APPENDIX E:

CORRESPONDENCE ASSOCIATED WITH ENDANGERED SPECIES ACT (ESA) CONSULTATION, BIOLOGICAL OPINION, AND BIOLOGICAL ASSESSMENT

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APPENDIX E:

CORRESPONDENCE ASSOCIATED WITH ENDANGERED SPECIES ACT (ESA) CONSULTATION, BIOLOGICAL OPINION, AND BIOLOGICAL ASSESSMENT

This appendix presents the biological assessment (BA) prepared for consultation with the U.S. Fish and Wildlife Service (USFWS) and the biological opinion (BO) that was issued by the USFWS. This appendix had previously presented species accounts for species listed under the Endangered Species Act (ESA), and it is now material that is also discussed in the BA or Section 4.3.6.4. This appendix also contains the correspondence between the U.S. Department of Energy (DOE) and the USFWS regarding ESA (Section 7) consultation. The correspondence began on November 7, 2011, and culminated on August 13, 2013, with a letter from the USFWS containing the BO (see page E-13).

Revisions made to the Draft ULP PEIS to prepare the Final ULP PEIS are identified with a line on the right margin of the pages. However, this same approach (i.e., providing lines on the right margin of the pages) to indicate new material was not done for this appendix. Instead, a description of the content of this appendix is provided as described in the paragraph above.

TABLE E-1 Endangered Species Act Consultation Correspondence

Date of Letter	Page	Source	Recipient
November 7, 2011	E-4	U.S. Department of Energy, Office of Legacy Management (T.A. Ribeiro, Environmental Program Manager)	U.S. Fish and Wildlife Service, Western Colorado Field Office (P. Gelatt, Fish and Wildlife Biologist)
November 16, 2011	E-9	U.S. Fish and Wildlife Service, Western Colorado Field Office (P. Repp, Acting Western Colorado Field Supervisor)	U.S. Department of Energy, Office of Legacy Management (T.A. Ribeiro, Environmental Manager)
May 13, 2013	E-11	U.S. Department of Energy, Office of Legacy Management (T.A. Ribeiro, Environmental Program Manager) (biological assessment attached)	U.S. Fish and Wildlife Service, Ecological Services (P. Gelatt, Western Colorado Supervisor)
August 13, 2013	E-13	U.S. Fish and Wildlife Service, Ecological Services (P. Gelatt, Western Colorado Supervisor)	U.S. Department of Energy, Office of Legacy Management (T.A. Ribeiro) (contains biological opinion)

Department of Energy
Washington, DC 20585

November 7, 2011

Ms. Patty Gelatt
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
Western Colorado Field Office
764 Horizon Drive, Building B
Grand Junction, CO 81506-3946

Subject: Initiation of Endangered Species Act Informal Consultation for the Department of Energy's Uranium Leasing Program

Dear Ms. Gelatt:

The U.S. Department of Energy Office of Legacy Management (DOE) is preparing a Programmatic Environmental Impact Statement (PEIS) to evaluate potential impacts associated with the management of DOE's Uranium Leasing Program (ULP), under which DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The PEIS is being prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended, following implementing regulations developed by the President's Council on Environmental Quality in 40 CFR Parts 1500-1508 and DOE's NEPA implementing procedures provided in 10 CFR Part 1021. The PEIS will analyze potential impacts to environmental resources including those involving threatened or endangered species. The Notice of Intent for the PEIS was published in the Federal Register on June 21, 2011 (76 FR 36097). Public scoping meetings for the PEIS were conducted on August 8-11, 2011 at Montrose, Telluride, and Naturita, in Colorado, and at Monticello, in Utah.

DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel Counties, Colorado, that cover a cumulative acreage of approximately 25,000 acres. The locations of the ULP lease tracts are shown in Figure 1 of the Attachment.

