Appendix F

USFWS Letter and Biological Assessment

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
764 Horizon Drive, Building B
Grand Junction, Colorado 81506-3946

IN REPLY REFER TO:
ES/CO: BLM/CRVFO
TAILS: 06E24100-2016-I-0260

May 19, 2016

Memorandum

To: Field Manager, Colorado River Valley Field Office, Bureau of Land Management (BLM), Silt, Colorado

From: Western Colorado Supervisor, Fish and Wildlife Service, Ecological Services, Grand Junction, Colorado

Subject: Section 7 Consultation on Previously Issued Oil and Gas Leases in the White River National Forest

On May 16, 2016, we received your letter, dated May 2, 2016, and associated biological assessment (BA) (received April 11, 2016) regarding the Previously Issued Oil and Gas Leases in the White River National Forest ("project"). You have requested initiation of section 7 consultation under the Endangered Species Act of 1973 (Act) as amended (16 U.S.C 1531 et. seq.) on this project.

You have determined that the project would have no effect on the following species due to lack of known occurrence or suitable habitat within the action area:

Black-footed ferret	*Mustela nigripes*
Western yellow-billed cuckoo	*Coccyzus americanus*
Mexican spotted owl	*Strix occidentalis lucida*
Penland alpine fen mustard	*Eutrema penlandii*

We acknowledge your determination of no effect for these species. Neither 7(a)(3) of the Act, nor implementing regulations under section 7(a)(2) of the Act require the U.S. Fish and Wildlife Service (Service) to review or concur with this determination; therefore the Service will not address these species further. However, we do appreciate you informing us of your analyses for these species.

You have requested our concurrence with your determination that implementation of your project may affect, but is not likely to adversely affect the following species:

Ute ladies'-tresses orchid	*Spiranthes diluvialis*
Colorado hookless cactus	*Sclerocactus glaucus*
DeBeque phacelia, and its critical habitat	*Phacelia submutica*
Western yellow-billed cuckoo	*Coccyzus americanus*
Green-lineage cutthroat trout^	*Oncorhynchus clarkii*
Colorado pikeminnow, and its critical habitat*	*Ptychocheilus lucius*
Razorback sucker, and its critical habitat *	*Xyrauchen texanus*
Humpback chub, and its critical habitat*	*Gila cypha*
Bonytail, and its critical habitat *	*Gila elegans*
Canada lynx	*Lynx canadensis*

^Due to unsettled taxonomy, the Service has advised Federal agencies to conduct section 7 consultations for actions that may affect the greenback cutthroat trout as well as the green lineage cutthroat trout (=Lineage GB) (Service 2012).
*The four endangered fish and their critical habitats are not likely to be adversely affected except through water depletions; discussed below.

Proposed Action and Project Area

The BA for the project describes the potential effects on federally listed threatened and endangered species under the Endangered Species Act of 1973, as amended (ESA) (16 United States 4 Code [USC] Section 1531 et seq.) from a combination of continued leasing, lease cancellation, and environmental protection stipulations on 65 existing federal fluid mineral leases within the White River National Forest (WRNF). The decision that made the 65 parcels available for oil and gas leasing was documented through the 1993 WRNF Oil and Gas Leasing Record of Decision (ROD) and reaffirmed in the 2002 WRNF Land Resource Management Plan (LRMP). Before offering the nominated parcels in an oil and gas lease sale, the BLM obtained consent from the Forest Service and subsequently issued the leases.

In 2007, the Interior Board of Land Appeals (IBLA) held that before including Forest Service parcels in an oil and gas lease sale the BLM must either formally adopt National Environmental Policy Act (NEPA) analysis completed by the Forest Service or conduct a NEPA analysis of its own (see Board of Commissioners of Pitkin County, 173 IBLA 173 [2007]). The IBLA ruled that although the BLM was a cooperating agency on the Forest Service's 1993 WRNF Oil and Gas Leasing EIS, the BLM did not formally adopt the Forest Service NEPA analysis or prepare its own analysis, and therefore did not comply with its NEPA obligations with respect to the issuance of those leases at issue in that proceeding. While the 2007 IBLA decision only specifically addressed 4 of the previously issued leases, all the remaining 65 leases are in the same procedural posture with respect to issuance.

In total, the BLM identified 65 existing leases with effective dates ranging from 1995 to 2012 that were issued based on the 1993 WRNF EIS. The BLM determined that it is necessary to conduct additional NEPA analysis to evaluate the impacts of its leasing decisions within the WRNF. The decision of whether National Forest System lands are available or unavailable for oil and gas leasing, however, remains with the Forest Service, although the BLM retains the ultimate discretion on whether to issue a lease (43 CFR 3101.7-2). As result, this project only considers the 65 currently leased parcels and not future leasing availability, which was recently

addressed in a separate NEPA analysis, the WRNF Oil and Gas Leasing Final EIS published by the Forest Service in December 2015 (USFS 2014), and associated BA (USFS 2015). The BLM has incorporated as much of the Forest Service's new NEPA analysis of future oil and gas leasing on the WRNF and the BA prepared by the Forest Service as possible into this analysis.

The 65 leases are located in Mesa, Garfield, Pitkin, and Rio Blanco counties, between the towns of DeBeque and Carbondale, south of Interstate 70, except for one lease northeast of Meeker (BA, Figure 1-1). As described in the BA, the action area for this consultation includes all of the previous leases plus a buffer to capture indirect effects (e.g., 300 foot buffer for listed plants and Canada lynx). The Previous Leases have been categorized into four zones (BA, Figure 1-1).

Ute ladies'-tresses orchid

No known occurrences of the Ute ladies'-tresses orchid exist within or near any of the Previous Leases. The closest known occurrences are several miles to the east along the Roaring Fork River. However, the possibility exists for this plant species to be found within the action area in the future as habitat potentially suitable for this species has been modeled within a portion of the action area. Critical habitat has not been designated for the Ute ladies'-tresses orchid.

No areas of potentially suitable habitat for this species would be made available for lease without a No Surface Occupancy (NSO) stipulation. Because any future activities that may affect federally listed plant species in the action area will be subject to survey requirements and consultation, and because of the NSO stipulations and additional protections outlined in the BA, we concur with your determination that implementation of the project may affect, but is not likely to adversely affect the Ute ladies'-tresses orchid.

Colorado hookless cactus

No known occurrences of the Colorado hookless cactus exist within any of the Previous Leases. However, individuals have been located near one of the Previous Leases in Zone 1. The possibility also exists for this plant species to be found within the action area in the future as habitat potentially suitable for this species has been modeled within a portion of Zone 1. Critical habitat has not been designated for the Colorado hookless cactus.

No areas of potentially suitable habitat for this species would be made available for lease without a No Surface Occupancy (NSO) stipulation. Because any future activities that may affect federally listed plant species in the action area will be subject to survey requirements and consultation, and because of the NSO stipulations and additional protections outlined in the BA, we concur with your determination that implementation of the project may affect, but is not likely to adversely affect the Colorado hookless cactus.

DeBeque phacelia and its critical habitat

The DeBeque phacelia is the only listed plant species known to occur in the action area, in two of the Previous Leases in Zone 1. Critical habitat has also been designated within these two Previous Leases. The possibility also exists for this plant species to be found within a few more

of the Previous Leases in the future as unoccupied, yet potentially suitable habitat for this species has been modeled within additional areas of Zone 1.

All Previous Leases containing occupied or potentially suitable habitat for this species are, however, protected by a No Surface Occupancy (NSO) stipulation. Likewise, all DeBeque phacelia critical habitat within the Previous Leases is protected by one or more NSO stipulations. Because any future activities that may affect federally listed plant species in the action area will be subject to survey requirements and consultation, and because of the NSO stipulations and additional protections outlined in the BA, we concur with your determination that implementation of the project may affect, but is not likely to adversely affect the DeBeque phacelia and its critical habitat.

Canada lynx

Over 90 percent of the lynx habitat located within the Previous Leases would be protected either through lease cancellation or via a NSO stipulation for threatened, endangered, proposed, and candidate species. The remaining lynx habitat within the Previous Leases would be subject to conditions of approval following section 7 consultation and the application of WRNF standards, objectives, and guidelines prior to the authorization of any oil and gas development at the project stage. The multiple standards, objectives, and guidelines outlined in the BA are designed to provide protection to lynx habitat and minimize impacts to lynx connectivity, maintain the competitive advantage of lynx in deep snow, minimize human activity in lynx habitat, etc. The BA also points out that, based on past history, oil and gas development on existing leases within the WRNF over the past 22 years has been minimal. Because any future activities that may affect lynx will be subject to section 7 consultation and because of the protections outlined in the BA, particularly lease cancellations and NSO stipulations, we concur with your determination that implementation of the project may affect, but is not likely to adversely affect the Canada lynx.

Green lineage cutthroat trout (= Colorado River cutthroat trout, green lineage)

Recent genetic (Metcalf et al. 2012) and meristics (Bestgen et al. 2013) research indicates that two cutthroat trout lineages exist in western Colorado where it was originally thought that only one existed. The two genetically distinct lineages of cutthroat trout are currently called the blue lineage (native to the Green, White, and Yampa river basins) and the green lineage (native to the Colorado, Dolores, and Gunnison river basins).

Initially, the new genetic information led to uncertainty regarding the relationship between greenback and green lineage cutthroat trout, and whether or not these lineages could both be considered the greenback cutthroat trout, which is listed as threatened under the ESA. While the taxonomy of these fish has yet to be fully resolved, the Service is advising Federal agencies to conduct section 7 consultations for actions that may affect the both the greenback and green lineage cutthroat trout until such time as a status assessment and a decision pursuant to the ESA is made (Service 2012).

As stated in the BA, five stream segments occupied by the green lineage cutthroat trout are found within action area. Several measures outlined in the BA provide protection for these streams.

Approximately one third of the occupied stream segments would be protected through cancelled leases or NSOs. The remaining occupied stream segments, totaling approximately 6.7 stream miles, would be subject to conditions of approval following section 7 consultation and the application of WRNF standards, objectives, and guidelines prior to the authorization of any oil and gas development at the project stage. The multiple standards, objectives, and guidelines outlined in the BA are designed to provide protection to cutthroat trout streams, including Standard 1: For management activities that have the potential to impact occupied cutthroat trout habitat, tributaries of occupied cutthroat trout habitat, or identified reintroduction areas, maintain or enhance existing cutthroat trout habitat; Guideline 1: Restrict construction of new roads within 350 feet of occupied cutthroat streams or within 150 feet from the edge of the current or historic floodplain, whichever is greater, to maintain hydrologic function and limit road-related stream sediment; and numerous additional measures described in the BA.

For these reasons, and further measures outlined in the BA, we concur with your determination that implementation of the proposed project is not likely to adversely affect the green-lineage cutthroat trout. No critical habitat has been designated for this species.

Colorado River endangered fish

Water depletions associated with projects addressed in your proposal would adversely affect the Colorado pikeminnow, razorback sucker, humpback chub, and bonytail, and their critical habitats. Even though the Previous Leases are located on lands administered by the Forest Service, the BLM is the agency responsible for approving drilling permits for oil and gas development projects accessing Federal minerals on all Federal lands. Water use for oil and gas development projects would be tracked by the BLM at the project level. BLM-authorized water depletions have been addressed in the December 19, 2008 "Programmatic Biological Opinion (PBO) for Water Depletions Associated with Bureau of Land Management's Fluid Mineral Program within the Upper Colorado River Basin in Colorado" (ES/GJ-6-CO-08-F-0006) ("Fluid Mineral PBO").

As a means of offsetting the impacts associated with this water use, the BLM secured a contribution from an industry representative group (Independent Petroleum Association of Mountain States) in the form of a monetary payment to the National Fish and Wildlife Foundation on behalf of the Upper Colorado River Endangered Fish Recovery Program (Recovery Program). These funds are used to contribute to the recovery of endangered fish through habitat restoration, fish propagation, genetics management, instream flow protection, nonnative fish management, research and monitoring, public education, and similar recovery actions. Under the PBO these contributions to the Recovery Program are considered a conservation measure that helps to avoid jeopardizing the continued existence of the endangered fish in the upper Colorado River Basin. All water depletions from the upper Colorado River Basin involved with fluid mineral extraction from Federal lands are compiled annually by the BLM and reported to our Ecological Services Office in Grand Junction.

The Service and the Recovery Program track all water depletions that are covered under the 15 Mile Reach of the Colorado River and Gunnison PBOs on a quarterly basis. A summary of those depletions are available at: http://www.coloradoriverrecovery.org/documents-

publications/section-7-consultation/consultation-list.html . Also, in accordance with the Section 7, Sufficient Progress, and Historic Projects Agreement, the Service reviews cumulative accomplishments and shortcomings of the Recovery Program in the upper Colorado River basin. Per that Agreement, the Service uses the following criteria to evaluate whether the Recovery Program is making "sufficient progress" toward recovery of the four listed fish species:

- actions which result in a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction;
- status of the fish populations;
- adequacy of flows;
- and magnitude of the impact of projects.

Through these bi-annual Sufficient Progress reviews the Service evaluates the best available and current information to determine if the Recovery Program continues to offset depletion effects identified in existing Section 7 consultations including the depletions covered by these PBOs. In the most recent assessment (dated October 7, 2015), the Service determined that sufficient progress has been made towards recovery. Sufficient Progress reports can be found at: http://www.coloradoriverrecovery.org/documents-publications/section-7-consultation/sufficient-progress-letters.html .

According to the BA, water depletions associated with Federal oil and gas wells that could be drilled within the Previous Leases would amount to roughly 17 acre-feet/year (339 AF/20 years, BA p. 6-14). This estimate is within the amount addressed in the Fluid Mineral PBO (4,046 acre-feet/year) and would fall under the umbrella of that PBO. As stated above, the actual amount of water used will be tracked and reported at the project stage for fluid mineral projects. No endangered fish critical habitat or occupied habitat is found within any of the Previous Leases. We concur with your determination that, other than through future water depletions discussed above, the proposed project is not likely to adversely affect any of the Colorado River endangered fish or their critical habitats.

If new information becomes available, new species listed, or should there be any changes to the project which alter the operation of the project, or the extent of the anticipated impact, from that which is described in this memo or which may affect any endangered or threatened species in a manner or to an extent not considered in the proposed action, section 7 consultation should be reinitiated. If the Service can be of further assistance, please contact Creed Clayton at (970) 628-7187.

Literature Cited

U.S. Forest Service (USFS). 2014. White River National Forest Oil and Gas Leasing Final Environmental Impact Statement. Eagle, Garfield, Gunnison, Mesa, Moffat, Pitkin, Rio Blanco, Routt, and Summit counties, Colorado. U.S. Department of Agriculture, White River National Forest. December.

U.S. Forest Service (USFS). 2015. Biological Assessment for Proposed White River National Forest Oil and Gas Leasing. USDA Forest Service White River National Forest, Eagle, Garfield, Gunnison, Mesa, Moffat, Pitkin, Rio Blanco, Routt, and Summit Counties, Colorado. January.

Bestgen, K.R., K.B. Rogers, and R. Granger. 2013. Phenotype predicts genotype for lineages of native cutthroat trout in the Southern Rocky Mountains. Final Report to U.S. Fish and Wildlife Service, Colorado Field Office, Denver Federal Center (MS 65412), Denver, Colorado. Larval Fish Laboratory Contribution 177. November 2013.

Metcalf, J.L., S.L. Stowell, C.M. Kennedy, K.B. Rogers, D. Mcdonald, J. Epp, K. Keepers, A. Cooper, J.J. Austin, and A.P. Martin. 2012. Historical stocking data and 19th century DNA reveal human-induced changes to native diversity and distribution of cutthroat trout. Molecular Ecology 21:5194-5207.

U.S. Fish and Wildlife Service (Service). 2012. Updated FWS position paper on ESA consultations on greenback cutthroat trout, including the cutthroat referred to as Lineage GB (Updated October 4, 2012). Unpublished document, Lakewood, Colorado.

U.S Department of the Interior
Bureau of Land Management

Previously Issued Oil and Gas Leases in the White River National Forest Biological Assessment

BLM

Colorado River Valley Field Office, Colorado

April 2016

BLM Mission Statement

The Bureau of Land Management is responsible for stewardship of our public lands. The BLM is committed to manage, protect and improve these lands in a manner to serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife habitat, wilderness, air and scenic quality, as well as scientific and cultural values.

List of Acronyms

^{o}C	Degrees Celsius
APD	Application for Permit to Drill
BA	Biological Assessment
bcf	billion cubic feet
BLM	Bureau of Land Management
BMP	Best Management Practice
CFR	Code of Federal Regulations
COA	Condition of Approval
CPW	Colorado Parks and Wildlife (formerly Colorado Division of Wildlife)
CRCT-GL	Colorado River cutthroat trout Green Lineage
CSU	Controlled Surface Use
dBA	decibels on the A weighted scale
DCH	Designated Critical Habitat
DPS	U.S. Distinct Population Segment
EIS	Environmental Impact Statement
ESA	Endangered Species Act of 1973
FR	Federal Register
FSVeg	Forest Service Field Sampled Region 2 Vegetation Data
GBCT	Greenback Cutthroat Trout
GMUGNF	Grand Mesa, Uncompahgre, and Gunnison National Forest
HUC	Hydrologic Unit Code
IBLA	Interior Board of Land Appeals
IPaC	Information, Planning, and Conservation
LAU	Lynx Analysis Unit
LCAS	Lynx Conservation Assessment Strategy
NEPA	National Environmental Policy Act
NFS	National Forest System
NMFS	National Marine Fisheries Service
NSO	No Surface Occupancy
Reform Act	Federal Onshore Oil and Gas Leasing Reform Act of 1987
RFDS	Reasonably Foreseeable Development Scenario
ROD	Record of Decision
Service	U.S. Fish and Wildlife Service
SRLA	Southern Rockies Lynx Amendment
SLT	Standard Lease Terms
SUPO	Surface Use Plan of Operation
TEPC	Threatened, Endangered, Proposed, and Candidate
TL	Timing Limitation
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WIZ	Water Influence Zones
WRNF	White River National Forest

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1.0 Introduction

This Biological Assessment (BA) presents the potential effects on federally listed threatened and endangered species under the Endangered Species Act of 1973, as amended (ESA) (16 United States Code Section 1531 et seq.) from a combination of continued leasing, lease cancellation, and environmental protection stipulations on 65 existing federal fluid mineral leases within the White River National Forest (WRNF). Under the direction of the Bureau of Land Management (BLM), the Previously Issued Leases on the White River National Forest Draft Environmental Impact Statement (EIS) was released for public comment on November 13, 2015. It is currently anticipated that the Final EIS will be available in August 2016. A Record of Decision (ROD) for the project is expected to be issued in October 2016.

In compliance with BLM regulations at 43 Code of Federal Regulations (CFR) 46.425, the BLM identified a preferred alternative based on the range of alternatives and input from the public during the Draft EIS public comment period. The identification of a preferred alternative does not constitute a commitment or decision in principle, and there is no requirement to select the preferred alternative in the ROD. Selection in the ROD of an alternative other than the preferred alternative does not require preparation of a supplemental EIS if the selected alternative was analyzed in the EIS.

The Preferred Alternative combines portions of two alternatives analyzed in the Previously Issued Leases in the White River National Forest Draft EIS (BLM 2015a): Alternative 2 would apply to leases that are producing or committed to a unit or agreement, and Alternative 4, with minor modifications, would apply to non-producing and non-committed leases.

1.1 Purpose of Document

The purpose of this BA is to identify the likely effects of the Preferred Alternative to federally listed threatened and endangered species and designated critical habitat. Under provisions of the ESA, federal agencies are directed to conserve threatened and endangered species and the habitats in which these species are found. Federal agencies also are required to ensure actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of endangered and threatened species or their critical habitat. In compliance with Section 7(a)(1) of ESA and the BLM's Special Status Species Manual 6840, the BLM, as the manager for federal minerals, is responsible for implementing conservation strategies as contained in approved recovery plans, cooperative agreements, and other instruments of which the BLM has cooperatively participated in developing. The Forest Service, as the federal manager for surface resources, pursues conservation actions focused on addressing identified threats to species with status under the ESA. Many of the programs associated with federally listed species and habitat have been in place for several years, are well recognized, and include Section 7 conference and consultation history with the U.S. Fish and Wildlife Service (USFWS) on relevant proposed management actions.

The ESA requires action agencies to consult or confer with the USFWS or National Marine Fisheries Service (NMFS) when there is discretionary federal involvement or control over the action under evaluation. Formal consultation becomes necessary when the action agency (the BLM in this case) determines that a proposed action is likely to adversely affect listed species or critical habitat, or when the USFWS does not concur with the action agency’s finding (USFWS and NMFS 1998). Preparation of a BA is required under Section 7(c) of the ESA if listed species or their critical habitat may be present in the area affected by a proposed federal action.

This BA provides documentation for the Preferred Alternative to meet federal requirements and agreements set forth by the BLM. It addresses federally listed threatened and endangered species and has been prepared pursuant to Section 7 regulations, in accordance with the 1998 procedures set forth

by USFWS and NMFS, and in accordance with the 1994 Memorandum of Understanding and 2000 Memorandum of Agreement. The BLM requests USFWS concurrence with the determinations made in this BA.

ESA Section 7 consultation for the proposed project would need to be reinitiated under the following conditions:

1) If new information obtained through species-specific surveys or detailed siting/engineering reveals that the action would affect listed species in a manner or to an extent not analyzed in the BA;
2) If the action is subsequently modified in a manner that causes an effect to a listed species that was not considered in the BA;
3) If a new species is listed or critical habitat is designated that may be affected by the Action; or
4) If the authorizing officer approves any other Final EIS alternative (or portion thereof) that differs from the Preferred Alternative analyzed in this BA.

1.2 Project Overview

The decision that made the 65 parcels available for oil and gas leasing was documented through the 1993 WRNF Oil and Gas Leasing ROD and reaffirmed in the 2002 WRNF Land Resource Management Plan. Before offering the nominated parcels in an oil and gas lease sale, the BLM obtained consent from the Forest Service and subsequently issued the leases.

In 2007, the Interior Board of Land Appeals (IBLA) held that before including Forest Service parcels in an oil and gas lease sale the BLM must either formally adopt National Environmental Policy Act (NEPA) analysis completed by the Forest Service or conduct a NEPA analysis of its own (see 173 IBLA 173 [2007]). The IBLA ruled that although the BLM was a cooperating agency on the Forest Service's 1993 WRNF Oil and Gas Leasing EIS, the BLM did not formally adopt the Forest Service NEPA analysis or prepare its own analysis, and therefore did not comply with its NEPA obligations with respect to the issuance of those leases at issue in that proceeding. While the 2007 IBLA decision only specifically addressed 4 of the previously issued leases, all the remaining 65 leases are in the same procedural posture with respect to issuance.

Following the IBLA's decision, the BLM determined that the Forest Service NEPA analysis conducted for the previously issued leases is no longer adequate due to changes in laws, regulations, policies, and conditions since the Forest Service's EIS was issued in 1993.

Examples of changed circumstances since 1993 considered in the current EIS (BLM 2015a) include modifications to the federal endangered and threatened species list and guidance, major changes to the National Ambient Air Quality Standards, implementation of the Colorado Roadless Rule, and new oil and gas drilling and production technologies.

In total, the BLM identified 65 existing leases with effective dates ranging from 1995 to 2012 that were issued based on the 1993 WRNF EIS. The BLM determined that it is necessary to conduct additional NEPA analysis to evaluate the impacts of its leasing decisions within the WRNF. The decision of whether National Forest System (NFS) lands are available or unavailable for oil and gas leasing, however, remains with the Forest Service, although the BLM retains the ultimate discretion on whether to issue a lease (43 CFR 3101.7-2). As result, the EIS and this BA only consider the 65 currently leased parcels and not future leasing availability, which has recently been addressed in a separate NEPA analysis, the WRNF Oil and Gas Leasing Final EIS published by the Forest Service in December 2015 (U.S. Forest Service [USFS] 2014a), and associated BA (USFS 2015a). The BLM has incorporated as

much of the Forest Service's new NEPA analysis of future oil and gas leasing on the WRNF and the BA prepared by the Forest Service as possible into this analysis.

1.3 Location and Action Area

The 65 leases were issued between 1995 and 2012, and are located in Mesa, Garfield, Pitkin, and Rio Blanco counties, between the towns of DeBeque and Carbondale, south of Interstate 70, except for one lease northeast of Meeker (**Figure 1-1**).

1.4 Action Area

As defined in the ESA Handbook (USFWS and NMFS 1998), a project "action area" refers to all areas that would be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR 402.02). The portion of action area for the proposed federal action that would be directly affected by oil and gas development includes lands within and adjacent to the 65 leases on the WRNF. The indirect effects portions of the action area vary somewhat depending on the species and the type of activity. This area is then buffered by varying amounts for different species (e.g., 300 feet for listed plants, the Lynx Analysis Units for Canada lynx) to account for additional species-specific indirect impacts that would result from human activity and construction disturbances that could extend beyond the leases. The analysis area for each species analyzed in this BA is defined in Chapter 6.0 under the species-specific Area of Analysis sections.

1.5 Reasonably Foreseeable Development Scenario

The Reasonably Foreseeable Development Scenario (RFDS) provides a long-term projection of the likely potential future oil and gas development and production within a defined area (the WRNF) and a defined period of time (20 years). The WRNF RFDS was prepared by the BLM for the Forest Service in 2010, and was included as Appendix F in the WRNF Oil and Gas Leasing Draft EIS (USFS 2012).

As stated in the RFDS (USFS 2010a), its purpose is to provide an estimated projection of unconstrained, future oil and gas exploration and development based on a set of assumptions in order "to evaluate potential effects that might reasonably occur as a result of leasing." The RFDS is based on geology; resource occurrence potential; past and current leasing, exploration, and development activity; and engineering technology, with consideration of economics and physical limitations on access to resources. An RFDS is not a decision, and it does not establish or imply a limit on future development.

The RFDS (USFS 2010a) was used as a starting point for estimating the number of wells likely to be developed within the 65 leases that are under evaluation. Using this as the basis for estimating well numbers allows the BLM to build on the previously prepared analysis completed for the Forest Service while focusing on the 65 leases using reasonable assumptions and patterns of observed development. Its use facilitates an analysis that is consistent with the Forest Service's assumptions and analyses presented in the WRNF Oil and Gas Leasing Final EIS (USFS 2014a), reducing the potential for inconsistencies between the projections for the 65 leases in this EIS and future leasing in the WRNF EIS and enabling better coordination between the Forest Service and the BLM.

The basic assumptions used to develop the estimated unconstrained oil and gas development within the 65 leases are summarized below.

- At least one well can be reasonably foreseen for each of the 65 leases.
- Future development will follow past development trends.
- Almost 4 percent of all wells will be horizontally drilled.

- A total of 444 wells is projected within the 65 leases without taking into account constraints such as No Surface Occupancy (NSO) stipulations.
- The 444 wells would not be evenly distributed across the 65 leases. Rather, the leases have been grouped spatially into zones based on the location of past development, production infrastructure, and access for exploration and production.

The following zones were used to estimate the projected well numbers and types. The leases within each zone are displayed on **Figure 1-1**. It is important to understand that the zones do not constitute management units or legal entities. They are intended only to be used to facilitate the analysis of indirect effects across the EIS alternatives by grouping the leases geographically and to organize the leases by terrain and development potential where useful to the resource discussions. New oil and gas development could be accessed from existing or new well pads constructed on each lease or on adjacent private or BLM land using directional or horizontal drilling technologies.

1.5.1 Zone 1

Zone 1 includes 10 leases at the western edge of the area encompassed by the 65 leases. There are 131 existing wells within 2 miles of the lease boundaries within this zone and, based on the RFDS, it is projected that there would be 63 new wells developed over the next 20 years, should the leases be made available without constraints. It is estimated that 95 percent of all horizontal wells projected within the 65 leases would occur in this zone. The primary target formations are the Mesa Verde and the Niobrara. Existing infrastructure includes pipelines and roads that were constructed to serve the existing wells in the Orchard and Place Mesa units.

1.5.2 Zone 2

Zone 2 includes 21 leases within an area in approximately the center of the east-west alignment of the 65 leases. There are 733 existing wells within 2 miles of the lease boundaries within this zone and, based on the RFDS, it is projected that there would be 318 new wells developed over the next 20 years, should the leases be made available without constraints. New development could be accessed primarily from existing and newly constructed well pads. Most of the successful development has been from the Mesa Verde Formation, but due to a successful horizontal Niobrara well, it is anticipated that future development would be likely to produce from both formations using mainly directional or vertical technologies. It is estimated that 5 percent of all horizontal wells projected within the 65 leases would occur in this zone. Existing infrastructure includes the numerous pipelines and roads that access the existing wells.

1.5.3 Zone 3

Zone 3 includes 33 leases within an area in the eastern part of the 65 leases. There are 50 existing wells within 2 miles of the lease boundaries within this zone and, based on the RFDS, it is projected that there would be 53 new wells developed over the next 20 years, should the leases be made available without constraints. New development would be accessed primarily from newly constructed well pads, with little exploration anticipated. No horizontal wells are expected to be drilled in this zone. Existing infrastructure includes Forest Service roads and pipelines. To successfully develop wells in this zone, road improvements and pipeline installation would be necessary.

1.5.4 Zone 4

Zone 4 includes only one lease (066948), located approximately 40 miles north of the main lease area near Meeker, Colorado. There are no existing wells within this zone or within 2 miles of the lease so the projected 10 new wells could only be accessed from newly constructed well pads. No horizontal wells are projected and existing infrastructure is limited to a county road and a pipeline within 1 mile of the lease boundary.

