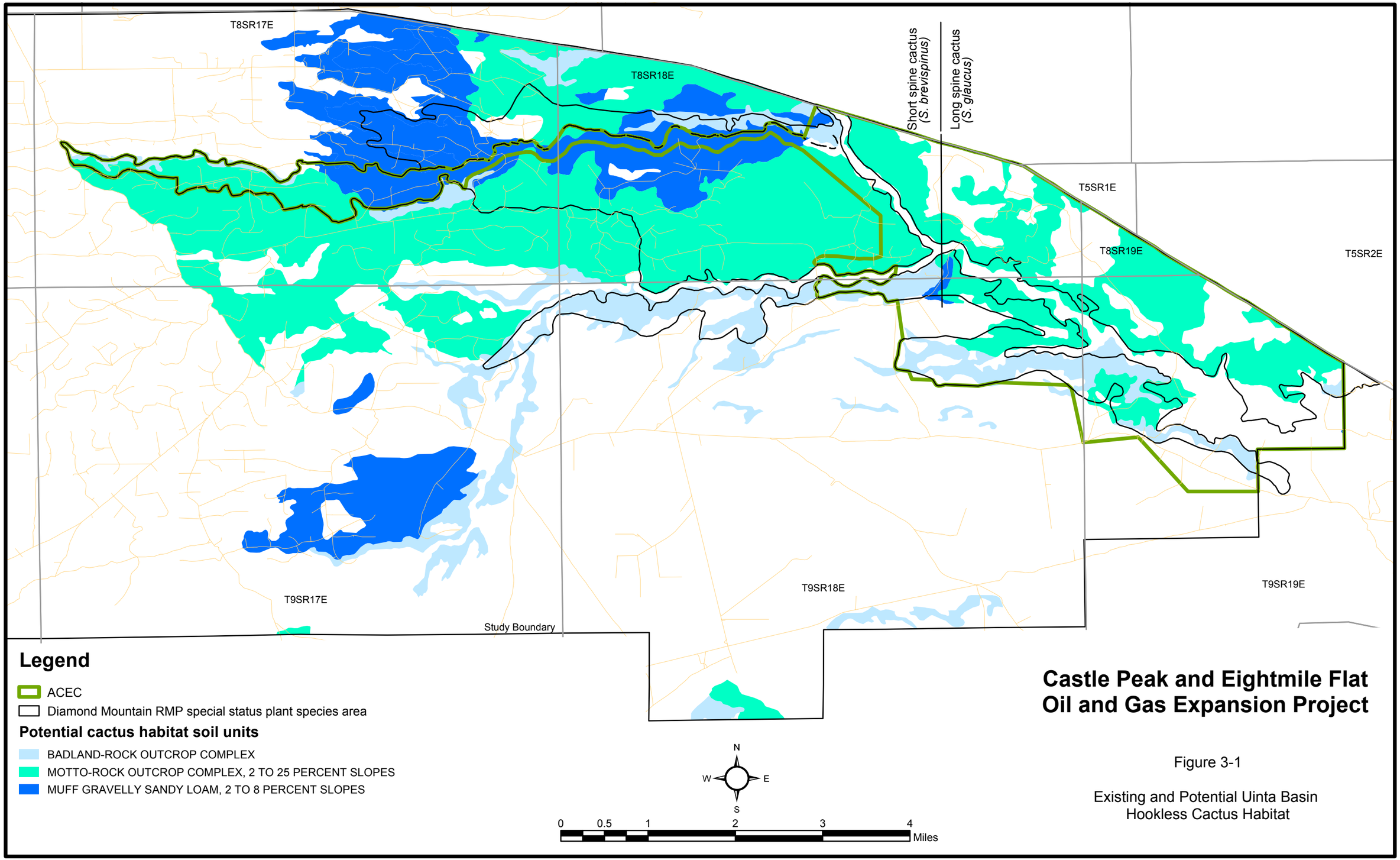
The pollination biology of the Uinta Basin hookless cactus has been studied by Tepidino at the APHIS Bee Lab in Logan, Utah (Heil and Porter 1994). Known pollinators of this species in western Colorado include several species of ground dwelling semi-social bees in the genera *Agapostemon*, *Lasioglossum*, *Ashmeadiella*, and *Exomalopsis* (Rechel 2003). Roads and well pads do not represent a physical barrier for these wide-ranging bees. These pollinators visit multiple flowers while gathering pollen, which increases the likelihood of cross fertilization among plants across the flowering population.

The primary seed dispersal agent for the cactus appears to be ants, likely harvester ants (Rechel 2003). Ants can disperse seeds up to 20 feet, or to the ant nest. Small mammals and birds may harvest fruits and disperse seeds for longer distances.

Juvenile plants often are seen downslope of mature larger plants, indicating passive dispersal in overland flow.

3.2.2.2 Species Taxonomy

As mentioned previously, the Uinta Basin hookless cactus is a highly variable species with an involved taxonomic history evidenced by its many synonyms. *S. glaucus* was originally described as *Echinocactus glaucus* in 1898. Rydberg re-named it *E. subglaucus* in 1917. In 1925, Purpus



Castle Peak and Eightmile Flat Oil and Gas Expansion Project

Figure 3-1

Existing and Potential Uinta Basin Hookless Cactus Habitat

03/16/05

assigned it to *S. whipplei* var. *glaucus*. In 1939, Evan's described *S. franklinii*, which is now considered a synonym. Benson (1966) assigned it back to *S. glaucus*, although Arp reassigned it to *Pediocactus glaucus* in 1972. Benson's concept was resurrected in 1981 and the USFWS adopted his classification scheme when the species was listed in 1979 and carried its use into the 1990 Recovery Plan for the Uinta Basin Hookless Cactus (USFWS 1990).

Hochstatter (1993) recognized *S. wetlandicus* var. *ilsea* as a short-spined subspecies of *S. glaucus* that occurs in the Uinta Basin of northern Utah. In 1994, the genus *Sclerocactus* was again revised by Heil and Porter (1994), who renamed *S. wetlandicus* var. *ilseae* as *Sclerocactus brevispinus*. Heil and Porter described the short-spined hookless cactus or Pariette cactus (*Sclerocactus brevispinus*) as a narrow endemic occurring in a series of small populations limited to badlands associated with the Pariette Wash drainage area south of Myton, Utah. It grows at the base of clay hills in the Duchesne Formation between 5,000 and 6,000 feet above sea level. They reported that *S. brevispinus* is the most morphologically distinct of all species in the *S. glaucus* complex and is one of the most restricted members of the genus (Heil and Porter 1994). The USFWS believes that Heil and Porter (1994) and Hochstatter (1993) have demonstrated that the populations of short-spined hookless cactus endemic to clay badlands of the Duchesne River Formation south of Myton are a distinct species (Harris 1999) (see Appendix C, November 17, 1999, Biological Opinion).

3.2.2.3 Legal Status

In 1979, *S. glaucus* was listed as threatened under the Endangered Species Act. Some of the above-described changes in the species taxonomy and nomenclature have occurred since then. The listed entity is *S. glaucus* as it occurs in Utah and Colorado. Within the species concept used at the time of listing, a new, short-spined and more narrowly ranging species (*S. wetlandicus* var. *ilsea* or *S. brevispinus*) has emerged in the literature and has been described from the Uinta Basin area. The USFWS determined that *S. brevispinus* has legal protection as a threatened species under the 1979 listing of *S. glaucus* in the Federal Register Vol. 62, No. 182 Notice of Review. Since 1997 the BLM has treated both species as threatened under *S. glaucus* (England 2002; USFWS 1997). The USFWS expects to separately list *S. brevispinus* and possibly de-list *S. glaucus* at a future time (USFWS 1997).

3.2.2.4 Potential Presence in the Project Area

Both *S. glaucus* and the Pariette cactus or short-spined hookless cactus (*S. brevispinus*), as well as potential hydrids with intermediate spines, are known to occur in the project area in the vicinity of Pariette Wash (BLM 1999). Populations of the hookless cactus can be found in three major habitat types in the region: 1) alluvial river terraces located near the confluence of the Green,

White, and Duchesne Rivers to Pariette Wash; 2) along the base of the Badland Cliffs in extreme southeastern Duchesne County; and 3) in clay badlands in the Pariette Wash drainage south of Myton, Utah (USFWS 1990).

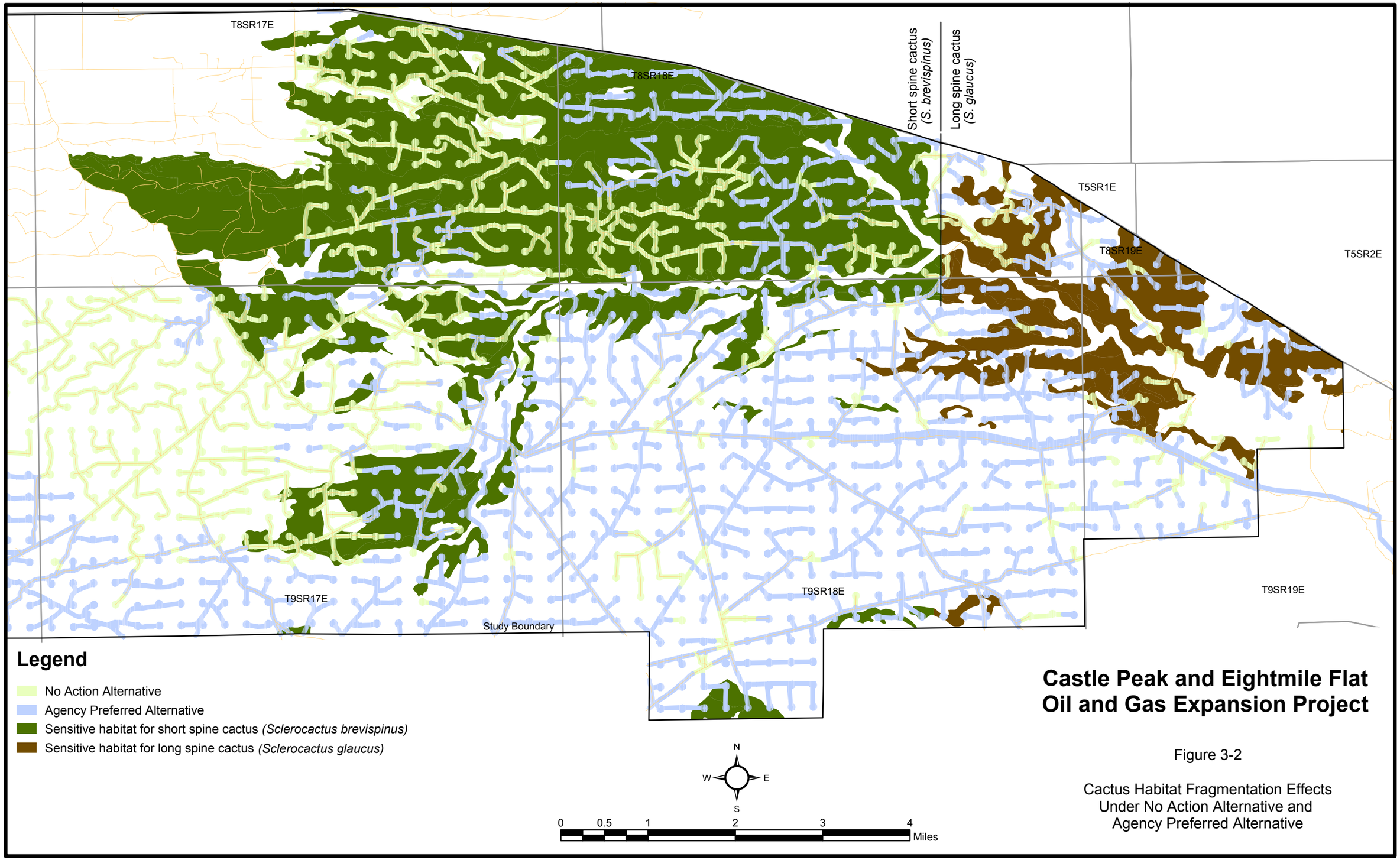
Over 250 populations of *S. glaucus* and *S. brevispinus* have been identified during previous surveys in the project area (Newfield 2005; Herring 1999; Benson 1993; Faircloth 1998). Using GIS evaluation methodology, it was established that over 90 percent of these populations occurred on 3 soils associations (see **Figure 3-1**).

In 1985, the BLM inventoried potentially suitable cactus habitat in the Pariette Wash area (Nitschke-Sinclear 1985). This survey resulted in the creation of a "special status plant boundary" (see **Figure 3-1**) in the area. No other survey data, other than locations where cactus populations had been previously observed, was available to indicate where prior surveys for cactus had occurred in the project area. Assuming that all potential habitat in the project area has not been surveyed and that populations could occur throughout suitable soil types as described in Section 3.2.2.1, 19,962 acres of potential habitat for *S. glaucus* and *S. brevispinus* could occur within the proposed project area (**Figure 3-1** and **3-2**). Based upon prior surveys in the Pariette Wash area, it appears that *S. glaucus* generally occurs to the east of the intersection of Pariette Wash with Castle Peak Draw and *S. brevispinus* is found more frequently to the west of this intersection (see **Figure 3-1**).

According to Heil and Porter (1994), habitat for *S. brevispinus* could be present throughout much of the project area. The entire range for this variation as it is currently known may occur wholly within the Pariette Wash watershed (England 2002).

3.2.2.5 Impact Evaluation

Impacts to this federally threatened species as a result of the agency preferred project alternative could include the direct removal of individual plants and the disturbance of occupied and potentially suitable habitat. Under the agency preferred action, approximately 377 acres of disturbance would occur within potential habitat in the Pariette Wash special status plant species habitat area. This includes 239 acres in potential *S. brevispinus* habitat and 138 acres in potential *S. glaucus* habitat. Approximately 331 acres of disturbance would occur within potentially suitable habitat located outside of the special status plant habitat boundary within the project area (see **Figure 3-2**). This includes approximately 16 acres in potential *S. glaucus* habitat and 314 acres in potential *S. brevispinus* habitat. The total direct disturbance acreage estimated for the agency preferred project alternative within cactus habitat would be 708 acres, or approximately 4 percent of the total estimated acreage of suitable habitat (19,962 acres). Approximately 898 acres, or 4.5 percent of potential cactus habitat have been previously disturbed as a result of historic activities in the project area (ENSR 2005).