By this letter, DOE is initiating informal consultation with the U.S. Fish and Wildlife Service (USFWS) under the provisions of the Endangered Species Act of 1973, as amended (ESA). DOE has identified a preliminary list of species that may be listed as endangered, threatened, or species that are proposed or candidates for listing under the ESA that may occur in the counties where DOE's ULP lease tracts are located (see Table 1 of the Attachment). In addition, our preliminary determination indicates that there are no critical habitats on DOE's ULP lease tracts. The nearest critical habitats are indicated in Figure 2 of the Attachment and are about twenty miles from the nearest DOE ULP lease tract(s). DOE requests a letter from your office concurring with or commenting on this preliminary list and the preliminary determination of critical habitat locations. Finally, please provide any other information you consider appropriate during the consultation process.

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Ms. Patty Gelatt -2-

DOE and its PEIS contractor (Argonne National Laboratory) will be contacting you and members of your staff in the near future to coordinate this effort. DOE looks forward to further consultation and coordinating activities with the USFWS on potential impacts, if any, of the ULP to federally-listed species.

Please do not hesitate to contact me if you have any questions on the ULP project at (970) 248-6621, or by e-mail at Tracy.Ribeiro@lm.doe.gov. Please send any correspondence to:

U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

Sincerely,

Tracy A. Ribeiro

Tracy A. Ribeiro
Environmental Program Manager

Enclosures

cc w/enclosures:
M. Picel, Argonne National Laboratory (e)
D. Geiser, DOE (e)
L. Kilpatrick, DOE (e)
T. Pauling, DOE (e)
S. Schiesswohl, DOE (e)
E. Cotter, Stoller (e)