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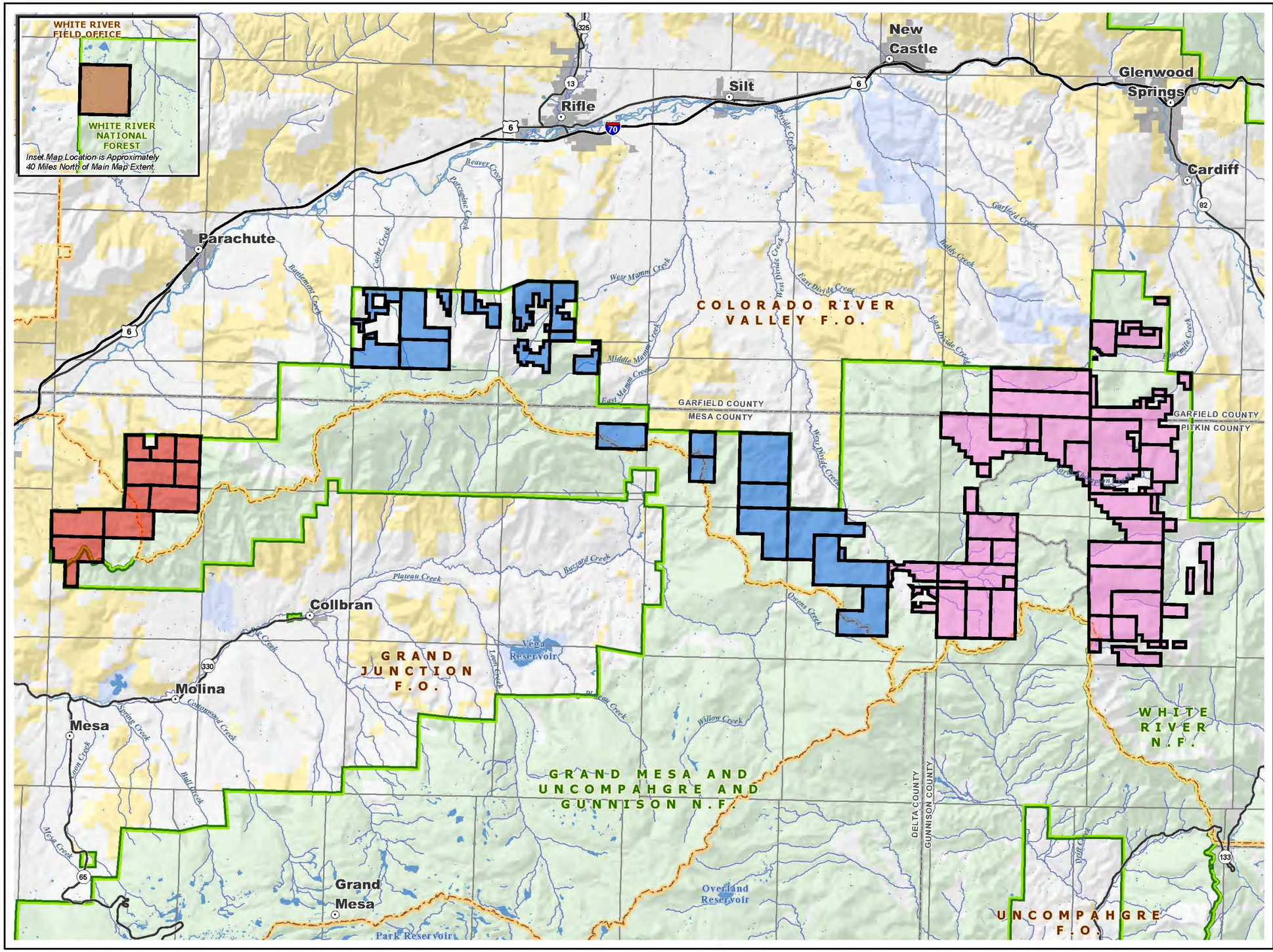

Date: 9/17/2015

Figure 1-1 General Location of Leases to be Evaluated

April 2016

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1.6 Leasing Terminology

1.6.1 Standard Lease Terms

Standard Lease Terms are part of every lease issued by the BLM. Essentially, these terms establish that the lessee has the right to use as much of the leased lands as is necessary to explore, drill, and extract all the leased resource. They allow for reasonable measures that may be required to minimize adverse impacts to other resource values, land uses, or land users. To the extent consistent with the lease rights granted, these reasonable measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. However, under standard lease terms, the agency cannot require relocation of proposed operations by more than 200 meters, require that operations be sited off the leasehold, or prohibit new surface disturbing operations for more than 60 days annually. The lessee must comply with all laws and regulations regardless of the when the law was enacted and regardless of the effect it may have on the rights granted. The lessee also must comply with all Oil and Gas Onshore Orders.

1.6.2 Lease Stipulations

Lease stipulations are conditions placed on a lease that become part of the lease issued by BLM. The purpose of lease stipulations is to minimize potential adverse impacts of exploration and development operations in compliance with applicable management direction. Stipulations may be necessary to protect specific resources, even where such protection is not specifically mandated by existing laws or regulations. Lease stipulations may be modified only through the use of exceptions, modifications, or waivers that are documented in the lease file. Additional information related to lease stipulations and the specific stipulations considered by the Forest Service to meet the standards and guidelines of the WRNF Forest Plan (USFS 2002a) can be found in Section 1.4.6 of the WRNF Oil and Gas Leasing Final EIS (USFS 2014a).

The following brief summary of different types of stipulations and changes to those stipulations is derived from the Uniform Format for Oil and Gas Lease Stipulations (Rocky Mountain Regional Coordinating Committee 1989). A specific stipulation would apply to oil and gas exploration and development if the resource being protected by the stipulation occurs at the proposed well location, based on site-specific field evaluations.

1.6.2.1 No Surface Occupancy

The NSO stipulation is intended for use only when other stipulations are determined to be inadequate to protect surface resources. It is used to provide protection for surface resources when standard lease terms are inadequate, such as where the resource protection cannot be accomplished by relocating proposed operations less than 200 meters. The type of resource to be protected and the rationale for attaching the NSO stipulation must be stated in the lease file along with the location of the stipulation or percentage of the lease affected within the lease boundary.

1.6.2.2 Controlled Surface Use

The Controlled Surface Use stipulation is intended to be used to strictly control lease activities where resource protection cannot be accomplished adequately with mitigation measures provided by standard lease terms, regulations, and other guidance like Onshore Orders. It is less restrictive than NSO or Timing Limitation stipulations and should be applied where use and occupancy is allowed but special operational constraints are needed for specific types of activities that modify the lease rights but do not prohibit all activities. It also may be used to notify the lessee that operations may be moved more than 200 meters to minimize impacts to other resource values.

1.6.2.3 Timing Limitations

The Timing Limitation stipulation prohibits surface use during a specified period to protect identified resources and resource values on a seasonal basis. The specified period must exceed the maximum annual 60-day period allowed under standard lease terms. This stipulation does not apply to operation and maintenance of existing facilities.

1.6.2.4 Exceptions, Modifications, and Waivers

Exceptions from stipulations can be issued on a case-by-case basis to temporarily exempt the lessee from lease stipulations because the conditions under which the stipulation was establish do not exist at the time of the exception. The acceptable causes for consideration of exceptions are stated in the applicable land use plan for the area.

Modifications are changes to the provisions of the lease stipulation, either temporarily or for the term of the lease. It may be needed if the conditions for which a stipulation was applied to a lease no longer occur. For example, if an NSO stipulation was established to protect a federally listed plant species, but a survey determines that the plant and its habitat do not exist, this may warrant modifying the lease to remove the NSO stipulation in that portion of the lease.

Waivers are permanent exemptions from a lease stipulation because the reason for implementing the stipulation is no longer applicable. Modifications and waivers are defined at 43 CFR 3101.1-4.

1.6.3 Lease Notice

A Lease Notice is a written notice from the authorized officer that serves to implement regulations not covered by stipulations or conditions of approval. It provides instructions on how to implement specific actions or items of local, regional, or state importance. Any requirements contained in a Lease Notice must be fully supported by law, regulations, Standard lease terms, or Onshore Orders, CFR 3101.3.

1.7 Development Assumptions

Table 1-1 displays the assumptions for surface disturbance, water use, and production forecasts by type for a typical well in the action area, depending on the drilling technology. The table and the projections for development of the 65 existing leases assume all wells would produce gas with small amounts of oil. For this reason, no production of oil is listed. **Table 1-1** also shows the projected surface disturbance, water usage, and mineral production based on the RFDS, assuming that the leases would be unconstrained by more than standard lease terms.

Initial surface disturbance refers to bare soils resulting from earthmoving activities until interim reclamation is achieved. Long-term surface disturbance refers to unvegetated surface that remains in that condition until final reclamation is completed. For example, during well pad construction, up to 6 acres would be disturbed (short-term) and it is assumed that 2.5 acres would be graded and revegetated, leaving 3.5 acres of long-term surface disturbance.

Table 1-2 lists other assumptions for typical wells.

Table 1-1 Surface Disturbance, Water Use, Production by Typical Well Type

Facility/Resource	Vertical/Directional				Horizontal			
			RFDS (Unconstrained)				RFDS (Unconstrained)	
Number of wells			427				17	
Number of pads			61				2.4	
	Per Well Rate		Total Amount[1]		Per Well Rate		Total Amount[1]	
Surface Disturbance (acres)	Initial	Long-term	Initial	Long-term	Initial	Long-term	Initial	Long-term
Pad size per well	0.9	0.5	366	214	0.9	0.5	14.6	8.5
Roads/Pipeline per pad	9.0	3.0	549	183	9.0	3.0	21.9	7.3
Water Use (acre-feet)								
Drilling (fresh)	0.77		330		3.22		55	
Completion (Recycled)	6.44		2,752		77.3		1,314	
Fluid Production (Life of Well)								
Gas (bcf)	1.2		512		6.4		109	
Produced Water (acre-feet)	4.9		2,1		9.7		164	

[1] Due to rounding of decimal places, the total amounts shown may vary from a calculation using the numbers displayed for the per well rates.

bcf = Billion Cubic Feet.

Table 1-2 Other Development Assumptions for Typical Wells

Category	Activity	Vertical or Directional Well	Horizontal Well
Surface disturbance	Road and pipeline disturbance (initial)	1 mile @ 75 ft. wide (initial); 1 mile @ 25 ft. wide (long-term)	
Drilling practice	Wells per pad	7 per pad	2 per pad
	Drilling Duration	10 days	60 days
	Completion Duration	20 days	30 days
	Specific practices	Closed loop, green completions	Closed loop, green completions, synthetic mud
	Directional Reach (depends on total vertical depth)	1,000 to 5,000 ft.	10,560 ft.
Transportation (trips per well pad)	**Total for Drilling[1]**	**266**	**916**
	Over-Legal Trucks	7	14
	Heavy Trucks	86	281
	Light Trucks	172	621
	Total for Completion[2]	**376**	**497**
	Over-Legal Trucks	1	1

Table 1-2 Other Development Assumptions for Typical Wells

Category	Activity	Vertical or Directional Well	Horizontal Well
Transportation (trips per well pad)	Heavy Trucks	241	294
	Light Trucks	134	202
	Daily for Operations/Maintenance[3]	10 trips per day	10 trips per day
	Over-Legal Trucks	0 (workover only)[4]	0 (workover only)[4]
	Heavy Trucks	4	4
	Light Trucks	6	6
	Total for Reclamation [5]	**54**	**53**
	Over-Legal Trucks	2	2
	Heavy Trucks	10	10
	Light Trucks	41	41
Staffing	Employees Per Day	55	55

[1] Drilling estimates include road, pad and pipeline construction, drilling rig up/rig down, and drilling phases.

[2] Completion estimates include mobilization and completion phases.

[3] Operations include ongoing production and workovers.

[4] Over-legal trucks are estimated to be used during workovers only (which would occur every 4 years, and up to 10 days per well).

[5] Reclamation estimates include plugging and abandoning g the well and reclaiming roads and pads.

Source: Mobley 2014.

1.8 Purpose of the Action

BLM's purpose for this federal leasing action is to:

- Revisit or reaffirm previous BLM decisions to issue 65 leases underlying Forest Service lands. These leases were issued from 1995 to 2012 following the Forest Service's availability decision considered in the 1993 EIS (USFS 1993a);
- Assess conformance with the decisions making these lands available for oil and gas leasing in the 1993 EIS, as reaffirmed in the 2002 WRNF Plan and consider consistency with the Forest Service's recent availability decisions for lands within the WRNF;
- Support the Forest Service in managing oil and gas resources, as required by law and memoranda of understanding between the agencies; and
- Fulfill the federal government's policy to "foster and encourage private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs" (Mining and Minerals Policy Act of 1970) while continuing to sustain the land's productivity for other uses and capability to support biodiversity goals (Forest Service Minerals Program Policy).

1.9 Need for the Action

The BLM's need for this federal leasing action is to:

- Meet domestic energy needs under the requirements of the Mineral Leasing Act, as amended, the Mining and Minerals Policy Act of 1970, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 ("Reform Act"). The BLM's responsibility under these laws is to regulate the development of oil and gas in the public domain, and to ensure that deposits of oil and gas owned by the U.S. shall be subject to disposition through the land use planning process.
- Address the NEPA deficiency identified by the 2007 IBLA ruling on the appeal by the Board of Commissioners of Pitkin County that BLM must formally adopt NEPA analysis completed by the Forest Service or conduct a NEPA analysis of its own for issuance of oil and gas leases underlying WRNF lands;
- Support Forest Service mineral policy that puts responsibility on field units, with the known presence or potential presence of a mineral or energy resource, to foster and encourage the exploration, development, and production of the mineral or energy resource consistent with Forest Service management direction; and
- Meet BLM's collaborative responsibility under the Reform Act to issue and manage oil and gas leases where the Forest Service has issued a land availability decision.

1.10 Decision to be Made

This EIS considers 65 leases issued since 1993 in the WRNF. The decision to be made by the BLM, based on the analysis in this EIS, is whether the 65 leases should be:

1. Reaffirmed with their current existing stipulations;
2. Modified with additional or different lease stipulations or additional mitigation measures; or
3. Cancelled.

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2.0 Preferred Alternative

The BLM developed this Preferred Alternative to address public comments and concerns submitted in response to the Draft EIS while incorporating recent decisions by the Forest Service, as the surface management agency, and recognizing the adverse economic impacts and technical challenges for the BLM and local governments associated with any decision to cancel producing or committed leases. The Preferred Alternative would apply the stipulations described under Alternative 2 (includes minor updates to reflect the 1993 Forest Service ROD) to all leases within the zones that are producing or committed to a unit or agreement. For those leases that are not producing or committed to a unit or agreement, Alternative 4 stipulations would apply (cancel or modify leases to match the WRNF Final ROD [USFS 2015b] issued by the Forest Service concerning future oil and gas leasing) with one exception. The Preferred Alternative would cancel in their entirety all undeveloped leases that overlap the area identified as closed to future leasing by the Final ROD (USFS 2015b).

Under this alternative, there would be 25 undeveloped leases administratively cancelled in full, 13 undeveloped leases that would remain open with new stipulations applied under Alternative 4 (with lessee consent), 23 producing or committed leases that would be reaffirmed or modified as described under Alternative 2, and 4 expired leases currently under appeal that had previously been part of the Willow Creek Unit (held by production) to which Alternative 2 would apply if the appeal is denied. **Table 2-1** lists the zones, lease numbers, stipulation types, and acreage for the Preferred Alternative. **Figures 2-1, 2-2, 2-3,** and **2-4** display the proposed stipulations under the Preferred Alternative. Following the maps is the rationale for why the BLM decided to formulate the Preferred Alternative in this way.

Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
1	058677	543	NSO	Roadless Areas	543
			TL	Big Game Winter Range	5
	059630	587	NSO	Bighorn Sheep	309
				Roadless Areas	587
				Slopes Greater than 60%	587
	066727	640	NSO	Bighorn Sheep	640
	066728	1,276	NSO	Bighorn Sheep	1,275
			TL	Big Game Winter Range	93
	066729	654	NSO	Bighorn Sheep	654
	066730	1,279	NSO	Bighorn Sheep	1,278
			SLT	Standard Lease Terms	1
	066731	651	NSO	Slopes Greater than 60%	651
	066732	1,437	NSO	Slopes Greater than 60%	1,435
	066733	1,416	NSO	Slopes Greater than 60%	1,416
	066926	1,629	NSO	Slopes Greater than 60%	1,629
2	061121	964	NSO	Slopes Greater than 60%	351
			TL	Big Game Winter Range	208

Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
2	061121	964	SLT	Standard Lease Terms	405
2	066723	1,280	NSO	Authorized Sites and Facilities	829
				Raptor Species Breeding Territories	120
				Roadless Areas	71
				Severe or High Landscape Stability Hazards	36
				Slope Greater Than 50 Percent	40
				TEPC Aquatic Species	1,077
				Water Influence Zones	174
			CSU	Authorized Sites and Facilities	1,165
				Big Game Migration Corridors	92
				Big Game Summer Concentration	1,280
				Big Game Winter Ranges	1,280
				Highly Erodible Soils	1,045
				Moderately High Landscape Stability Hazards	2
				Paleontological Resources	1,280
				Sensitive Aquatic Species	122
				Sensitive Plant Species	1,280
				Sensitive Terrestrial Avian Invertebrate Species	1,031
				Slopes 30 to 50 Percent	422
			TL	Big Game Summer Concentration	1,280
				Big Game Winter Range	1,280
				Raptor Species Breeding Territories	120
	066724	1,973	TL	Big Game Winter Range	1,973
	066915	2,537	NSO	Authorized Sites and Facilities	336
				Native Cutthroat Trout Habitat	41
				Raptor Species Breeding Territories	1,529
				Roadless Areas	1,916
				Severe or High Landscape Stability Hazards	86
				Slope Greater Than 50 Percent	176
				TEPC Raptor Species	503
				TEPC Wildlife Species	334
				Water Influence Zones	279
			CSU	Authorized Sites and Facilities	998
				Big Game Migration Corridors	165

Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
2	066915	2,537	CSU	Big Game Production Areas	1,845
				Big Game Summer Concentration	2,537
				Big Game Winter Ranges	2,456
				High Concern Travel Ways or Use Areas	662
				Highly Erodible Soils	2,082
				Moderately High Landscape Stability Hazards	8
				Paleontological Resources	2,537
				Sensitive Aquatic Species	465
				Sensitive Plant Species	2,537
				Sensitive Terrestrial Avian Invertebrate Species	2,169
				Slopes 30 to 50 Percent	1,349
				Designated Winter Groomed Routes	0.02 mile
			TL	Big Game Summer Concentration	2,537
				Big Game Winter Range	2,325
				Raptor Species Breeding Territories	554
	066916	2,562	NSO	Native Cutthroat Trout Habitat	10
				Raptor Species Breeding Territories	292
				Roadless Areas	2,562
				Severe or High Landscape Stability Hazards	115
				Slope Greater Than 50 Percent	135
				TEPC Wildlife Species	549
				Water Influence Zones	189
			CSU	Authorized Sites and Facilities	49
				Big Game Migration Corridors	175
				Big Game Production Areas	1,839
				Big Game Summer Concentration	2,376
				Big Game Winter Ranges	244
				High Concern Travel Ways or Use Areas	421
				Highly Erodible Soils	2,193
				Moderately High Landscape Stability Hazards	24
				Paleontological Resources	2,562
				Sensitive Aquatic Species	276
				Sensitive Plant Species	2,486
				Sensitive Terrestrial Avian Invertebrate Species	2,048

Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
2	066916	2,562	CSU	Slopes 30 to 50 Percent	943
			TL	Big Game Summer Concentration	2,376
				Big Game Winter Range	136
				Raptor Species Breeding Territories	135
	066917	1,920	NSO	Authorized Sites and Facilities	68
				High Geologic Hazard—GMUGNF	20
				Native Cutthroat Trout Habitat	8
				Roadless Areas	1,324
				Severe or High Landscape Stability Hazards	4
				Slope Greater Than 50 Percent	13
				TEPC Aquatic Species	563
				TEPC Plant Species	349
				TEPC Wildlife Species	139
				Water Influence Zones	109
			CSU	Authorized Sites and Facilities	270
				Big Game Production Areas	70
				Big Game Summer Concentration	924
				Big Game Winter Ranges	99
				High Concern Travel Ways or Use Areas	1,201
				Highly Erodible Soils	1,337
				Paleontological Resources	1,452
				Plant Species of Local Concern	915
				Sensitive Aquatic Species	534
				Sensitive Plant Species	1,708
				Sensitive Terrestrial Avian Invertebrate Species	920
				Slopes 30 to 50 Percent	277
				Watersheds with CRCT and GBCT Conservation Populations	206
				Designated Winter Groomed Routes	1.5 miles
			TL	Big Game Summer Concentration	924
	066918	2,557	NSO	Slopes Greater than 60%	216
			CSU	Level 1 Travel Route	98
			TL	Big Game Winter Range	2,531
	066920	418	NSO	Slopes Greater than 60%	32
			SLT	Standard Lease Terms	386
	067147	783	NSO	Slopes Greater than 60%	771

Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
2	067147	783	TL	Big Game Winter Range	11
			SLT	Standard Lease Terms	1
	067150	662	NSO	Slopes Greater than 60%	207
			TL	Big Game Winter Range	385
			SLT	Standard Lease Terms	70
	067542	480	NSO	Severe or High Landscape Stability Hazards	375
				Slope Greater Than 50 Percent	330
				TEPC Wildlife Species	297
				Water Influence Zones	44
			CSU	Big Game Migration Corridors	67
				Big Game Production Areas	145
				Big Game Summer Concentration	343
				Big Game Winter Ranges	467
				High Concern Travel Ways or Use Areas	53
				Highly Erodible Soils	45
				Paleontological Resources	480
				Sensitive Plant Species	479
				Sensitive Terrestrial Avian Invertebrate Species	306
				Slopes 30 to 50 Percent	101
				Spruce Fir Old Growth and Old Growth Recruitment Stands	57
				Watersheds with CRCT and GBCT Conservation Populations	480
			TL	Big Game Summer Concentration	343
				Big Game Winter Range	14
				Raptor Species Breeding Territories	43
	067543	1,167	NSO	Authorized Sites and Facilities	126
				Raptor Species Breeding Territories	57
				Roadless Areas	994
				Severe or High Landscape Stability Hazards	13
				Slope Greater Than 50 Percent	11
				Summer Non Motorized Recreation	60
				TEPC Aquatic Species	128
				TEPC Wildlife Species	1,024
				Water Influence Zones	112
			CSU	Authorized Sites and Facilities	560

Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
2	067543	1,167	CSU	Big Game Production Areas	268
				Big Game Summer Concentration	1,167
				Big Game Winter Ranges	579
				Ground Water Resources	479
				High Concern Travel Ways or Use Areas	995
				Highly Erodible Soils	834
				Moderate Scenic Integrity Objective	778
				Moderately High Landscape Stability Hazards	37
				Paleontological Resources	1,166
				Sensitive Aquatic Species	199
				Sensitive Plant Species	1,088
				Sensitive Terrestrial Avian Invertebrate Species	1,143
				Slopes 30 to 50 Percent	202
				Spruce Fir Old Growth and Old Growth Recruitment Stands	405
				Watersheds with CRCT and GBCT Conservation Populations	451
			TL	Big Game Summer Concentration	1,167
	067544	730	NSO	Slopes Greater than 60%	730
	070013	1,262		>60% Slope—GMUGNF	1
				High Geologic Hazard—GMUGNF	52
				Riparian/ Wetland—GMUGNF	3
				Roadless Area—GMUGNF	186
				Slopes Greater than 60%	1,037
			CSU	40-60% Slope—GMUGNF	33
				Moderate Geologic Hazard—GMUGNF	173
	070014	1,486	NSO	Authorized Sites and Facilities	251
				Fen Wetlands	38
				Native Cutthroat Trout Habitat	107
				Roadless Areas	1,485
				Severe or High Landscape Stability Hazards	24
				Slope Greater Than 50 Percent	49
				Summer Non Motorized Recreation	781
				TEPC Aquatic Species	114
				TEPC Wildlife Species	1,163
				Water Influence Zones	168

Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
2	070014	1,486	CSU	Authorized Sites and Facilities	722
				Big Game Production Areas	389
				Big Game Summer Concentration	1,486
				Big Game Winter Ranges	704
				Ground Water Resources	346
				Highly Erodible Soils	458
				Moderate Scenic Integrity Objective	1,187
				Moderately High Landscape Stability Hazards	155
				Paleontological Resources	1,486
				Sensitive Aquatic Species	219
				Sensitive Plant Species	1,394
				Sensitive Terrestrial Avian Invertebrate Species	1,277
				Slopes 30 to 50 Percent	450
				Spruce Fir Old Growth and Old Growth Recruitment Stands	933
				Watersheds with CRCT and GBCT Conservation Populations	228
			TL	Big Game Summer Concentration	1,486
	070015	1,598	NSO	Authorized Sites and Facilities	118
				Native Cutthroat Trout Habitat	39
				Roadless Areas	1,595
				Severe or High Landscape Stability Hazards	317
				Slope Greater Than 50 Percent	324
				Summer Non-Motorized Recreation	31
				TEPC Aquatic Species	45
				TEPC Wildlife Species	824
				Water Influence Zones	136
			CSU	Authorized Sites and Facilities	445
				Big Game Production Areas	683
				Big Game Summer Concentration	1,598
				Big Game Winter Ranges	1,564
				Ground Water Resources	298
				Highly Erodible Soils	700
				Moderate Scenic Integrity Objective	1,004
				Moderately High Landscape Stability Hazards	115

Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
2	070015	1,598	CSU	Paleontological Resources	1,598
				Sensitive Aquatic Species	81
				Sensitive Plant Species	1,231
				Sensitive Terrestrial Avian Invertebrate Species	1,124
				Slopes 30 to 50 Percent	671
				Spruce Fir Old Growth and Old Growth Recruitment Stands	420
				Watersheds with CRCT and GBCT Conservation Populations	693
			TL	Big Game Summer Concentration	1,598
	070016	51	NSO	Roadless Areas	51
				TEPC Wildlife Species	40
				Water Influence Zones	6
			CSU	Big Game Production Areas	46
				Big Game Summer Concentration	51
				Big Game Winter Ranges	50
				Ground Water Resources	21
				High Concern Travel Ways or Use Areas	40
				Highly Erodible Soils	28
				Moderate Scenic Integrity Objective	50
				Paleontological Resources	51
				Sensitive Plant Species	1
				Sensitive Terrestrial Avian Invertebrate Species	44
				Slopes 30 to 50 Percent	6
			TL	Big Game Summer Concentration	51
	070361	638	NSO	Slopes Greater than 60%	556
			CSU	Moderate Geologic Hazard—GMUGNF	47
				Powerline Corridor	35
			TL	Big Game Winter Range	35
				Big Game Winter Range—GMUGNF	47
	072157	638	NSO	Slope Greater Than 50 Percent	0
				TEPC Aquatic Species	419
				TEPC Wildlife Species	2
				Water Influence Zones	23
			CSU	Big Game Summer Concentration	4
				Big Game Winter Ranges	638

Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
2	072157	638	CSU	High Concern Travel Ways or Use Areas	627
				Highly Erodible Soils	295
				Moderate Geologic Hazard—GMUGNF	341
				Paleontological Resources	298
				Sensitive Aquatic Species	4
				Sensitive Plant Species	498
				Sensitive Terrestrial Avian Invertebrate Species	249
				Slopes 30 to 50 Percent	75
				Designated Winter Groomed Routes	1.22
			TL	Big Game Summer Concentration	4
				Big Game Winter Range	638
	075070	1,152	NSO	Authorized Sites and Facilities	40
				Public Water Supply Source Area Protection	30
				Raptor Species Breeding Territories	15
				Roadless Areas	1,113
				Severe or High Landscape Stability Hazards	92
				Slope Greater Than 50 Percent	95
				TEPC Wildlife Species	1
				Water Influence Zones	49
			CSU	Authorized Sites and Facilities	163
				Big Game Migration Corridors	116
				Big Game Production Areas	425
				Big Game Summer Concentration	31
				Big Game Winter Ranges	1,150
				High Concern Travel Ways or Use Areas	114
				Highly Erodible Soils	766
				Moderate Scenic Integrity Objective	3
				Moderately High Landscape Stability Hazards	59
				Paleontological Resources	1,151
				Plant Species of Local Concern	24
				Sensitive Aquatic Species	3
				Sensitive Plant Species	1,094
				Sensitive Terrestrial Avian Invertebrate Species	314
				Slopes 30 to 50 Percent	452

Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
2	075070	1,152	CSU	Watersheds with CRCT and GBCT Conservation Populations	267
			TL	Big Game Summer Concentration	31
	076123	80	NSO	Big Game Winter Range	194
				Raptor Species Breeding Territories	15
				Raptor Species Breeding Territories	1
				Roadless Areas	80
				Severe or High Landscape Stability Hazards	2
				Slope Greater Than 50 Percent	2
				Water Influence Zones	13
			CSU	Authorized Sites and Facilities	28
				Big Game Production Areas	80
				Big Game Winter Ranges	80
				High Concern Travel Ways or Use Areas	79
				Highly Erodible Soils	31
				Moderate Scenic Integrity Objective	15
				Paleontological Resources	80
				Sensitive Plant Species	80
				Sensitive Terrestrial Avian Invertebrate Species	31
				Slopes 30 to 50 Percent	29
			TL	Raptor Species Breeding Territories	1
3	058835	1,475	SLT	Standard Lease Terms	1,475
	058836	1,279	SLT	Standard Lease Terms	1,279
	058837	1,669	TL	Elk Production Area	1,669
				Snowmobile Corridor	0.003 mile
	058838	1,277	CSU	Areas of Moderate Geologic Hazard—GMUGNF	26
			SLT	Standard Lease Terms	1,251
	058839	1,127	TL	Elk Production Area	1,086
				Snowmobile Corridor	2.1 miles
			SLT	Standard Lease Terms	41
	058840	639	TL	Snowmobile	88
			SLT	Standard Lease Terms	552
	058841	638	TL	Snowmobile	327
			SLT	Standard Lease Terms	311
	066687	1,053	Cancelled		1,053

Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
3	066688	774	Cancelled		774
	066689	40	Cancelled		40
	066690	274	Cancelled		274
	066691	198	Cancelled		198
	066692	1,417	Cancelled		1,417
	066693	2,167	Cancelled		2,167
	066694	119	Cancelled		119
	066695	1,061	Cancelled		1,061
	066696	1,027	Cancelled		1,027
	066697	1,872	Cancelled		1,872
	066698	2,460	Cancelled		2,460
	066699	114	Cancelled		114
	066700	841	Cancelled		841
	066701	1,885	Cancelled		1,885
	066702	1,254	Cancelled		1,254
	066706	2,548	Cancelled		2,548
	066707	1,276	Cancelled		1,276
	066708	2,554	Cancelled		2,554
	066709	638	Cancelled		638
	066710	2,329	Cancelled		2,329
	066711	1,751	Cancelled		1,751
	066712	875	Cancelled		875
	066908	2,400	Cancelled		2,400
	066909	2,077	Cancelled		2,077
	066913	1,660	NSO	Slopes Greater than 60%	53
			CSU	Level 1 Travel Route	402
			TL	Snowmobile	301
			SLT	Standard Lease Terms	1,134
4	066948	2,562	NSO	Fen Wetlands	98
				Raptor Species Breeding Territories	2,085
				Severe or High Landscape Stability Hazards	18
				Slope Greater Than 50 Percent	39
				TEPC Aquatic Species	48
				TEPC Raptor Species	503
				TEPC Wildlife Species	1,239
				Water Influence Zones	302

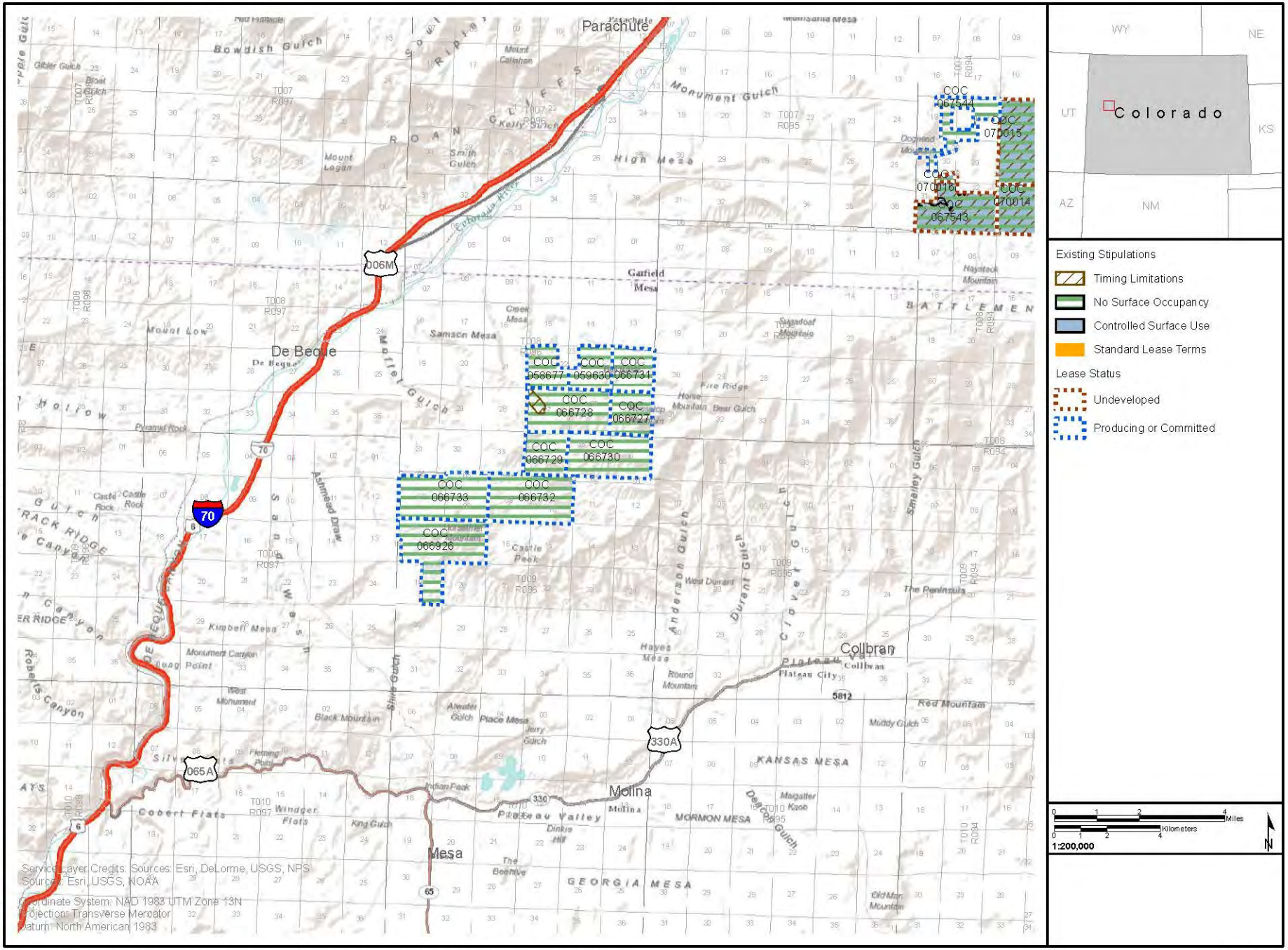
Table 2-1 Stipulations on Each Lease for Preferred Alternative

Zone	Lease No.	Lease Acres	Type of Stipulation [1]	Type of Restriction	Acres or Miles of Stipulation or SLT [2]
4	066948	2,562	CSU	Big Game Production Areas	1,709
				Big Game Summer Concentration	2
				Big Game Winter Ranges	469
				Ground Water Resources	89
				High Concern Travel Ways or Use Areas	1,421
				Highly Erodible Soils	1,176
				Moderate Scenic Integrity Objective	789
				Moderately High Landscape Stability Hazards	7
				Paleontological Resources	2,561
				Sensitive Aquatic Species	91
				Sensitive Plant Species	2,282
				Sensitive Terrestrial Avian Invertebrate Species	1,284
				Slopes 30 to 50 Percent	156
				Spruce Fir Old Growth and Old Growth Recruitment Stands	132
				Watersheds with CRCT and GBCT Conservation Populations	2,562
				Designated Winter Groomed Routes	4.1 miles
			TL	Bald Eagle Winter Roost and Perch Sites	2,562
				Big Game Summer Concentration	2
				Big Game Winter Range	317
				Raptor Species Breeding Territories	587

[1] NSO = No Surface Occupancy; CSU = Controlled Surface Use; TL = Timing Limitation; SLT = Standard Lease Terms.

[2] Stipulations often overlap so cannot be summed to determine the total acreage of stipulations. The units are in acres unless miles are noted.

GMUGNF = Grand Mesa, Uncompahgre, and Gunnison National Forest; TEPC = Threatened, Endangered, Proposed, and Candidate; CRCT = Colorado River cutthroat trout; GBCT = Greenback Cutthroat Trout.



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3/4/2016

Figure 2-1 Preferred Alternative Lease Stipulations (West Section)

April 2016

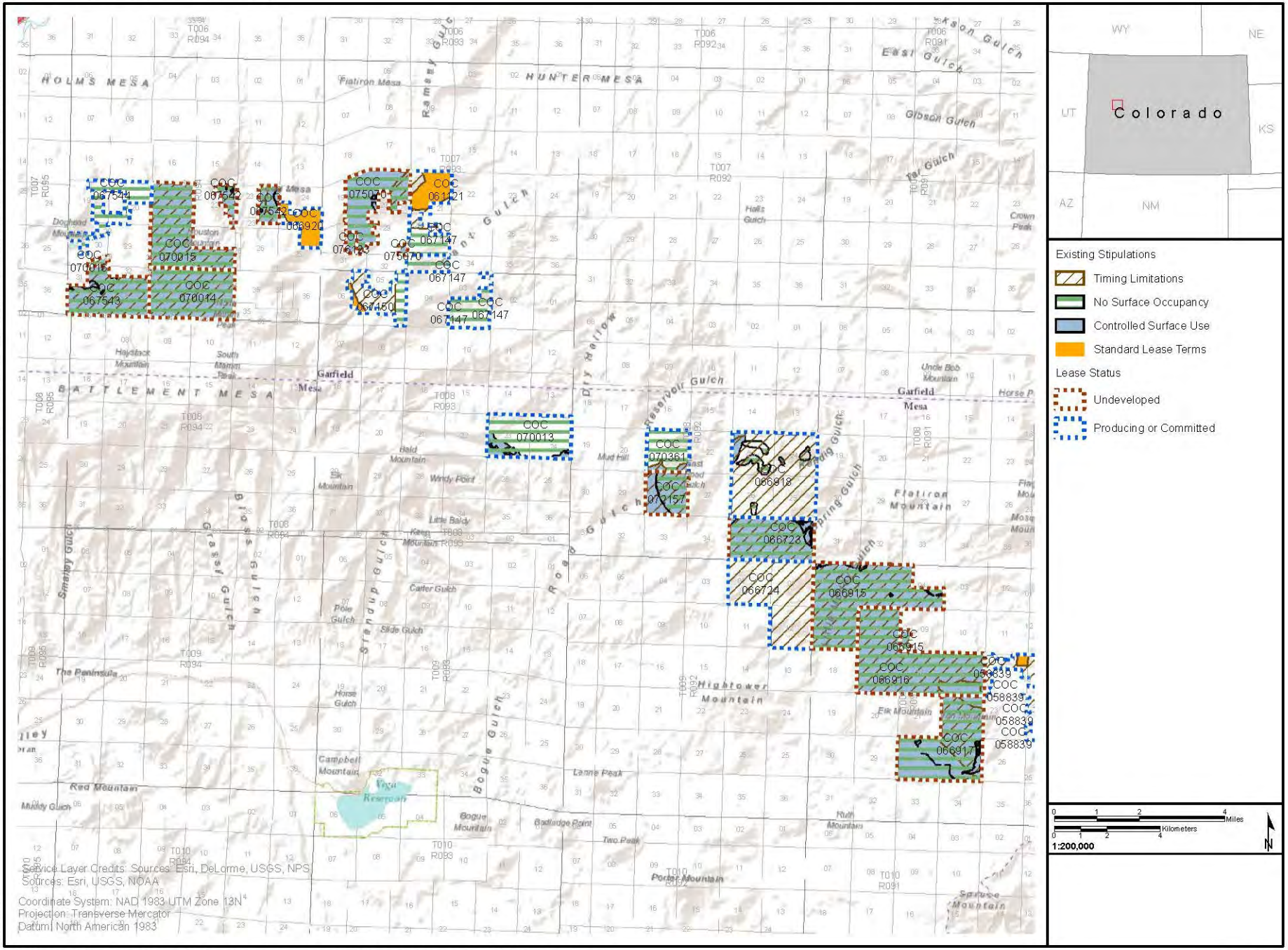

Figure 2-2 Preferred Alternative Lease Stipulations (Middle Section)

April 2016

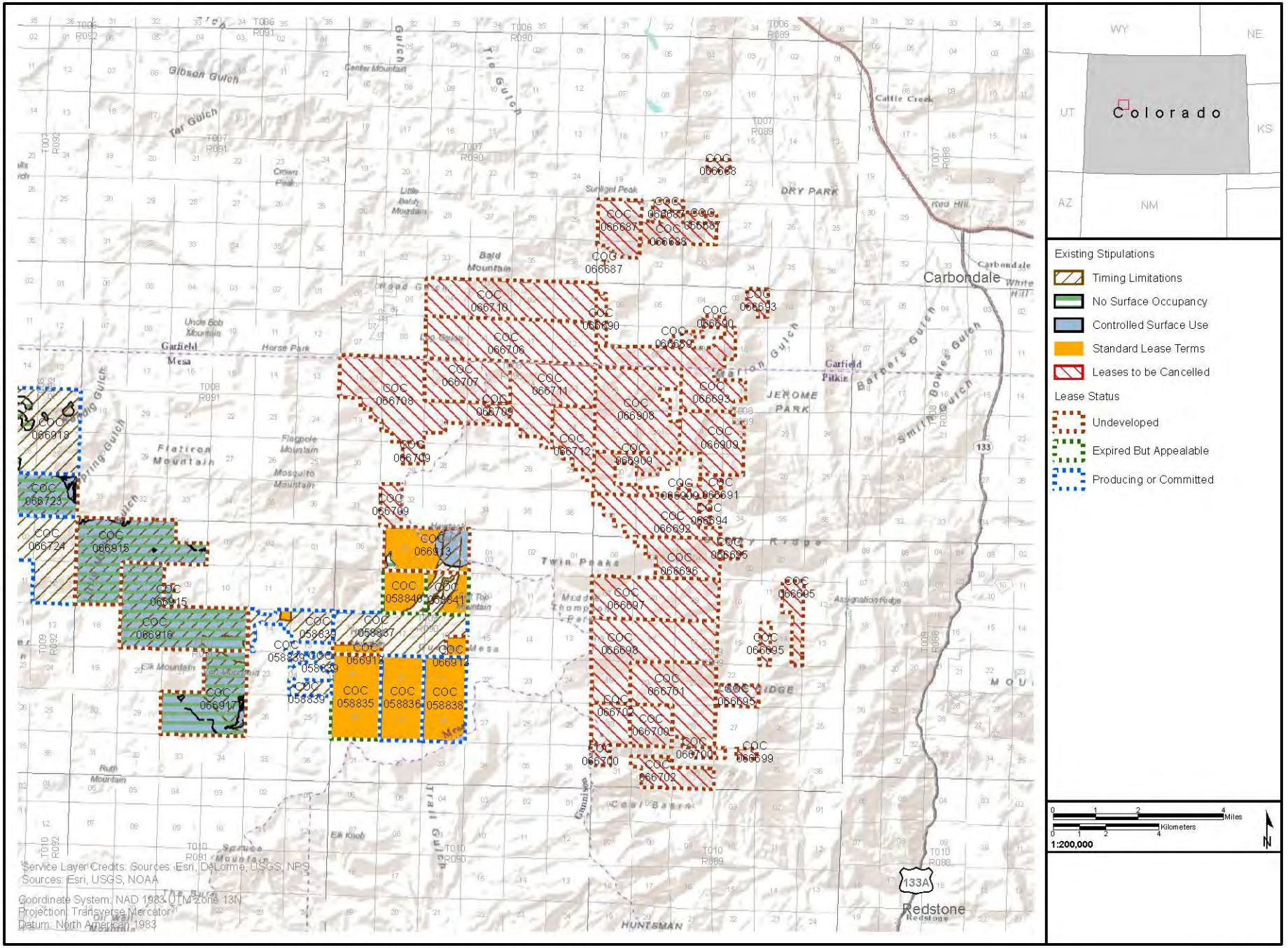

Figure 2-3 Preferred Alternative Lease Stipulations (East Section)

April 2016

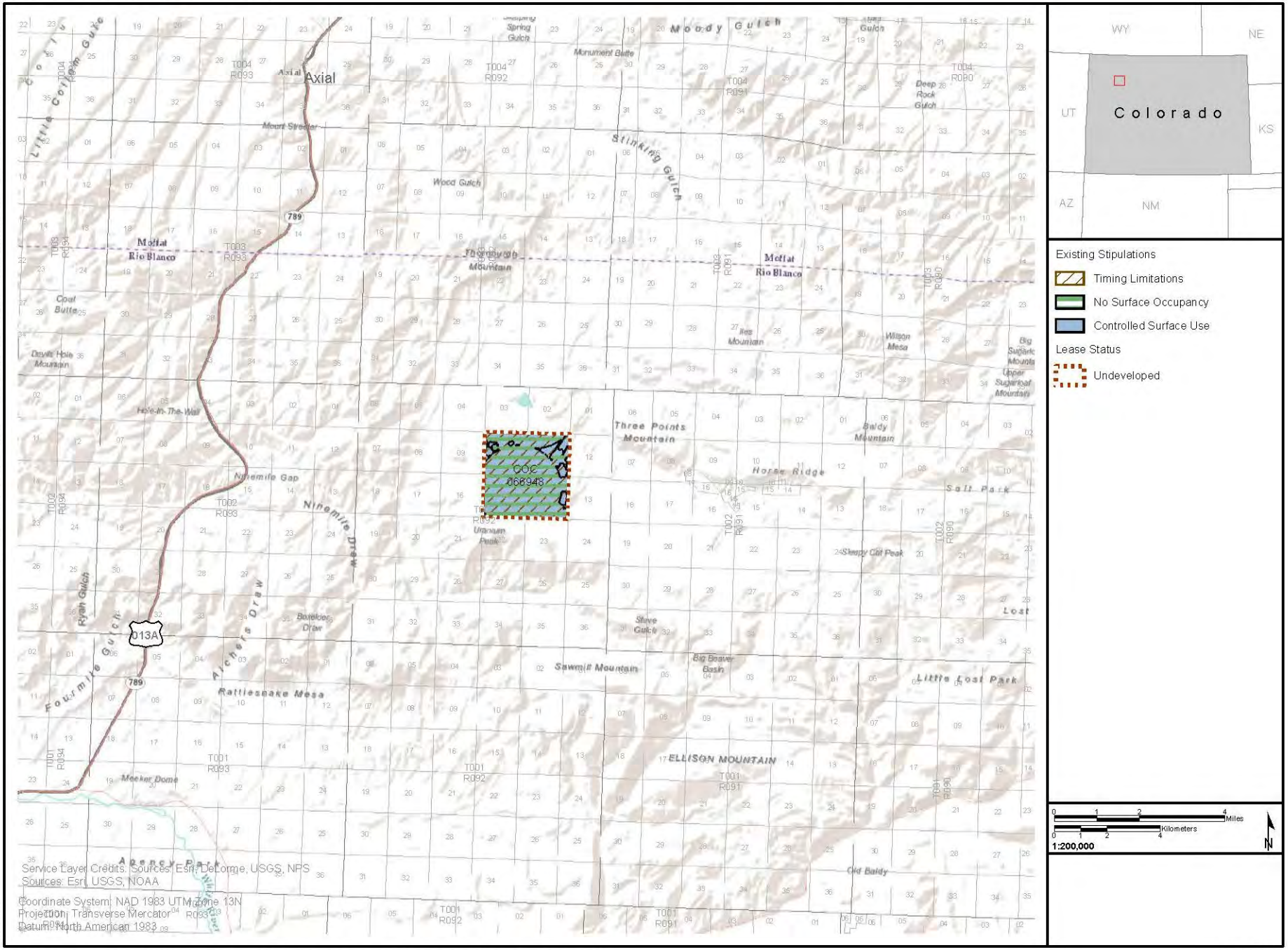

Figure 2-4 Preferred Alternative Lease Stipulations (North Section)

2.1 Rationale for Development of Preferred Alternative Components

This approach is consistent with the BLM's stated purpose and need for the EIS including: 1) fulfilling the federal government's policy of fostering the development of stable industries and orderly development of domestic resources under the Mining and Minerals Policy Act of 1970; 2) meeting domestic energy needs under the requirements of the Mineral Leasing Act, as amended, the Mining and Minerals Policy Act of 1970, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987; and 3) supporting the Forest Service mineral policy that places responsibility on field units to foster and encourage the exploration, development, and production of the mineral or energy resource.

2.1.1 Undeveloped Leases to Be Cancelled

This proposal would affect 33,004 acres on 25 leases in Zone 3. The Forest Service identified management conflicts with future oil and gas leasing and development in the areas where the 25 undeveloped leases to be cancelled are located. Because the leases proposed to be cancelled are not producing or committed to units or agreements and they are located in an area with little past development, the BLM anticipates that the economic benefits to industry from developing these leases would be less than in other parts of the WRNF. The BLM agrees with the Forest Service determination that environmental and resource management needs outweigh oil and gas development benefits in this area. Specifically, cancellation of these leases is needed to "maintain the natural character of the landscape and continue to protect the outstanding wildlife and recreational values" (USFS 2015b).

2.1.2 Undeveloped Leases to Be Modified

This proposal would affect 17,513 acres on 13 leases in Zones 2 and 4. These leases would remain available for development with the modification of existing stipulations to resolve identified conflicts with managing surface resources. The BLM and the Forest Service recognize that there are fewer resource conflicts with oil and gas development in this area. Applying the stipulations proposed under Alternative 4 would ensure that the lease stipulations would be the same as newly issued leases in this area by complying with the Forest Service's decision for future leasing stated in the WRNF ROD (USFS 2015b). If the lessees do not consent to the modified lease terms, the leases would be cancelled administratively. They would be available for future leasing under the same stipulations.

2.1.3 Expired Leases

This proposal would affect 4,411 acres on 4 leases within Zone 3. These leases were previously part of the Willow Creek Unit, which is held by production. In 2011, the BLM contracted the Unit under the automatic contraction provisions of Section 2(e) of the unit agreement (eliminating all lands not in a participating area on the 5th anniversary if there has not been continuous drilling every 90 days). The BLM's decision to remove these 4 leases from the Unit has been appealed to the IBLA, so the specific status of those leases is currently uncertain. Due to this uncertainty, the BLM carried these leases forward in this EIS.

If the IBLA reverses the BLM's decision, then those leases would be considered producing leases and the stipulations under Alternative 2 would apply. If the IBLA affirms the BLM's decision, then they would remain expired and would not be addressed by the BLM's decision. The areas covered by these four leases would remain available for oil and gas leases under the Forest Service's decision (USFS 2015b).

2.1.4 Producing Leases

This proposal would affect 25,452 acres on 23 leases in Zones 1, 2, and 3. These leases are either producing or committed to units or agreements that are producing. For that reason, the BLM recognizes that modification or cancellation of these leases would result in considerable adverse economic impacts and technical challenges for the BLM, the Forest Service, and local governments. These adverse effects,

in an area that already has developed wells and associated infrastructure, may include loss of future production, the potential for orphan wells requiring BLM oversight, plugging and abandonment of wells, uncertain judicial action in the event that cancellation is pursued, and high costs due to abandonment and reclamation. The environmental concerns related to future leasing identified by the Forest Service (USFS 2014a) can be addressed through site-specific mitigation measures, design features, and Conditions of Approval (COAs) at the Application for Permit to Drill (APD) stage of development, as they have been in the past on these leases and units. The producing leases and development plans already have had site-specific Forest Service analysis, concurrence, and approval at the time the permit to drill was issued.

Most of the 23 leases would be reaffirmed with their existing stipulations. One lease (058677) would be affected by a change in stipulations, in order to add approximately 5 acres of timing limitation to correct a noted deficiency. If the lessee does not accept the modified stipulations, the BLM would pursue cancellation, requiring judicial action with an uncertain outcome. Other considerations for these producing leases are summarized below.

- Two leases (067544 and 070361) in Zone 2 would be more constrained by NSO stipulations under Alternative 2 than under Alternative 4.
- Leases 058837, 058838, 058839 in Zone 3, and Leases 061121, 066724, 066918, 066920 in Zone 2 would be encumbered with a considerable increase in NSO stipulations under Alternatives 3 and 4. Because these leases contain existing areas of disturbance and infrastructure that may be used for colocation of future development and access, applying the stipulations under Alternative 2 is preferred by the BLM based on technical and economic considerations.
- Lease 067150 in Zone 2 and Lease 058836 in Zone 3 would be encumbered with a considerable increase in NSO stipulations under Alternatives 3 and 4 but do not have existing areas of disturbance and infrastructure. Future exploration and development would be highly constrained under Alternatives 3 and 4 but, without many resource conflicts identified by the Forest Service the BLM does not see the need to require high constraints that outweigh the technical and economic considerations of development.

2.2 Implementation of the Preferred Alternative Relevant to the Management of Federally Listed Species

Future site-specific analysis would occur when there is a review of onsite resources and conditions after the operator submits a Surface Use Plan of Operation (SUPO) and an APD for oil and gas exploration or development. The onsite review helps to determine the level of NEPA analysis required, such as a categorical exclusion, environmental assessment, or EIS, before a SUPO can be approved and a permit to drill is issued. The site-specific analysis would evaluate requests by operators to approve waivers, exceptions, or modifications of lease stipulations. Regardless of the level of NEPA analysis, the onsite review is used to determine what site- and project-specific design features, best management practices (BMPs), mitigation measures, or COAs would be attached to the SUPO and permit to drill to minimize impacts and protect resources.

The Forest Service, as the land management agency, requires that operations associated with development of each lease must comply with all the rules and regulations of the Secretary of Agriculture set forth at 36 CFR Part II governing the use, occupancy, and management of NFS lands when not inconsistent with existing lease rights granted by the Secretary of the Interior.

The Forest Service authorized officer is responsible for compliance with the ESA prior to any surface-disturbing activities associated with a lease where there are potential effects to species or habitats

protected by the ESA. The results of consultation may indicate a need for modification of or restrictions on proposed surface-disturbing activities.

2.3 Well Numbers by Zone Under the Preferred Alternative

The numbers of wells predicted to be developed under each alternative was determined by starting with the unconstrained development from the RFDS, shown in **Table 2-2**; prorating the well numbers projected for each zone based on past development numbers, production potential, and anticipated drilling technology; and considering the constraints on development, such as NSO stipulations and the maximum distance from the surface location to the target formation. **Table 2-3** displays the estimated number of new wells and pads that are used as the basis for the analysis of effects. Because the number of wells and pads are prorated based on scaling the RFDS projections but the actual numbers and locations of wells and pads is unknown for this leasing analysis, there are fractional numbers for wells and pads only to be used for the analysis of impacts.

Table 2-2 Number of Projected Wells under the Preferred Alternative

Zone/Well Type	Preferred Alternative
Zone 1	
Vertical/Directional Wells	19.7
Horizontal wells	16
Pads	5.1
Zone 2	
Vertical/Directional Wells	318.1
Horizontal wells	1
Pads	45.6
Zone 3	
Vertical/Directional Wells	10.6
Horizontal wells	0.2
Pads	1.5
Zone 4	
Vertical/Directional Wells	10
Horizontal wells	0
Pads	1.4
Totals	
Vertical/Directional Wells	358.4
Horizontal wells	17.2
Pads	53.7

2.4 Development Assumptions

Table 2-3 displays the projected surface disturbance (for well pads, roads, and pipelines), as well as projected water use, transportation needs, staffing requirements, and production forecasts for reasonably foreseeable development under the Preferred Alternative. The totals shown in the table account for the combination of vertical/directional wells and the number of horizontal wells projected under each alternative. These results are used in the analysis of effects.

Table 2-3 Development Assumptions for the Preferred Alternative

	Preferred Alternative
Zone 1 (10,114 acres)	
Initial Surface Disturbance (acres)	77
Long-term Surface Disturbance (acres)	33
Fresh Water Use [1] (acre-feet)	339
Recycled Water Use (acre-feet)	1,091
Gas Production (Bcf)	126
Produced Water (gallons)	81,761,565
Zone 2 (24,938 acres)	
Initial Surface Disturbance (acres)	684
Long-term Surface Disturbance (acres)	296
Fresh Water Use [1] (acre-feet)	675
Recycled Water Use (acre-feet)	1,702
Gas Production (Bcf)	388
Produced Water (gallons)	510,837,600
Zone 3 (42,767 acres)	
Initial Surface Disturbance (acres)	23
Long-term Surface Disturbance (acres)	10
Fresh Water Use [1] (acre-feet)	26
Recycled Water Use (acre-feet)	70
Gas Production (Bcf)	14
Produced Water (gallons)	17,681,236
Zone 4 (2,562 acres)	
Initial Surface Disturbance (acres)	21
Long-term Surface Disturbance (acres)	9
Fresh Water Use [1] (acre-feet)	21
Recycled Water Use (acre-feet)	52
Gas Production (Bcf)	12
Produced Water (gallons)	15,960,000
Total (80,381 acres)	
Initial Surface Disturbance (acres)	805
Long-term Surface Disturbance (acres)	349
Fresh Water Use [1] (acre-feet)	1,061
Recycled Water Use (acre-feet)	2,914
Gas Production (Bcf)	540
Produced Water (gallons)	626,240,401

[1] Includes 20% of completion water (for hydraulic fracturing) that is not recycled.

Note: Assumptions used to calculate this information are derived from **Tables 1-1, 2-2,** and **2-3**.

3.0 Consultation History

Informal activities have been completed to meet the ESA Section 7 consultation requirements for the federal action. These activities involved phone calls and e-mails among the lead agencies, USFWS, and AECOM regarding potential occurrence related to federally listed, proposed, and candidate species within the action area; and review of the USFWS Information, Planning, and Conservation (IPaC) system, the WRNF Oil and Gas Leasing BA (USFS 2015a) and the WRNF Oil and Gas Final EIS (USFS 2014b).

The Forest Service recently consulted on its oil and gas leasing decision in the WRNF through the WRNF Oil and Gas Leasing BA (USFS 2015a) in which all of the species considered in this BA were addressed on a Forest-wide scale. Section III, Consultation History (pp. 29-31) in the Forest Service BA provides more detail on consultation under Section 7 of the ESA for the Forest Plan, plan amendments, leasing decisions, and water depletions due to oil and gas exploration and development within the WRNF.

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4.0 Species Considered in the Analysis

An informal request was made to the USFWS Colorado Ecological Services Field Office on January 25, 2016, to confirm a list of federal species for this action area that included 13 listed species. The initial species lists were developed from data sources, including the USFWS IPaC system, the 2015 WNRF Oil and Gas Leasing BA (USFS 2015a), and published literature on species distributions. The list was confirmed by the USFWS on February 1, 2016, with three species eliminated from further consideration. After further analysis of suitable habitat within the action area, additional BLM consultation with the USFWS determined a forth species (western yellow-billed cuckoo) could be removed from further consideration. The 9 federally listed, candidate, and conservation agreement species (treated as proposed species for consultation purposes) carried forward for detailed analysis in this BA are presented in **Table 4-1**. Species that were eliminated or considered to be unaffected by the federal action are not discussed further in this document. For species with potential to be directly or indirectly affected by the action, species-specific information, including the environmental baseline, assessment of effects, and determinations of effect, are provided in Chapters 6.0 and 7.0 of this BA.