Castle Peak and Eightmile Flat Oil and Gas Expansion Project

Figure 3-2

Cactus Habitat Fragmentation Effects
Under No Action Alternative and
Agency Preferred Alternative

It currently is unknown where Uinta Basin hookless cactus or the Pariette cactus (the short-spined form of this species) occur in relation to proposed disturbance areas; however, if they were to occur in the proposed disturbance area, project development would result in the direct removal of individual cacti. To minimize impacts to individual cacti, Inland has committed to restricting new construction or surface-disturbing activities in areas previously identified by BLM as containing potential habitat for this species until notice and approval by BLM's AO. Site-specific surveys within potential cactus habitat would be conducted by a biologist approved by the BLM prior to new construction or surface-disturbing activities to avoid impacts to high quality habitat and individual plants. Surveyors would conduct their work on foot.

Indirect effects would be expected to occur as a result of effects such as soil compaction that may reduce seed germination potential, and erosion and sedimentation from roads or well pads. Other indirect effects would be expected to occur as a result of increased general access to the area. *S. glaucus* is prized by cactophiles and would have increased vulnerability to illegal collecting. If *S. glaucus* is de-listed in the future, collectors may no longer hold the same regard for *S. glaucus*; however, *S. brevispinus* would be expected to gain in popularity. Collection has already been documented in the species range (USFWS 1990).

Increased access to the area also would be expected to increase recreational use of the area, including off-road vehicle use. This activity could result in both direct and indirect impacts to cactus through crushing, and by increased erosion, compaction, and sedimentation.

Indirect effects also would be expected to occur as a result of increased ground disturbance and the associated potential to introduce and/or proliferate noxious weeds. Noxious weeds have the potential to negatively change the ecological characteristics of the hookless cactus habitat. At present, cheatgrass and halogeton are known to occur in portions of cactus habitat in the project area. Russian knapweed and other noxious weeds have the potential to be brought in to cactus habitat by construction equipment.

Indirect effects also could occur if there is increased grazing pressure from sheep and/or cattle due to forage losses in their allotments. Grasses and shrubs that provide "nurse" plants for immature cacti may be more heavily grazed and increased presence of stock could result in direct effects to cacti due to crushing.

Although cactus populations are naturally scattered in mosaics in the project area, fragmentation effects would incrementally increase as a result of long-term surface disturbance from the project of approximately 708 acres within potential cactus habitat. Indirect effects from increased human presence (e.g., collection and ATV use), dispersal of noxious and invasive weeds, dust from

unpaved roads, erosion, and effects to seed dispersal agents (ants) could further reduce habitat quality and utilization for approximately 3,192 additional acres adjacent to direct disturbance areas (see **Figure 3-2**). As well field road density increases within cactus habitat areas, some individual populations would become more physically isolated from each other.

Field observations indicate that seeds that disperse in overland flow downslope into borrow ditches are buried and lost. It also has been found that mature plants covered by sediment discharged from road turnouts do not survive. Consequently, roads can cause cactus mortality in local areas of high sediment movement and deposition.

3.2.2.6 Cumulative Effects

The cumulative study area for this project is the Pariette Wash watershed. The estimated potential habitat for *S. glaucus* and *S. brevispinus* in this watershed is about 19,962 acres. The area of known occupied habitat is expected to increase as future well pad and access road preconstruction clearance surveys are completed. The study area encompasses the entire known population of the *S. brevispinus*.

Past construction of BLM-approved well field facilities has resulted in the long-term surface disturbance of 898 acres within known occupied cactus habitat. Since 1995, proposed surface-disturbing activities within known and potential habitat have been subject to protection measures included in Biological Opinions (USFWS 1995, 1996, 1999). These measures are described in greater detail under Section 3.2.2.7, Mitigation Measures, below.

Proposed construction of well field facilities within known occupied cactus habitat under the Agency-preferred Alternative (Alternative A) included in the Castle Peak and Eight Mile Flat Oil and Gas Expansion Draft EIS (BLM 2004) would result in new surface disturbance of 708 acres within suitable cactus habitat. Inland would conduct pre-construction surveys that would identify cactus individuals. These individuals and associated high quality habitat would be avoided.

No future non-federal actions (state, Tribal, local, or private and other entities) that are reasonably certain to occur in the Monument Butte-Red Wash Development have been identified as cumulative projects. The Petroglyph Antelope Creek wellfield expansions on tribal land (BIA 2002, 2003) located adjacent to the Inland Monument Butte/Myton Bench field to the west are located outside suitable *S. glaucus* habitat.

3.2.2.7 Mitigation Measures

The BLM is currently responsible for protecting the Uinta Basin hookless cactus populations and habitat within the Pariette Wash drainage in accordance with the following stipulations contained in the Diamond Mountain Resource Management Plan (BLM 1993).

VE10. Do not allow surface-disturbing activities on 48,000 acres of special status plant habitat. A site-specific analysis will be completed to determine if site characteristics exclude potential habitat from a proposed surface-disturbing activity. (The 48,000-acre special status plant habitat occupies portions of Pariette Wash drainage within the project study area – see **Figure 3-1**.)

PW35. Do not allow surface-disturbing activities on special status plant species habitat within the ACEC. A site-specific analysis will be completed to determine if site characteristics exclude potential habitat from a proposed surface-disturbing activity. (The areas of special status plant species habitat within the Pariette Wetlands ACEC boundary are illustrated on **Figure 3-1**.)

The BLM has complied with these stipulations by requiring site-specific clearance surveys within suitable Uinta Basin hookless cactus habitat for any proposed development activities, followed by avoidance of occupied and potential cactus habitat. This management direction is consistent with the conservation measures included in Biological Opinions that have been issued for prior projects (USFWS 1995, 1996, 1997) located within the BLM areas specifically designated for protection (see **Figure 3-3**). **Figure 3-3** illustrates the area that would require site-specific cactus surveys based on the DMRMP stipulations, as well as potential cactus habitat that lies outside these specific areas that are recommended for survey based on known cactus occurrence, and soil characteristics.

The BLM commits that it will avoid the loss of Uinta Basin hookless cactus and populations and habitat by continued compliance with these DMRMP stipulations, if the agency-preferred alternative (Alternative A) is approved in the Record of Decision.

Based on the prior consultations with the USFWS, the BLM also will implement cactus protection measures that have been included in prior Biological Opinions. The relevant Opinions, and associated measures are listed below.

In the Equitable (Balcron/DALEN) Oil and Gas Development BO, the USFWS (1995) included the following measures:

1. Instruct all vehicle users associated with the oil field to remain on existing roads and well pads at all times;

2. Sign all appropriate roads to advise motorists to remain on existing roads;

3. Advise other permitted users of the area to remain on existing roads; and

4. Restrict surface disturbance within Pariette Bench hookless cactus (*Sclerocactus brevispinus*) habitat to areas that on-the-ground surveys have determined to not contain occupied or potential habitat for this species.

In the Monument Butte Field Oil Well #42-25 Development BO, the USFWS (1996) indicated that the Pariette Bench hookless cactus (*S. brevispinus*) population should be considered a portion of the species Uinta Basin hookless cactus (*S. glaucus*) (listed as threatened), and that additional conservation measures should be adopted to maintain the population viability of the short-spined phase of Uinta Basin hookless cactus (*S. glaucus*). Conservation measures recommended in this BO incorporated recommendations from the 1995 Equitable/DALEN BO and added two additional measures:

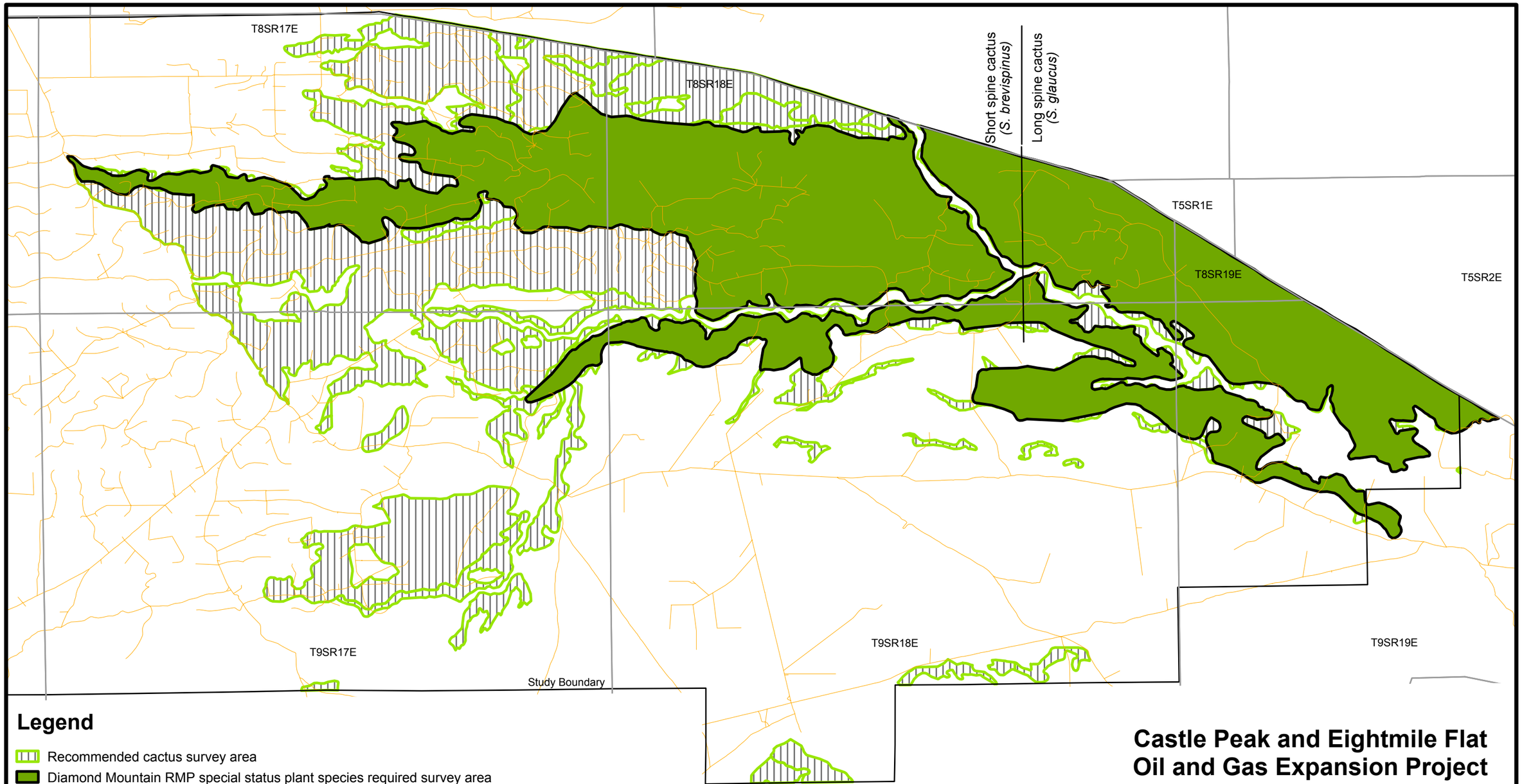
5. Remove cactus individuals that would be disturbed by development and transmit them to the USFWS's Utah Field Office for disposition in support of the species recovery program.

6. Remove soil surrounding the cactus to be disturbed to a radius of one meter and a depth of 5 centimeters centered on the plant. Secure the soil in a container at the site until the site is reclaimed after drilling. Soil with its presumed Uinta Basin hookless cactus (*S. glaucus*) seed bank will be used in the site's reclamation.

In the Inland Humpback and Greater Boundary Oil Field Units Development BO, the USFWS (1999) specified the same survey, avoidance, and mitigation measures identified for the 1996 Monument Butte Oil Well #42-25 Development, with the two following additions:

7. Survey all road and pipeline routes and oil and gas well locations using appropriate cactus survey techniques for the season of survey. Thirty-foot-wide survey transects through all suitable habitat will be required during the flowering period. Five-foot-wide transects will be required during non-flowering periods. Surveys cannot be completed during periods of snow cover.

8. Enforce off-road vehicle closures within the habitat of the Uinta Basin hookless cactus (*S. glaucus*).



Castle Peak and Eightmile Flat Oil and Gas Expansion Project

Figure 3-3

Required and Recommended Survey Areas for Uinta Basin Hookless Cactus

03/16/05

Based on recent field observations by the BLM, and informal consultation with the USFWS, the BLM intends to amend Measures 5, 6, and 7 as follows:

BLM would require cactus surveys on foot in disturbance areas located within the special status plant boundary and all other potentially suitable habitat. Five-foot-wide transects would be required through all suitable habitat during both the flowering and non-flowering periods. Surveyors would identify both individual cactus and suitable habitat. Upon completion of cactus surveys, the BLM will review the field results. For individual cactus located within 100 feet of proposed roads, the BLM will implement site-specific distance buffers from the proposed road to protect cactus individuals from sedimentation, weed invasion, and prevent loss of seeds carried downslope into drainage ditches. The road may require realignment to meet distance buffer requirements.

For suitable habitat, BLM also would require road and/or well relocation to avoid the habitat. If it is determined that a road or well pad cannot be realigned to avoid cactus populations or habitat within 100 feet of proposed disturbance boundaries, the BLM would reinitiate formal consultation with the USFWS. Construction in suitable habitat would not occur until further direction is received from the USFWS regarding additional cactus protection measures (e.g., fencing) or removal of cactus individuals.

Excavation of individual cactus to prevent loss would only occur after initiation of formal consultation with the USFWS and if agreed to by the USFWS in a biological opinion. Only a biologist approved by the BLM and the USFWS would undertake this action. Final deposition of the plant(s) and surrounding soil would be based on the biological opinion.

3.2.2.8 Determination

Effect on Critical Habitat. No critical habitat has been identified for this species.