ULP webpage
http://ulpeis.anl.gov

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ATTACHMENTS

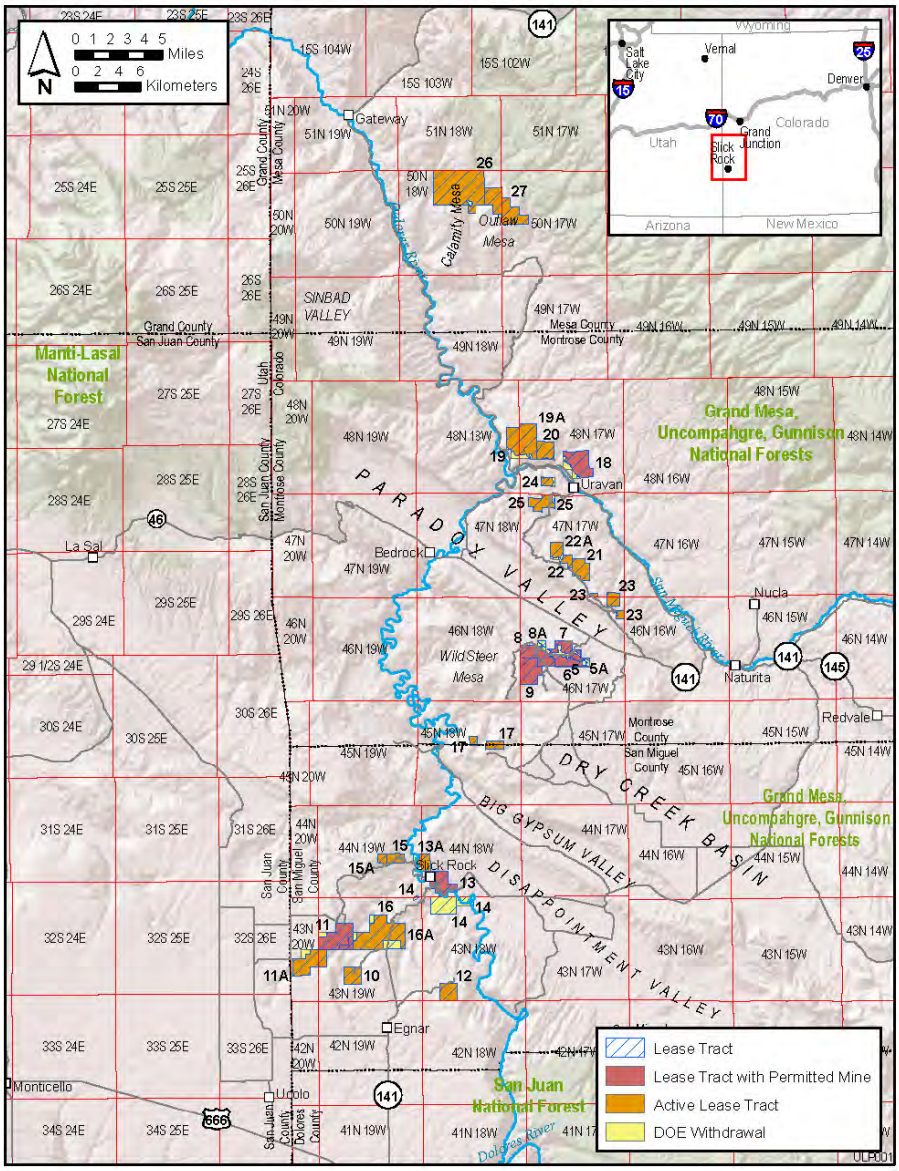

FIGURE 1 – Location of DOE ULP Lease Tracts in Mesa, Montrose, and San Miguel Counties, Colorado

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TABLE 1 – Species Listed as Endangered or Threatened Under the Endangered Species Act, or Species That are Proposed or Candidates for Listing Under the Endangered Species Act That May Occur in the Counties Where DOE ULP Lease Tracts are Located

Scientific Name	Common Name	Status[a]	Counties in Which Species May Occur	Counties in Which Critical Habitat May Occur
Plants				
Phacelia submutica	Debeque phacelia	PT	Mesa	
Eriogonum pelinophilum	Clay-loving wild buckwheat	E	Montrose	
Sclerocactus glaucus	Colorado hookless cactus	T	Mesa, Montrose	
Invertebrates				
Boloria acrocnema	Uncompahgre fritillary butterfly	E	San Miguel	
Fish				
Gila cypha	Humpback chub	E	Mesa, Montrose, San Miguel	Mesa[b]
Gila elegans	Bonytail	E	Mesa, Montrose, San Miguel	Mesa[b]
Oncorhynchus clarki stomias	Greenback cutthroat trout	T	Mesa	
Ptychocheilus lucius	Colorado pikeminnow	E	Mesa, Montrose, San Miguel	Mesa[b]
Xyrauchen texanus	Razorback sucker	E	Mesa, Montrose, San Miguel	Mesa[b]
Birds				
Centrocercus minimus	Gunnison sage-grouse	C	Mesa, Montrose, San Miguel	
Centrocercus urophasianus	Greater sage-grouse	C	Mesa, Montrose, San Miguel	
Coccyzus americanus	Yellow-billed cuckoo	C	Mesa, Montrose, San Miguel	
Empidonax traillii extimus	Southwestern willow flycatcher	E	San Miguel	
Strix occidentalis lucida	Mexican spotted owl	T	Montrose, San Miguel	
Mammals				
Cynomys gunnisoni	Gunnison's prairie dog	C	Montrose	
Lynx canadensis	Canada lynx	T	Mesa, Montrose, San Miguel	
Mustela nigripes	Black-footed ferret	E	Montrose, San Miguel	

[a] C = candidate; E = endangered; PT = proposed threatened; T = threatened.

[b] Designated critical habitats for these species are located outside the DOE ULP lease tracts (on the Colorado and Gunnison Rivers).