Table 4-1 List of Federal Species Considered

Species Scientific Name	Species Common Name	Federal Listing Status[1]	Associated Habitat Description
Mammals			
Lynx canadensis	Canada lynx	T	Boreal forests.
Fish			
Gila elegans	Bonytail	E[2]	The general types of habitat include mainstem riverine areas and impoundments in the Colorado River system. Deep pools and eddies with slow to fast currents are characteristic of the riverine habitat (USFWS 2002a).
Ptychocheilus lucius	Colorado pikeminnow	E[2]	Habitat requirements of Colorado pikeminnow vary depending on the life stage and time of year. Young-of-the-year and juveniles prefer shallow backwaters, while adults use pools, eddies, and deep runs (USFWS 2002b). 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.
Oncorhynchus clarkii subspecies	Colorado River cutthroat trout (green lineage)[3]	T	Based on genetics (Metcalf et al. 2012) and meristics (Bestgen et al. 2013) research, this lineage of cutthroat trout is native to the Colorado, Gunnison, and Dolores river basins in western Colorado and eastern Utah. It is primarily found in small, headwater streams containing cold, clear water.
Gila cypha	Humpback chub	E[2]	Species mainly occur in river canyons where they utilize a variety of habitats including deep pools, eddies, upwells near boulders, and areas near steep cliff faces. Young and spawning adults are generally found in sandy runs and backwaters (USFWS 2002c).

Table 4-1 List of Federal Species Considered

Species Scientific Name	Species Common Name	Federal Listing Status[1]	Associated Habitat Description
Xyrauchen texanus	Razorback sucker	E[2]	General habitats used by adults include eddies, pools, and backwaters during the non-breeding period (July through March) (USFWS 2002d). Seasonal habitat use includes 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 prefer shallow water with minimal flow in backwaters, tributary mouths, off-channel impoundments, and lateral canals (USFWS 2002d).
Plants			
Phacelia submutica	DeBeque phacelia	T (CH)	Below 6,700 feet within the South Rifle Ranger District near DeBeque, Colorado. Found on sparsely vegetated slopes in clay soils (Atwell Gulch and Shire Members of Wasatch Formation).
Sclerocactus glaucus	Colorado hookless cactus	T	Below 6,700 feet on the South Rifle Ranger District near DeBeque, Colorado. Found on alluvium derived from seleniferous shales (Mancos shale, or members of the Wasatch Formation).
Spiranthes diluvialis	Ute ladies'-tresses	T	Seasonally moist soils and wet meadows of drainages below 7,200 feet in Eagle, Garfield, and Pitkin counties. Sub-irrigated meadows along margins of ditches.

[1] Federal Listing Status: E = Endangered, T = Threatened, and (CH) = Designated Critical Habitat within the Study Area.

[2] Critical habitat is located downstream of the leases.

[3] Considered threatened by the Forest Service until such time as a status review of cutthroat trout in Colorado is completed.

Sources: USFWS 2015a,b; USFS 2015a, 2014a,b.

The species listed in **Table 4-2** were initially considered for this BA based on their known range, but were eliminated from further analysis based on the lack of known occurrence or suitable habitat within the action area.

Table 4-2 Species Considered, but Eliminated from Further Analysis

Species Scientific Name	Species Common Name	Federal Listing Status[1]	Associated Habitat	Reasons for Elimination
Mammals				
Mustela nigripes	Black-footed ferret	E	Large prairie dog colonies found within short-grass prairie.	The lease boundaries are currently located outside the Northwestern Colorado / Northeastern Utah Black–footed Ferret Experimental Population Area and no wild ferrets are documented outside reintroduced populations.

Table 4-2 Species Considered, but Eliminated from Further Analysis

Species Scientific Name	Species Common Name	Federal Listing Status[1]	Associated Habitat	Reasons for Elimination
Birds				
Strix occidentalis lucida	Mexican spotted owl	T	Mixed coniferous forests and hardwood forests in rocky steep-walled canyons.	USFS mapped potential habitats are found within the previous leases area. Additionally, there is no suitable habitat within the previous leases area and this species has not been reported within the lease boundaries.
Coccyzus americanus occidentalis[1]	Western yellow-billed cuckoo	T	Large contiguous blocks of cottonwoods/riparian.	Suitable habitat is not found within the previous leases area and this species has not been reported within the lease boundaries.
Plants				
Eutrema edwardsii spp. *penlandii*	Penland alpine fen mustard	T	Alpine tundra above 11,800 feet. Rooted in mosses on stream banks and wetlands. Endemic to the Mosquito Range in central Colorado	Suitable alpine habitat is not found within the analysis area for this species.

[1] Federal Listing Status: E = Endangered, T = Threatened.

Sources: USFWS 2015a,b; USFS 2015a, 2014a,b.

4.1 Information Sources and Characterization of Habitat

4.1.1 Information Sources

The baseline information summarized in this BA was obtained primarily from data, reports, and references provided by the BLM, the WNRF, and the GMUGNF, supplemented by information and references from other sources. The affected environment for each species is described based on the area where potential environmental impacts are likely to result from the leasing decision and subsequent projected development.

Information regarding federally listed species, their habitat, and the potential for occurrence within the action area was obtained from a review of existing published and unpublished sources and agency reports, including the USFWS IPaC System, the WNRF Oil and Gas Leasing BA (USFS 2015a), WRNF Land and Resource Management Plan (Forest Plan) (USFS 2002a), and the WRNF Final EIS (USFS 2014a).

For species without complete or current occurrence data within the action area, this BA takes a conservative, programmatic approach and assumes that potentially suitable habitat is occupied. Projected effects to these species are therefore based on the extent to which species and potential habitat would be affected by proposed oil and gas development.

Vegetation types and community characterizations are based on vegetation cover types identified through the Forest Service Field Sampled Region 2 Vegetation Data (FSVeg) geospatial database

(USFS 2010b). FSVeg stores data about cover type, dominant vegetative lifeforms, and understory vegetation.

Information regarding aquatic species and their habitats within the action area was obtained from a review of existing published sources, BLM Resource Management Plans, Forest Plan, file information from the BLM, Forest Service, Colorado Parks and Wildlife (CPW) (formerly Colorado Division of Wildlife), and USFWS. Species occurrence information was obtained from CPW (2015) and the BLM (2015b).

4.1.2 Habitat

There are 13 primary vegetation cover types found within the 65 leases that provide habitat for wildlife and plant species (**Table 4-3**). The vegetation cover types presented below are grouped from cover types identified in the FSVeg dataset and include: aspen, Douglas fir/mixed conifer, gambel oak/mixed mountain shrub, grassland/forbland, lodgepole pine, pinyon-juniper, riparian/wetland, sagebrush/shrub mix, saltbush/greasewood, montane shrubland, snowberry, spruce/fir, and unvegetated. Distribution of vegetation types in these areas is strongly influenced by variations in landscape position, soil type, moisture, elevation, and aspect.

Aspen and Spruce/Fir comprise the dominant cover types in the 65 leases. Pinyon-juniper is the dominant cover type for Zone 1. Aspen and Gambel Oak-mixed Mountain Shrub are co-dominant cover types for Zone 2. Aspen is the dominant cover type for Zones 3 and 4. Lodgepole Pine and Saltbush/Greasewood have the least amount of cover in the action area and are only observed in Zone 4 and Zone 1, respectively.

Overall, aquatic habitat in the region includes a mixture of rivers, streams, reservoirs, lakes, ponds wetlands, and springs. In total, approximately 40 miles of perennial streams occur within the areas associated with the leases. River and stream habitats consist of perennial, intermittent, and ephemeral waterbodies. Perennial streams contain water and habitat wetted continuously during a normal or average year, while intermittent (sporadic or periodic flows) and ephemeral (short-lived or transitory) provide temporary habitat for aquatic species. Approximately 108 lakes or reservoirs occur within the 65 leases combined. All of these waterbodies are less than 10 acres in surface area.

Table 4-3 Vegetation Cover Types within the Action Area

Vegetation Cover Type[1]	Zone 1 Acres (%)	Zone 2 Acres (%)	Zone 3 Acres (%)	Zone 4 Acres (%)	Total Percent Cover in the Action Area[3]
Aspen	0 (0)	*7,238 (29)*	*23,066 (54)*	*1,288 (50)*	39
Douglas Fir/Mixed Conifer	1,378 (14)	448 (2)	826 (2)	53 (2)	3
Gambel Oak/Mixed Mountain Shrub	488 (5)	*7,313 (29)*	1,035 (2)	68 (3)	11
Grassland/Forbland	24 (<1)	827 (3)	2,340 (6)	28 (1)	4
Lodgepole Pine	0 (0)	0 (0)	0 (0)	605 (24)	<1
Montane Shrubland	735 (7)	1,040 (4)	160 (<1)	104 (4)	3

Table 4-3 Vegetation Cover Types within the Action Area

Vegetation Cover Type[1]	Zone 1 Acres (%)	Zone 2 Acres (%)	Zone 3 Acres (%)	Zone 4 Acres (%)	Total Percent Cover in the Action Area[3]
Pinyon-Juniper	*5,414 (54)*	335 (1)	7 (<1)	0 (0)	7
Riparian/Wetland[2]	1,635 (16)	2,444 (10)	6,228 (15)	301 (12)	13
Sagebrush/Shrub Mix	740 (7)	3,176 (13)	335 (1)	0 (0)	5
Saltbush/Greasewood	111 (1)	0 (0)	0 (0)	0 (0)	<1
Snowberry	0 (0)	985 (4)	831 (2)	180 (7)	2
Spruce/Fir	181 (2)	3,280 (13)	12,672 (30)	236 (9)	*20*
Unvegetated	1,041 (10)	271 (1)	177 (<1)	0 (0)	2
Total[3]	**10,114 (13)**	**24,938 (31)**	**42,767 (53)**	**2,562 (3)**	**100**

[1] Dominant cover type by zone is *italicized and highlighted.*

[2] The Riparian/Wetland cover acreage was determined separately from the general vegetation by analyzing three separate data sources: FSVeg, National Wetland Inventory, Forest Service Water Influence Zones data, and Forest Service Fen data. It overlaps the general vegetation analysis, and is therefore not included in the Zone Acreage Total or Total Percent Cover in the Analysis Area.

[3] Zone Acreage Total and Total Percent Cover in the Analysis Area represent the total acres and percentages within the lease area. Because the Riparian/Wetland vegetation type was analyzed using a separate data set, it overlaps the other vegetation cover types and percent cover. The zone acreages and percentages do not account for this data overlap and therefore, the individual vegetation acreage is greater than the Zone Acreage Total listed in the table. pproximately 7 acres or 0.01 percent of the total 80,380 acres is not included in the total due to differences in resolution between the FSVeg WRNF dataset compared to the FSVeg GMUGNF dataset.

Source: USFS 2010b.

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5.0 Species Discussion

5.1 Canada Lynx

5.1.1 Natural History

For a comprehensive discussion of lynx natural history, see Ruediger et al. (2000) and Ruggiero et al. (2000). In summary, lynx habitat can generally be described as moist boreal forests dominated by conifer trees, primarily species of spruce (*Picea* spp.) and fir (*Abies* spp.), that have cold, snowy winters and a high-density snowshoe hare prey base (USFWS 2014). In the contiguous U.S., the boreal forest type transitions to subalpine forest in the west. In mountainous areas, the boreal forests that lynx use are characterized by scattered moist forest types with high hare densities in a matrix of other habitats (e.g., hardwoods, dry forest, non-forest) with low hare densities. In these areas, lynx incorporate the matrix habitat (non-boreal forest habitat elements) into their home ranges and use it for traveling between patches of boreal forest that support high hare densities where most foraging occurs. In Colorado, the lynx is found in dense subalpine forest and willow-choked corridors along mountain streams and avalanche chutes (CPW 2014). Native lynx historically occurred sparsely in mountainous areas above 9,000 feet elevation in the Park, Gore, San Juan, and La Plata mountains, and the White River Plateau.

Denning habitat includes forested areas, primarily high elevation spruce-fir, which provide adequate cover and habitat for its primary prey, the snowshoe hare (*Lepus americanus*). Appropriate habitat usually includes a dense understory of thickets and windfalls, and requires minimal human disturbance. Dens typically occur in hollow trees, under stumps, rootwads, or downed logs, within jack-strawed windthrow, or in thick brush. Den sites tend to be in mature or old growth stands with a high density of logs (NatureServe 2004; Ruediger et al. 2000; Ruggiero et al. 2000). Foraging areas include early successional forests with a high density of stems and branches that protrude above the snow. Older forests with understories of conifers and shrubs also provide important foraging habitat, especially for alternative prey species including red squirrels, grouse, and voles. The primary limiting factor for lynx populations is the abundance of snowshoe hare and alternative prey species, which in turn is limited by availability of winter habitat (Ruggiero et al. 2000, Ruediger et al. 2000).

Individual lynx maintain large home ranges generally between 12 to 83 square miles (USFWS 2014). Lynx are active throughout the year; their huge hind feet help them move across heavy snow. Lynx breed in late winter, and after a gestation period of about 9 weeks, females produce a litter of about 4 kittens in April or May (CPW 2014).

5.1.2 Conservation Status

5.1.2.1 Listing Status

The contiguous U.S. Distinct Population Segment (DPS) of the Canada lynx was designated as threatened on March 24, 2000 (65 Federal Register [FR] 16051). This DPS includes lynx inhabiting forested portions of Colorado. In response to a 2002 court order, the USFWS reconfirmed the species' status as threatened (68 FR 40076). A Final Rule on revised critical habitat for the Canada lynx was issued in September 2014 (79 FR 54782). No critical habitat for the Canada lynx has been designated in Colorado. A 5-year species status review was initiated in 2007 (72 FR 19549). Although a formal recovery plan has not been published for the Canada lynx, an interim Recovery Outline was issued in 2005 to guide recovery efforts and critical habitat designation for the DPS until a draft recovery plan is completed (USFWS 2005).

5.1.2.2 Threats, Population Trends, and Recovery

Threats

Persistence of the Canada lynx in the contiguous U.S. appears to be dependent on dispersal from larger populations and maintenance of connectivity between northern and southern populations (Schwartz et al. 2002). For lynx in Colorado, this requires maintaining connectivity between populations in the state, and between populations that could disperse from Canada into Montana and subsequently into Wyoming (Schwartz et al. 2002). Threats affecting the Canada lynx include human alteration of forested habitat, including tree distribution and abundance, species composition, successional stages, and connectivity of forests; and the resulting changes in carrying capacity to sustain lynx populations. Humans have altered forests through timber harvest, fire suppression and conversion of forest lands to agriculture. Forest fragmentation could eventually become severe enough to isolate suitable lynx habitat into small areas, thereby reducing the viability of lynx populations that are dependent on larger areas of forest habitat (USFWS 2005). In addition, one of the primary reasons for listing the Canada lynx is the residual effect of excessive trapping pressure that is believed to have occurred in the 1970s and 1980s (USFWS 2005a). Lynx also have been threatened by inadequacy of existing regulatory mechanisms. Other factors that could pose a threat to lynx population viability include: high traffic roads that bisect lynx habitat and negatively affect lynx behavior and movement, and human alteration of habitat that has led to an increase in lynx competitors such as coyote, bobcat, and mountain lion (USFWS 2005).

Population Trends

From 1999 through 2006, a total of 218 lynx were reintroduced by CDOW into the San Juan Mountains of southwestern Colorado. Reproduction has been documented with 42 dens and a total of 126 kittens located from 2003 through June 2009. No known dens were located in 2007 or 2008, but 5 dens with a total of 10 kittens were documented in 2009, and successful reproduction was documented again in 2010. All known den locations through 2009 were south of Interstate 70. In September 2010, CDOW stated that the lynx reintroduction effort has been successful, and projected that the population should be self-sustaining, based on documented demographic parameters of the reintroduced lynx population. As of summer 2010, DOW stated that all of their benchmarks for a successful lynx reintroduction had been met.

Recovery

The USFWS initially identified the main threat to the Canada lynx contiguous U.S. DPS as the inadequacy of existing regulatory mechanisms to protect the species and its habitat; particularly the lack of protection conferred by Forest Service Land and Resource Management Plans (65 FR 16051). To address this inadequacy, the Forest Service, BLM, and USFWS developed the Lynx Conservation Assessment Strategy (LCAS) to provide a consistent and effective approach to conserve Canada lynx on federal lands across the contiguous U.S. (Ruediger et al. 2000). The LCAS included the identification of Lynx Analysis Units (LAUs). LAUs are based upon 5th and 6th level Hydrologic Unit Codes (HUCs) delineated by the U.S. Geological Survey, and a HUC becomes a LAU when at least 30 percent of the HUC is suitable Canada lynx habitat (USFWS 2005).

The Forest Service and BLM signed 4-year Conservation Agreements with the USFWS in 2000. The Forest Service agreement was revised and renewed in 2005 (USFS and USFWS 2005). The BLM agreement has not been renewed, although the agency continues to work within the agreement. Under the Forest Service and BLM agreements, lynx habitat was mapped on all NFS and BLM-managed lands across the contiguous U.S. and Section 7 consultation is required on these lands. Determination of project effects on lynx is based on the most current science, including the LCAS (Ruediger et al. 2000).The LCAS has since been replaced by the Southern Rockies Lynx Amendment (SRLA) (USFS 2008), which revised forest plans on all NFS lands in the Southern Rocky Mountains, including the WNRF. In 2009, the interagency SRLA Implementation Guide was published, which provides clarification, explanation, and direction on implementing the SRLA (USFS and USFWS 2009).

5.2 Bonytail Chub, Colorado Pikeminnow, Humpback Chub, Razorback Sucker

5.2.1 Natural History

Bonytail Chub

The specific habitat requirements of bonytail are not well understood because the species is extirpated from most of its historic range. The bonytail has been observed in pools and eddies of mainstem rivers. Spawning probably occurs in spring over rocky substrates, rocky shoals, and shorelines. It is possible that flooded bottomland habitats provide important growth and conditioning areas, particularly as nursery habitats for young (USFWS 2002a).

Colorado Pikeminnow

The Colorado pikeminnow migrates hundreds of kilometers between spawning areas and other habitats. Adults require pools, deep runs, and eddies that are maintained by high spring flows. These flows provide channel and habitat diversity, flush sediments from spawning areas, enhance food production, deposit gravel and cobble necessary for spawning, and revitalize backwater nursery habitats. Spawning occurs after spring runoff when water temperatures are between 18 and 23 degrees Celsius (^{o}C). When hatchlings emerge from the spawning substrate, the larvae drift downstream to backwater nursery habitat that has been conditioned by high spring flows (USFWS 2002b).

Humpback Chub

The humpback chub inhabits deep, swift, canyon regions of the mainstem and large tributaries of the Colorado River basin. Adults require eddies and sheltered shorelines that are maintained by high spring flows. These flows provide channel and habitat diversity, flush sediments from spawning areas, enhance food production, deposit gravel and cobble necessary for spawning, and revitalize backwater nursery habitats. Spawning occurs in spring when water temperatures are between 16 and 23^{o}C. The young require flow conditions typical of base-flow conditions along shoreline habitats, including eddies and backwaters (USFWS 2002c).

Razorback Sucker

The razorback sucker inhabits rivers with deep runs, eddies, backwaters, and flooded off-channel areas in spring. In summer, the species inhabits runs and pools in shallow water associated with submerged sandbars. In winter the species inhabits low-velocity runs, pools, and eddies. A variety of local and long-distance movements have been documented for the razorback sucker. Spawning occurs in rivers over cobble, gravel, and sand substrates during spring runoff when water temperatures are greater than 14^{o}C. The young require quiet, warm, shallow water for nursery habitat, including tributary mouths, backwaters, or flooded habitats (USFWS 2002d).

These four fish species occur in segments of the Colorado, White, and Yampa rivers, which are located downstream of the 65 leases. However, they are included in this consultation due to effects associated with the depletion of water from within the Upper Colorado River basin associated with future implementation of the Preferred Alternative. The approximate distance downstream to critical habitat varies depending on the lease zone, as indicated in **Table 5-1**.

Table 5-1 Downstream Distance (Miles) to Critical Habitat from Zones

Species	Zone 2 (miles downstream)	Zone 3 (miles downstream)
Bonytail chub	90	124
Colorado pikeminnow	4	26
Humpback chub	90	124
Razorback sucker	4	26

5.2.2 Conservation Status

5.2.2.1 Listing Status

Four federally endangered fish species (bonytail, Colorado pikeminnow, humpback chub, and razorback sucker) are included in this BA. The listing status of these species is summarized as follows:

- Bonytail Chub—The species was listed as endangered in 1980 (45 FR 27710). In 1994 the USFWS designated seven reaches of the Colorado River system (totaling 312 miles) as critical habitat for the species, including portions of the Colorado, Green, and Yampa rivers in the Upper Basin and the Colorado River in the Lower Basin (59 FR 13374).
- Colorado Pikeminnow—The species (originally named Colorado squawfish) was listed as endangered under the ESA on March 11, 1967 (32 FR 4001). With the 1973 passage of the ESA, the fish retained its endangered status. On March 21, 1994 the USFWS designated six reaches of the Colorado River system (totaling 1,148 miles) as critical habitat for the species, including portions of the Colorado, Green, Yampa, White, and San Juan rivers (59 FR 13374).
- Humpback Chub—The dates for listing the humpback chub are the same as those discussed for the Colorado pikeminnow. On March 21, 1994, the USFWS designated seven reaches of the Colorado River system (totaling 379 miles) as critical habitat for the species, including portions of the Colorado, Green, and Yampa Rivers in the Upper Basin and portions of the Colorado and Little Colorado Rivers in the Lower Basin (59 FR 13374).
- Razorback Sucker—In 1994, the USFWS designated 15 reaches of the Colorado River system (totaling 1,724 miles) as critical habitat for the species, including portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San Juan rivers in the Upper Basin and portions of the Colorado, Gila, Salt, and Verde rivers in the Lower Basin (59 FR 13374).

5.2.2.2 Threats, Population Trends, and Recovery

<u>Bonytail Chub</u>

Threats to the bonytail include streamflow regulation, habitat modification, competition with and predation by nonnative fish species, hybridization, and pesticides and pollutants. Use of hatchery-reared fish will be necessary to establish new bonytail populations. The rate at which populations become established depends on a number of variables related to the species' reproductive success and habitat enhancement (USFWS 2002a). The USFWS conducted a 5-year review of the status of the bonytail chub in 2012. At that time, the majority of the all downlisting criteria/subcriteria had not been met and no change in the endangered status of the bonytail chub was recommended (USFWS 2012a).

<u>Colorado Pikeminnow</u>

Threats to the Colorado pikeminnow include streamflow regulation, habitat modification, competition with and predation by nonnative fish species, pesticides and pollutants (USFWS 2002b). Anthropogenic

mercury emissions can indirectly affect the species, its critical habitat, and its recovery by ambient air exposure, deposition into aquatic habitat and bioaccumulation in diet and in fish tissues. The effects of climate change to Colorado pikeminnow should be considered for each of the threats as those impacts are realized. The USFWS conducted a 5-year review of the status of the Colorado pikeminnow in 2011. At that time, less than half of the downlisting criteria/subcriteria had been met and no change in the endangered status of Colorado pikeminnow was recommended (USFWS 2011a).

Humpback Chub

Threats to the humpback chub include streamflow regulation, habitat modification, predation by nonnative fish species, parasitism, hybridization with other native *Gila*, pesticides, and pollutants (USFWS 2002c). The USFWS conducted a 5-year review of the status of the humpback chub in 2011. At that time, the majority of the downlisting criteria/subcriteria had not been met and no change in the endangered status of humpback chub was recommended (USFWS 2011b).

Razorback Sucker

Threats to the razorback sucker include streamflow regulation, habitat modification, competition with and predation by nonnative fish species, pesticides, and pollutants. The USFWS conducted a 5-year review of the status of the razorback sucker in 2012. At that time, the majority of the downlisting criteria/subcriteria had not been met and no change in the endangered status of razorback sucker was recommended (USFWS 2012b).

5.3 Greenback Cutthroat Trout (Colorado River Cutthroat Trout [Green Lineage])

5.3.1 Natural History

Recent genetic and meristic studies have provided evidence of six historical lineages of cutthroat trout in the Colorado River basin and the Front Range of Colorado (Bestgen et al. 2013; Metcalf et al. 2012). Based on new genetic analysis, it appears that only one true greenback population exists in the region in Bear Creek near Colorado Springs, Colorado. Two lineages of CRCT occur within the lease zones. The blue lineage is native to the Green and Yampa watersheds, while the green lineage is native to the Colorado River, Gunnison, and Dolores river basins. The green lineage may require taxonomic revision and a new subspecies name. Until the taxonomy of these cutthroat trout subspecies is resolved, the USFWS has recommended that federal agencies treat the CRCT Green Lineage (CRCT-GL) as if it is the federally threatened GBCT (*Oncorhynchus clarkia stomias*) (USFWS 2012c). As with GBCT, no critical habitat has been designated for the CRCT-GL.

Green linage fish were thought to be greenback cutthroat trout based on genetic research (Metcalf et al. 2007). However, new genetic (Metcalf et al. 2012) and meristics (Bestgen 2013) research suggests that they are not greenback cutthroat trout. Regardless, the USFWS has recommended that action agencies consult on green lineage fish until such time as a status assessment is completed on this lineage (USFWS 2012c).

The species primarily inhabits small headwater streams with cold, clear water (Behnke 1981). As of November 2012, more than 60 populations of CRCT-GL have been identified in western Colorado (Rogers 2012). Five of these populations reside in the planning area within Zones 2 or 3: Cache, Beaver, West Divide, Little Rock, and Park creeks. A list of stream occurrences and designated conservation populations within Zones 2 and 3 are provided in **Tables 5-2** and **5-3**.

Table 5-2 Perennial Streams in Lease Zone 2 Containing CRCT (Green Lineage)

HUC-12 Name	HUC-12 Number	Stream Name	Stream Miles	Conservation Population
Within Zone				
Upper West Divide Creek	140100050302	West Divide Creek	0.56	Yes: upper portion of stream
Beaver Creek-Colorado River	140100050701	Beaver Creek	0.62	Yes: entire segment
Cache Creek-Colorado River	140100050702	Cache Creek	2.21	Yes: entire segment
		Total	**3.39**	
Outside Zone				
Middle West Divide Creek	140100050304	West Divide Creek	9.18	Yes: upper portion of stream
Beaver Creek-Colorado River	140100050701	Beaver Creek	11.93	Yes: entire segment
Cache Creek-Colorado River	140100050702	Cache Creek	7.51	Yes: entire segment
		Total	**28.62**	

Table 5-3 Perennial Streams in Lease Zone 3 Containing CRCT (Green Lineage)

HUC-12 Name	HUC-12 Number	Stream Name	Stream Miles	Conservation Population
Within Zone				
Thompson Creek	140100040708	Park Creek	1.32	Yes: entire segment
Headwaters West Divide Creek	140100050301	Little Rock Creek	0.11	Yes: entire segment
		West Divide Creek	5.15	Yes: entire segment
Upper West Divide Creek	140100050302	West Divide Creek	0.90	No
		Total	**7.48**	
Outside Zone				
Thompson Creek	140100040708	Park Creek	0.89	Yes: entire segment
Headwaters West Divide Creek	140100050301	Little Rock Creek	2.59	No
Headwaters West Divide Creek	140100050301	West Divide Creek	1.47	No
Upper West Divide Creek	140100050302	West Divide Creek	5.28	No
		Total	**10.23**	

5.3.2 Conservation Status

The population status of the two native CRCT lineages is considered to be stable or increasing due to efforts to reestablish this cutthroat subspecies in historical habitat (BLM 2014a). In 2006, a conservation agreement and strategy was completed for Colorado River Cutthroat Trout in the States of Colorado, Utah, and Wyoming. Signatories to the document include the USFS Region 2 among others. The purpose of the agreement and strategy is to reverse declining population trends and maintain or

increase fish numbers and miles of occupied habitat for conservation populations (CRCT Conservation Team 2006).

Threats to CRCT-GL are similar to threats to other CRCT, including competition and hybridization with non-native trout, whirling disease and other pathogens, habitat loss and alteration, and dewatering.

5.3.2.1 Listing Status

GBCT was listed under the ESA as endangered in 1973 and downlisted to threatened in 1978. Cooperative efforts between the Colorado Division of Wildlife (now CPW), Forest Service, BLM, USFWS and Rocky Mountain National Park have led to a large recovery effort for the GBCT. Critical habitat has not been designated for GBCT.

5.3.2.2 Threats, Population Trends, and Recovery

Primary threats to GBCT include hybridization; competition with nonnative salmonids; overharvest; the effects of fire and firefighting with chemical retardants; increased human population growth within the range of the subspecies; potential for new water depletions; new introductions of nonnative species; fragmentation and genetic isolation of small populations; and the effects of global climate change. In 2009 the USFWS conducted a 5-year review of the status of the GBCT. At that time no change in the threatened status of GBCT was recommended (USFWS 2009). A status assessment for Colorado River Cutthroat Trout – Green Lineage is currently under way.

5.4 DeBeque Phacelia

5.4.1 Natural History

DeBeque phacelia grows at elevations between 5,000 to 7,150 feet on moderately steep and sparsely vegetated slopes, and is restricted to clay soils from the Atwell Gulch and Shire members of the Wasatch Formation. DeBeque phacelia only grows in small patches on soils with suitable characteristics to allow for seed retention and germination. The life cycle ends by late June to early July, and the seeds fall into the cracks of the dried clay soil where they can lay dormant for more than five years until optimal germination conditions are present. The dormant seeds trapped within the soil are likely the species' only method of propagation (USFS 2015a, pg. 38).