Effect on the Species. The BLM has determined that the Agency-preferred Alternative may affect, and is likely to adversely effect, the Uinta Basin hookless cactus. This determination is based on the potential for incidental long-term loss of habitat from construction, habitat fragmentation due to surface disturbance from the project, and the potential accidental loss of individuals from increased access for illegal collectors.

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3.3 Federal Candidate Species

3.3.1 Yellow-billed Cuckoo

3.3.1.1 Natural History and Habitat Association

The yellow-billed cuckoo (*Coccyzus americanus*) is a federal candidate species that formally ranged throughout much of North America from southern Canada, south to northern Mexico (FR 66 38611). However, in recent years, the species' distribution in the west has declined precipitously throughout its range and the species is nearly extinct west of the Continental Divide, primarily due to habitat loss (BISON-M 2002).

Western yellow-billed cuckoos (west of the Continental Divide) typically breed in large blocks of riparian habitat that is characterized by an overstory of cottonwood trees and a dense sub-canopy

or shrub layer (regenerating canopy trees, willows, or other riparian shrubs) almost exclusively near water (FR 66 38611). Eastern yellow-billed cuckoos (east of the Continental Divide) breed in a much wider range of habitats including lowland deciduous woodlands, willow and alder thickets, mature riparian woodlands, deserted farmlands, and orchards (FR 66 38611; BISON-M 2002).

Yellow-billed cuckoos breed from March through August (BISON-M 2002). Cuckoos typically hide their nests 4 to 8 feet above the ground on horizontal limbs of deciduous trees or shrubs, but nests may range from 3 to 20 feet and higher. Nests consist of a loosely arranged platform of twigs lined with softer materials such as grass, rootlets, and dried leaves. The female lays 1 to 8 (usually 3) eggs over a period of several days; laying often begins before the nest is complete. Both males and females incubate eggs for a period of 9 to 11 days, beginning when the first egg is laid. Nestlings are altricial and hatch asynchronously over several days. Young are brooded by both adults for 7 to 8 days before leaving the nest, an unusually rapid development for a bird this size. Young climb on branches for about 2 weeks after leaving the nest until they are capable of flight at about 3 weeks of age. Both adults tend the fledglings, although in some cases males tend the early fledglings and females tend the older fledglings. Yellow-billed cuckoo nesting behavior may be closely tied to food abundance. In years of low food abundance, cuckoos may forego nesting; in years when the food supply is abundant, cuckoos may lay a large number of eggs and even parasitize the nests of other species (FR 66 38611; UDWR 1999).

Yellow-billed cuckoos feed almost entirely on large insects that they glean from tree and shrub foliage. They feed primarily on caterpillars, including tent caterpillars. They also feed frequently on grasshoppers, cicadas, beetles, and katydids, occasionally on lizards, frogs, and eggs of other birds, and rarely on berries and fruits (FR 66 38611; UDWR 1999).

3.3.1.2 Potential Presence in the Project Area

The yellow-billed cuckoo has been documented at the Ouray NWR located approximately 6 to 10 miles northeast of the project area and along the Green River, east of the project area. Potentially suitable habitat within the project area would be limited to patches of willow or tamarisk along Pariette Wash, particularly in the vicinity of the Pariette Ponds in the eastern portion of the project area and along the Green River corridor.

3.3.1.3 Impact Evaluation

As stated above, potentially suitable habitat for the yellow-billed cuckoo could occur within the Pariette Wash located in the eastern portion of the project area and the Green River corridor. Direct impacts to the yellow-billed cuckoo from development and production activities would include the incremental long-term disturbance of approximately 73 acres of potentially suitable

riparian/wetland habitat for breeding cuckoos within Pariette Draw. In addition, less than 5 acres of riparian habitat would be disturbed from the construction of 3 to 5 new water wells within the 100-year floodplain of the Green River. Indirect effects from human presence, dispersal of noxious and invasive weeds, and dust effects associated with unpaved road traffic would further reduce habitat quality within riparian habitats associated with Pariette Draw. In addition, since noise generated by pumpjacks would exceed 45 dBA, a general threshold for wildlife avoidance, noise related impacts could further reduce nesting and foraging activities within the development area, assuming that pumpjacks are not equipped with mufflers. Collectively, these effects would result in overall reductions in habitat quality for breeding cuckoos, until development activities are complete and native vegetation has become reestablished.

As discussed above, potentially suitable habitat for the yellow-billed cuckoo could occur along Pariette Wash and along the Green River. If development or production activities were to occur during the cuckoo's breeding season (March through July), direct impacts could result in loss of nests, eggs, or young, or the disruption of breeding activities for that season**. In order to minimize potential impacts to breeding yellow-billed cuckoo, Inland will contract a qualified biologist to conduct a breeding bird survey within 660 feet (200 meters) from proposed surface disturbance activities associated with wellfield development (e.g., well pads, roads, pipelines, power lines, and ancillary facilities) that would occur during the breeding season from April 1 through July 31. The biologist will provide documentation of active nests, bird species, and other evidence of nesting (e.g., mated pairs, territorial defense, birds carrying nesting material, transporting of food) to the BLM following each survey and prior to surface disturbance activities. If an active nest for Important Migratory Bird Species (USFWS Bird of Conservation Concern, Partners in Flight Priority Bird Species, Utah Sensitive Species) including the yellow-billed cuckoo is documented during the survey, Inland will coordinate with the BLM to determine if any additional protection measures will be required. If applicable, appropriate protection measures, including establishment of buffers areas and constraint periods, will be implemented on a case-by-case and species-specific basis. Alternatively, prior to surface disturbance activities within that year, Inland will clear vegetation within the year of surface disturbance activities outside of the breeding season (April 1 through July 31).**

3.3.1.4 Cumulative Impacts

Approximately 54 acres of riparian and wetland habitat has been previously cleared for well development within Pariette Draw. In addition, approximately 78 acres of riparian habitat would be disturbed under the Agency-preferred Alternative for a total proposed cumulative total disturbance of approximately 186 acres of riparian habitat.

No future non-federal actions (state, Tribal, local, or private and other entities) that are reasonably certain to occur in the Myton Bench project study area have been identified for the Inland Project (see Chapter 5.0, Cumulative Impacts, in the EIS).

3.3.1.5 Mitigation Measures

Diamond Mountain RMP stipulations that would be implemented to further minimize potential impacts to this species are presented below:

1. Avoid or mitigate the impact of surface-disturbing activities on riparian-wetland areas. Riparian habitat will be protected by limiting surface-disturbing activities to established ROW corridors and crossings and by restricting grazing.

2. Allow new surface-disturbing activities within 330 feet of riparian zones only when it can be shown that there are no practical alternatives, that long-term impacts are fully mitigated, or that the construction is an enhancement to the riparian area.

3. Keep construction of all new stream crossings to a minimum. Culverted stream crossings will be designed and constructed to allow fish passage. All stream crossings will be designed and constructed to keep impacts to riparian and aquatic habitat to a minimum.

4. Manage vegetation (in the Pariette Wetlands ACEC) to attain the ecological state that would most benefit riparian and watershed values, and manage vegetation in the remaining areas in a way which results in the highest vegetation species diversity to meet the special status plant species, wildlife, and recreation values.

5. Roads, except county and state ROWs, may be permanently or seasonally closed where human/wildlife conflicts exist or are expected, or when roads are no longer necessary.

6. Authorize no action is suitable habitat for threatened and endangered species if it would jeopardize the continued existence of the species or result in severe modification of the habitat. However, it may be possible to permit activities within the mapped area if a site-specific inventory shows that suitable habitat for threatened and endangered species would not be adversely affected.

3.3.1.6 Determination

Impact Summary. The BLM has determined that the Agency-preferred Alternative may impact the yellow-billed cuckoo, but it is not expected that project activities would result in population

level declines or lead to federal listing. This determination is based on the lack of known breeding occurrence by this subspecies within or the project area, and applicable protection measures that have been developed for this species and its habitat.

3.3.1.7 Literature Cited

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APPENDIX A
AGENCY CORRESPONDENCE

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FAX (970) 493-0213
www.ensr.com

April 3, 2002

Mr. Reed Harris
Field Supervisor
U.S. Fish and Wildlife Service
145 East 1300 South
Lincoln Plaza, Suite 404
Salt Lake City, Utah 84115

RE: Request for USFWS Species List for the Inland Oil Field Expansion Project, Duchesne and Uintah Counties, Utah

Dear Mr. Harris:

On behalf of the Bureau of Land Management (BLM), Vernal Field Office, ENSR is preparing an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) for Inland Resources' (Inland) proposed Oil Field Expansion in the Castle Peak and Eightmile Flat Areas. Inland proposes to expand its existing waterflood oil recovery operations in the Castle Peak and Eightmile Flat Areas by drilling 600 to 900 additional wells between 2002 and 2015. The project area would include about 110 sections (approximately 65,500 acres) in T8S, R17E, R18E, R19E, and T9S, R16E, R17E, R18E, R19E, in Duchesne and Uintah Counties, Utah (Figure 1-1). The majority of the proposed project area would occur on BLM and state administered lands.

The proposed project area currently includes approximately 465 existing oil and water-injection wells. Inland proposes to drill an additional 70 to 130 wells per year (5 to 11 wells per month) until the resource base is fully developed. The wells would be drilled on a 40-acre spacing pattern to recover oil and gas reserves from the Green River Formation at depths of 4,500 to 6,500 feet (Figure 2). Inland would drill approximately 50 percent of the wells as producing wells and 50 percent as water injection wells. Water for the project would be supplied from existing Water District contracts and from various oil and water bearing reservoirs within the Green River Formation underlying the oil field. At its peak water usage, the project would require about 1,400 acre-feet per year.

Other project-related activities would include the construction and operation of roads, gas pipelines, well pads (with pumping units and oil storage tanks), and water pipelines. Oil produced from new wells would be transferred from 400-barrel well site storage tanks to tanker trucks for transport to refineries near Salt Lake City, Utah. Gas would be transported via pipeline to one of Inland's existing compression facilities. Produced water would be trucked to one of several existing Inland water injection plants where it would be filtered and mixed with culinary fresh water before being re-injected into the oil reservoir via a water-pipeline and well injection system.

On behalf of the BLM, ENSR would like to request a list of federally listed, federally proposed, and federal candidate species potentially associated with the proposed oil field expansion project (see Figure 1). On behalf of the BLM, ENSR also is contacting the Utah Division of

Wildlife Resources and the Utah Natural Heritage Program regarding sensitive species issues and other agency concerns potentially associated with the proposed project.

If you have any questions or comments on this request, please call me at the number above.

Sincerely,

Charles Johnson
Wildlife Biologist

CJ/bb

Ref. 03719-007

Enc. Figure 1-1
Figure 2

cc: Mr. Duane DePaepe (BLM)
Mr. John Holst (Inland)
Ms. Karen Caddis-Burrell (ENSR)

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April 3, 2002

Ms. Anne Axel
Information Manager
Utah Division of Wildlife Resources
1594 West North Temple, Suite 2110
P.O. Box 146301
Salt Lake City, Utah 84114-6301

RE: Inland Oil Field Expansion Project, Duchesne and Uintah Counties, Utah

Dear Ms. Axel:

On behalf of the Bureau of Land Management (BLM), Vernal Field Office, ENSR is preparing an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) for Inland Resources' (Inland) proposed Oil Field Expansion in the Castle Peak and Eightmile Flat Areas. Inland proposes to expand its existing waterflood oil recovery operations in the Castle Peak and Eightmile Flat Areas by drilling 600 to 900 additional wells between 2002 and 2015. The project area would include about 110 sections (approximately 65,500 acres) in T8S, R17E, R18E, R19E, and T9S, R16E, R17E, R18E, R19E, in Duchesne and Uintah Counties, Utah (Figure 1-1). The majority of the proposed project area would occur on BLM and state administered lands.

The proposed project area currently includes approximately 465 existing oil and water-injection wells. Inland proposes to drill an additional 70 to 130 wells per year (5 to 11 wells per month) until the resource base is fully developed. The wells would be drilled on a 40-acre spacing pattern to recover oil and gas reserves from the Green River Formation at depths of 4,500 to 6,500 feet (Figure 2). Inland would drill approximately 50 percent of the wells as producing wells and 50 percent as water injection wells. Water for the project would be supplied from existing Water District contracts and from various oil and water bearing reservoirs within the Green River Formation underlying the oil field. At its peak water usage, the project would require about 1,400 acre-feet per year.

Other project-related activities would include the construction and operation of roads, gas pipelines, well pads (with pumping units and oil storage tanks), and water pipelines. Oil produced from new wells would be transferred from 400-barrel well site storage tanks to tanker trucks for transport to refineries near Salt Lake City, Utah. Gas would be transported via pipeline to one of Inland's existing compression facilities. Produced water would be trucked to one of several existing Inland water injection plants where it would be filtered and mixed with culinary fresh water before being re-injected into the oil reservoir via a water-pipeline and well injection system.

On behalf of the BLM, ENSR is requesting aquatic and terrestrial plant and animal species occurrence data for:

Federally listed, proposed, and candidate species;

Designated critical habitat of federally-listed species;
State-listed or state-sensitive species; and
Unique ecosystems or sensitive communities.

Because of the mobility of wildlife species, we would like to request wildlife information up to 5 miles from the project area. For plant species, we would like to request data up to 3 mile from the project area.

On behalf of the BLM, ENSR also has requested data from the U.S. Fish and Wildlife Service and the Utah Division of Wildlife Resources. We would greatly appreciate your timely response and recommendations.

If you have any questions or comments on this request, please contact me at the number listed above. Thank you in advance for your prompt response to this request.