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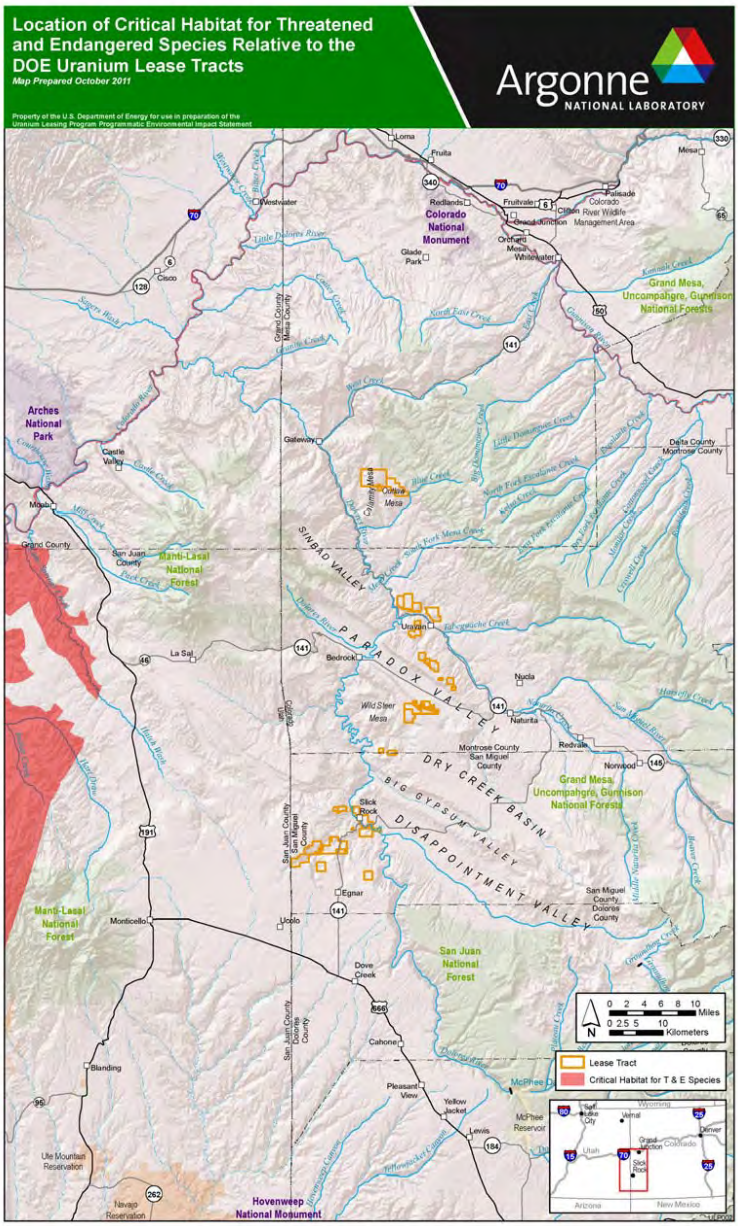

FIGURE 2 – Location of Designated Critical Habitats Relative to the DOE ULP Lease Tracts

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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: DOE
TAILS: 06E24100-2012-TA-0033

RECEIVED DOE
NOV 17 2011
GRAND JUNCTION OFFICE

November 16, 2011

Tracy A. Ribeiro
Environmental Manager
US Department of Energy
Office of Legacy Management
Grand Junction, CO 81503

Dear Ms. Ribeiro:

This responds to your November 7, 2011, correspondence regarding the US Department of Energy, Office of Legacy Management (DOE) Uranium Leasing Program (ULP). We understand that you are preparing a Programmatic Environmental Impact Statement to evaluate the potential impacts of the ULP in Mesa, Montrose, and San Miguel Counties, Colorado.

You submitted a preliminary list of federally endangered, threatened, and candidate species that may occur in the counties where DOE's ULP lease tracts are located. We discussed your preliminary species list in our meeting on November 9, and concluded that it is an appropriate list with the following exceptions: 1) remove greater sage-grouse (*Centrocercus Urophasianus*) because this candidate species does not occur in Mesa, Montrose, or San Miguel Counties, and 2) add North American wolverine (*Gulo gulo luscus*) because this candidate species may occur in Mesa, Montrose, or San Miguel Counties. You should determine what species on the list occur in the ULP areas, or may be affected by the ULP. Your biological assessment should provide an analysis of how the ULP may affect listed species.

One or more candidate species potentially occur within the project area. Federal candidates for official listing as threatened or endangered have no legal protection under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act). However, it is within the spirit of the Act to consider project impacts to these species.

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In the future, we recommend that DOE and its contractors use our web-based Information Planning and Conservation system (IPAC) (http://ecos.fws.gov/ipac/) to obtain an official species list. If the Service can be of further assistance, please contact Patty Gelatt at the letterhead address or (970) 243-2778, extension 26.