DeBeque phacelia is endemic to the southern Piceance Basin in Garfield and Mesa counties, Colorado, within an approximate 12 mile radius from the town of DeBeque. The majority of occupied habitat occurs on lands managed by the BLM; a smaller percentage occurs on private lands, USFS managed lands on the Grand Mesa/Uncompagre/Gunnison and White River National Forests, and lands managed by CPW (USFS 2015a, pg. 38). One population of 55 occurrences is within the area of influence of the Preferred Alternative (Colorado Natural Heritage Project 2013). Of these, 14 occurrences are documented on the WRNF and 41 are documented on adjacent BLM managed lands. The 14 occurrences on the WRNF are entirely within the proposed Horsethief Research Natural Area and also entirely within DCH for the species (USFWS 2012d; USFS 2015a, page 35). Approximately 1,210 acres (4.84 percent) of DeBeque phacelia DCH (approximately 24,987 acres in total) are located in the WRNF oil and gas leasing base analysis area within lands which have already been leased for oil and gas and are held by production (USFS 2015a, pg. 38).

5.4.2 Conservation Status

5.4.2.1 Listing Status

On July 27, 2011, DeBeque phacelia was listed as a federally threatened species under Section 7 of the ESA (76 FR 45054). On August 13, 2012, designated critical habitat was established for the species

(77 FR 48367) (USFWS 2016). A portion of the DCH is found within the base analysis area for the Preferred Alternative.

5.4.2.2 Threats, Population Trends, and Recovery

DeBeque phacelia is inherently vulnerable to habitat loss due to its unique habitat requirements and a very restricted distribution (Ladyman 2003). The species requires a seed bank within suitable soil in order to survive. Significant soil disturbance or erosion would likely reduce or eliminate the seed banks. DeBeque phacelia occupied habitat contains significant gas reserves and resource extraction poses significant threats to the species. In addition to soil disturbance, the DeBeque phacelia is vulnerable to invasive non-native plant species. Livestock grazing which includes soil disturbance as well as herbivory, may be a threat to some occurrences. Climate change could disrupt the reproductive cycle of DeBeque phacelia by altering the weather conditions the species requires for seed bank germination (USFS 2015a, pg. 40).

According to the USFWS Environmental Conservation Online System database, there is currently no formal recovery or conservation plan for this species (USFWS 2016). However, a recovery plan outline was drafted by the Western Colorado Ecological Services Field Office in 2013 and includes measures such as protection of populations and habitat, threat abatement, surveys and monitoring, research, and seed banking (USFWS 2013b). This plan has not yet been implemented.

5.5 Colorado Hookless Cactus

5.5.1 Natural History

The Colorado hookless cactus generally occurs at elevations between 4,200 and 6,500 feet, although individuals are known to occasionally occur at higher elevations. Populations of Colorado hookless cactus occur primarily on alluvial benches (soils deposited by water) along the Colorado and Gunnison rivers and their tributaries and also on lower mesa slopes. The species is often found in association with shadscale, galleta, black sagebrush and Indian ricegrass (USFS 2015a, pg. 40).

Colorado hookless cactus is endemic to west-central Colorado. The Denver Botanic Gardens is currently completing genetic work on the species that may ultimately change the known distribution (USFS 2015a, pg. 40). One population of the species is known to occur in the area of influence of the Preferred Alternative near the WRNF boundary (Colorado Natural Heritage Project 2013). While no occurrences are currently documented on the WRNF, the species was recently identified on BLM managed lands within 100 meters of the Forest boundary near the proposed Horsethief Research Natural Area. This occurrence is part of a larger population extending south of the base analysis area on both the GMUGNF and BLM managed lands (USFS 2015a, pg. 40).

5.5.2 Conservation Status

5.5.2.1 Listing Status

On October 11, 1979, Colorado hookless cactus was listed as a federally threatened species under Section 7 of the ESA (44 FR 58868). On September 15, 2009, the species was officially recognized as one of three distinct species within the Uinta Basin hookless cactus complex (74 FR 47112) and the Colorado hookless cactus retained the original species name. No critical habitat has been designated for this species (USFWS 2016).

5.5.2.2 Threats, Population Trends, and Recovery

Threats to Colorado hookless cactus include collection for horticultural purposes, energy development and resource extraction (including oil, gas, and potential oil-shale development), grazing, off-road vehicle

use, and water development. Additional threats include agricultural developments, pesticide use, and competition with invasive non-native species (USFS 2015a; pg. 42).

No formal recovery or conservation plan for this species exists; however, a recovery plan outline was drafted by the Colorado Ecological Services Field Office in 2010. The outline proposes to change the recovery priority of the species from 14C to 8C. This change reflects a change from a low degree of threat to the Uinta Basin hookless cactus complex to a moderate degree of threat to the more range-limited Colorado hookless cactus. Additional surveys and monitoring; threat abatement, and research also are proposed (USFWS 2010). The plan has not yet been implemented.

5.6 Ute ladies'-tresses

5.6.1 Natural History

Ute ladies' tresses orchid has only three known populations in Colorado including dispersed distribution along the Front Range, Dinosaur National Monument and in the greater Carbondale area. Ute ladies' tresses orchid occurs between the elevations of 4,300 to 7,200 feet in wet meadows associated with perennial stream terraces, sparsely forested and non-forested flood plains, and stream oxbows. It also is found in sub-irrigated meadows and along the ditch banks. Orchids typically produce seeds requiring specific symbiotic associations with mycorrhizal fungi for germination. The seeds can be dispersed by water, wind, and gravity. The fungal associate also may be necessary for the survival of mature plants (USFS 2015a; pg. 42).

In Colorado, the Ute ladies' tresses orchid is documented along the front-range in Garfield, Eagle, Boulder, El Paso, Jefferson, Larimer, Moffat, and Weld counties. In the greater Carbondale area approximately 2,000 plants are documented (USFWS 2012d). Approximately half of the known Ute ladies' tresses orchid populations in Colorado consist of fewer than 100 individuals. The species exhibits prolonged dormancy during which a proportion of the plants do not emerge in any given year. Population counts are therefore only a subset of the total number of individuals and numbers fluctuate dramatically from year-to-year (USFS 2015a, pg. 42).

There are no known populations of Ute ladies'-tresses within or near the leases (USFS 2015a, pg. 42). The leases are at the edge of the suitable range for this species. Ute ladies'-tresses is not likely to be found in drainages within the lease areas, since these drainages are generally steep and not likely to provide suitable habitat. In floodplains, necessary USACE permitting would discourage and potentially prohibit development.

5.6.2 Conservation Status

5.6.2.1 Listing Status

In January 17, 1992, the Ute Ladies-tresses was determined to be a Federally Threatened species under Section 7 of the ESA (57 FR 2048). No critical habitat has been designated for this species (USFWS 2016).

5.6.2.2 Threats, Population Trends, and Recovery

Habitat loss and modification, over-collection, competition with invasive non-native species, and herbicide use are the primary threats to the long term survival of the Ute ladies'-tresses orchid. Vegetation succession also is a potential impact to the species by altering the composition of riparian and wet meadow vegetation. Successful conservation of Ute ladies' tresses also would require protecting pollinator habitat in and around known orchid populations and in suitable habitat (USFS 2015a; pg. 43).

No formal recovery or conservation plan exists for this species (USFWS 2016). A draft recovery plan was issued by USFWS Region 6 (Colorado) in 1995, which included surveys and monitoring, habitat management, habitat creation, and protection and research (USFWS 1995). Initial research has been partially completed, but the status of the plan implementation is reported as “ongoing, not current” (USFWS 2016).

6.0 Assessment of Effects

6.1 Environmental Baseline

The term "environmental baseline" refers to current conditions including the past and present impacts of all federal, state, or private actions and other human activities in an action area, the anticipated impacts of all proposed federal projects in an action area that have already undergone formal or early Section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process. According to the BA for the WNRF Oil and Gas Leasing (USFS 2015a, pp. 46-47), most of the activities that have had effects on WNRF lands occurred (and may be ongoing) prior to the signing of the Forest Plan. The primary past and present actions with surface disturbance affecting the resources analyzed in this BA include mineral development; road development and other land development such as rights-of-way (ROWs) for pipelines, telephone lines or other developments. **Table 6-1** presents total quantifiable past and present surface disturbance by area of analysis for all of the species analyzed in this BA. Other past and present actions, such as farming, timber harvests, livestock grazing, and vegetation treatments also may affect species considered in this BA but do not have quantifiable surface disturbance.

Table 6-1 Past and Present Surface Disturbing Actions by Area of Analysis

Past/Present Actions	Long-term Disturbance by Area of Analysis[1] (acres/ percent)		
	Lease Area	HUC-12	Lynx
Mineral Development[2]	38 / <1	2,658 /<1	693 /<1
Transportation Corridors[3]	91 / <1	1,460 /<1	669 /<1
Other Land Development	325 / <1	1108 /<1	695 /<1
TOTAL	**454 / <1**	**5,226 /<1**	**2,057 /<1**

[1] Area of Analysis for each species is further defined in the assessment of effects below.

[2] Number of wells by Area of Analysis: Lease Area-75; Lease+2 miles -1,180, HUC-12-5,315; Big Game-8,523; Sage-Grouse-43; Lynx-1,385; Range-183; Special Designations-5. Well count incudes all COGCC well categories except "permitted locations". Long term surface disturbance assumptions: Wellpad size- 0.5 acres per well (see Chapter 2).

[3] Disturbance acreages for roads assume the following widths: Interstate: 72 feet (4 lanes); principal arterial: 60 feet (4 lanes); minor arterial: 60 feet (2 lanes); major collector: 30 feet (2 lanes); minor collector: 15 feet (2 lanes); local road: 22 feet (1 lane).

Source: BLM 2015c, 2014b, COGCC 2015, CDOT 2015, USDOT 2013.

6.1.1 Direct and Indirect Effects

Leasing, by itself, would not directly impact the species analyzed in this BA but, given that the development of the leases is a reasonably foreseeable result of the granted lease right, the impact analysis considers the potential impacts of reasonably foreseeable future development. The basis for the analysis of future oil and gas development is the RFDS for Oil and Gas Activities on the WRNF (USFS 2010a), which has been scaled to the amount of development feasible under the Preferred Alternative (see Section 2.3). It should be noted that many of the reasonably foreseeable wells may extract minerals from each lease using directional or horizontal well bores so that well pads may be located either on-lease or off-lease.

Using the assumptions for average initial and long-term surface disturbance for well pads, roads, and pipelines and the estimated number of wells per pad, acres of surface disturbance were calculated for each lease and totaled for each lease zone (**Table 2-3**). Surface disturbance is an important factor in

predicting the potential impacts for most of the resources that are analyzed. Until the actual locations and number of proposed wells are known, the analysis of impacts from fluid mineral development cannot be site-specific. For this reason, the impacts analyses focuses on the extent of protection of surface resources that would result from implementation of the stipulations proposed under each alternative and the potential risk to the resources where no protection through stipulations would occur. The extent to which different types of stipulations vary across the alternatives is analyzed in detail in this chapter.

Because this is a leasing analysis with general projections of the amount of development likely to occur within each lease, analysis of site-specific conditions or potential impacts in precise locations cannot be addressed until the APD stage of permitting, when onsite surveys and site-specific NEPA analysis is completed and mitigation measures or management practices are prescribed. All permitted activities that could affect federally threatened or endangered species would be required to undergo ESA Section 7 consultation with the USFWS, and would need to be mitigated to ensure that those species would not be adversely affected on a project-specific basis or at a cumulative level. The BLM would implement measures to conserve BLM sensitive species and their habitats to reduce the likelihood and need for these species to become listed. Success of mitigation depends on the specific protective measures employed and the assumption that proper implementation of these measures would take place. Adaptive management would be used (i.e., changing techniques, as necessary) until success is achieved.

The impact analyses assume that the environmental protection measures required by Forest Service and BLM policies and guidelines would be successfully implemented. It also assumes that operators and lessees would comply with applicable state and federal regulations and conditions of required permits. As noted in Section 2.2, specific environmental protection measures, such as project design features, BMPs, and COAs, would be evaluated during the onsite review at the APD stage of oil and gas development. These measures would become part of the Forest Service SUPO and the permit to drill issued by the BLM. Because site-specific locations and conditions are unknown at this time, recommended mitigation measures have not been incorporated and are deferred to future NEPA and ESA Section 7 analyses.

Under the Preferred Alternative, depending on habitat, all threatened and endangered species would have the potential to be impacted directly and indirectly by oil and gas development. Reduction of impacts from surface-disturbing activities would be in place for associated habitats through the application of NSO stipulations specific to these species and their associated habitats, as well as non-resource-related NSO stipulations. Limited protection from surface-disturbing activities to all threatened and endangered species would be potentially applied as a CSU in this Preferred Alternative. Potential protection from behavioral disturbance during winter months would be applied as a TL.

Additionally, general lease notice protections and protections from the USFS Forest Plans standards and guidelines will guide the application of site-specific USFS COAs to protect threatened and endangered species. The lease notice applied to each of the current USFS leases for threatened and endangered species is as follows:

> *ENDANGERED OR THREATENED SPECIES - The FS is responsible for assuring that the leased land is examined prior to undertaking any surface-disturbing activities to determine effects upon any plant or animal species listed or proposed for listing as endangered or threatened, or their habitats. The findings of this examination may result in some restrictions to the operator's plans or even disallow use and occupancy that would be in violation of the Endangered Species Act of 1973 by detrimentally affecting endangered or threatened species or their habitats.*
>
> *The Lessee/operator may, unless notified by the FS that the examination is not necessary, conduct the examination on the leased lands at his discretion and resource specialist approved by the FS. An acceptable report must be provided to the FS identifying the anticipated effects of a proposed action on endangered or threatened species or their habitats.*

The lease notice applied to new leases for threatened and endangered species is as follows:

> *THREATENED OR ENDANGERED SPECIES (The Endangered Species Act. (ESA), P.L. 93-205 (1973), P.L. 94-359 (1974), P.L. 95-212 (1977), P.L. 95-632 (1978), P.L. 96-159 (1979), P.L. 97-304 (1982), P.L. 100-653 (1988)).*
>
> *The Forest Service authorized officer is responsible for compliance with the Endangered Species Act. This includes meeting ESA Section 7 consultation requirements with the U.S. Fish and Wildlife Service prior to any surface disturbing activities associated with this lease with potential effects to species and/or habitats protected by the ESA. The results of consultation may indicate a need for modification of or restrictions on proposed surface disturbing activities.*
>
> *The lessee or operator may choose to conduct the examination at their cost. Results of the examination will be used in any necessary ESA consultation procedures. This examination and any associated reports, including Biological Assessments, must be done by or under the supervision of a qualified resource specialist approved by the Forest Service. Any reports must also be formally approved by the USDA Forest Service biologist or responsible official.*

The following direction applies to implementation of standards and guidelines for all species of viability concern on the WRNF. Specifically, this applies to the WRNF Forest Plan (USFS 2002a) sections on proposed, threatened, endangered and sensitive species, species of viability concern—aquatic, species of viability concern—plants, and species of viability concern—terrestrial. It also applies to lynx direction found in Management Area 8.25—ski areas, existing and potential. Within Management Area 8.25, lynx direction can be found under the heading *Threatened Species – lynx*, Guidelines #1 and #2. The direction found in the standards and guidelines in these sections is intended to ensure the viability of all species of concern. Specifically:

- **Standards:** All standards must be met.
- **Guidelines:** The intent of guidelines must be met. Many guidelines have two components, a quantitative part (distance, %, etc.), and a statement of intent. If the quantitative part cannot be met, it must be documented in the appropriate NEPA document. The NEPA document must show how the intent of the guideline is met, or how progress is made towards the conditions described in the guidelines.

Finally, the cancellation of the 25 undeveloped leases in full in Zone 3 provides beneficial effects to threatened and endangered species within the analysis areas. As a result, there would be no anticipated alteration of habitat related to oil and gas development within the cancelled leases that could affect threatened and endangered species and their associated habitats.

6.1.2 Cumulative Effects

Under the ESA, cumulative effects include future non-federal (i.e., state, local, or private) activities that are reasonably certain to occur within the action area (50 CFR 402.02), and would have potential to affect one or more of the same species that would be affected by the Preferred Alternative. No future non-federal actions are reasonably certain to occur within the lease boundaries. Very little information was found on non-federal activities outside the action area. In addition, no reasonably foreseeable non-federal future actions on state lands have been identified within the vicinity of the action area. Therefore, cumulative effects to the species would be a result of actions involving surface disturbance or water depletions on private lands adjacent to the action area that may include private and commercial development (e.g., private homes, housing developments); private oil and gas development; water development projects; mining; agricultural practices; herbicide use; and livestock grazing.

6.2 Canada Lynx

6.2.1 Area of Analysis

The Canada lynx analysis area consists of all identified habitats within the seven Lynx Analysis Units (LAUs) that are overlapped by the leases. LAUs are management areas that contain suitable lynx habitat and approximate the size of a female home range. The analysis area is approximately 510,804 acres including the following LAUs: Aldrich Lakes, Battlement, Crystal West, Divide Creek, Huntsman Mountain, Ruth Mountain, and South Mamm Peak (**Table 6-2**).

Table 6-2 Habitat Types within the Canada Lynx Analysis Area

LAU	Lynx Habitat Condition (acres)					
	Denning	Denning /Winter	Winter Forage	Other	Unsuitable	Total [1]
Aldrich Lakes	5,364	0	10,306	6,394	290	22,354
Battlement	8,544	285	6,879	9,231	25	24,964
Crystal West	14,601	<1	20,789	10,882	3	46,275
Divide Creek	10,954	176	13,725	8,819	37	33,711
Huntsman Mountain	1	467	4,352	8,371	4	13,195
Ruth Mountain	2	8,304	621	6,231	0	15,159
South Mamm Peak	1	3,029	327	2,050	1	5,180
Total	**39,468**	**12,261**	**56,999**	**51,978**	**359**	**160,838**
Percentage of the Analysis Area	8%	2%	11%	10%	<1%	32%

[1] LAU acreage in each column cannot be totaled in the South Mamm Peak LAU because of overlapping areas. The total in this column excludes the overlapping acreage.

Note: The remaining areas within the LAUs include non-habitat (38%), private inholdings (5%), and the area within the LAU boundary that extends beyond the WRNF lands that does not have a category assigned so it is unknown. This totals 68% of the LAU and is all outside the WRNF and the 65 leases.

Portions of the White River National Forest (WRNF) have seen wide-spread insect epidemics that have affected large areas of forested habitats in lodgepole pine and to a lesser extent in spruce/fir. Sudden aspen decline has also occurred. Spruce beetle epidemics are currently centered around the Fourmile Creek/Baylor Park, and Triangle Park areas within the Crystal West LAU. The mountain pine beetle epidemic is essentially over but has impacted thousands of acres of lodgepole pine throughout the WRNF with the least amount of impact in Pitkin, Rio Blanco, and Garfield Counties. Areas of sudden aspen decline are widely dispersed across the WRNF. An interim Forest-wide lynx habitat remapping effort was done in 2011 in order to better estimate forest mortality. The WRNF has not changed its lynx habitat model yet to reflect new direction in the Southern Rockies Lynx Amendment (SRLA). Lynx habitat is still classified as denning, winter foraging, and other, instead of primary and secondary lynx habitat.

Within the analysis area, 8 percent (39,468 acres) of lynx habitat is currently suitable denning habitat and 11 percent (56,999 acres) of lynx habitat is currently suitable winter foraging habitat. Please note that denning habitat also provides winter foraging habitat and approximately 2 percent or 12,261 acres of habitat are categorized as denning/winter. An additional 51,978 acres (10 percent) of lynx habitats are classified as lower quality habitats than those considered to be suitable for denning or winter foraging. These are forest habitats with open canopy closures, young aspen/mixed conifer stands, lodgepole pine pole stands, and willow, sagebrush, and pure aspen stands within 500 meters of lynx denning and winter foraging habitats. These lower quality lynx habitats are shown as “Other Lynx Habitat” in **Table 6-2**.

There are 359 acres (<1 percent) of lynx habitat in the analysis area that are currently unsuitable to support lynx but may become suitable in the future. These unsuitable lynx habitats are young forest stands that do not yet provide winter snowshoe hare habitat. Forest habitats with high levels of tree mortality are included in the currently unsuitable category.

Lynx landscape linkages are important areas delineated by the USFS and US Fish and Wildlife Service to manage lynx movement corridors between larger blocks of lynx habitat. These linkages are also important to other wildlife species to provide landscape connectivity. Lynx linkage areas that connect LAUs that fall within the Canada lynx analysis area include McClure Pass and Battlement Mesa. However, only the Battlement Mesa linkage area is found within the lease boundaries; 7,657 acres or 35 percent of this area is found in Zone 2 (**Figures 6-1** and **6-2**).

6.2.2 Direct and Indirect Effects

The Lynx Conservation Assessment and Strategy (LCAS) identified possible risk factors to lynx and lynx habitat. The identified risk factors of this project include those actions that affect lynx productivity, mortality, and movement.

Lynx require certain habitat elements for productivity. Generally, these elements include denning and foraging habitat. Denning habitat is found in areas that provide large woody debris, either down logs or root wads. Foraging habitat is found on sites that contain a high number of young trees or shrubs that are tall enough to protrude above the snow. These conditions may occur in early successional stands following some type of disturbance, or in older forests with a substantial understory of shrubs and young conifer trees. Activities associated with oil and gas development can potentially affect the amount, distribution and condition of lynx denning and foraging habitat by directly removing or fragmenting habitat and indirectly by causing avoidance of those areas due to human activity. Predators may also affect lynx productivity. Lynx have developed a competitive advantage in places where the deep, soft snow tends to exclude other predators in midwinter, a time when prey is most limited. Activities that result in snow compaction or removal provide access to predators to areas that would not be accessible otherwise. These activities include human developments such as road maintenance associated with oil and gas activities (SRLA).

Several factors can directly affect lynx mortality. Highways and roads are a known conduit of direct mortality due to vehicular collisions. Activities that increase the presence of competing predators also can be a factor in lynx mortality by reducing the amount of prey available, resulting in starvation of the lynx and also predation of lynx individuals. As mentioned above, oil and gas activities can result in easier access for predators into areas that would be inaccessible otherwise. Additionally, oil and gas related activities can result in direct mortality from vehicle collisions and in rare circumstances, poaching.

Lynx have large home ranges and may move long distances. Within lynx home ranges, roads and associated high-intensity uses and developments may constrain habitat use and impede daily movements. At a broader scale, lynx are known to disperse and make exploratory movements across long distances and varied habitat and terrain. Maintaining connectivity within and between lynx subpopulations is an important consideration to maintain long-term persistence. Activities such as roads and associated oil and gas developments may impede lynx movements (SRLA).

As federally leased areas are developed, they add to the overall fragmentation of the landscape in the Southern Rocky Mountains. If these developed areas occur adjacent to each other, there is a higher likelihood that lynx will have a more difficult time moving across these portions of the Southern Rocky Mountain landscape. As noted by Buskirk et al. (2000a), lynx and snowshoe hare habitats are more prone to a metapopulation structure in western forests due to fragmented landscapes and heterogeneous distribution of topographic, climatic and vegetative conditions. This condition is further exacerbated by the presumably greater human-caused fragmentation of lynx habitat in the south

(Buskirk et al. 2000a). What little is known about lynx populations in the contiguous U.S. indicates that the subpopulations are not large. Until more is known about the current distribution and size of these small subpopulations, it is unwise to assume they can be reduced or further isolated without increasing risk to the species (McKelvey et al. 2000a).

Although it is unknown where future oil and gas development may occur, some general conclusions may be made based on how much lynx habitat is covered by No Surface Occupancy (NSO) stipulations under the Preferred Alternative and the expected distribution of new well pads, facilities, and road and pipeline construction that would access well pads as identified by the Reasonable Foreseeable Development Scenario (RFDS).

As detailed in **Table 6-3**, approximately one fifth of lynx habitat in the seven LAUs falls within lease boundaries and is therefore potentially affected by the Preferred Alternative. However, under the Preferred Alternative two-thirds fall within leases that will be cancelled, therefore eliminating the impacts to lynx from the Preferred Alternative in those areas (**Figures 6-1** and **6-3**). Additionally, of that remaining area, 78 percent would be covered by NSO stipulations with approximately 77 percent of that being covered with an NSO specifically for TEPC species, including lynx. Approximately 8 percent of the leased area, and less than 1 percent of the analysis area, does not have any cancelled leases or NSOs overlying the surface to protect lynx. The majority of that area falls within leases that are already producing or committed. However by law and per the previously noted “lease notice” attached to each lease, all permitted activities that could affect federally threatened or endangered species would be required to undergo ESA Section 7 consultation with the USFWS, and would need to be mitigated to ensure that those species would not be adversely affected on a project-specific basis or at a cumulative level. Additionally, some of the unprotected area falls within leases that are currently expired but appealable (**Figure 2-3**).

Table 6-3 Habitat with Protection Within the Canada Lynx Analysis Area

LAU	Acres Lynx Analysis Area	Acres habitat within leases considered	Acres lynx habitat within cancelled leases (% of habitat in leases)	Acres/% coverage- NSO for TEPC Wildlife (% of habitat in leases)	Acres/% coverage- All NSO (% of habitat in leases)[1]	Remaining Acres in Leases (% of habitat in leases)
Aldrich Lakes	22,354	1,239	0 (0%)	1,239 (100%)	1,239 (100%)	0 (0%)
Battlement	24,964	5,336	0 (0%)	3,348 (63%)	4,989 (93%)	347 (7%)
Crystal West	46,275	13,090	12,929 (99%)	0 (0%)	0 (0%)	161 (1%)
Divide Creek	33,711	9,280	6,549 (71%)	1,017 (11%)	1,052 (11%)	1,679 (18%)
Huntsman Mountain	13,195	122	100 (82%)	0 (0%)	0 (0%)	22 (18%)
Ruth Mountain	15,159	12	0 (0%)	7 (58%)	12 (100%)	0 (0%)
South Mamm Peak	5,180	0	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Grand Total	160,838	29,079	19,578 (67%)	5,611 (19%)	7,292 (25%)	2,209 (8%)
Percentage of the Analysis Area (510, 804 acres)	32%	6%	4%	1%	1%	<1%

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Aldrich Lakes
COC 066948
Inset Map Location is Approximately 40 Miles North of Main Map Extent.
T.2N R.92W

GARFIELD COUNTY
MESA COUNTY
GARFIELD COUNTY
PITKIN COUNTY
T.8S R.91W
T.8S R.90W
T.8S R.89W
T.9S R.91W
T.9S R.90W
T.9S R.89W
Fourmile Creek
West Divide Creek
Dry Hollow Creek
Crystal West
Divide Creek
Ruth Mountain
Huntsman Mountain

COC 066687
COC 066688
COC 066710
COC 066706
COC 066690
COC 066689
COC 066693
COC 066707
COC 066708
COC 066711
COC 066908
COC 066712
COC 066909
COC 066691
COC 066709
COC 066692
COC 066694
COC 066913
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COC 058841
COC 066697
COC 066695
COC 058839
COC 058837
COC 066698
COC 066701
COC 058836
COC 058838
COC 058835
COC 066700
COC 066699
COC 066702
COC 066918
COC 066723
COC 066724
COC 066915
COC 066916
COC 066917

Legend

Project Features

Lease Zones
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Lease Boundary

Lynx Potential Habitat
- Denning
- Denning/Winter
- Winter
- Unsuitable
- Other
- Linkage Area
- Lynx Analysis Unit

Stipulations Coverage Under Preferred Alternative
- NSO-TEPC Wildlife Species
- Leases to be Cancelled

Boundaries
- County Boundary
- Township/Range
- Urban Area

Hydrology
- Stream/River
- Lake/Reservoir

Highways
- Interstate
- Highway

Surface Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Local
- Private
- US Forest Service

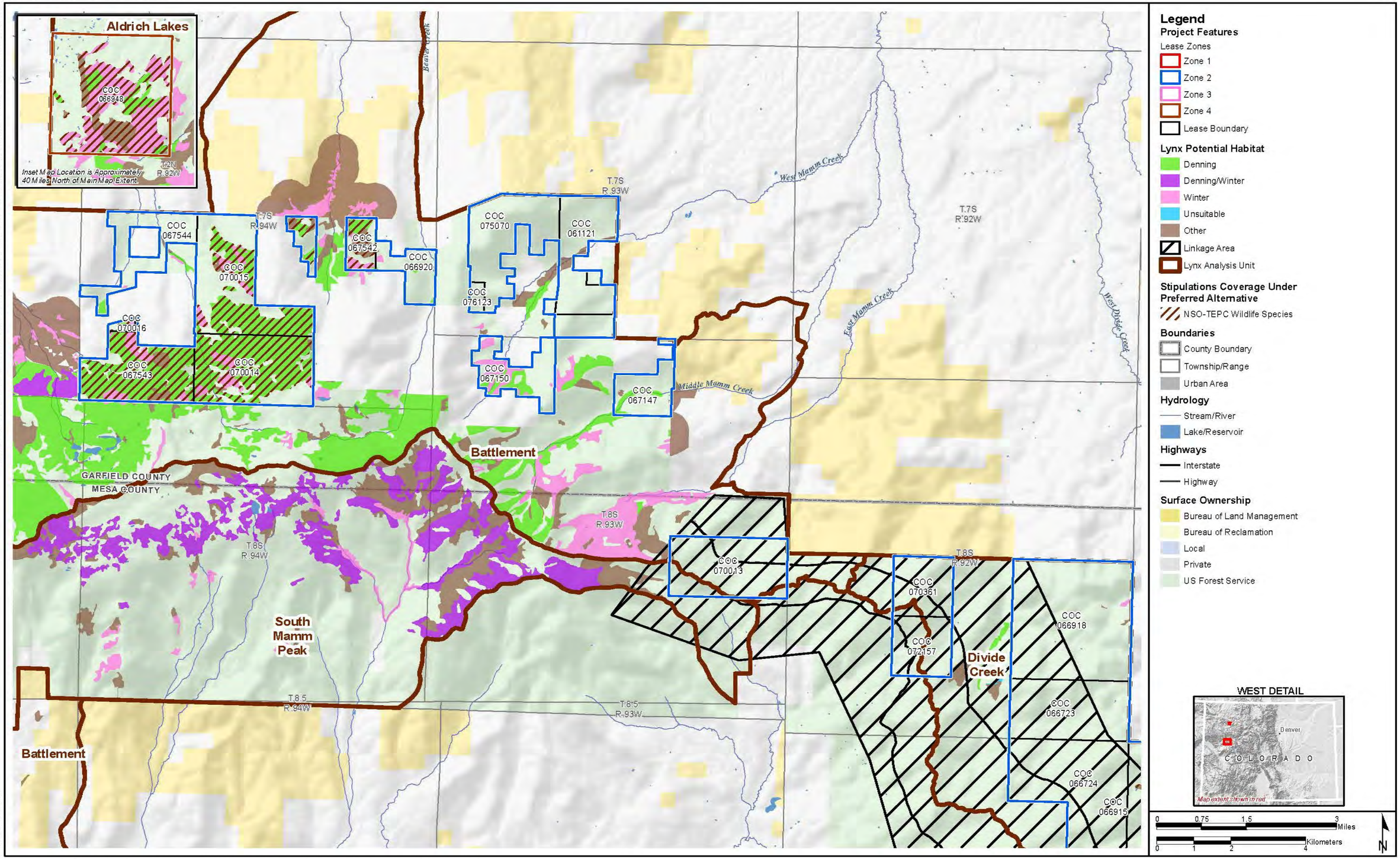
EAST DETAIL
Denver
C O L O R A D O
Map extent shown in red