Sincerely,

Charles Johnson
Wildlife Biologist

CJ/bb

Ref: 03719-007

Enc. Figure 1-1
Figure 2

cc: Mr. Duane DePaepe (BLM)
Mr. John Holst (Inland)
Ms. Karen Caddis-Burrell (ENSR)

ENSR International
1601 Prospect Parkway
Fort Collins, CO 80525-9769
(970) 493-8878
FAX (970) 493-0213
www.ensr.com

April 3, 2002

Mr. John Kimball
Director
Utah Division of Wildlife Resources
1594 West North Temple, Suite 2110
Salt Lake City, Utah 84114-6301

RE: Inland Oil Field Expansion Project, Duchesne and Uintah Counties, Utah

Dear Mr. Kimball:

On behalf of the Bureau of Land Management (BLM), Vernal Field Office, ENSR is preparing an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) for Inland Resources' (Inland) proposed Oil Field Expansion in the Castle Peak and Eightmile Flat Areas. Inland proposes to expand its existing waterflood oil recovery operations in the Castle Peak and Eightmile Flat Areas by drilling 600 to 900 additional wells between 2002 and 2015. The project area would include about 110 sections (approximately 65,500 acres) in T8S, R17E, R18E, R19E, and T9S, R16E, R17E, R18E, R19E, in Duchesne and Uintah Counties, Utah (Figure 1-1). The majority of the proposed project area would occur on BLM and state administered lands.

The proposed project area currently includes approximately 465 existing oil and water-injection wells. Inland proposes to drill an additional 70 to 130 wells per year (5 to 11 wells per month) until the resource base is fully developed. The wells would be drilled on a 40-acre spacing pattern to recover oil and gas reserves from the Green River Formation at depths of 4,500 to 6,500 feet (Figure 2). Inland would drill approximately 50 percent of the wells as producing wells and 50 percent as water injection wells. Water for the project would be supplied from existing Water District contracts and from various oil and water bearing reservoirs within the Green River Formation underlying the oil field. At its peak water usage, the project would require about 1,400 acre-feet per year.

Other project-related activities would include the construction and operation of roads, gas pipelines, well pads (with pumping units and oil storage tanks), and water pipelines. Oil produced from new wells would be transferred from 400-barrel well site storage tanks to tanker trucks for transport to refineries near Salt Lake City, Utah. Gas would be transported via pipeline to one of Inland's existing compression facilities. Produced water would be trucked to one of several existing Inland water injection plants where it would be filtered and mixed with culinary fresh water before being re-injected into the oil reservoir via a water-pipeline and well injection system.

The BLM will be evaluating project-related and cumulative effects to both aquatic and terrestrial resources. Because of the mobility of wildlife species, resource issues will be examined beyond the proposed project area. On behalf of the BLM, ENSR is requesting information on pertinent resource data from federal and state offices in order to address potential impacts to aquatic and terrestrial species. We would like to provide an opportunity for the UDWR biologists and

botanists to identify prominent terrestrial and aquatic resource issues or concerns that may occur in and adjacent to the proposed project area, focusing on species that are either sensitive (e.g., state-listed), have high economic value (e.g., big game, waterfowl), or are considered important by the state (e.g., raptors, bats). Please forward this request to the applicable specialists (e.g., fisheries and/or wildlife biologists, habitat biologists, botanists, etc.) in the appropriate Regional Offices so they may provide information and input. Resource information provided by the UDWR will be incorporated into the NEPA analysis for the proposed oil field expansion project.

On behalf of the BLM, ENSR also will be collecting resource information from the U.S. Fish and Wildlife Service and the Utah Natural Heritage Program for the proposed project. If you have any questions or comments on this request, you may contact me at the number listed above.

Sincerely,

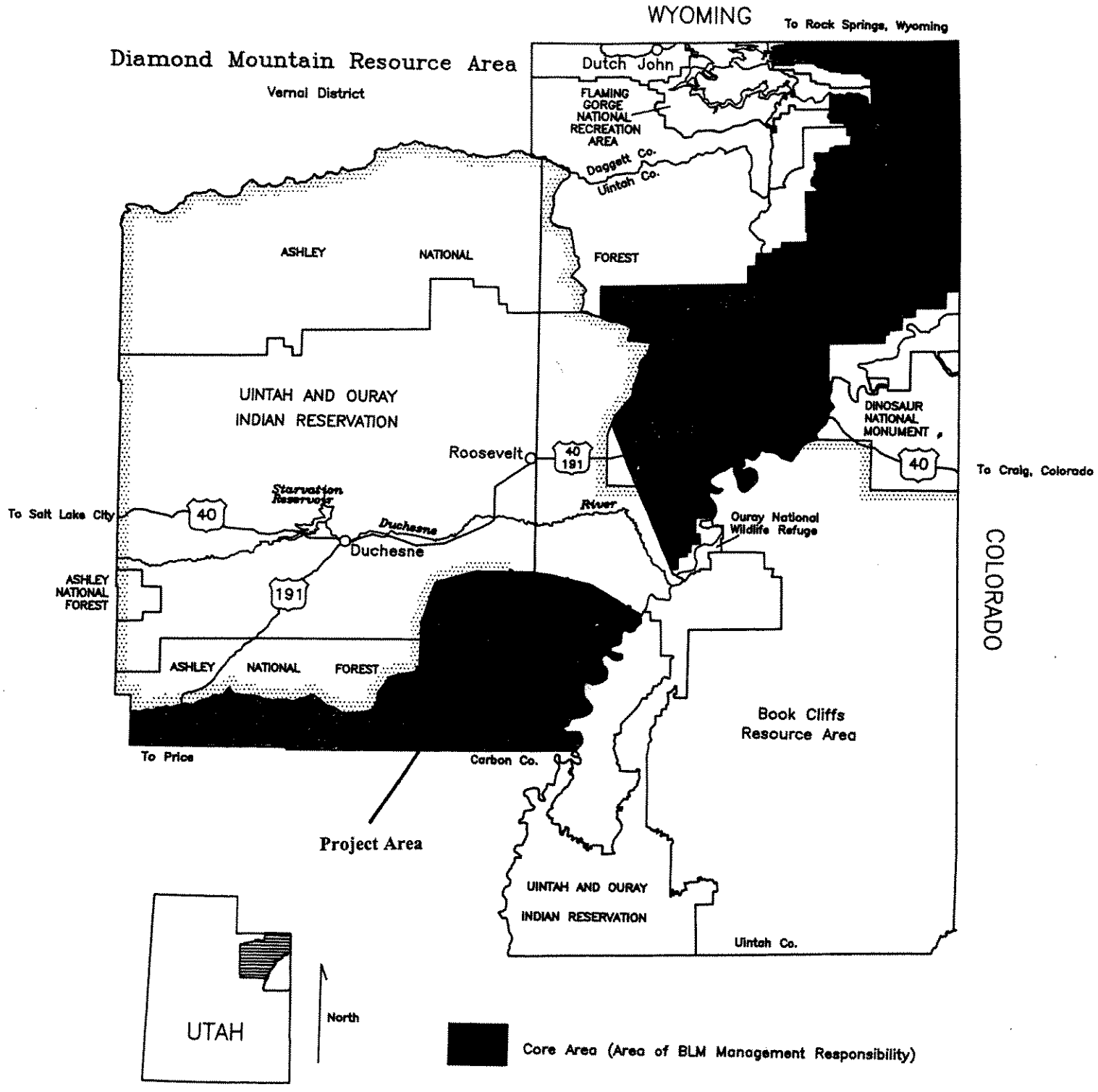
Charles Johnson
Wildlife Biologist

CJ/bb

Ref. 03719-007

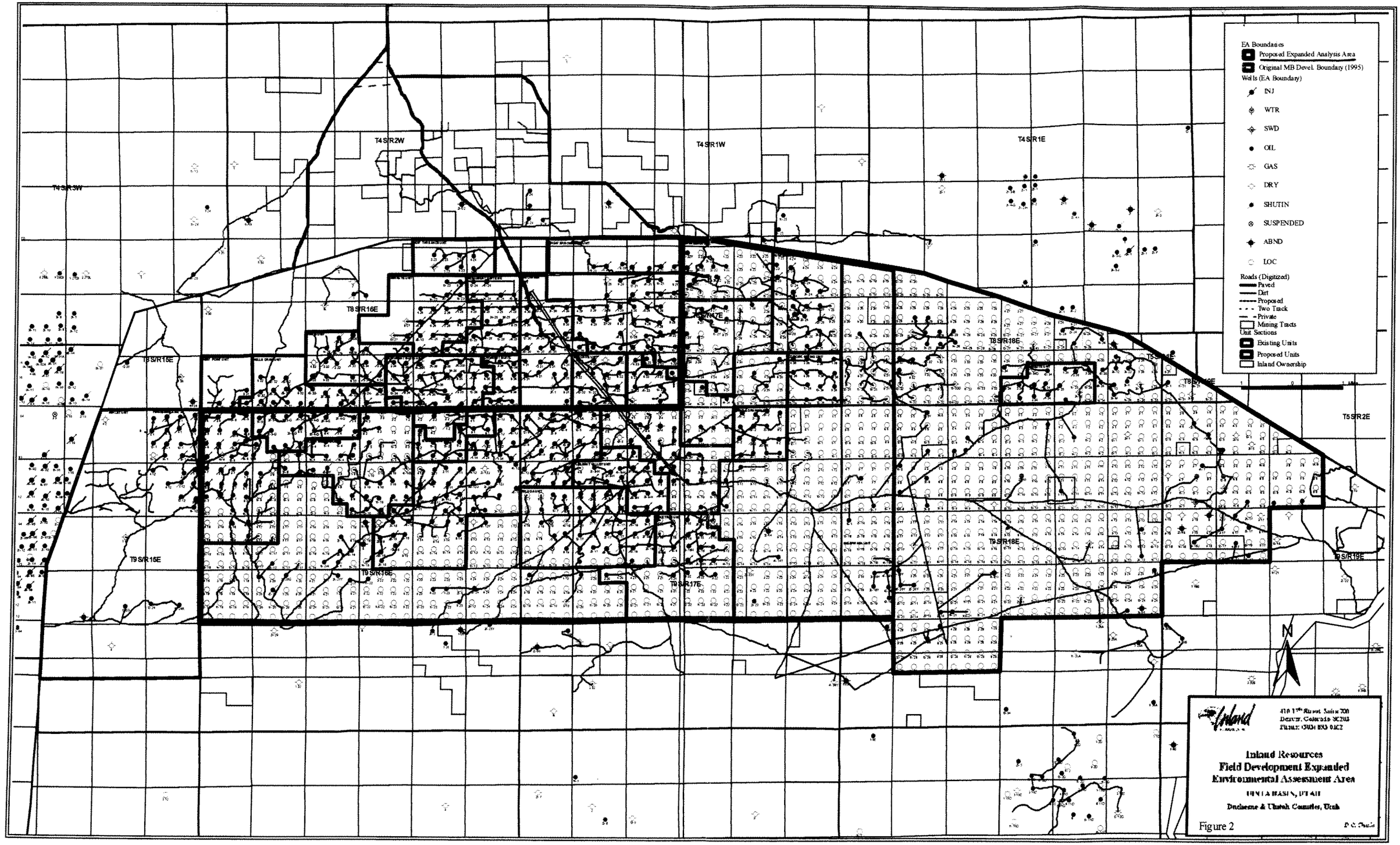
Enc. Figure 1-1
Figure 2

cc: Mr. Duane DePaepe (BLM)
Mr. John Holst (Inland)
Ms. Karen Caddis-Burrell (ENSR)



GENERAL LOCATION MAP

MAP 1–1


EA Boundaries
Proposed Expanded Analysis Area
Original MB Devel. Boundary (1995)
Wells (EA Boundary)
INJ
WTR
SWD
OIL
GAS
DRY
SHUTIN
SUSPENDED
ABND
LOC
Roads (Digitized)
Paved
Dirt
Proposed
Two Track
Private
Mining Tracts
Unit Sections
Existing Units
Proposed Units
Inland Ownership
T4S/R3W
T4S/R2W
T4S/R1W
T4S/R1E
T8S/R16E
T8S/R17E
T8S/R18E
T8S/R19E
T9S/R15E
T9S/R16E
T9S/R17E
T9S/R18E
T9S/R19E
T5S/R2E
N
Inland
410 17th Street, Suite 700
Denver, Colorado 80202
Phone: (303) 893-0102
Inland Resources
Field Development Expanded
Environmental Assessment Area
UINTA BASIN, UTAH
Duchesne & Uintah Counties, Utah
Figure 2
January 24, 2002

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

April 9, 2002

Charles Johnson
Wildlife Biologist
ENSR International
1601 Prospect Parkway
Fort Collins, CO 80525-9769

RE: Species List for the Inland Oil Field Expansion Project, Duchesne and Uintah Counties

Dear Mr. Johnson:

In response to your letter dated April 3, 2002, below is a list of endangered (E), threatened (T), and candidate (C) species that may occur in the area of influence of your proposed action.

Common Name	Scientific Name	Status
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
California Condor[7]	*Gymnogyps californianus*	E
Mexican Spotted Owl[1,4]	*Strix occidentalis lucida*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Utah Prairie Dog	*Cynomys parvidens*	T

[1] Nests in this county of Utah.
[3] Wintering populations (only four known nesting pairs in Utah).
[4] Critical habitat designated in this county.
[7] Experimental nonessential population.

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

Formal consultation (50 CFR 402.14) is required if the Federal agency determines that an action is "likely to adversely affect" a listed species or will result in jeopardy or adverse modification of critical habitat (50 CFR 402.02). Federal agencies should also confer with the Service on any action which is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat (50 CFR 402.10). A written

request for formal consultation or conference should be submitted to the Service with a completed biological assessment and any other relevant information (50 CFR 402.12).

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

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

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

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

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

The following is a list of species that may occur within the project area and are managed under Conservation Agreements/Strategies. Conservation Agreements are voluntary cooperative plans among resource agencies that identify threats to a species and implement conservation measures to proactively conserve and protect species in decline. Threats that warrant a species listing as a sensitive species by state and federal agencies and as threatened or endangered under the ESA

should be significantly reduced or eliminated through implementation of the Conservation Agreement. Project plans should be designed to meet the goals and objectives of these Conservation Agreements.

Common Name	Scientific Name
Arizona Willow	*Salix arizonica*
Bonneville Cutthroat Trout	*Oncorhynchus clarki utah*

If we can be of further assistance or if you have any questions, please feel free to contact Laura Romin of our office at (801)975-3330 extension 142.

Sincerely,

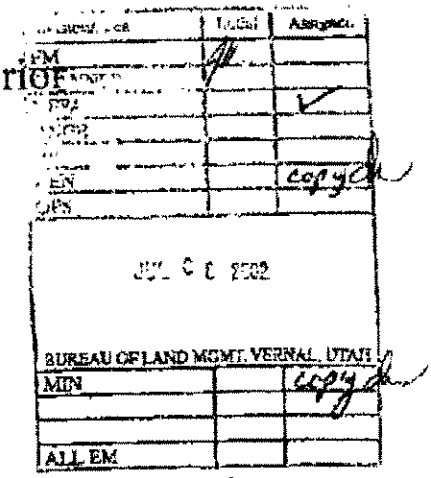
Henry R. Maddux
Utah Field Supervisor

cc: Ron Bolander, BLM, Utah State Office

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

July 5, 2002

Memorandum

To: Field Manager, (Attn: David E. Howell), Bureau of Land Management, Vernal Field Office, 170 South 500 East, Vernal, Utah 84078-2799

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

Subject: EIS for Inland Resources Field Expansion in Castle Peak and Eight Mile Flat Area of Duchesne and Uintah Counties

The U.S. Fish and Wildlife Service (Service) has reviewed your letter of May 31, 2002 announcing your intent to prepare an EIS on the Inland Resources Field Expansion project in the Castle Peak and Eight Mile Flat areas of Duchesne and Uintah Counties. The purpose of the project is to expand the existing waterflood oil recovery operation by drillin 600 to 900 additional wells between 2002 and 2015. There are currently 465 existing wells in the project area. Inland proposes to drill an additional 70 to 130 wells per year on a 40-acre spacing pattern. Water for the project would be from existing Water District contracts and from various oil and water bearing reservoirs within the Green River formation underlying the oil field. This project will also include the construction and operation of roads, gas pipelines, well pads (with pumping units and oil storage tanks), and water pipelines. Inland also proposes to construct a new water filtration/injection plant.

On May 23, 2002, Diana Whittington and Larry England from our office attended an Agency Stakeholder Meeting in Salt Lake City, where they were pleased to be able to present our concerns and recommendations to your staff and representatives of Inland Resources. On June 11, 2002, Diana Whittington participated in a day-long visit to the proposed area with staff from your office and a representative of Inland. As a result of that field trip, we are working with the BLM Statewide Hydrologist and the USGS to assist in developing a method to evaluate the potential for gas condensate to reach the Green River from dry washes during a catastrophic storm event. As part of our continuing dialogue, we are providing the following comments for your consideration in your EIS.

Section 1. We believe our communication on this project has been fruitful and constructive, and appreciate the opportunity to participate early in the process. Our chief concerns regarding this project are: cumulative impacts; habitat fragmentation from roads, wellpads, and infilling; new avenues for invasive species; impacts to Pariette Wetlands, especially if drilling is proposed in

the wetlands or associated uplands; impacts to ground-nesting migratory birds; and increased wildlife mortality from greater traffic. We anticipate that our continuing dialogue with your office and the contractor for Inland will lead to effective and efficient mitigation for impacts.

Section 2. Federal agencies have specific additional responsibilities under Section 7 of the ESA. To help you fulfill these responsibilities, we are providing an updated list of threatened (T) and endangered (E) species that may occur within the area of influence of your proposed action. At the May 23, 2002 meeting, we made specific reference to the Uinta Basin Hookless Cactus, mountain plover, Colorado pikeminnow, razorback sucker, and humpback chub. The following lists cover the full range of T&E species that may be present in Duchesne and Uintah Counties.

Common Name	Scientific Name	Status
DUCHESNE		
Barneby Ridge-cress	*Lepidium barnebyanum*	E
Graham Beardtongue	*Penstemon grahamii*	C
Shrubby Reed-mustard	*Schoenocrambe suffrutescens*	E
Uinta Basin Hookless Cactus	*Sclerocactus glaucus*	T
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
Bonytail[4,10]	*Gila elegans*	E
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Humpback Chub[4,10]	*Gila cypha*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Mountain Plover	*Charadrius montanus*	PT
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Black-footed Ferret[6]	*Mustela nigripes*	E
Canada Lynx	*Lynx canadensis*	T
UINTAH		
Clay Reed-mustard	*Schoenocrambe argillacea*	T
Graham Beardtongue	*Penstemon grahamii*	C
Horseshoe Milkvetch	*Astragalus equisolensis*	C
Shrubby Reed-mustard	*Schoenocrambe suffrutescens*	E
Uinta Basin Hookless Cactus	*Sclerocactus glaucus*	T
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
White River Beardtongue	*Penstemon scariosus* var. *albifluvis*	C
Bonytail[4,10]	*Gila elegans*	E
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Humpback Chub[4,10]	*Gila cypha*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Mexican Spotted Owl[9]	*Strix occidentalis lucida*	T
Mountain Plover	*Charadrius montanus*	PT
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E

Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Whooping Crane[2]	*Grus americanus*	E
Black-footed Ferret[6]	*Mustela nigripes*	E
Canada Lynx	*Lynx canadensis*	T

[2] Migrates through Utah, no resident populations.
[3] Wintering populations (only four known nesting pairs in Utah).
[4] Critical habitat designated in this county.
[5] Historical range.
[10] Water depletions from *any* portion of the occupied drainage basin are considered to adversely affect or adversely modify the critical habitat of the endangered fish species, and must be evaluated with regard to the criteria described in the pertinent fish recovery programs.

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

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

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

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

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

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

We recommend use of the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* (Romin and Muck, January 2002) which were developed in part to provide consistent application of raptor protection measures statewide and provide full compliance with environmental laws regarding raptor protection. Raptor surveys and mitigation measures are provided in the Raptor Guidelines as recommendations to ensure that proposed projects will avoid adverse impacts to raptors, including the peregrine falcon.

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

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

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

cc: UDWR - SLC

FEDERALLY LISTED AND PROPOSED (P) ENDANGERED (E), THREATENED (T) AND CANDIDATE[9] (C) SPECIES AND HABITAT IN UTAH BY COUNTY

As of July 2003

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

FEDERALLY LISTED AND PROPOSED (P) ENDANGERED (E), THREATENED (T) AND CANDIDATE[9] (C) SPECIES AND HABITAT IN UTAH BY COUNTY
As of July 2003

COUNTY

Species	Scientific Name	Status

[1] Nests in this county of Utah.

[2] Migrates through Utah, no resident populations.

[3] Wintering populations (only four known nesting pairs in Utah).

[4] Critical habitat designated in this county.

[5] Critical habitat proposed in this county.

[6] Historical range.

[7] Experimental nonessential population.

[8] Introduced, refugia population.

[9] Candidate species have no legal protection under the Endangered Species Act. However, these species are under active consideration by the Service for addition to the Federal List of Endangered and Threatened Species and may be proposed or listed during the development of the proposed project.

[10] Water depletions from *any* portion of the occupied drainage basin are considered to adversely affect or adversely modify the critical habitat of the endangered fish species, and must be evaluated with regard to the criteria described in the pertinent fish recovery programs.

For additional information contact: U.S. Fish and Wildlife Service, Utah Field Office, 2369 West Orton Cirlce, Suite 50, West Valley City, Utah 84119 Telephone: (801) 975-3330

Caddis-Burrell, Karen

From: Johnson, Charlie
Sent: Tuesday, May 21, 2002 10:39 AM
To: Caddis-Burrell, Karen; Daggett, Rollin; Ellis, Scott; Koontz, Dolora
Cc: 'Duane DePaepe'
Subject: FW: Inland species list

FYI

-----Original Message-----
From: Laura_Romin@fws.gov [mailto:Laura_Romin@fws.gov]
Sent: Tuesday, May 21, 2002 10:29 AM
To: Johnson, Charlie
Subject: Inland species list

Charles:

Thank you for calling to let us know that the April 9, 2002 species list sent to you was in error. I have noted that the list sent to you was for
the wrong county.

The following species may occur within your project area, in Uinta and Duchesne counties. Please note that these are county lists and your specific project area should be evaluated:

	DUCHESNE COUNTY		
	Barneby Ridge-cress	Lepidium barnebyanum	
E			
	Graham Beardtongue	Penstemon grahamii	
C			
	Shrubby Reed-mustard	Schoenocrambe suffrutescens	
E			
	Uinta Basin Hookless Cactus	Sclerocactus glaucus	
T			
	Ute Ladies'-tresses	Spiranthes diluvialis	
T			
	Bonytail4,10	Gila elegans	
E			
	Colorado Pikeminnow4,10	Ptychocheilus lucius	
E			
	Humpback Chub4,10	Gila cypha	
E			
	Razorback Sucker4,10	Xyrauchen texanus	
E			
	Bald Eagle3	Haliaeetus leucocephalus	
T			
	Mountain Plover	Charadrius montanus	PT
	Western Yellow-billed Cuckoo	Coccyzus americanus occidentalis	
C			
	Black-footed Ferret6	Mustela nigripes	
E			
	Canada Lynx	Lynx canadensis	
T			
	UINTA COUNTY		
	Clay Reed-mustard	Schoenocrambe argillacea	
T			

	Graham Beardtongue	Penstemon grahamii
C	Horseshoe Milkvetch	Astragalus equisolensis
C	Shrubby Reed-mustard	Schoenocrambe suffrutescens
E	Uinta Basin Hookless Cactus	Sclerocactus glaucus
T	Ute Ladies'-tresses	Spiranthes diluvialis
T	White River Beardtongue	Penstemon scariosus var. albifluvis
C	Bonytail4,10	Gila elegans
E	Colorado Pikeminnow4,10	Ptychocheilus lucius
E	Humpback Chub4,10	Gila cypha
E	Razorback Sucker4,10	Xyrauchen texanus
E	Bald Eagle3	Haliaeetus leucocephalus
T	Mexican Spotted Owl6	Strix occidentalis lucida
T	Mountain Plover	Charadrius montanus
PT	Southwestern Willow Flycatcher	Empidonax trailii extimus
E	Western Yellow-billed Cuckoo	Coccyzus americanus occidentalis
C	Whooping Crane2	Grus americanus
E	Black-footed Ferret6	Mustela nigripes
E	Canada Lynx	Lynx canadensis
T		

In addition, the Colorado River Cutthroat Trout (Oncorhynchus clarki pleuriticus)

is

a

Conservation

Agreement

Species that occurs in both counties. Please attach this email to the original

April

9

letter,

for

your

files.

Thanks.

Laura Romin, Wildlife Biologist
U.S. Fish and Wildlife Service
2369 West Orton Circle
Salt Lake City, UT 84119
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FEDERALLY LISTED AND PROPOSED (P) ENDANGERED (E),
THREATENED (T) AND CANDIDATE[9] (C) SPECIES
AND HABITAT IN UTAH BY COUNTY
As of May 2004

COUNTY Species	Scientific Name	Status
BEAVER		
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
California Condor[7]	*Gymnogyps californianus*	E
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Utah Prairie Dog	*Cynomys parvidens*	T
BOX ELDER		
Fat-whorled Pondsnail	*Stagnicola bonnevillensis*	C
June Sucker[8]	*Chasmistes liorus*	E
Lahontan Cutthroat Trout	*Oncorhynchus (=Salmo) clarki henshawi*	T
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
CACHE		
Maguire Primrose	*Primula maguirei*	T
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Canada Lynx	*Lynx canadensis*	T
CARBON		
Graham Beardtongue	*Penstemon grahamii*	C
Uinta Basin Hookless Cactus	*Sclerocactus glaucus*	T
Bonytail[4,10]	*Gila elegans*	E
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Humpback Chub[4,10]	*Gila cypha*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Mexican Spotted Owl[4]	*Strix occidentalis lucida*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Black-footed Ferret[6]	*Mustela nigripes*	E

FEDERALLY LISTED AND PROPOSED (P) ENDANGERED (E),
THREATENED (T) AND CANDIDATE[9] (C) SPECIES
AND HABITAT IN UTAH BY COUNTY
As of May 2004

COUNTY Species	Scientific Name	Status
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Black-footed Ferret[6]	*Mustela nigripes*	E
Canada Lynx	*Lynx canadensis*	T
DAVIS		
Bald Eagle[1,3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
DUCHESNE		
Barneby Ridge-cress	*Lepidium barnebyanum*	E
Graham Beardtongue	*Penstemon grahamii*	C
Shrubby Reed-mustard	*Schoenocrambe suffrutescens*	E
Uinta Basin Hookless Cactus	*Sclerocactus glaucus*	T
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
Bonytail[4,10]	*Gila elegans*	E
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Humpback Chub[4,10]	*Gila cypha*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Black-footed Ferret[6]	*Mustela nigripes*	E
Canada Lynx	*Lynx canadensis*	T
EMERY		
Barneby Reed-mustard	*Schoenocrambe barnebyi*	E
Jones Cycladenia	*Cycladenia humilis* var. *jonesii*	T
Last Chance Townsendia	*Townsendia aprica*	T
Maguire Daisy	*Erigeron maguirei*	T
San Rafael Cactus	*Pediocactus despainii*	E
Winkler Cactus	*Pediocactus winkleri*	T
Wright Fishhook Cactus	*Sclerocactus wrightiae*	E

FEDERALLY LISTED AND PROPOSED (P) ENDANGERED (E),
THREATENED (T) AND CANDIDATE[9] (C) SPECIES
AND HABITAT IN UTAH BY COUNTY
As of May 2004

COUNTY Species	Scientific Name	Status
Black-footed Ferret[6]	*Mustela nigripes*	E
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E
GARFIELD		
Aquarius Paintbrush	*Castilleja aquariensis*	C
Autumn Buttercup	*Ranunculus aestivalis*	E
Jones Cycladenia	*Cycladenia humilis* var. *jonesii*	T
Maguire Daisy	*Erigeron maguirei*	T
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
Bonytail[4,10]	*Gila elegans*	E
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Humpback Chub[4,10]	*Gila cypha*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
California Condor[7]	*Gymnogyps californianus*	E
Mexican Spotted Owl[1,4]	*Strix occidentalis lucida*	T
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Utah Prairie Dog	*Cynomys parvidens*	T
GRAND		
Jones Cycladenia	*Cycladenia humilis* var. *jonesii*	T
Bonytail[4,10]	*Gila elegans*	E
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Humpback Chub[4,10]	*Gila cypha*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[1]	*Haliaeetus leucocephalus*	T
California Condor[7]	*Gymnogyps californianus*	E
Gunnison Sage Grouse	*Centrocercus minimus*	C
Mexican Spotted Owl[1,4]	*Strix occidentalis lucida*	T
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E