0 0.75 1.5 3 Miles
0 1 2 4 Kilometers
N

Date: 4/6/2016

Figure 6-1 Canada Lynx Habitat with Resource Specific Stipulation Coverage and within Cancelled Leases (East)

April 2016



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Date: 4/7/2016

Figure 6-2 Canada Lynx Habitat with Resource Specific Stipulation Coverage (West)

April 2016

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Date: 4/6/2016

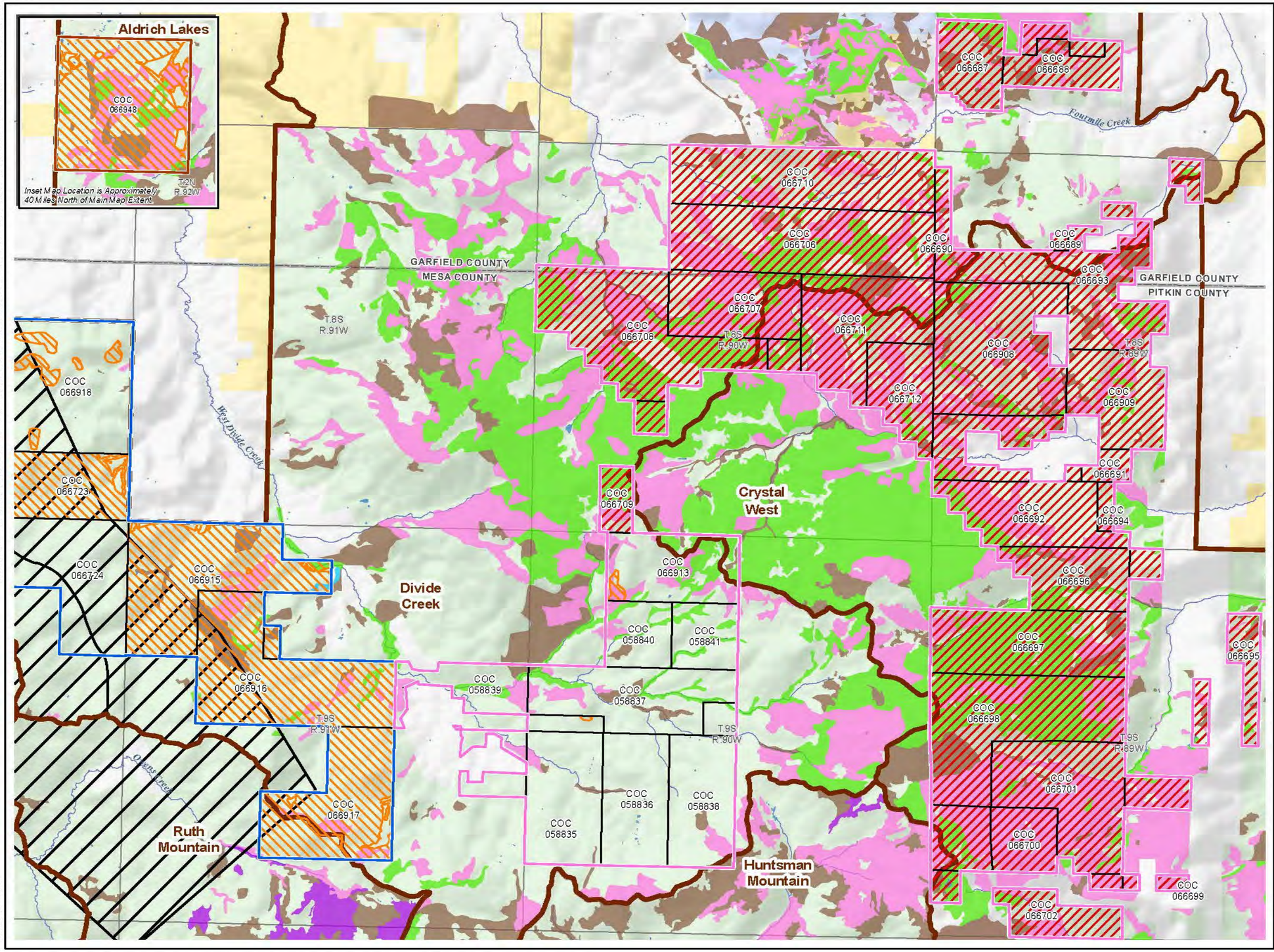

Figure 6-3 Canada Lynx Habitat within All NSO Coverage and within Cancelled Leases (East)

April 2016

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Further protecting lynx in this 8 percent of "remaining" lease acres, the following objectives, standards, and guidelines in the SRLA pertain to oil and gas management and associated activities. Most of these apply to site specific locations of new developments (including roads) and would be applicable for identifying appropriate COAs for the USFS Surface Use Plan of Operations (SUPO), if an Application for Permit to Drill (APD) is received. Several guidelines apply to oil and gas production and post-production activities and would be applied at the APD level.

The Preferred Alternative is consistent with the Forest Plan objectives, standards, and guidelines that pertain to oil and gas development, management, and associated activities as identified in the Southern Rockies Lynx Amendment (SRLA; USDA Forest Service 2008) to the extent that it can be at this level of programmatic analysis and decision. Applicable SRLA guidance is briefly summarized below. Most of the objectives, standards, and guidelines apply to site specific locations of new developments (including roads) and would be followed if an Application for Permit to Drill (APD) is received in the future for proposed oil and gas activities in lynx habitat with allowable surface occupancy (i.e., without NSO stipulations). Several guidelines apply to oil and gas production and post-production activities. Site specific NEPA analysis would be conducted for APD proposals and proposed activities would be designed to avoid or minimize impacts to lynx and lynx habitats.

Objective ALL O1: Maintain or restore lynx habitat connectivity in and between LAUs, and in linkage areas.

- A large percentage of each LAU and lynx linkage area that overlaps the base analysis area is covered by No Surface Occupancy (NSO) stipulations, limiting the amount of surface disturbance allowed in lynx habitats. Lynx linkage areas were specifically selected for NSO coverage to maintain habitat connectivity between LAUs. Oil and gas surface disturbance footprints would be small and the RFDS estimates that oil and gas developments would be sparsely distributed across the landscape. Lynx habitat connectivity would be maintained within and between LAUs, including in linkage areas.

Standard ALL S1: New or expanded permanent developments and vegetation management projects must maintain habitat connectivity in an LAU and/or linkage area.

- If new future oil and gas developments are proposed for lynx habitats, the large percentage of NSO stipulations that overlap LAUs and lynx linkage areas in the base analysis area would limit the amount of surface disturbance. Oil and gas surface disturbance footprints would be small and the RFDS estimates that oil and gas developments would be sparsely distributed across the landscape. Lynx habitat connectivity would be maintained within LAUs and in linkage areas.

Objective HU O1: Maintain the lynx's natural competitive advantage over other predators in deep snow, by discouraging the expansion of snow-compacting activities in lynx habitat.

- If new future oil and gas developments are proposed for lynx habitats outside of NSO areas, winter access roads may or may not occur in deep snow habitats. Oil and gas personnel would be required to stay on designated routes. Although competing predators may be able to follow access roads, it would be unlikely that they would be able to leave the linear compacted road surface if soft snow conditions are present. Lynx habitat surrounding the road corridor would remain inaccessible to competing predators during much of the winter season.

Objective HU O3: Concentrate activities in existing developed areas, rather than developing new areas in lynx habitat.

- Because it is unknown where future oil and gas development may occur, this objective would need to be addressed site specifically if an APD is received for proposed oil and gas activities within lynx habitat.

Objective HU O5: Manage human activities, such as special uses, mineral and oil and gas exploration and development, and placement of utility transmission corridors, to reduce impacts on lynx and lynx habitat.

- No Surface Occupancy stipulations were placed on priority lynx habitats as a way of reducing oil and gas exploration and development impacts on lynx and lynx habitat. If an APD is received in the future for proposed oil and gas activities within lynx habitat and outside of NSO areas, project specific NEPA analysis would be conducted and projects would be designed to avoid or minimize potential impacts to lynx and lynx habitat.

Guideline HU G4: Remote monitoring of mineral and energy development sites and facilities should be encouraged to reduce snow compaction.

- This guideline applies to oil and gas production activities. It would be applied if an APD is received in the future for proposed oil and gas activities within lynx habitat and outside of NSO areas.

Guideline HU G5: A reclamation plan should be developed (e.g., road reclamation and vegetation rehabilitation) for closed mineral and energy development sites and facilities that promote the restoration of lynx habitat.

- This guideline applies to oil and gas post-production activities. It would be applied if an APD is received in the future for proposed oil and gas activities within lynx habitat and outside of NSO areas.

Guideline HU G6: Methods to avoid or reduce effects to lynx habitat connectivity should be used when upgrading unpaved roads to maintenance levels 4 or 5, where the result would be increased traffic speeds and volumes, or contribute to development or increases in human activity.

- Because it is unknown where future oil and gas development may occur and which roads may need to be upgraded to accommodate oil and gas equipment and vehicles, this guideline would need to be addressed site specifically if an APD is received for proposed oil and gas activities within lynx habitat.

Guideline HU G7: New permanent roads should not be built on ridge-tops and saddles, or in areas identified as important for lynx habitat connectivity. New permanent roads and trails should be situated away from forested stringers.

- Because it is unknown where future oil and gas development may occur, this guideline would need to be addressed site specifically if an APD is received for proposed oil and gas activities within lynx habitat and outside of NSO areas.

Guideline HU G8: Cutting brush along low-speed, low-traffic-volume roads should be done to the minimum level necessary to provide for public safety.

- This guideline applies to oil and gas production activities. It would be applied if an APD is received in the future for proposed oil and gas activities within lynx habitat.

Guideline HU G9: If project level analysis determines that new roads adversely affect lynx, then public motorized use should be restricted. Upon project completion, these roads should be reclaimed or decommissioned, if not needed for other management objectives.

- Because it is unknown where future oil and gas development may occur and where new road construction may be proposed, this guideline would need to be addressed site specifically if an APD is received for proposed oil and gas activities within lynx habitat outside of NSO areas.

Guideline HU G10: Designated over-the-snow routes or designated play areas should not expand outside baseline areas of consistent snow compaction, unless designation serves to consolidate use and improve lynx habitat. This may be calculated on an LAU basis, or on a combination of immediately adjacent LAUs.

This does not apply inside permitted ski area boundaries, to winter logging, to rerouting trails for public safety, to accessing private inholdings, or to access regulated by Guideline HU G12.

Use the same analysis boundaries for all actions subject to this guideline.

- Winter routes needed for access to oil and gas development locations would be subject to Guideline HU G12 and therefore Guideline HU G10 would not apply.

Guideline HU G12: Winter access for non-recreation special uses and mineral and energy exploration and development should be limited to designated routes or designated over-the- snow routes.

- Because it is unknown where future oil and gas development may occur and where new access roads may be proposed, this guideline would need to be addressed site specifically if an APD is received for proposed oil and gas activities within lynx habitat outside of NSO areas.

6.2.3 Cumulative Effects

No reasonably foreseeable non-federal future actions would occur within the action area or on state lands adjacent to the action area. Therefore, cumulative effects to the lynx would be a result of actions on private lands adjacent to the action area that may include private and commercial development (e.g., private homes, housing developments, road developments), recreational activities on private lands, private oil and gas development, mining, agricultural practices, timber harvest, herbicide use, livestock grazing (USFS 2015a; pp. 68-69).

6.2.4 Additional Conservation Measures

No additional conservation measures are proposed for the Canada lynx.

6.3 Bonytail Chub, Colorado Pikeminnow, Humpback Chub, Razorback Sucker

6.3.1 Area of Analysis

The area of analysis for the bonytail, Colorado pikeminnow, humpback chub, and razorback sucker includes their occupied and critical habitat in the Colorado, White, and Yampa Rivers, which are located downstream of lease zones for the Preferred Alternative. The distance downstream of the lease zone boundaries ranges from approximately 4 to 124 miles, depending on the species and zone.

6.3.2 Direct and Indirect Effects

The impact issue for these species from the Preferred Alternative is that lands would be made available for oil and gas leasing and potential future development which would then result in water depletion. The Preferred Alternative would have no direct effects on these species, since the lease areas do not overlap

with occupied or critical habitat. Potential sedimentation and spills within the area of analysis also could adversely affect river segments containing occupied or critical habitat for the Colorado River Basin listed fish species populations that are located outside and immediately downstream of the lease zone boundaries. The closest critical habitat exists for Colorado pikeminnow and razorback sucker, which is located approximately 4 miles downstream of the Zone 2 boundary. BMPs and erosion and spill containment plans would be required to minimize the risk of any adverse effects on aquatic species. The remaining section of this impact discussion focuses on potential water depletions.

Freshwater is defined as surface water or ground water connected to surface water. Produced water coming up from a well from deep rock formations generally has no connection to ground water or surface water and is not considered fresh water. Recycled water is the use of produced water or flowback water, and is not considered fresh water. The total estimated fresh water use for well drilling and completions under the Preferred Alternative would be approximately 1,061 acre-feet over the 20-year period of development (annual average of 53 acre-feet per year). This fresh water depletion estimate is well within the amount consulted on by the BLM in 2008 under there programmatic consultation on federal fluid mineral development discussed in detail below. At the project stage, water use will again be projected and the actual fresh water use and associated depletions associated with future development authorized and conducted under the components of the Preferred Alternative will be tracked and reported annually to the USFWS by the BLM.

In October 2008, the BLM completed a Programmatic BA for water depletion activities associated with BLM's fluid minerals program (including Forest Service leases) in the Colorado River basin in Colorado (BLM 2008b). In response to BLM's Programmatic BA, the USFWS issued a Programmatic Biological Opinion (ES/GJ-6-CO-08-F-0006) on December 19, 2008, which concurred with BLM's determination that water depletions are "Likely to Adversely Affect" the Colorado pikeminnow, humpback chub, bonytail, and razorback sucker (USFWS 2008). Likewise, reasonably foreseeable oil and gas development is likely to adversely affect designated critical habitats for these endangered fish along the Yampa, White, Colorado, and Gunnison rivers. However, the USFWS determined that water depletions from the Colorado River basin are not likely to jeopardize the continued existence of the Colorado pikeminnow, humpback chub, bonytail, or razorback sucker, and are not likely to destroy or adversely modify designated critical habitat. The Programmatic BA and Programmatic Biological Opinion were written to remain in effect for up to 15 years or as long as an average annual depletion of 4,046 acre-feet per year is not exceeded. In the event this amount is exceeded, the BLM would reinitiate Section 7 consultation on a new depletion amount. Water use associated with federal fluid mineral development is tracked and reported annually.

As part of the Recovery Program for the Upper Colorado River fish species, a one-time payment is required for the average annual depletion volume in acre-feet that exceeds 100 acre-feet. The depletion fee is established each fiscal year after it has been determined that the Recovery Program is making sufficient progress toward recovery of the federally endangered fish species regarding ESA compliance for water withdrawals.

6.3.3 Cumulative Effects

Water development is expected to continue on private lands within the analysis area. A large proposal to develop water in the Eagle River, outside the analysis area is under consideration. No further information about this project development is available at this time (USFS 2015a; pg.78).

The estimated water use for oil and gas RFFAs is 22,304 acre-feet for drilling and 431,291 acre-feet for completions. The Preferred Alternative water use would be approximately 339 acre-feet over the 20-year time frame of the project. The total cumulative effect of water use would adversely affect occupied and critical habitat for the Colorado River Basin federally listed fish species. The Recovery Program would be required for each future project with water use and no previous Section 7 compliance. The BLM has

already offset the impacts of water depletions associated with federal fluid mineral development within the Upper Colorado River basin soliciting a one-time payment from the industry representative group Independent Petroleum Association of Mountain States (now Western Energy Alliance) on behalf of the oil and gas operators working in the Upper Colorado River basin. A one-time lump sum payment of $71,978.34 based on the 2008 depletion fee of $17.79 per acre-foot was made. This amount was provided to the USFWS's designated agent, the National Fish and Wildlife Foundation. Fifty percent of the funds were to be used for acquisition of water rights to meet the instream flow needs of the endangered fishes (unless otherwise recommended by the Implementation Committee); the balance was to be used to support other recovery activities for the Colorado River endangered fishes. Additional Conservation Measures

As a means of minimizing negative effects, the following conservation measures are still appropriate as identified in the 2008 consultation and they are restated here for emphasis:

- Water may be extracted directly out of the Colorado, Gunnison, White, Yampa, or Green River, which all have occupied and critical habitat for the four endangered Colorado River fish. The 8 western slope Field Offices/Administrative Units have committed to implement the following measures within critical habitat for any of the endangered fish to minimize direct impacts to federally listed species from pumping water directly out of these rivers:
    1. The best method to avoid entrainment is to pump from off-channel locations (e.g., ponds, lakes, and diversion ditches), not directly connected to the mainstem rivers even during high spring flows.
    2. If the pump head must be located in the river channel where larval fish are known to occur (generally within Designated Critical Habitat), the following measures apply:
        a. do not situate the pump in a low-flow or no-flow area as these habitats tend to concentrate larval fishes. Instead place the pump into fast moving/riffle habitat;
        b. limit the amount of pumping, to the greatest extent possible, during that period of the year when larval fish may be present (June 1 to August 15); and
        c. avoid pumping, to the greatest extent possible, during the pre-dawn hours (two hours prior to sunrise) as larval fish drift studies indicate that this is a period of greatest daily activity.
    3. Screen all pump intakes with ¼" or finer mesh material.
    4. Report any fish impinged on any intake screens to the U. S. Fish and Wildlife Service (970.243.2778) or Colorado Parks & Wildlife:

        Northwest Region, 711 Independent Ave., Grand Junction, CO 81505. Phone: (970) 255-6100.

        Southwest Region, 415 Turner Dr., Durango, CO 81303. Phone: (970) 375-6700.

The above conservation measure will be implemented via the BLM/USFS working with the individual companies, their sub-contractors and industry representative groups directly to inform and educate on the ground personnel of the need to implement this conservation measure. In addition, the above conservation measure will be added to all APD's as a COA prior to commencement of development activity.

6.3.4 Additional Conservation Measures

No additional conservation measures are proposed for the bonytail chub, Colorado pikeminnow, humpback chub, or razorback sucker.

6.4 Greenback Cutthroat Trout (Colorado River Cutthroat Trout, Green Lineage)

6.4.1 Area of Analysis

The area of analysis for CRCT-GL consists of the leases that would be developed as part of the Preferred Alternative where they overlap with CRCT–GL streams, Zones 2 and 3. In addition, the downstream segments of CRCT-GL streams that extend beyond the lease boundaries are included in the analysis. The impact discussion for the downstream segments of CRCT-GL streams that are outside of the zones is general in nature.

6.4.2 Direct and Indirect Effects

Five CRCT-GL populations occur in the analysis area, and are found in the following streams: West Divide Creek, Beaver Creek, and Cache Creek in Zone 2; and Park Creek, Little Rock Creek, and West Divide Creek in Zone 3. Note: portions of West Divide Creek reside in both lease zones. In total, 3.4 miles of CRCT-GL habitat exists in Zone 2, and 7.6 miles in Zone 3.

Protections for CRCT-GL streams would be provided by cutthroat trout focused stipulations, stipulations for other resource values that protect cutthroat trout habitats, and in select areas, (Park Creek) by the cancellation of select leases. USFS Standards and Guidelines found in the WRNF Forest Plan (USFS 2002a), the WRNF Oil and Gas Leasing EIS/Plan Amendment (USFS 2014a, 2015b), objectives and strategies in the Conservation Agreement and Strategy for Colorado River Cutthroat Trout in the States of Colorado, Utah, and Wyoming (CRCT Conservation Team, 2006) that USFS Region 2 is signatory to, guidelines from the USFS Region 2 sensitive species policy, and COGCC Rule 317B (specific to Beaver Creek) all help to provide protection or rationale and justification for the creation of site specific COAs to protect or minimize impacts to occupied CRCT-GL habitats..

6.4.2.1 Cutthroat Trout Focused Stipulations

Cutthroat trout focused stipulations that would prohibit or restrict development in the streams or in adjacent drainage areas and would avoid or minimize negative impacts in portions of the streams include: 1) Native Cutthroat Trout NSO, 2) TEPC Aquatic Species NSO, 3) Water Influence Zone NSO, 4) Road Density in Watersheds with Colorado River Cutthroat Trout Conservation Populations CSU, and 5) Sensitive Aquatic Species CSU. Protection that would be provided by the cutthroat trout-focused stipulations is shown in terms of acres and stream miles in **Table 6-4**. The location of these stipulations in relation to the CRCT-GL streams is shown in **Figures 6-4** and **6-5**. For context purposes, the percentage of protection through lease stipulations compared to total lease acres in Zone 2 would be approximately less than 1 percent for the Native Cutthroat Trout NSO, 9 percent for the TEPC Aquatic Species, and 8 percent for the for the Native In terms of stream miles, the cutthroat trout stipulations would protect approximately 65 percent or 2.2 miles of the CRCT-GL habitat in Zone 2. There also would be protection to cutthroat trout streams in Zone 2 (2,325 acres or 9 percent of the total lease acres) as a result of the Watersheds with CRCT and GBCT Conservation Populations CSU stipulation that protects uplands in watersheds draining to CRCT streams but does not directly overlap them.

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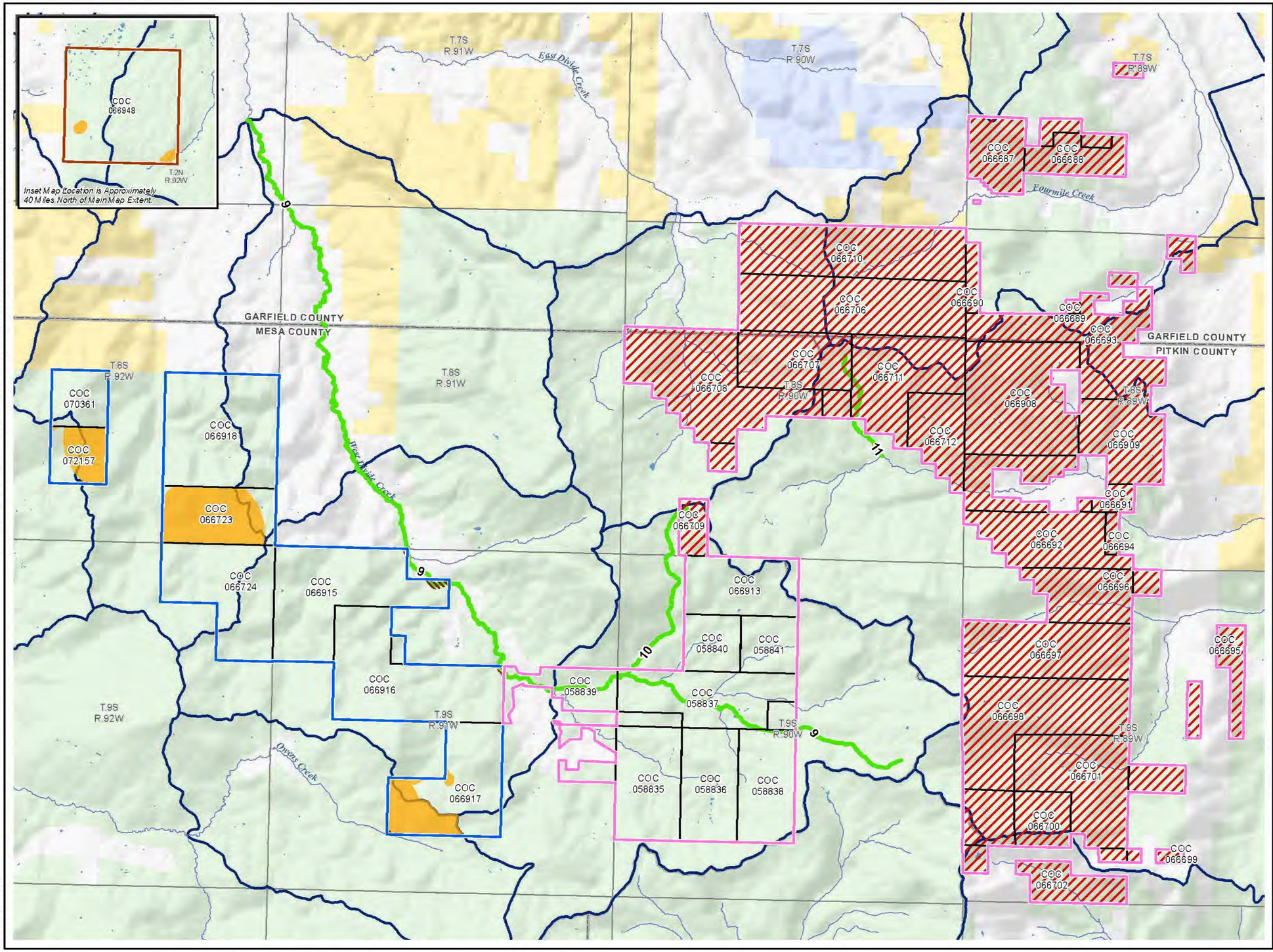

Legend

Project Features

Lease Zones
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Lease Boundary

Cutthroat Trout Habitat
- Green Lineage

Stipulations Coverage Under Preferred Alternative
- NSO-Native Cutthroat Trout Habitat
- NSO-TEPC Aquatic Species
- Leases to be Cancelled

Boundaries
- County Boundary
- Township/Range
- Urban Area

Hydrology
- Stream/River
- Lake/Reservoir

Highways
- Interstate
- Highway

Surface Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Local
- Private
- US Forest Service

EAST DETAIL

0 0.875 1.75 3.5 Miles
0 1 2 4 Kilometers
N

Figure 6-4 Cutthroat Trout Streams and Resource-specific Lease Stipulations (East Side)

April 2016

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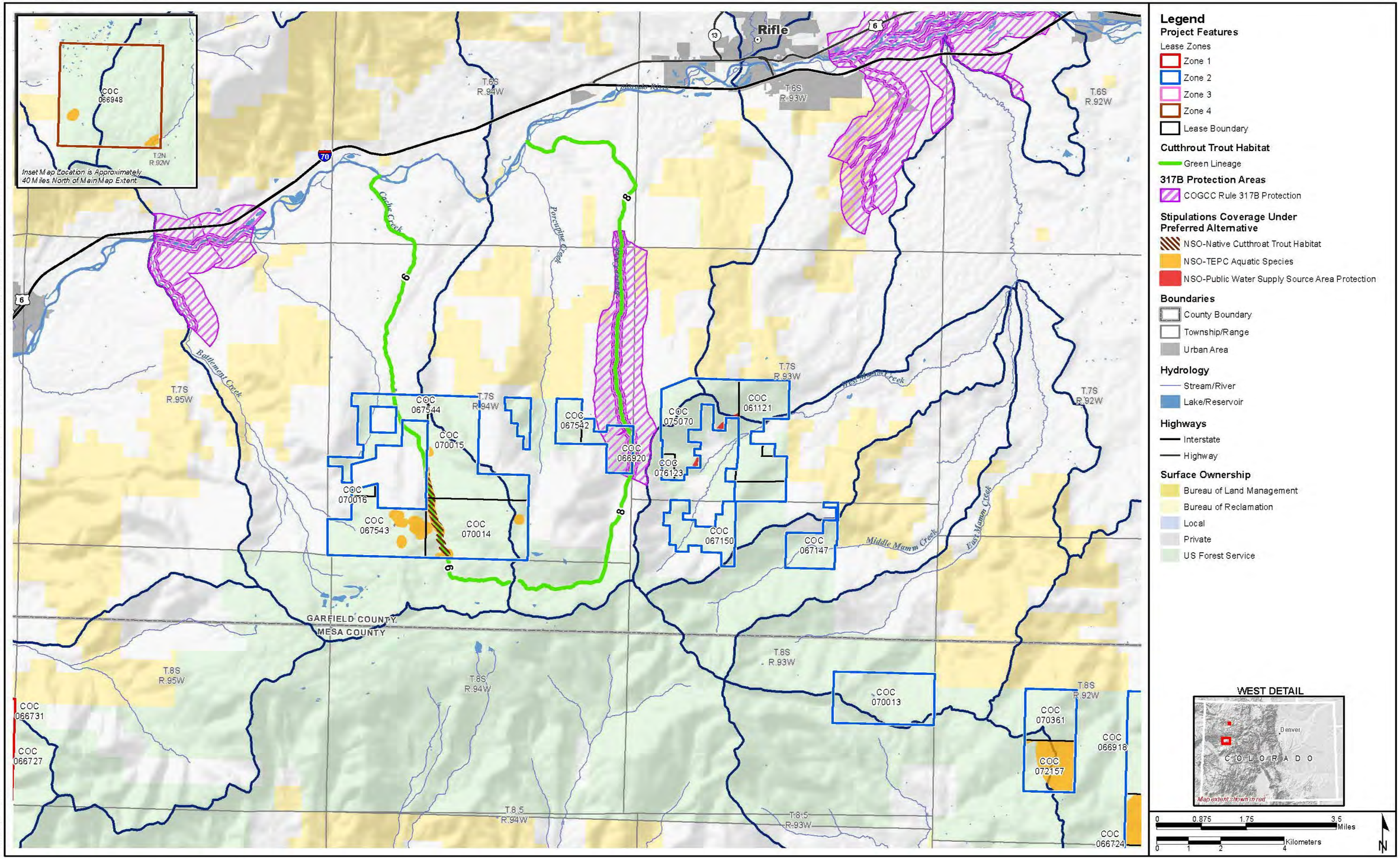

Legend

Project Features

Lease Zones
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Lease Boundary

Cutthroat Trout Habitat
- Green Lineage

317B Protection Areas
- COGCC Rule 317B Protection

Stipulations Coverage Under Preferred Alternative
- NSO-Native Cutthroat Trout Habitat
- NSO-TEPC Aquatic Species
- NSO-Public Water Supply Source Area Protection

Boundaries
- County Boundary
- Township/Range
- Urban Area

Hydrology
- Stream/River
- Lake/Reservoir

Highways
- Interstate
- Highway

Surface Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Local
- Private
- US Forest Service

WEST DETAIL

0 0.875 1.75 3.5 Miles

0 1 2 4 Kilometers

N

Figure 6-5 Cutthroat Trout Streams and Resource-specific Lease Stipulations (West Side)

April 2016

Table 6-4 Protection from Cutthroat Trout Stipulations in Stream Miles and Acres

Stream Name	Stream Miles	Acres
Native Cutthroat Trout NSO		
Cache Creek	1.6	146
West Divide Creek	0.6	51
Total	2.2	197
TEPC Aquatic Species NSO		
Cache Creek	1.3	2,346
Sensitive Aquatic Species CSU		
Cache Creek	1.6	300
West Divide Creek	0.6	741
Total	2.2	1,041

6.4.2.2 Stipulations for Other Resource Values

A combination of all NSO and CSU stipulations related to other resources would also restrict development in CRCT-GL streams assuming that all of the measures are implemented (**Table 6-5; Figure 6-6**).The Fen Wetlands NSO, Battlement Reservoir Watershed NSO, Groundwater Resources CSU, and Known and/or Potential Habitats for Sensitive Species CSU, in particular would help protect surface waters by limiting ground disturbance within watersheds containing CRCT-GL. In total, all NSOs combined would protect 2.8 miles of CRCT-GL or approximately 82 percent of the total habitat in Zone 2. In terms of acres, all combined NSOs would protect approximately 36 percent of the lease area in Zone 2. The combined NSO stipulations would provide additional protection for CRCT-GL streams when compared to the cutthroat trout-focused stipulations by themselves.

Table 6-5 Protection from All NSOs for CRCT-GL in Stream Miles and Acres

Stream Name	Stream Miles	Acres
Cache Creek	2.2	3,813
West Divide Creek	0.6	5,044
Total	2.8	8,857

There also would be a benefit to CRCT-GL populations under the Preferred Alternative as a result of cancelled leases in Zone 3. In total, 33,033 acres in 25 currently undeveloped leases would be cancelled for oil and gas development. The cancelled leases would represent approximately 77 percent of Zone 3. In terms of individual CRCT-GL streams, this would benefit 0.1 mile in Little Rock Creek (Lease 066709) and all of the habitat (1.3 miles) in Park Creek (Leases 066707 and 066711).

After applying the cutthroat trout-focused stipulations, combined NSOs, and cancelled leases, there would be three streams that would not be protected by lease stipulations: Beaver Creek (0.6 mile in Lease 066920), Little Rock Creek (0.1 mile in Lease 058837), and West Divide Creek (6 miles in Leases 058837, 058838, and 058839). The total unprotected stream length of 6.7 miles would represent approximately 64 percent of the CRCT-GL habitat in Zones 2 and 3. However, the following would provide rationale for site specific COA's that would be used to help protect these remaining stream segments:

6.4.2.3 Forest Plan Standards and Guidelines

The following Forest Plan Standard and Guidelines would also be used to help guide the development of site specific COA's intended to reduce potential impacts to Colorado River Cutthroat Trout populations residing in the five streams:

Proposed, Threatened, and Endangered Species and Sensitive Species

- Standard 2: Restrict activities to avoid disturbing proposed, threatened, or endangered species during breeding, young rearing, or at other times critical to survival. Exceptions may occur when individuals are adapted to human activity, or the activities are not considered a threat.
- Standard 3: Activities will be managed to avoid disturbance to sensitive species that would result in a trend toward federal listing or loss of viability. The protection will vary depending on the species, potential for disturbance, topography, location of important habitat components, and other pertinent factors. Special attention will be given during breeding, young rearing, and other times that are critical to survival of both flora and fauna

Colorado River Cutthroat Trout

Standards

- Standard 1: For management activities that have the potential to impact occupied cutthroat trout habitat, tributaries of occupied cutthroat trout habitat, or identified reintroduction areas, maintain or enhance existing cutthroat trout habitat. At minimum and where necessary:
  - Reduce sediment from existing roads and trails;
  - Maintain pool depths;
  - Maintain riparian vegetation; and
  - Retain large woody debris in streams.
- Standard 2: When implementing management activities in 6th field Hydrologic Unit Codes (sub-watersheds) containing cutthroat trout identified as recovery populations in the Colorado River Cutthroat Recovery Plan, maintain or reduce existing net density of roads (open or closed) to restore or prevent alteration of the hydrologic function of the sub-watershed. Temporary roads must be decommissioned upon project completion.

Guidelines

- Guideline 1: Restrict construction of new roads within 350 feet of occupied cutthroat streams or within 150 feet from the edge of the current or historic floodplain, whichever is greater, to maintain hydrologic function and limit road-related stream sediment.
- Guideline 2: Reroute roads adjacent to cutthroat trout streams and their tributaries, when possible, to reduce direct impacts to cutthroat habitat, or to improve hydrologic function.
- Guideline 3: In sub-watersheds with occupied cutthroat trout habitat, methods for decommissioning roads should emphasize restoring hydrologic function.

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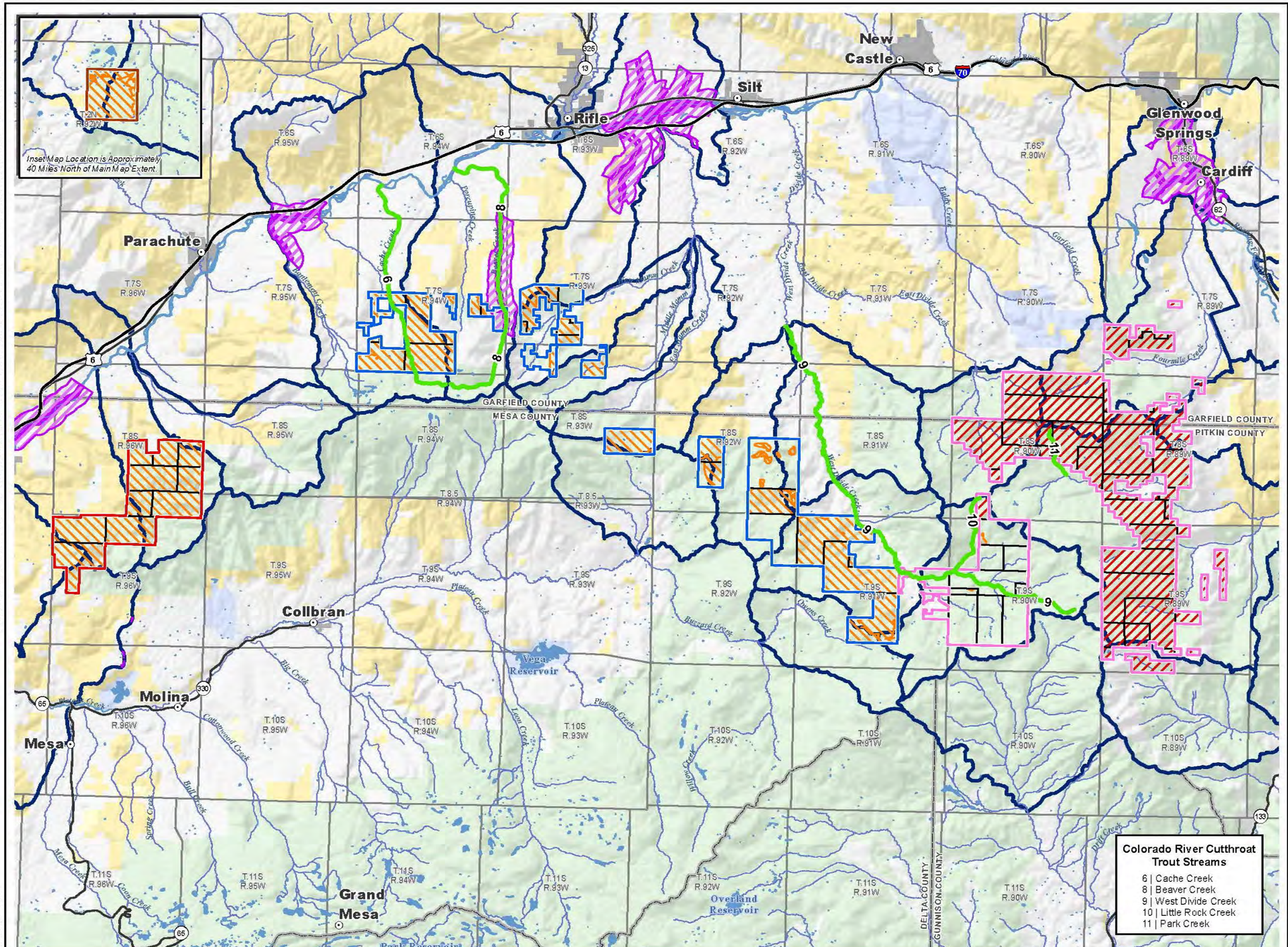

Figure 6-6 Cutthroat Trout Streams and All NSO Stipulations Providing Protection

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Water and Riparian Resources

- Standard 1: In each stream currently supporting a self-sustaining fish population, ensure that projects maintain sufficient habitat, including flow, for all life history stages of native and desired non-native aquatic species.

Wildlife

- Standard 6: In riparian areas, vegetation cover will be managed to provide suitable wildlife habitat along a minimum of 80 percent of the length of riparian zones within the project area. New corridor interruptions will be spaced to minimize interruptions to habitat connectivity"

Select Strategies from the Colorado River Cutthroat Trout Conservation Agreement and Strategy

Objectives

- Objective 2: Secure and Enhance Conservation Populations
- Objective 4: Secure and Enhance Watershed Conditions

Strategies

- Strategy 6: Monitor Watershed Conditions to Detect Change
- Strategy 7: Improve Habitat Conditions for CRCT
- Strategy 11: Evaluate and Monitor Land Management Actions

USFS Region 2 Sensitive Species Policy

This policy intends to maintain spatial distribution of identified USFS sensitive species.

COGCC Rule 317B

This Rule pertains specifically to Beaver Creek in Lease Zone 2. The amount of the stream protected by implementation of this rule is shown in **Table 6-6**.

Table 6-6 Protection from COGCC Rule 317B

Stream Name	Stream Miles within the Lease	Stream Miles Outside Lease	% of Stream Protected
Beaver Creek	0.62	2.83	100
Total	**0.62**	**2.83**	**100**

Zone Classified	Water Supply Segments (ft)
Internal Buffer	0 - 300
Intermediate Buffer	301 - 500
External Buffer	501 - 2,640

Within the Internal buffer (to 300 ft):

- Drilling, Completion, Production and Storage ("DCPS") Operations may not occur in whole or in part within the Internal Buffer Zone identified in Table 1 unless a variance is granted pursuant to Rule 502.b and consultation with the Colorado Department of Public Health and Environment occurs pursuant to Rule 306.d and a Form 2A or Form 2 with appropriate conditions of approval has been approved, or the Director has approved a Comprehensive Drilling Plan pursuant to Rule 216 that covers the operation.

Within the Intermediate buffer (301-500 ft) the following are required:

- Pitless drilling systems
- Flowback and stimulation fluids contained within tanks that are placed on a well pad or in an area with downgradient perimeter berming;
- Berms or other containment devices shall be constructed in compliance with Rule 603.e.(12) around crude oil, condensate, and produced water storage tanks; and
- When sufficient water exists in the Classified Water Supply Segment, collection of baseline surface water data consisting of a pre-drilling surface water sample collected immediately downgradient of the oil and gas location and follow-up surface water data consisting of a sample collected at the same location three (3) months after the conclusion of any drilling activities and operations or completion. The sample parameters shall include: A. pH; B. Alkalinity; C. Specific conductance; D. Major cations/anions (chloride, fluoride, sulfate, sodium); E. Total dissolved solids; F. BTEX/GRO/DRO; G. TPH; H. PAH's (including benzo(a)pyrene); and I. Metals (arsenic, barium, calcium, chromium, iron, magnesium, selenium).
- An emergency spill response program that includes employee training, safety, and maintenance provisions

Within external buffer (to 2,640 ft) and for new locations:

- Pitless drilling systems or containment of all drilling flowback and stimulation fluids pursuant to Rule 904; and
- When sufficient water exists in the Classified Water Supply Segment, collection of baseline surface water data consisting of a pre-drilling surface water sample collected immediately downgradient of the oil and gas location and follow-up surface water data consisting of a sample collected at the same location 3 months after the conclusion of any drilling activities and operations or completion. The sample parameters shall include: A. pH; B. Alkalinity; C. Specific conductance; D. Major cations/anions (chloride, fluoride, sulfate, sodium); E. Total dissolved solids; F. BTEX/GRO/DRO; G. TPH; H. PAH's (including benzo(a)pyrene); and I. Metals (arsenic, barium, calcium, chromium, iron, magnesium, selenium).
- An emergency spill response program that includes employee training, safety, and maintenance provisions

Oil and gas development could negatively affect CRCT-GL populations in the unprotected streams as a result of soil erosion and sedimentation, turbidity, removal of riparian vegetation, and water quality changes from chemical spills. Potential indirect effects include reduced water infiltration rates, increased watershed runoff and erosion, and subsequent effects to stream channels. Aquatic habitat CRCT-GL streams could be negatively affected by water quality changes due to surface disturbance activities and potential fuel spills or leaks. Accelerated erosion from surface disturbance may adversely impact aquatic habitats by increasing sedimentation in waterbodies. Actions including ground disturbance, vegetation removal, pipeline construction, and construction and use of access roads are the primary causes of

erosion that can result in increased sedimentation and turbidity in streams. Natural events such as floods, fire, and drought conditions also can contribute to increased erosion. Changes in water quality resulting from surface disturbance within or near waterbodies would include increases in suspended sediment concentrations and turbidity. Sediment that is suspended or enters the waterbody from adjacent areas would be redeposited in areas in downstream areas. The extent of the sedimentation effect would depend on the flow conditions, substrate composition, stream configuration, and types of aquatic communities located within the affected areas. Sedimentation also could adversely affect stream segments containing CRCT-GL populations that are located outside and immediately downstream of the lease zone boundaries. Sedimentation also can affect water quality conditions by reducing dissolved oxygen, increase water temperature (Waters 1995).

The effects of sedimentation on aquatic species would range from adverse effects on species behavior and physiological functions or important activities such as spawning and reproduction (Waters 1995). Excessive sedimentation also can alter important habitats by reducing depths in pools and covering spawning and rearing areas that are used by early stage development of fish. Over a long-term period, increased sediment loading also can reduce primary production and macroinvertebrate productivity (Waters 1995). The duration of sediment effects could range from short-term to long-term, depending on the duration of the surface disturbance activities and timeframe for stabilization.

Vehicle and equipment use, pipeline leaks, and failed well casings, or fuel and lubricant storage near waterbodies would pose a potential risk to aquatic biota. If fuel or other contaminants reached a waterbody, aquatic species could be exposed to toxic conditions from chemical residues within or on substrates in waterbodies. Impacts to aquatic species could range from lethal to sublethal effects and result in direct mortalities or reduced health. The magnitude of impacts would depend on the volume of spilled fuel, flow conditions, channel configuration, timing of cleanup and remediation, and species present in the affected area. Spills also could adversely affect stream segments containing CRCT-GL populations that are located outside and immediately downstream of the lease zone boundaries.

All of the identified effects in the unprotected stream segments can be potentially mitigated through site specific COA's, targeted design criteria, and best management practices if an APD is received for future oil and gas development. In addition, the WRNF Forest Plan and associated Final EIS (USFS 2002a,b) requires crossing techniques that would minimize adverse effects on stream habitat, as well as the restoration of disturbed areas to pre-construction conditions. The Forest Plan direction also provides additional protection for streams that contain pure genetic populations of CRCT- New or widened stream crossings would not be allowed in streams with pure CRCT. In addition, no instream disturbance would be allowed during the CRCT spawning period (June 1 through September 1).

In conducting operations associated with the leases, the operators must comply with all rules and regulations that the Secretary of Agriculture set forth in Title 36, Chapter II of the Code of Regulations governing the use, occupancy, and management on NFS lands. In related to federally listed species, the USFS must comply with the ESA Section 7 consultation requirements with the USFWS. The results of the consultation may require modifications or restrictions regarding surface disturbance activities. Modifications of restrictions could be applied to the three streams that are not protected by stipulations or cancelled leases under the Preferred Alternative.

6.4.3 Cumulative Effects

No reasonably foreseeable non-federal future actions on state lands have been identified within the vicinity of the action area for the CRCT-GL. Therefore, cumulative effects to the species would be a result of actions involving surface disturbance or water depletions on private lands adjacent to the action area that may include private and commercial development (e.g., private homes, housing developments); private oil and gas development; water development projects; mining; agricultural practices; herbicide use; and livestock grazing. The activity on private land that may have the greatest

potential to affect the CRCT-GL is expected to be on private land in the Cache Creek watershed (USFS 2015a, pp. 81-82).

6.4.4 Additional Conservation Measures

No additional conservation measures are proposed for CRCT-GL.

6.5 DeBeque Phacelia, Colorado Hookless Cactus, Ute Ladies'-tresses

6.5.1 Area of Analysis

The analysis area for impacts to suitable habitat for listed plant species and critical habitat is comprised of the area within the boundaries of the 65 leases (approximately 80,380 acres), plus a 300-meter extension beyond the edge of the collective lease boundaries for DeBeque phacelia (approximately 30,388 acres), for a total of approximately 110,768 acres. Critical habitat is designated only for DeBeque phacelia. The amount of suitable and critical habitat for each listed plant species is detailed in **Table 6-7**.

As evidenced in **Table 6-8**, nearly all suitable habitat for the 3 listed plant species falls within Zone 1 and within the off-lease area covered by the 300-meter extension around leases. Suitable habitat for both DeBeque phacelia and Colorado hookless cactus is only found in Zone 1 or off-lease surrounding Zone 1. Designated critical habitat is identified only for DeBeque phacelia and is found only in Zone 1 or off-lease adjacent to Zone 1. Suitable habitat for Ute ladies'-tresses is found in only in Zones 1 and 2 and adjacent off-lease area. There is no suitable or critical habitat for DeBeque phacelia and no suitable habitat for Colorado hookless cactus in Zones 2, 3, or 4.

Table 6-7 Suitable and Critical Habitat For Listed Plant Species Within the Analysis Area

Species	Status	Total Suitable Habitat Acreage in Analysis Area[1] (% of total)
DeBeque phacelia[2]	Threatened	Suitable Habitat: 3,850 acres (3%) Critical Habitat: 1,903 acres (2%)
Colorado hookless cactus	Threatened	3,850 acres (3%)
Ute ladies'-tresses	Threatened	5,277(5%)

[1] Percentage calculated based on the analysis area (including the 300-meter extension); 110,768 acres.

[2] Only DeBeque phacelia critical habitat is found within the analysis area.

Table 6-8 Suitable and Critical Habitat For Listed Plant Species Within the Analysis Area by Zone

Location	Suitable Habitat [1] Acreage (% of zone)	All NSOs, % of zone[3]
DeBeque Phacelia Suitable Habitat		
Off-lease[2]	121 (<1)	94
Zone 1	3,729 (37)	100
Zone 2	0	N/A
Zone 3	0	N/A
Zone 4	0	N/A

Table 6-8 Suitable and Critical Habitat For Listed Plant Species Within the Analysis Area by Zone

Location	Suitable Habitat [1] Acreage (% of zone)	All NSOs, % of zone[3]
DeBeque Phacelia Critical Habitat		
Off-lease[2]	528 (<1)	99
Zone 1	1,375 (5)	100
Zone 2	0	N/A
Zone 3	0	N/A
Zone 4	0	N/A
Colorado Hookless Cactus Suitable Habitat		
Off-lease[2]	121 (<1)	94
Zone 1	3,729 (37)	100
Zone 2	0	N/A
Zone 3	0	N/A
Zone 4	0	N/A
Ute Ladies'-tresses Suitable Habitat		
Off-lease[2]	355 (1)	95
Zone 1	4,829 (48)	100
Zone 2	92 (<1)	0
Zone 3	0	N/A
Zone 4	0	N/A

[1] Suitable habitats were determined by Forest Service modeling for significant plant species; significant plant community habitat is based on Colorado Natural Heritage Program data.

[2] The "off-lease" area is the 300-meter buffer around the leasing area. Total NSO column is reported to address the potential protection for off-lease development.

[3] 2.9 acres (or <0.1 percent of the analysis area) are covered by an existing Riparian/Wetland GMUGNF NSO stipulation.

Based on analysis of the on- and off-lease area (300-meter buffer), the resource-specific stipulations do not offer coverage for any suitable or critical habitat for listed plant species that would preclude or minimize surface disturbance for suitable or critical habitat for listed plant species.

6.5.2 Direct and Indirect Effects

The following resource-specific stipulations apply to listed plants under the Preferred Alternative.

- NSO—TEPC Plant Species Populations and Habitats
- CSU—Plant Species of Local Concern, including Significant Natural Plant Communities
- CSU—Sensitive Plant Species

Under the Preferred Alternative, there would be no resource-specific stipulations for listed plant species or habitat to preclude or minimize surface disturbance for suitable or critical habitat for listed plant species. Without consideration of non-resource related NSO stipulations, all suitable and critical habitat would be available to oil and gas development activities prior to site-specific surveys, NEPA analysis, and ESA consultation at the APD stage of permitting. However, implementation of other (non-vegetation resource) NSO stipulations may minimize impacts to vegetation resources from potential surface-disturbing impacts. These may include, but are not limited to geology/soils (steep slopes and sensitive soils), water resources and aquatic habitat (water influence zones, WIZ), and wildlife (sensitive habitat).

A full list of stipulations can be found in **Table 2-1**. If the resources that these stipulations were designed to address are not found to occur on the leases, than the coverage provided by these stipulations to vegetation resources would not be realized. The degree of coverage from the implementation of all NSO stipulations would therefore be overestimated if not all stipulations are implemented (BLM 2015a). With consideration of all NSO stipulations, the potential for development in special status plant species and significant plant community habitat would as follows:

- **DeBeque phacelia:** Within Zone 1, 100 percent of DeBeque phacelia suitable habitat (3,728 acres) in Zone 1 would be covered by non-resource-related NSOs for steep slopes, bighorn sheep, and roadless areas. Ninety-four percent of DeBeque phacelia suitable habitat (114 of 121 total acres) in off-lease areas is covered by existing NSO stipulations. There is no suitable habitat for DeBeque phacelia in Zones 2, 3, and 4 (**Figure 6-7**).
- **DeBeque phacelia Critical Habitat:** Within Zone 1, 100 percent of DeBeque phacelia critical habitat (1,375 aces) would be covered by non-resource-related NSOs for steep slopes, bighorn sheep, and roadless areas. Off-lease, 99 percent of DeBeque phacelia critical habitat (521 of 528 total acres) would be covered by non-resource-related NSOs. There is no critical habitat for DeBeque phacelia in Zones 2, 3, and 4 (**Figure 6-8**).
- **Colorado hookless cactus:** Within Zone 1, 100 percent of Colorado hookless cactus suitable habitat (3,728 acres) would be covered by non-resource-related NSOs for steep slopes, bighorn sheep, and roadless areas. Approximately 94 percent of Colorado hookless cactus suitable habitat (114 of 121 total acres) in the off-lease area is covered by existing NSO stipulations. There is no suitable habitat for Colorado hookless cactus in Zones 2, 3, and 4 (**Figure 6-9**).
- **Ute ladies'-tresses:** Within Zone 1, 100 percent of Ute ladies'-tresses suitable habitat (4,828 acres) would be covered by non-resource-related NSOs. Approximately 95 percent of Ute ladies'-tresses suitable habitat (340 of 355 total acres) in the off-lease area is covered by existing NSO stipulations. In Zone 2, there would be no mapped NSO stipulations (resource specific and non-resource specific) covering suitable habitat. However, habitat may be protected under the Riparian/Wetland and WIZ NSOs. This comprises 2 percent (92 of 5,277 total acres) of all suitable habitat within the Preferred Alternative. There is no suitable habitat for Ute ladies'-tresses in Zones 3 and 4 (**Figure 6-10**).

Non-resource specific NSO stipulations would preclude adverse effects from projected surface disturbance in nearly all suitable habitat and critical habitat under the Preferred Alternative. Within Zone 2, 92 acres of Ute ladies'-tresses habitat is not covered by mapped stipulations. However, occurrence is unlikely in this area as noted in Section 5.7.1. Off-lease within the 300-meter buffer area, about 15 acres of suitable habitat for Ute ladies'-tresses, 7 acres of suitable habitat for DeBeque phacelia, and 7 acres for Colorado hookless cactus would not be protected from surface-disturbing activities by NSOs (BLM 2015a). Federally listed species receive protection under the 2002 WRNF Land Resource Management Plan Standards which state: "Restrict activities to avoid disturbing proposed, threatened, or endangered species during breeding, young rearing, or at other times critical to survival." The Plan further states that "Activities will be managed to avoid disturbance to sensitive species that would result in a trend toward federal listing or loss of viability," which is dependent on factors such as potential for disturbance, topography, and other pertinent environmental factors. The Plan also states that it will be amended if new information or changes in species status occur (USFS 2002a). Leases also are subject to the USFS Lease Notice for Threatened and Endangered Species which requires consultation and adherence to the ESA and the examination of land by a qualified specialist prior to surface disturbance to ensure that threatened or endangered species will not be detrimentally harmed from development.

Surveys would be conducted during site-specific NEPA to ensure compliance with the ESA, and any activities that may affect federally listed species would be subject to consultation with the USFWS under Section 7 of the ESA. Depending on stipulation coverage, the BLM can require minor or major project

relocations to minimize the potential for spread to areas with new surface disturbance. The BLM and USFS may also impose conditions of approval at the site-specific level, in accordance with USFWS consultation, to protect federally listed plant populations from both direct and indirect effects (BLM 2015a). These conditions of approval may include: 1) presence of an approved botany monitor on site during project implementation; 2) temporary construction fencing to prevent accidental expansion of disturbance beyond the approved disturbance area; 3) dust abatement measures; 4) invasive species control, restricted to spot-spray use of herbicides or manual treatment; 5) timing limitations during flowering periods; 6) reclamation seeding of disturbed areas with habitat appropriate native seed mixes; and 7) post-project monitoring of plants and habitat.

According to the WRNF BA (USFS 2015a; pg. 72), “There is slight potential for the following impacts to occur in areas of potential suitable or critical habitat where it occurs along the edges of NSO boundaries. Operations and increased traffic associated with potential future development could result in: 1) increases in airborne dust which could negatively impact photosynthesis and reproduction if plants are present, 2) vector and/or create favorable conditions for invasive plant species, and 3) cause displacement of /or mortality to species pollinators through vehicle collisions, dust or habitat loss or habitat degradation. It is expected that during the APD phase that conservation measures would be implemented to mitigate these potential impacts in a way that effects would be immeasurable and discountable including: 1) dust abatement measures; 2) invasive species control measures; and 3) measures to offset proposed infrastructure such as roads, well pads, and pipelines.”

6.5.3 Cumulative Effects

There are no reasonably foreseeable non-federal future actions would occur within the action area or on state lands adjacent to the action area. The primary activities on adjacent private land that may affect DeBeque phacelia, Colorado hookless cactus, and Ute ladies’-tresses are anticipated to result from livestock grazing, urban development, private oil and gas development, mining, timber harvesting, and herbicide use.

6.5.4 Additional Conservation Measures

No additional conservation measures are proposed for the federally listed plant species and DeBeque phacelia designated critical habitat.