FEDERALLY LISTED AND PROPOSED (P) ENDANGERED (E),
THREATENED (T) AND CANDIDATE[9] (C) SPECIES
AND HABITAT IN UTAH BY COUNTY
As of May 2004

COUNTY Species	Scientific Name	Status
IRON		
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
California Condor[7]	*Gymnogyps californianus*	E
Mexican Spotted Owl[1,4]	*Strix occidentalis lucida*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Utah Prairie Dog	*Cynomys parvidens*	T
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E
JUAB		
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
KANE		
Jones Cycladenia	*Cycladenia humilis* var. *jonesii*	T
Kodachrome Bladderpod	*Lesquerella tumulosa*	E
Navajo Sedge	*Carex specuicola*	T
Siler Pincushion Cactus	*Pediocactus sileri*	T
Welsh's Milkweed[4]	*Asclepias welshii*	T
Kanab Ambersnail[5]	*Oxyloma haydeni kanabensis*	E
Coral Pink Sand Dunes Tiger Beetle	*Cincindela limbata albissima*	C
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
California Condor[7]	*Gymnogyps californianus*	E
Mexican Spotted Owl[1,4]	*Strix occidentalis lucida*	T
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Utah Prairie Dog	*Cynomys parvidens*	T
MILLARD		
Bald Eagle[3]	*Haliaeetus leucocephalus*	T

FEDERALLY LISTED AND PROPOSED (P) ENDANGERED (E),
THREATENED (T) AND CANDIDATE[9] (C) SPECIES
AND HABITAT IN UTAH BY COUNTY
As of May 2004

COUNTY Species	Scientific Name	Status
PIUTE		
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Utah Prairie Dog	*Cynomys parvidens*	T
RICH		
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Black-footed Ferret[6]	*Mustela nigripes*	E
Canada Lynx	*Lynx canadensis*	T
SALT LAKE		
Slender Moonwort	*Botrychium lineare*	C
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
June Sucker[8]	*Chasmistes liorus*	E
Bald Eagle[1,3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Canada Lynx	*Lynx canadensis*	T
SAN JUAN		
Navajo Sedge	*Carex specuicola*	T
Bonytail[4,10]	*Gila elegans*	E
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Humpback Chub[4,10]	*Gila cypha*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
California Condor[7]	*Gymnogyps californianus*	E
Gunnison Sage Grouse	*Centrocercus minimus*	C
Mexican Spotted Owl[1,4]	*Strix occidentalis lucida*	T
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Black-footed Ferret[6]	*Mustela nigripes*	E

FEDERALLY LISTED AND PROPOSED (P) ENDANGERED (E), THREATENED (T) AND CANDIDATE[9] (C) SPECIES AND HABITAT IN UTAH BY COUNTY

As of May 2004

COUNTY Species	Scientific Name	Status
SANPETE		
Heliotrope Milkvetch[4]	*Astragalus montii*	T
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Canada Lynx[6]	*Lynx canadensis*	T
Utah Prairie Dog	*Cynomys parvidens*	T
SEVIER		
Heliotrope Milkvetch[4]	*Astragalus montii*	T
Last Chance Townsendia	*Townsendia aprica*	T
Wright Fishhook Cactus	*Sclerocactus wrightiae*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Utah Prairie Dog	*Cynomys parvidens*	T
SUMMIT		
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Black-footed Ferret[6]	*Mustela nigripes*	E
Canada Lynx	*Lynx canadensis*	T
TOOELE		
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
UINTAH		
Clay Reed-mustard	*Schoenocrambe argillacea*	T
Graham Beardtongue	*Penstemon grahamii*	C
Horseshoe Milkvetch	*Astragalus equisolensis*	C
Shrubby Reed-mustard	*Schoenocrambe suffrutescens*	E

FEDERALLY LISTED AND PROPOSED (P) ENDANGERED (E),
THREATENED (T) AND CANDIDATE[9] (C) SPECIES
AND HABITAT IN UTAH BY COUNTY
As of May 2004

COUNTY Species	Scientific Name	Status
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Mexican Spotted Owl	*Strix occidentalis lucida*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Black-footed Ferret[6]	*Mustela nigripes*	E
Canada Lynx	*Lynx canadensis*	T
UTAH		
Clay Phacelia	*Phacelia argillacea*	E
Deseret Milkvetch	*Astragalus desereticus*	T
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
Utah Valvata Snail[6]	*Valvata utahensis*	E
June Sucker[4]	*Chasmistes liorus*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Canada Lynx	*Lynx canadensis*	T
WASATCH		
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Canada Lynx	*Lynx canadensis*	T
WASHINGTON		
Dwarf Bear-Poppy	*Arctomecon humilis*	E
Holmgren Milkvetch	*Astragalus holmgreniorum*	E
Shivwits Milkvetch	*Astragalus ampullarioides*	E
Siler Pincushion Cactus	*Pediocactus sileri*	T
Virgin River Chub[4]	*Gila seminuda*	E
Woundfin[4]	*Plagopterus argentissimus*	E
Desert Tortoise[4]	*Gopherus agassizii*	T
Bald Eagle[3]	*Haliaeetus leucocephalus*	T

FEDERALLY LISTED AND PROPOSED (P) ENDANGERED (E),
THREATENED (T) AND CANDIDATE[9] (C) SPECIES
AND HABITAT IN UTAH BY COUNTY
As of May 2004

COUNTY Species	Scientific Name	Status
WAYNE		
Aquarius Paintbrush	*Castilleja aquariensis*	C
Barneby Reed-mustard	*Schoenocrambe barnebyi*	E
Last Chance Townsendia	*Townsendia aprica*	T
Maguire Daisy	*Erigeron maguirei*	T
Rabbit Valley Gilia	*Gilia caespitosa*	C
San Rafael Cactus	*Pediocactus despainii*	E
Winkler Cactus	*Pediocactus winkleri*	T
Wright Fishhook Cactus	*Sclerocactus wrightiae*	E
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
Bonytail[4,10]	*Gila elegans*	E
Colorado Pikeminnow[4,10]	*Ptychocheilus lucius*	E
Humpback Chub[4,10]	*Gila cypha*	E
Razorback Sucker[4,10]	*Xyrauchen texanus*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
California Condor[7]	*Gymnogyps californianus*	E
Mexican Spotted Owl[1,4]	*Strix occidentalis lucida*	T
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Utah Prairie Dog	*Cynomys parvidens*	T
WEBER		
Ute Ladies'-tresses	*Spiranthes diluvialis*	T
Ogden Rocky Mountainsnail	*Oreohelix peripherica wasatchensis*	C
June Sucker[8]	*Chasmistes liorus*	E
Bald Eagle[3]	*Haliaeetus leucocephalus*	T
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*	C
Canada Lynx	*Lynx canadensis*	T

FEDERALLY LISTED AND PROPOSED (P) ENDANGERED (E),
THREATENED (T) AND CANDIDATE[9] (C) SPECIES
AND HABITAT IN UTAH BY COUNTY
As of May 2004

COUNTY

Species	Scientific Name	Status

[1] Nests in this county of Utah.

[2] Migrates through Utah, no resident populations.

[3] Wintering populations (only five known nesting pairs in Utah).

[4] Critical habitat designated in this county.

[5] Critical habitat proposed in this county.

[6] Historical range.

[7] Experimental nonessential population.

[8] Introduced, refugia population.

[9] Candidate species have no legal protection under the Endangered Species Act. However, these species are under active consideration by the Service for addition to the Federal List of Endangered and Threatened Species and may be proposed or listed during the development of the proposed project.

[10] Water depletions from *any* portion of the occupied drainage basin are considered to adversely affect or adversely modify the critical habitat of the endangered fish species, and must be evaluated with regard to the criteria described in the pertinent fish recovery programs.

For additional information contact: U.S. Fish and Wildlife Service, Utah Field Office, 2369 West Orton Cirlce, Suite 50, West Valley City, Utah 84119 Telephone: (801) 975-3330

APPENDIX B
SPILL RISK ASSESSMENT INFORMATION

APPENDIX B
NATURAL GAS CONDENSATE RISK ASSESSMENT FOR FISHERIES

Most producing wells in the Inland project area would be associated with 2- to 6-inch-diameter poly pipes carrying natural gas and natural gas condensate. If the pipelines were to leak or rupture, there would be a possibility that condensate could drain into nearby dry washes and perennial stream bottoms. These channels could carry spilled natural gas condensate into lower Pariette Wash and into the Green River.

Federal agencies have expressed concerns for federally-protected fish species in the Green River if a spill were to occur. Consequently, a risk assessment was conducted to evaluate the potential risk to these aquatic species from a release of natural gas condensate into these washes and stream bottoms.

For fish and aquatic biota in the Green River, risk of adverse effects is a function of: 1) the chance of exposure and 2) the concentration of the contaminant that could occur within the river as the result of a spill. Both of these factors were evaluated to determine the likelihood of adverse effects to endangered fish and other aquatic biota in the Green River.

B.1 Background

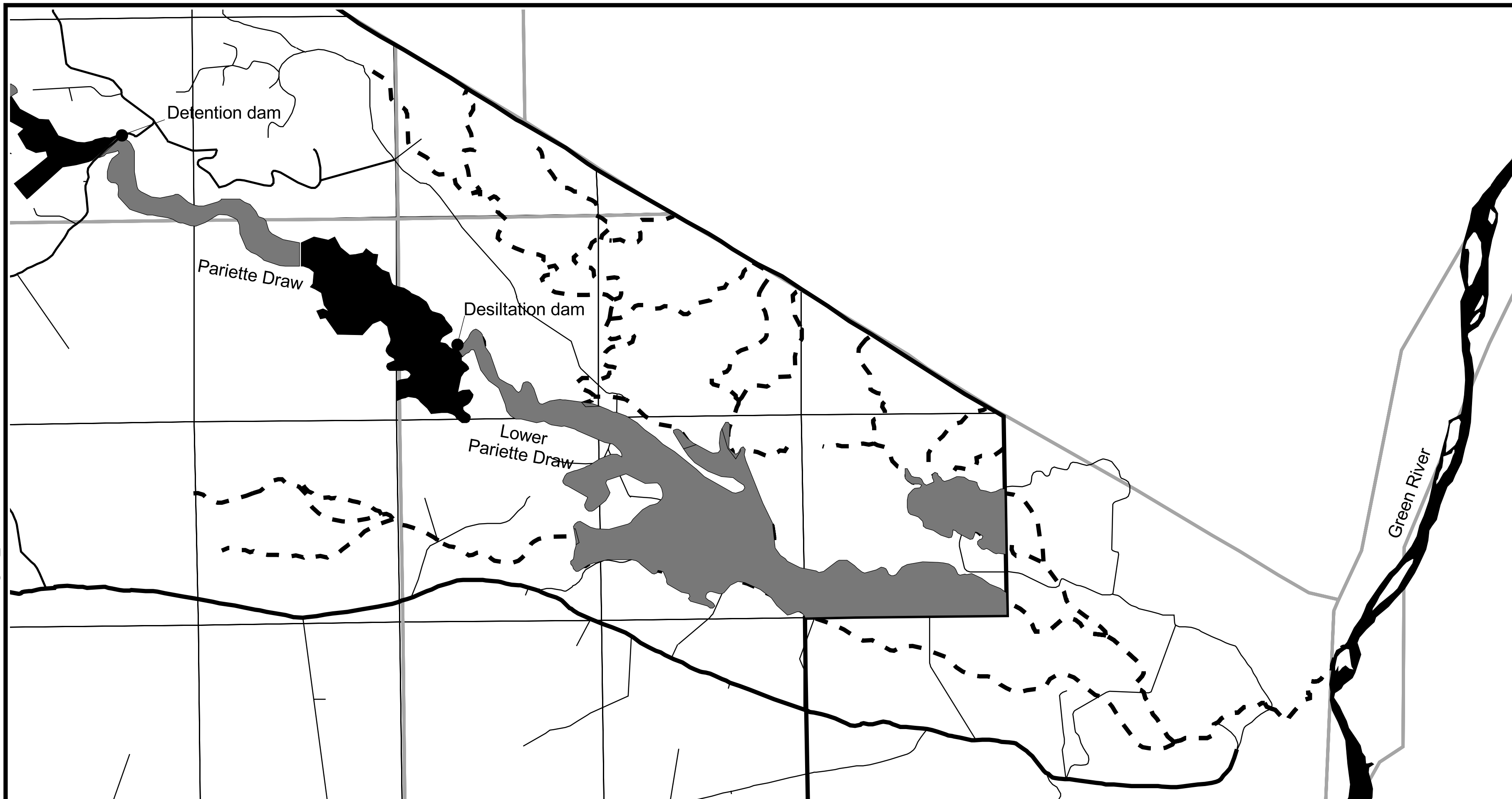
For most of the wells and their pipelines, substantial amounts of condensate would be unlikely to reach the Green River given the sizable overland distance between the pipeline and stream bottoms and the high evaporation rate of the condensate. For this analysis, it was assumed that appreciable quantities of condensate would be unable to reach the wash that was greater than 0.1 mile away.

The Inland project area can be roughly divided into three separate areas: 1) areas that drain into upper Pariette Draw (above the desiltation dam); 2) lower Pariette Draw (below the detention and desiltation dam); and 3) Sheep Wash (**Figure B-1**).

B.1.1 Upper Pariette Draw

In the project area, much of the watershed (e.g., Castle Peak Draw and many unnamed washes) drains directly into upper Pariette Draw, located above the detention and desiltation dams. Stream flow in upper Pariette Draw tributaries often is intermittent and becomes perennial as the washes near the dams. When completely dry, the two dams take about a week to fill (Faircloth 2003). When full, it is estimated these ponds typically retain water for a minimum of 1 day before water reaches the Green River. Below the dams, stream flow in Pariette Draw travels 4 miles before emptying into the Green River.