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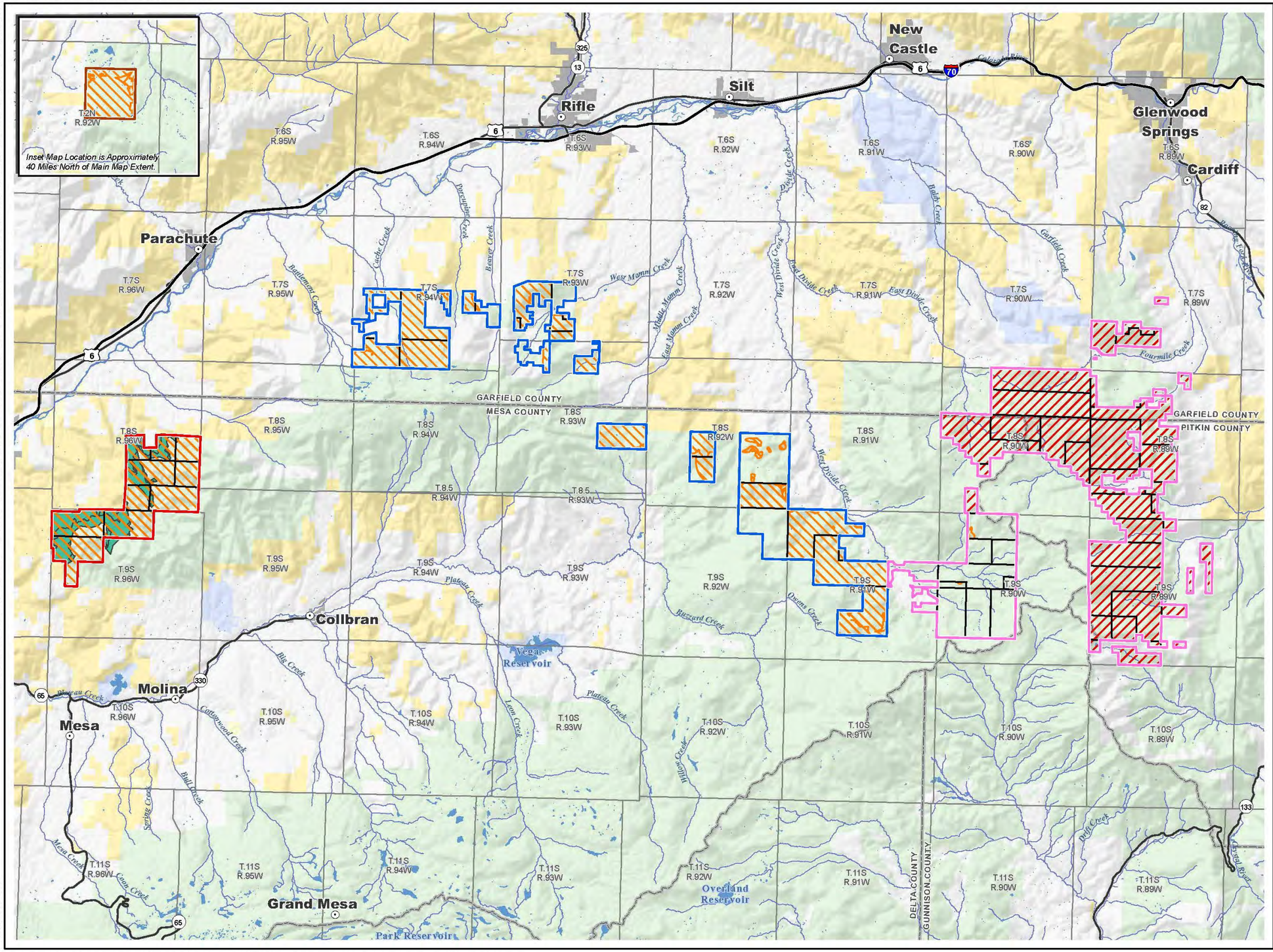

Legend

Project Features
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Lease Boundary

Special Status Plant Habitat
- DeBeque Phacelia Suitable Habitat

Stipulations Coverage Under Preferred Alternative
- All NSO Stipulations
- Leases to be Cancelled

Boundaries
- County Boundary
- Township/Range
- Urban Area

Hydrology
- Stream/River
- Lake/Reservoir

Highways
- Interstate
- Highway

Surface Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Local
- Private
- US Forest Service

Figure 6-7 DeBeque Phacelia Suitable Habitat and All NSO Lease Stipulations

April 2016

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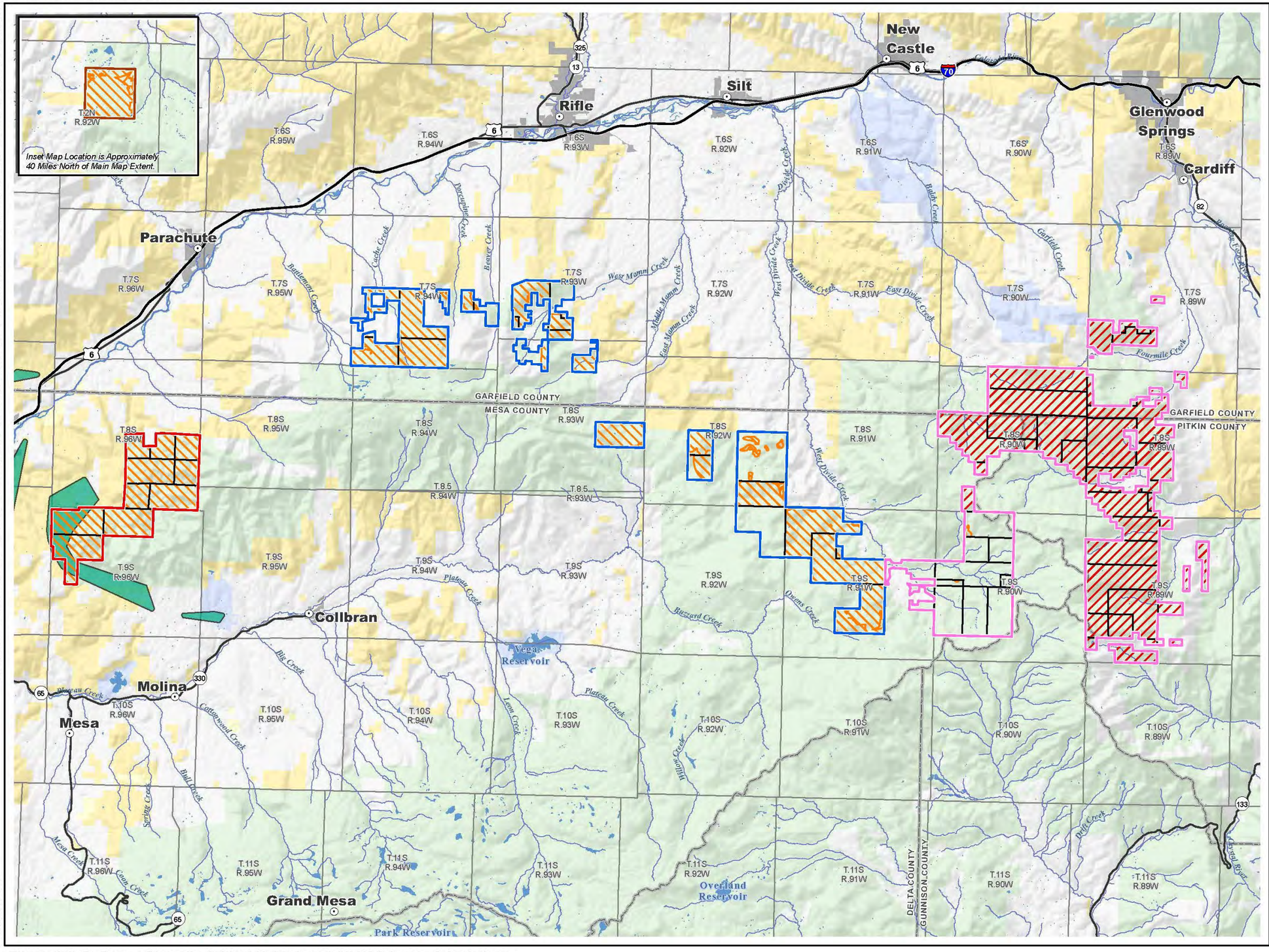

Legend

Project Features
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Lease Boundary

Special Status Plant Habitat
- DeBeque Phacelia Critical Habitat

Stipulations Coverage Under Preferred Alternative
- All NSO Stipulations
- Leases to be Cancelled

Boundaries
- County Boundary
- Township/Range
- Urban Area

Hydrology
- Stream/River
- Lake/Reservoir

Highways
- Interstate
- Highway

Surface Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Local
- Private
- US Forest Service

Figure 6-8 DeBeque Phacelia Critical Habitat and All NSO Lease Stipulations

April 2016

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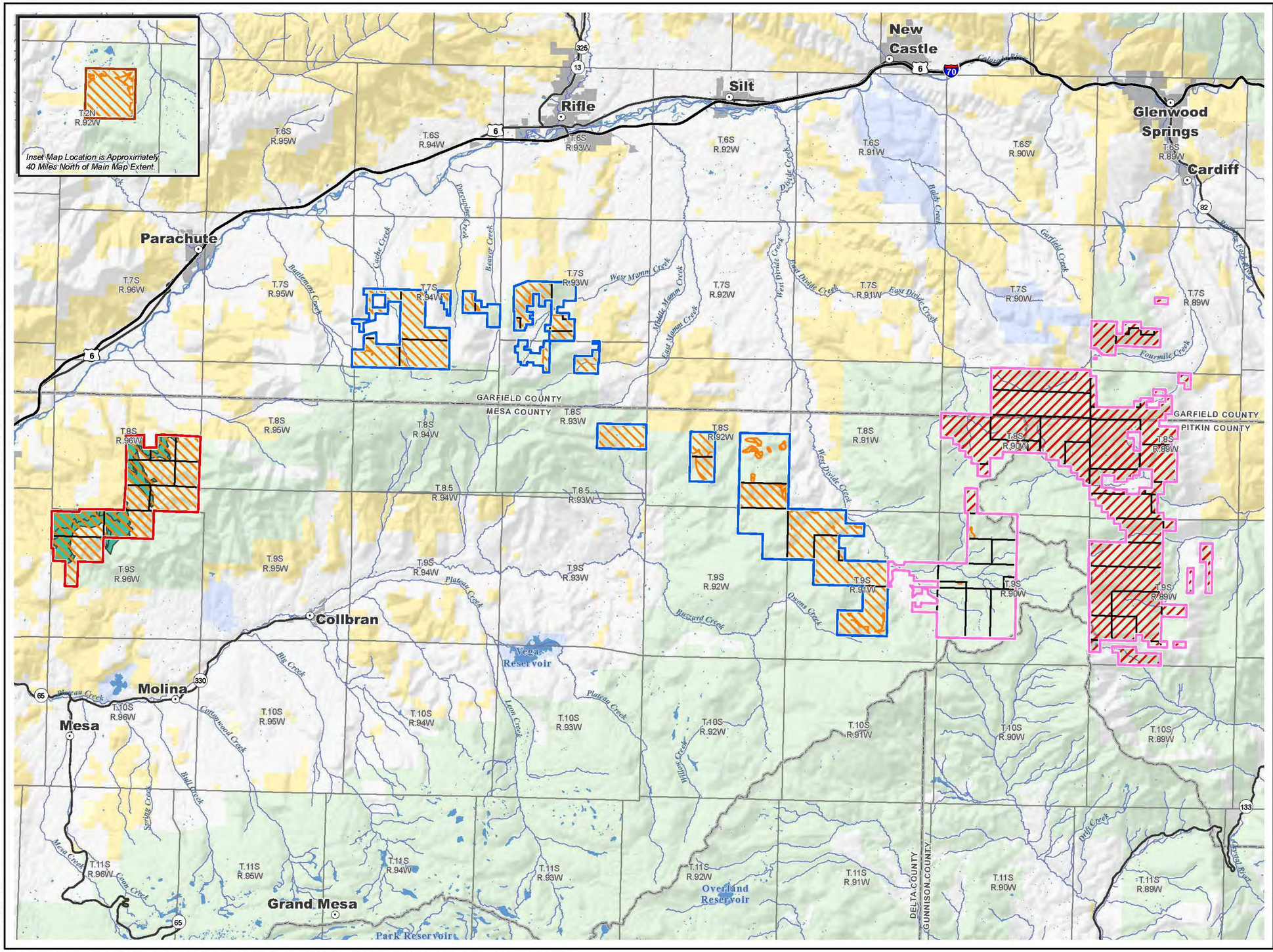

Legend

Project Features
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Lease Boundary

Special Status Plant Habitat
- Colorado Hookless Cactus Suitable Habitat

Stipulations Coverage Under Preferred Alternative
- All NSO Stipulations
- Leases to be Cancelled

Boundaries
- County Boundary
- Township/Range
- Urban Area

Hydrology
- Stream/River
- Lake/Reservoir

Highways
- Interstate
- Highway

Surface Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Local
- Private
- US Forest Service

Figure 6-9 Colorado Hookless Cactus Suitable Habitat and All NSO Lease Stipulations

April 2016

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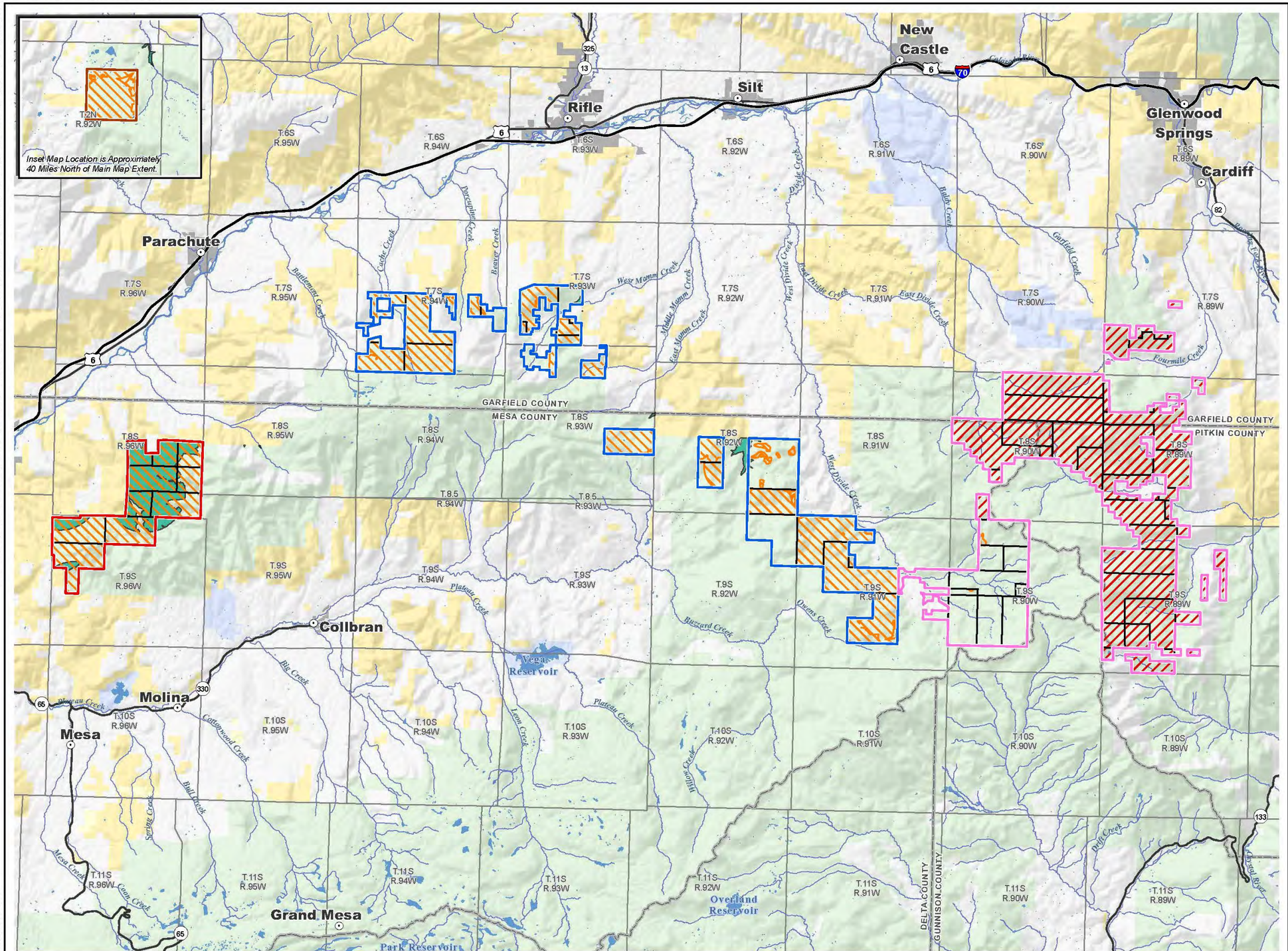

Legend

Project Features
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Lease Boundary

Special Status Plant Habitat
- Ute Ladies'-tresses Suitable Habitat

Stipulations Coverage Under Preferred Alternative
- All NSO Stipulations
- Leases to be Cancelled

Boundaries
- County Boundary
- Township/Range
- Urban Area

Hydrology
- Stream/River
- Lake/Reservoir

Highways
- Interstate
- Highway

Surface Ownership
- Bureau of Land Management
- Bureau of Reclamation
- Local
- Private
- US Forest Service

Figure 6-10 Ute Ladies'-tresses Suitable Habitat and All NSO Lease Stipulations

April 2016

7.0 Determination of Effects

7.1 Canada Lynx

Effect on Critical Habitat: The Preferred Alternative would not affect critical habitat because none has been designated within the analysis area for the Canada lynx.

Effect on the Species: The Preferred Alternative *may affect, but is not likely to adversely affect* the Canada lynx as a result of oil and gas development in the lease area for the following reasons:

1. Because it is not known specifically where future oil and gas leasing or development may occur, it is possible that new leasing and oil and gas development would not occur within lynx habitats.
2. The Preferred Alternative was designed to include No Surface Occupancy (NSO) stipulations for the protection of suitable lynx habitats. This includes lynx linkage areas. These NSO stipulations cover approximately 19 percent of the habitat within the lease area.
3. The Preferred Alternative includes the decision to cancel a large portion of the leases that fall within suitable lynx habitats. This includes lynx linkage areas. These cancellations cover approximately 67 percent of the habitat within the lease area.
4. In addition to the NSO stipulations specifically identified for priority lynx habitats, the Preferred Alternative includes extensive NSO stipulations for protection of other resources. There is some overlap of these NSOs with lynx habitats, which would provide additional protections for lynx. These NSO stipulations cover approximately 25 percent of the habitat within the lease area. Controlled Surface Use (CSU) stipulations for the protection of other resources would also provide protections for lynx and lynx habitats outside of NSO areas.
5. All but <1 percent of the analysis area is covered by NSO stipulations or is found in areas where the existing leases will be cancelled. If a future Application for Permit to Drill (APD) is received for an existing lease in lynx habitat without NSOs, project specific NEPA analysis would be conducted and the proposal would be designed to avoid or minimize potential impacts to lynx and lynx habitats per the USFS SUPO process and in accordance with the applicable Forest Plan standards and Objectives.
6. Current oil and gas developments within lynx habitats on existing leases is minimal. This reflects the oil and gas development history on the White River National Forest over the last 22 years or more.
7. Given the small surface disturbance footprints of individual well pads, if future oil and gas development occurs within lynx habitats outside of NSO areas it is likely that lynx habitat connectivity would be maintained across the landscape and habitat fragmentation for lynx would be minimal. Similarly, lynx would be expected to cross road and buried pipeline corridors easily.
8. Although most studies have shown that lynx do not alter their behavior to avoid human activities (with the possible exception of intense winter recreation use), if future oil and gas development occurs in lynx habitat outside of NSO areas, disturbance from noise and nighttime lighting that are generated by road use, well drilling, construction activities, oil and gas facilities, equipment and vehicles, and the presence of people at development sites could cause behavioral disturbance impacts to lynx prey species. This may include temporary avoidance of localized sites while activities are occurring or longer term displacement from preferred habitats for some lynx prey species. Given the dispersed nature of future oil and gas developments, potential disturbance impacts to lynx prey species would be expected to be localized and insignificant within the context of the full analysis area and associated populations.

9. Most lynx denning habitat was purposely included in the No Surface Occupancy stipulation for lynx protection. If an APD is received for future proposed oil and gas development in lynx denning habitat outside of NSO areas, site specific NEPA analysis would be conducted and the proposal would be designed to avoid suitable lynx denning habitat where possible. If that is not possible, if a potential denning site receives excessive disturbance from a road, oil and gas development site, or associated human uses, lynx could easily move kittens to alternate sites and avoid busy sites in the future. It is not unusual for lynx to move their kittens several times from multiple natal and rearing den sites. Given the large home range of lynx and the dispersed nature oil and gas projected development including access roads, the likelihood for future oil and gas activities to impact denning lynx is very low and considered discountable.

10. Even when added to existing oil and gas developments in lynx habitats, the Preferred Alternative is expected to result in very limited physical and behavioral impacts to lynx, lynx prey species, and their habitats at the LAU level. If future oil and gas development occurs in lynx habitat outside of NSO areas, much of the initial surface disturbance would be reclaimed and become suitable lynx habitat again within 20-30 years. Long-term potential conversion of lynx habitat to unsuitable conditions would be limited in amount and extent. The remaining LAUs and lynx linkage areas on the White River National Forest would not be developed e for oil and gas leasing. The Canada lynx is a wide-ranging species with a large home range. The Preferred Alternative is expected to result in insignificant and discountable impacts to this wide ranging species.

11. The Preferred Alternative is consistent with the Southern Rockies Lynx Amendment objectives, standards, and guidelines that pertain to oil and gas development, management, and associated activities to the extent that it can be at this level of programmatic analysis and decision.

7.2 Bonytail Chub, Colorado Pikeminnow, Humpback Chub, Razorback Sucker

Effect on the Species: Implementation of the Preferred Alternative would result in a "*may affect, not likely to adversely affect*" determination for all components that do not result in the depletion of water from the Colorado River basin. Water depletions are considered a "May Affect, Likely to Adversely Affect." However, the effects of these water depletions from federal fluid mineral development within the Upper Colorado River basin in western Colorado were addressed at the programmatic level (BLM 2008). Any fresh water use for the subsequent retrieval of federal fluid minerals under the prescriptions identified in the Preferred Alternative would be tracked, logged, and reported to the USFWS by the BLM under the umbrella of the 2008 programmatic consultation.

Effect on Critical Habitat: The Preferred Alternative *may affect, but is not likely to adversely affect* designated critical habitat as a result of potential water depletions. Construction and operation activities would not directly affect Colorado pikeminnow, because there would be no ground disturbance allowed in the 100-year floodplain.

Rationale*:* Any water depletions in the Upper Colorado River Basin may affect occupied and critical habitat for the four federally endangered fish species. However, these effects have been addressed under the umbrella of the BLM 2008 programmatic consultation. In addition, Forest Service standards and guidelines are in effect to protect federally listed species and their designated critical habitats. The following Lease Notice protections would be applied to each existing USFS lease.

- The Forest Service is responsible for assuring that the leased land is examined prior to undertaking any surface-disturbing activities to determine effects upon any plant or animal species listed or proposed for listing as endangered or threatened, or their habitats. The findings of this examination may result in some restrictions to the operator's plans or even disallow use and occupancy that would be in violation of the Endangered Species Act of 1973 by detrimentally affecting endangered or threatened species or their habitats.

- The lessee/operator may, unless notified by the Forest Service that the examination is not necessary, conduct the examination on the leased lands at his discretion and cost. This examination must be done by or under the supervision of a qualified resource specialist approved by the Forest Service. An acceptable report must be provided to the Forest Service identifying the anticipated effects of a proposed action on endangered or threatened species or their habitats.

The following Lease Notice protections (also see Section 6.1.1) would be applied to each new Forest Service lease.

- THREATENED OR ENDANGERED SPECIES:
  - The Endangered Species Act. (ESA);
  - P.L. 93-205 (1973);
  - P.L. 94-359 (1974);
  - P.L. 95-212 (1977);
  - P.L. 95-632 (1978);
  - P.L. 96-159 (1979);
  - P.L. 97-304 (1982); and
  - P.L. 100-653 (1988).
- The Forest Service authorized officer is responsible for compliance with the Endangered Species Act. This includes meeting ESA Section 7 consultation requirements with the U.S. Fish and Wildlife Service prior to any surface disturbing activities associated with this lease with potential effects to species and/or habitats protected by the ESA. The results of consultation may indicate a need for modification of or restrictions on proposed surface disturbing activities.
- The lessee or operator may choose to conduct the examination at their cost. Results of the examination will be used in any necessary ESA consultation procedures. This examination and any associated reports, including Biological Assessments, must be done by or under the supervision of a qualified resource specialist approved by the Forest Service. Any reports also must be formally approved by the USDA Forest Service biologist or responsible official.

7.3 Colorado River Cutthroat Trout (Green Lineage)

Effect on the Species: The Preferred Alternative *may affect, but is not likely to adversely affect the* CRCT-GL as a result of oil and gas development in the analysis area.

Effect on Critical Habitat: The Preferred Alternative would not affect critical habitat because none has been designated for the CRCT-GL.

Rationale: Cutthroat trout-focused stipulations, stipulations for other resource values, and cancelled leases would protect approximately 48 percent of the CRCT-GL populations in the analysis area. Beaver Creek would be entirely protected via COGCC Rule 317B. Assurance of protections to the remaining occupied stream segments (primarily West Divide Creek) would be via the identified Forest Plan Standards and Guidelines, USFS Region 2 Sensitive Species Policy, and select objectives and strategies identified in the Conservation Agreement and Strategy for Colorado River Cutthroat Trout in the states of Colorado, Utah, and Wyoming that USFS Region 2 is signatory to. These are all discussed in detail in the Assessment of Effects - Section 6 above, and they all provide rationale and justification for the creation of site specific COA's to protect and minimize impacts to occupied CRCT-GL stream segments not specifically covered by lease stipulations. In addition, impacts to the remaining CRCT-GL

populations would be avoided or minimized through targeted design criteria and best management practices under the site specific APD and NEPA process, and site-specific Section 7 consultation and ESA compliance, if applicable. Finally, the WRNF Oil and Gas Leasing EIS/Plan Amendment (USFS 2014a, 2015b), as well as the Lease Notice stipulations described in Sections 6.1.1 and 7.2 would also be in effect and serve to help protect CRCT-GL populations and their habitats.

7.4 DeBeque Phacelia

Effect on the Species: The Preferred Alternative *may affect, but is not likely to adversely affect,* the DeBeque phacelia.

Effect on Critical Habitat: The Preferred Alternative *may affect, but is not likely to adversely modify* Critical Habitat for the DeBeque phacelia.

Rationale: Non-resource-specific NSOs cover 100 percent of suitable habitat within the lease area and 94 percent in the off-lease extension under the Preferred Alternative. Non-resource-specific NSOs would cover 100 percent of designated critical habitat for DeBeque phacelia within the lease area and 99 percent in the off-lease extension. Therefore, the majority of suitable and critical habitat is not available for future oil and gas leasing without a NSO stipulation. For those areas without full protection from NSO stipulations, compliance with Forest Service regulations (see Section 2.2), would require compliance with the ESA at the APD stage, when surveys for listed species would be conducted and conservation measures established to avoid adverse impacts would be required as part of the permit to drill, through consultation with USFWS. Because ground disturbance would not be allowed inside areas of NSO, the Preferred Alternative would not be expected to adversely affect DeBeque phacelia.

As stated in Section s 6.1.1 and 6.3.2, federally listed species also receive protection under the 2002 WRNF Land and Resource Management Plan (USFS 2002a) Standards and the USFS Lease Notice which requires adherence to ESA and examination of land by qualified specialists prior to any ground disturbing activity. Modifications of a lease are possible based on findings of the examination.

7.5 Colorado Hookless Cactus

Effect on the Species: The Preferred Alternative *may affect, but is not likely to adversely affect* the Colorado hookless cactus.

Effect on Critical Habitat: The Preferred Alternative would not affect critical habitat because none has been designated for the Colorado hookless cactus.

Rationale: Non-resource specific NSOs cover 100 percent of suitable habitat within the lease area and 94 percent in the off-lease extension under the Preferred Alternative. Therefore, the majority of suitable habitat is not available for future oil and gas leasing without a NSO stipulation. For those areas without full protection from NSO stipulations, compliance with Forest Service regulations (see Section 2.2), would require compliance with the ESA at the APD stage, when surveys for listed species would be conducted and conservation measures established to avoid adverse impacts would be required as part of the permit to drill, through consultation with USFWS. Because ground disturbance would not be allowed inside areas of NSO, the Preferred Alternative would not be expected to adversely affect the Colorado hookless cactus.

As stated in Section s 6.1.1 and 6.3.2,, federally listed species also receive protection under the 2002 WRNF Land and Resource Management Plan (USFS 2002a) Standards and the USFS Lease Notice which requires adherence to ESA and examination of land by qualified specialists prior to any ground disturbing activity. Modifications of a lease are possible based on findings of the examination.

7.6 Ute Ladies'-tresses

Effect on the Species: The Preferred Alternative *may affect, but is not likely to adversely affect* the Ute ladies'-tresses orchid.

Effect on Critical Habitat: The Preferred Alternative would not affect critical habitat because none has been designated for the Ute ladies'-tresses.

Rationale: There are no known populations of Ute ladies'-tresses within or near the leases (USFS 2015a, pg. 42). The leases are at the edge of the suitable range for this species. Ute ladies'-tresses is not likely to be found within drainages in the lease areas, because these drainages are generally steep and not likely suitable habitat. In floodplains, necessary USACE permitting would discourage and potentially prohibit development.

Non-resource-specific NSOs cover 100 percent of suitable habitat within Zone 1 and 95 percent in the off-lease extension for the Preferred Alternative. There is no NSO stipulation coverage for the 92 acres of suitable habitat within Zone 2. This comprises 2 percent (92 of 5,277 total acres) of all suitable habitat within the Preferred Alternative. There is no suitable habitat found within Zones 3 and 4. Therefore, the majority of suitable habitat is not available for future oil and gas leasing without a NSO stipulation. For those areas without full protection from NSO stipulations, compliance with Forest Service regulations (see Section 2.2), would require compliance with the ESA at the APD stage, when surveys for listed species would be conducted and conservation measures established to avoid adverse impacts would be required as part of the permit to drill, through consultation with USFWS.Because ground disturbance would not be allowed inside areas of NSO, the Preferred Alternative would not be expected to adversely affect the Ute ladies' tresses orchid.

As stated in Sections 6.1.1 and 6.3.2, federally listed species also receive protection under the 2002 WRNF Land Resource Management Plan (USFS 2002a) Standards and the USFS Lease Notice which requires adherence to ESA and examination of land by qualified specialists prior to any ground disturbing activity. Modifications of a lease are possible based on findings of the examination.

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