While flannelmouth sucker larvae historically have utilized Pariette Draw as habitat, Pariette Draw currently is dry, and a dam prevents the upstream movement of fish from the Green River into Pariette Draw. Flannelmouth sucker larvae may have previously colonized Pariette Draw using irrigation canals as conduits. Since agricultural practices in the area recently have changed, the canals are not used at this time. Consequently, flannelmouth suckers and threatened and endangered fish species are not expected to inhabit Pariette Draw.



Legend:

- Impoundment area
- 100 year floodplain
- Intermittent tributaries to Lower Pariette Draw
- Collector roads
- Local roads
- Minor roads

N

0 2000 4000 Feet

Note: Floodplain representation based on USGS and FEMA information.

Castle Peak and Eightmile Flat Oil and Gas Expansion Project

Figure B-1

Floodplain and Intermittent Tributaries to Lower Pariette Draw

B.1.2 Lower Pariette Draw

Lower Pariette Draw is located below the desiltation and detention dams. Tributaries leading into lower Pariette Draw are intermittent, while flow in lower Pariette Draw is perennial. Stream flow within this small drainage would not be detained by disiltation and detention dams before entering the Green River. As a result, a release of condensate within the 100-year floodplain of Pariette Draw potentially could reach the Green River with only minor attenuation.

As described above for upper Pariette Draw, flannelmouth sucker larvae historically have utilized lower Pariette Draw as habitat, but a dam prevents the upstream movement of fish from the Green River into Pariette Draw. Given the current agricultural practices, recolonization of lower Pariette Draw by flannelmouth sucker larvae is not anticipated.

Lower Pariette Draw also contains riparian habitat as well as several ponds and wetlands. While dry at this time, these ponds often contain aquatic and semi-aquatic species.

The confluence of Pariette Draw and the Green River is an important rearing habitat for several threatened and endangered fish species and their young during periods of high flow.

B.1.3 Sheep Wash

Sheep Wash watershed (also known as Eightmile Flat watershed), drains the southeastern portion of the project area. While there is no perennial water in this drainage, any intermittent flow in Sheep Wash would drain into the Green River. While there are no detention dams along this drainage, there is a pond located near the confluence with the Green River. Under most conditions, this pond would increase the length of time it would take for condensate to travel from Sheep Wash into the Green River.

The confluence of Pariette Draw and the Green River, identified as an important rearing habitat for several threatened and endangered fish species and their young during periods of high flow, is located immediately upstream of the mouth of Sheep Wash. Consequently, larval fish also may use this area as rearing habitat during periods of high flow.

B.2 Toxicity Assessment

In order to estimate the potential concentration of natural gas condensate reaching aquatic biota in lower Pariette Draw or the Green River from the pipelines associated with most well pads, conservative assumptions (i.e., assumptions that are most likely to show an adverse effect) were made. If the results of this screening-level exposure assessment suggested the potential for toxicity, more realistic and less highly conservative assumptions could be made to further refine the assessment. Furthermore, the results from the screening risk assessment should be coupled with the exposure assessment (see Section B.3), which calculates the likelihood of a spill reaching lower Pariette Draw or the Green River in sufficient quantities to cause toxicity. However, if the screening assessment indicates minimal risk to aquatic species, then it can be concluded that adverse effects are unlikely, regardless of conditions.

Assumptions Included:

1) The overland distance that condensate could be reasonably expected to traverse from a pipeline to a wash was estimated to be 0.2 mile (0.1 mile on either side of the wash).

2) The locations of small natural gas/condensate pipelines are not known at this time. For this analysis, it was assumed that the maximum draindown distance of a pipeline (the distance of pipeline that could drain into the environment if a rupture were to occur) was estimated to be 1.5 mile.

3) The entire draindown volume was assumed to enter a wash leading to Pariette Draw and/or the Green River. The assumption of 100 percent draindown is highly conservative. Research has shown that in only 6 percent of the historical spills did the actual draindown volumes account for as much as 50 percent of the potential draindown volume (CSFM 1993). In 80 percent of pipeline spills, the volume released was less than 8.5 percent of the total volume in the pipe.

4) Small diameter natural gas condensate pipelines would not be routinely pigged to remove condensate. Based on a 1.5-mile draindown distance for a 3-inch pipeline and assuming complete draindown, the release volume would be about 2,600 gallons.

5) If a small natural gas condensate pipeline crosses or is within 0.1 mile of an intermittent wash that drains to lower Pariette Draw, condensate would be able to reach the wash. Pipeline ruptures beyond 0.1 mile of a wash would evaporate before a substantial fraction could reach a wash.

6) Approximately 85 percent of the natural gas liquids spilled would be natural gas condensate, and the remainder would be water. (This worst-case assumption was used for risk assessment in the Saddletree Draw EA, UTU-76880.) For a 3-inch pipeline with a total release volume of 2,600 gallons, the natural gas liquids release would contain about 2,200 gallons of condensate.

7) To maximize concentrations in Pariette Draw and/or the Green River, it was assumed that 100 percent of the natural gas condensate spilled into a wash would reach Pariette Draw or the Green River without natural attenuation or breakdown of the natural gas condensate.

8) Natural gas condensate contains a variety of lightweight hydrocarbons (**Table B-1**). Of these, the most toxic constituent to aquatic biota is the volatile aromatic hydrocarbon fraction (benzene, ethylbenzene, toluene, and xylenes [BETX]), which would account for less than 0.5 percent of the volume of spilled material. For this screening assessment, acute toxicity was evaluated assuming the condensate consisted of twice the expected volatile aromatic hydrocarbon concentration (i.e., 1 percent) and that the volatile aromatic hydrocarbons were entirely solubilized within the water column.

Table B-1
Chemical Composition of Inland's Natural Gas Condensate

Liquid Components	Carbon Content	Percent of Total Spilled Volume	Residence Time
Ethane	C2	0[1]	Immediately becomes gas.
Propane	C3	0[1]	Immediately becomes gas.
Butanes	C4	0[1]	Immediately becomes gas.
Pentanes	C5	71	Less than 8 hours.
N-Hexane	C6	5	Less than 8 hours.
Benzene	C6	0.3	Less than 8 hours.
Toluene	C7	0.1	Less than 8 hours.
Ethylbenzene	C8	0.04	Less than 8 hours.
Xylenes	C8	0.03	Less than 8 hours.
Other paraffins[2]	C10 - C12	23	10 days or less.

[1]While present in the pipeline as a liquid, the component immediately becomes gas upon release. As a result, the component is not considered as part of the spilled volume.
[2]Chemical analysis of condensate found no hydrocarbons larger than C12.

9) Adverse effects associated with lightweight hydrocarbons in natural gas condensate would be limited to acute toxicity (i.e., mortality). Chronic effects were not evaluated since any condensate that would reach the river would have a short residence time in any single location due to rapid evaporation and downstream transport. Larger, straight-chained paraffins (C10 to C12 hydrocarbons) that may persist for more than a day are relatively insoluble and have low acute toxicity to aquatic species (NAS 1975; Robotham and Gill 1989). Since the residence time for potential contamination would be short (i.e., minutes to hours) within the Green River and chronic toxicity would require exposure for a longer period (i.e., weeks to months), it is reasonable to assume chronic toxicity would not be an issue.

The acute toxicity threshold for aromatic hydrocarbons was set at 7.4 ppm, based on the toxicity of benzene. This value was the lowest acute toxicity value for aromatic hydrocarbons for freshwater fish, invertebrates, and algae cited in the USEPA's toxicity database (AQUIRE 1998). This acute toxicity threshold value would be protective of endangered fish species and other aquatic biota. To allow direct comparison with this value, concentrations of aromatic hydrocarbons within the Pariette Draw and Green River were calculated over a 96-hour exposure period, a timeframe equivalent to the duration of the acute exposure threshold value.

B.2.1 Upper Pariette Draw

Once released into the environment, evaporation and other attenuation mechanisms immediately would begin to reduce the spill volume after natural gas condensate was released into the environment. Based on the chemical composition of the natural gas condensate that would be produced by Inland, it is estimated that the majority of the released material would evaporate within 8 hours (**Table B-1**).

Once the condensate reached the perennial reaches of upper Pariette Draw, the intervening detention and desiltation dams along the Pariette Draw drainage would intercept floodwaters and any associated condensate prior to reaching important fish habitat in the lower Pariette Draw and its confluence with the Green River. The detention and desiltation dams would increase travel time and enhance evaporative losses as the condensate spread across the water's surface. The amount of condensate that would reach the Green River would be reduced in proportion to its increased travel time. If the travel time reached 8 hours or more, the amount of condensate reaching lower Pariette Draw or the Green River would be negligible and acute toxicity would not be anticipated in either location.

The areas behind the detention and desiltation dams in upper Pariette Draw are often dry; most semi-permanent aquatic habitat is located in lower Pariette Draw and its confluence with the Green River. As a result, ephemeral contamination within the detention and desiltation dams would be unlikely to markedly affect aquatic populations.

B.2.2 Lower Pariette Draw

Based on USGS gaging data (USGS station 09307300, Pariette Draw at mouth near Ouray, Utah), Pariette Draw streams discharge data for 9 years (from 1975 to 1984) was statistically summarized (**Table B-2**). Concentrations of aromatic hydrocarbons were calculated for a range of discharge rates, including the minimum-recorded streamflow and low flow.

Table B-2
Comparison of the Estimated Aromatic Hydrocarbon Concentrations in Lower Pariette Draw with Acute Toxicity Threshold Value (7.4 ppm) Based On A Release in Lower Pariette Draw

Pariette Draw Discharge Rates	Streamflow (cfs)	Estimated Aromatic Hydrocarbon Concentration in Pariette Draw (ppm)	Exceeds Toxicity Threshold (7.4 ppm)
Minimum Recorded	0	NA	Yes
Low	4	157	Yes
Median	15	39	Yes
High	53	11	Yes

Note: Estimated concentrations in Pariette Draw based on a 2,200-gallon spill containing 1 percent aromatic hydrocarbons, which completely solubilizes and uniformly disperses throughout the entire water column.

Based on the conservative assumptions described in Section B.2, Toxicity Assessment, the concentrations of aromatic hydrocarbons in Pariette Draw were calculated (**Table B-2**). The estimated concentrations of aromatic hydrocarbons were found to exceed the acute toxicity threshold, regardless of flow.

In contrast to upper Pariette Draw, a release that empties into lower Pariette Draw has greater potential for acute toxicity and its consequences would be more significant than for a release into upper Pariette Draw. Because of the absence of the detention and desiltation dams, condensate would not attenuate to any

appreciable extent. During periods of low flow, aquatic and semi-aquatic biota occupying lower Pariette Draw potentially could be exposed to toxic concentrations as summarized in **Table B-2**.

An alternative evaluation method to estimate the potential for toxicity to aquatic biota in lower Pariette Draw is to estimate the volume of condensate that would be necessary to cause acute toxicity. Based on a stream flow of 4 cfs (low flow conditions), about 112 gallons of condensate would result in an exceedance of the acute toxicity threshold. This amount of condensate could be contained within a 0.5-mile segment of a 3-inch pipeline filled with 5 percent condensate.

B.2.3 Green River

Using USGS gaging data (USGS station 09261000, Green River near Jensen, Utah), Green River stream discharge data over the past 20 years was statistically summarized. Concentrations of aromatic hydrocarbons were calculated for a range of discharge rates.

Based on a release of condensate in Sheep Wash drainage, concentrations of aromatic hydrocarbons in the Green River were calculated in **Table B-3**. The estimated concentration of aromatic hydrocarbons in the Green River would be more than 10 times lower than the acute toxicity threshold, regardless of flow conditions (**Table B-3**). These results indicate that the probability of acute toxicity in the mainstem of the Green River would be low.

Table B-3
Comparison of the Estimated Aromatic Hydrocarbon Concentrations in the Green River with Acute Toxicity Threshold Value (7.4 ppm)

Green River Discharge Rates	Streamflow (cfs)	Estimated Aromatic Hydrocarbon Concentration in Green River (ppm)	Exceeds Toxicity Threshold (7.4 ppm)
Minimum Recorded	828	0.7	No
Low	1,330	0.4	No
Median	2,640	0.2	No
High	9,234	0.06	No

Note: Estimated concentrations in the Green River based on a 2,200-gallon spill containing 1 percent aromatic hydrocarbons, which completely solubilizes and uniformly disperses throughout the entire water column.

Because the tributaries in Sheep Wash drainage are intermittent streams, condensate would not be transported downstream in the absence of a storm event. The likelihood of a storm event coinciding with a release is evaluated in the exposure assessment presented in Section B.3.

If stream flow should be present in the Sheep Wash drainage during a spill event, the pond near Sheep Wash's confluence with the Green River would detain condensate under most conditions. If an exceptionally large flow event quickly transported condensate beyond the pond to the Green River, the condensate would be diluted by the streamflow and, again, toxicity in the Green River would not be anticipated.

Concentrations in **Table B-3** do not completely eliminate the possibility of localized toxicity at the confluence of the Green River with Pariette Draw or Sheep Wash. If a release were to occur in lower Pariette Draw or if storm waters allowed a release into Sheep Wash to bypass the pond, condensate potentially could reach the Green River with only minor attenuation. Aquatic biota in backwater areas would experience higher concentrations of the condensate than in the main river channel. Nevertheless, the potential for adverse effects would be moderated by downstream transport and rapid attenuation that quickly would reduce exposure concentrations and substantially limit exposure duration. Additionally, though this portion of the Green River is used as rearing habitat for threatened and endangered fish species, the area primarily is used during high flows when dilution effects would be greatest. Thus, condensate releases to either Pariette Draw or Sheep Wash drainages would not pose a major threat to aquatic biota in the Green River.

B.3 Exposure Assessment

The risk to aquatic biota is a function of the toxicity of the compound as well as the likelihood of exposure. This section evaluates the probability of condensate reaching areas containing aquatic biota.

Most spills would not enter a stream channel due to the distance the condensate must travel overland and the rapid evaporation rate of the condensate. For this assessment, it was assumed that a release within 0.1 mile of a wash (a combined distance of 0.2 mile for both stream banks) potentially could enter the drainage and be transported downstream (see Assumption #1 in Section B.2).

B.3.1 Upper Pariette Draw

While the locations and mileage of natural gas pipelines in areas that drain into upper Pariette Draw are unknown at this time, these pipelines are unlikely to cause toxicity due to the residence time anticipated in impoundments behind the detention and desiltation dams. Consequently, the likelihood of exposure in the Green River was not evaluated.

B.3.2 Lower Pariette Draw

Under the Proposed Action, new natural gas condensate pipelines could be located within the 100-year floodplain of lower Pariette Draw and new natural gas condensate pipelines could cross the lower Pariette Draw stream channel. For the purposes of calculating exposure risk, a total of 5.0 miles of natural gas condensate pipeline was assumed within the 100-year floodplain. These pipelines would not be routinely pigged and could contain up to 35 percent natural gas liquids. If a 3-inch pipeline within the 100-year floodplain were to rupture and the entire draindown volume was released for 1.5 miles, acute toxicity would be predicted under all flow conditions.

Based on historical national averages for pipeline incidents (0.001 incidents/mile per year; calculated from data in OPS 2002), a pipeline release in the 100-year floodplain would be predicted to occur once every 300 years (= 1/[0.001 spills/mile per year x 3 miles]).

Outside of the 100-year floodplain, there are only a few drainages that empty into lower Pariette Draw; most of the project area drains into upper Pariette Draw and a lesser amount drains into the Sheep Wash

drainage. For this assessment, it is assumed that 40 crossings of tributary washes could be needed. This would result in 8 miles of pipeline within 0.1 mile of tributary washes (8 miles = 40 crossings x 0.2 mile per crossing [both sides of the wash]).

Using national averages for pipeline incidents as described previously, the chance of a release into tributaries of lower Pariette Draw would be once in 125 years. Since all tributaries to lower Pariette Draw are intermittent, a storm event would have to occur in order for condensate to be transported downstream to lower Pariette Draw. Given the volatility of the condensate, a rainstorm would need to coincide within a few hours of the spill, otherwise the vast majority of the spilled material would have already evaporated. A storm event of sufficient size to transport the condensate downstream to lower Pariette Draw would likely occur no more than 10 percent of the time. When the chance of a pipeline release is combined with the chance of a storm event capable of reaching lower Pariette Draw, the chances of condensate reaching lower Pariette Draw and then the Green River is once in 1,250 years (= 125 years/10 percent).

The combined probability of a spill in either the 100-year floodplain or outside of the floodplain in lower Pariette Draw is once in 90 years.

Since larvae of threatened and endangered fish species are present at the confluence of Pariette Draw and the Green River only during very high flows (10 percent of the time), the chance of fish being present during a spill would be once in 900 years (= 90 years/10 percent).

B.3.3 Green River

The likelihood of a spill event capable of reaching the Green River would be moderately low (once in 900 years). If such an event were to occur, acutely toxic concentrations potentially could occur in backwater areas in the immediate vicinity of the spill or at the stormwater's confluence with the Green River. However, larval fish utilize the confluence of Pariette Draw and the Green River only during high flows when dilution effects would be the greatest. In the mainstem of the Green River, the event would be unlikely to cause adverse effects to aquatic biota since the conservatively estimated concentrations in the Green River did not exceed toxic thresholds, regardless of streamflows and presumed maximum draindown volume (**Table B-3**). Thus, risk to fish in the Green River would be low under the Proposed Action.

B.4 Risk Assessment Summary

This assessment evaluated the risk of toxic effects on endangered fish species of the Green River. Spills that would drain into upper Pariette Draw were not considered to be a risk to Green River fish due to the presence of detention and desiltation dams. These dams would prevent condensate from reaching the Green River before the condensate evaporated. Similarly, releases within the Sheep Wash drainage would be retained by a pond before reaching the Green River, so toxicity in the Green River would not be anticipated. In contrast, dams would not retain spills in lower Pariette Draw and its tributaries. As a result, aquatic biota in lower Pariette Draw could experience acute toxicity in the event of a spill. The chance of a release reaching lower Pariette Draw at sufficient concentrations to cause acute toxicity within Pariette Draw would be once in 90 years under the Proposed Action. Finally, if a spill occurred in lower Pariette Draw and was transported to the Green River, the concentration of the condensate would be at least 10 times lower

than the acute toxicity threshold. Since threatened and endangered fish larvae utilize the confluence of Pariette Draw and the Green River only during very high flows, the chance of these fish being present during a spill would be once in 900 years under the Proposed Action. Overall, the possibility of adverse effects to aquatic biota in the Green River would be very low.

B.4.1 Cumulative Impacts

Given that the probability of a pipeline release and the predicted magnitude of impacts are remote, unmitigated or unavoidable adverse impacts to special status fish species from the Proposed Action would have minimal cumulative impacts.

There is the potential that fish may be directly and indirectly affected from other oil and gas spills from other nearby pipelines. The risk posed by each pipeline depends primarily on the pipeline's diameter, the type of pipe material, the type of product transported, likely spill volume size, and its distance to the Green River. Since each new pipeline that crosses a wash contributes to the potential for adverse effects on endangered fish and other aquatic fauna, cumulative risk of additional natural gas condensate pipelines to risk posed by existing pipelines was evaluated. The analysis follows the same assumptions described above.

At this time, there are a number of existing, small diameter, natural gas condensate pipelines. These pipelines are associated with the No Action Alternative. Risk from these pipelines would be the same or higher than described for the Proposed Action, since existing pipelines located within the project area are not necessarily routinely pigged. Consequently, existing small diameter pipelines could release condensate to the environment.

In addition to small-diameter pipelines, there is an existing 10-inch natural gas condensate transmission pipeline. Another 10-inch transmission natural gas/condensate pipeline would be built (Inland 2004) and this pipeline would transport much of the material already carried by the existing pipeline (i.e., no net increase in condensate transported by these 10-inch pipelines). Releases from these two pipelines would drain into upper Pariette Draw; however, they are not expected to pose a significant threat to fish in the Green River (BLM 2003b; Inland 2004).

Increasing the overall miles of pipelines in the area markedly increases the amount of condensate that could be released into the environment. More pipelines would increase the probability that a release could occur somewhere within the project area. Additionally, more pipelines also would increase the total volume of condensate within the pipeline system. A rupture of more than one pipeline rapidly would increase the likelihood of toxicity to downstream receptors.

In most circumstances, pipeline ruptures are largely independent events (i.e., the rupture of one small pipeline does not generally cause the rupture of another pipeline). However, flooding and vandalism are examples of events that could result in multiple pipeline failures. Historical data from the Office of Pipeline Safety suggest that only 2 percent of pipeline failures can be attributed to natural forces, including flooding (NTSB 1996). Similar statistics are unavailable for vandalism, but are expected to be relatively low.

In total, increasing the amount of natural gas condensate pipelines in the project area, particularly in areas draining directly into lower Pariette Draw, increases the potential hazard to Green River fish. Since the mileage of existing and proposed pipe is unknown, the increased risk cannot be quantified. However, the chance of two or more pipelines independently failing at the same time would be extremely remote, roughly once in 1 million years (=1/(0.001 incidents/mile per year x 0.001 incidents/mile per year). The chance for a flood to break two or more pipelines in lower Pariette Draw is calculated to be once in 10,000 years (=1/(0.001 incidents/mile per year x 5 miles x 2 percent chance). The risk of vandalism rupturing 2 or more pipes is unknown, but also is expected to be low. Consequently, while cumulative impacts to aquatic biota in the Green River from natural gas condensate spills could occur, the chance of multiple pipelines rupturing is estimated to be once in at least 10,000 years.

APPENDIX C
NOVEMBER 17, 1999, BIOLOGICAL OPINION

United States Department of the Interior

FISH AND WILDLIFE SERVICE

UTAH FIELD OFFICE
LINCOLN PLAZA
145 EAST 1300 SOUTH, SUITE 404
SALT LAKE CITY, UTAH 84115

Division/Area	Initial	Assigned
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[illegible]		
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PNCR		
ADM		
RES		✓
OPS		

NOV 19 '99

BUREAU OF LAND MGMT. VERNAL, UTAH

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ALLEM		

In Reply Refer To
(FWS/6-UT-00-F-002) November 17, 1999

Memorandum

To: District Manager, Bureau of Land Management, Vernal, Utah

From: Field Supervisor, Utah Field Office, U.S. Fish and Wildlife Service, Salt Lake City, Utah

Subject: Biological Opinion for the Proposed Inland Production Company Road, Water Pipeline and Natural Gas Pipeline and Potential Well Development within Inland's Humpback and Greater Boundary Oil Field Units.

In accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), and the Interagency Cooperation regulations (50 CFR 402), this memorandum transmits the Fish and Wildlife Service's (Service) final biological opinion for impacts to federally listed endangered species for the proposed development of roads, water pipelines, and natural gas pipelines and future oil well development within Inland Production Company's Humpback and Greater Boundary Oil Field Units. This opinion is provided to you as the lead Federal Agency regarding section 7 consultation on projects covered under this consultation. Copies of this opinion should be provided to the applicant because the Service has incorporated conservation recommendations that should be included as conditions of any permits issued by the Bureau of Land Management (Bureau) for this project.

Reference is made to your memorandum of June 3, 1999, requesting initiation of formal section 7 consultation for the subject oil field road project and sundry notices of May 26, 1999, for the water pipeline, and July 8, 1999, for the natural gas pipeline, transmitted to our office on August 18, 1999, with a Special Status Plant Report for the proposed project area. The Service concurs with your "may affect" determination for the short spined phase of the threatened plant species Sclerocactus glaucus (Uinta Basin hookless cactus).

BIOLOGICAL OPINION

Based upon the best scientific and commercial information that is currently available, it is the Service's biological opinion that the proposed project as described below, is not likely to jeopardize the continued existence of Sclerocactus glaucus. The Service provides additional conservation recommendations for the species which we request be included in any permits or authorizations issued by the Bureau regarding these projects and subsequent well site

environmental stipulations proposed within the Humpback and Greater Boundary Oil Field Units. The proposed project, including subsequent oil well drilling and site development may take up to one hundred individuals of the short-spined phase of Sclerocactus glaucus.

PROJECT DESCRIPTION

Inland Production Company (Inland) proposes to develop roadways, buried water pipelines and surface laid natural gas pipelines within Inland's Humpback and Greater Boundary Oil Field Units (Township 8 South, Range 17 East, Sections 23, 24, 25, 26, 27, 28, 33, 34, and 35 SLBM) within Duchesne and Uintah Counties, Utah. These oil field facilities will enable petroleum extraction for the above oil field units with a projected well density of 40 acres per well (16 wells per section).

BASIS FOR BIOLOGICAL OPINION

The short spined phase of Sclerocactus glaucus is known from one scattered population primarily on Federal Lands managed by the Bureau with a small portion on the Uintah and Ouray Reservation of the Ute Indian Tribe. The entire population of short spined phase of Sclerocactus glaucus is experiencing or is vulnerable to over-collecting and off-road vehicle damage. Most of the species population is within active oil and gas fields. Continued unrestricted off-road vehicle use and future development of the oil and gas fields is likely to jeopardize the continued existence of short spined phase of Sclerocactus glaucus unless specific measures are taken to protect this species and its occupied habitat.

Heil and Porter (1994) and Hochstatter (1993) have demonstrated that the population of diminutive short spined sclerocactii endemic to clay badlands of the Duchesne River Formation south of Myton is a distinct species. The short-spined phase population of Sclerocactus glaucus impacted by the proposed project is the species Sclerocactus brevispinus (Heil and Porter 1994) or Sclerocactus wetlandicus var. ilsea (Hochstatter 1993). This population is a portion of the species S. glaucus listed by the Service as threatened (44 FR 58870 see, also 62 FR 49401).

The Bureau in consultation with both the Service and the project sponsor has designed those oil field projects to impact the minimum number of S. glaucus individuals and the smallest amount of the species potential habitat while still allowing for the development of those projects. Potential secondary impacts will be mitigated to avoid additional impact to S. glaucus populations and habitat. The Service makes the following conservation recommendations, to reclaim lost individuals and habitat, to lessen the impacts of the project.

CONSERVATION RECOMMENDATIONS

The following are conservation recommendations the Service considers crucial in maintaining the population viability of the short-spined phase of S. glaucus.

1. Survey all road and pipeline routes and oil and gas well locations using appropriate cactus survey techniques for the season of survey. Thirty (30) foot wide survey transects through

all suitable habitat will be required during the plants flowering period. Five (5) foot wide transects will be required during non flowering periods. Surveys cannot be done during periods of snow cover.

2. Remove the Sclerocactus glaucus individuals to be lost and, with coordination with the Service, either transmit them to the Service's Utah Field Office for disposition as specimens for biological research in support of the species recovery plan, or utilize them in re-vegetation actions to support the oil fields reclamation actions.

3. Remove the soil surrounding each lost Sclerocactus glaucus plant in circular area with a radius of one meter to depth of 5 centimeters centered on the plant. Secure the soil in a water proof container and maintain the soil container. The Bureau, with coordination with the Service, will use this soil with its presumed Sclerocactus glaucus seed bank in this oil field's reclamation actions.

4. Prohibit unauthorized off-road vehicle use and unauthorized routes off established roads.

5. Sign all appropriate roads to advise all motorists to remain on existing roads. Instruct all vehicle users associated with the field operations to remain on legally defined existing roads and well pads at all times. Enforce off-road vehicle closures within the habitat of S. glaucus.

CONCLUSION

This concludes the Service's biological opinion on the impacts of the proposed projects. This opinion was based upon the information described herein. If new information becomes available, new species listed, if the projected loss of S. glaucus plants exceeds 100 individuals, or any other change which alters the operation of the projects from that which is described in your correspondence and which may affect any endangered or threatened species in a manner or to an extent not considered in this biological opinion (see 50 CFR 402.16), formal section 7 consultation should be reinitiated.

Thank you for your cooperation in the formulation of this biological opinion and your interest in conserving endangered species.

Reed E. Harris

REFERENCES

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Hochstatter, F. 1993. The Genus Sclerocactus. Published by the Author, Mannheim, Germany. 128 pp.