Sincerely,

Pamela Repp
Acting Western Colorado Field Supervisor

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Department of Energy
Washington, DC 20585

Ms. Patty Gellatt
Western Colorado Supervisor
U.S. Fish and Wildlife Service, Ecological Services
764 Horizon Drive, Building B
Grand Junction, Colorado 81506

Subject: FINAL BIOLOGICAL ASSESSMENT FOR THE DEPARTMENT OF ENERGY URANIUM LEASING PROGRAM AND A REQUEST FOR FORMAL CONSULTATION

Dear Ms. Gellatt:

The U.S. Department of Energy (DOE) has prepared the enclosed final biological assessment (BA) to evaluate whether the continued management of the DOE Uranium Leasing Program (ULP) (involving exploration, mine development and operations, and reclamation for a period of 10 or more years) would have adverse effects on listed species under the Endangered Species Act (ESA). The BA is part of the ongoing informal consultation started in concert with a programmatic environmental impact statement (PEIS) under the National Environmental Policy Act (NEPA) for the ULP. The proposed action is for an approximate area of 25,000 acres located in the southwest corner of Colorado.

By letter dated November 7, 2011, (Ribeiro 2011), DOE indicated it was beginning a NEPA PEIS. As part of that effort, DOE requested informal consultation with the U.S. Fish and Wildlife Service (USFWS) and concurrence on a list of federally threatened or endangered species that may be in the vicinity of the ULP. DOE met with the USFWS on November 9, 2011, to discuss the list and other details associated with the BA investigation, such as water depletions. In a letter dated November 16, 2011, (Repp 2011) the USFWS provided a few revisions to the list of federally threatened or endangered species. Subsequent to these letters, the USFWS submitted a rule to propose Gunnison Sage Grouse as endangered under the ESA. On March 20, 2013, DOE provided a BA for review. After further review of documents associated with the four endangered fish species within the Upper Colorado River basin, DOE concluded that it was necessary to change the previous determination for these species. DOE is providing this final BA to replace the BA provided in March.

A total of 14 species listed or proposed for listing under the ESA are considered for Section 7 consultation in this BA; an additional three species that are candidates for listing under the ESA are discussed in coordination with USFWS conservation objectives. The species are listed in Table 3-3 of the BA.

With the implementation of various compliance and mitigation measures or best management practices, ULP activities are expected to have **no effect** on eight species (clay-loving wild buckwheat, Colorado hookless cactus, Debeque phacelia, Uncompahgre fritillary butterfly, greenback cutthroat trout, black-footed ferret, Canada lynx, and North American wolverine) and

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Ms. Patty Gellatt -2-

on the designated critical habitat for five species (clay-loving wild buckwheat, Debeque phacelia, Mexican spotted owl, southwestern willow flycatcher, and Canada lynx). DOE has determined that ULP activities **may affect, but are not likely to adversely affect**, five species (Mexican spotted owl, southwestern willow flycatcher, Gunnison sage-grouse, western yellow-billed cuckoo, and Gunnison's prairie dog). It has been determined that ULP activities may affect, and are likely to adversely affect the four Colorado River endangered fish species (bonytail, Colorado pikeminnow, humpback chub, and razorback sucker) and their critical habitat.

DOE requests your review of the final BA and your concurrence with these determinations. Since the ULP activities may affect, and are likely to adversely affect the four endangered fish species within the Upper Colorado River basin, DOE is also requesting initiation of formal consultation. Please call me at (303) 410-4817, or the ULP PEIS Document Manager - Mr. Ray Plieness at (303) 410-4806. Please address any correspondence to:

U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

Sincerely,

Tracy A. Ribeiro
Tracy Ribeiro
2013.05.14 16:57:24
-06'00'

Tracy A. Ribeiro
Environmental Program Manager

Enclosure

cc w/enclosure:
V. Bowie, GC-54 (e)
E. Cohen, GC-54 (e)
S. Dove, GC-31 (e)
S. Miller, GC-51 (e)
M. Picel, ANL (e)
D. Shafer, DOE-LM
R. Plieness, DOE-LM
E. Cotter, Stoller (e)
File: ULP 001.01 (A) (rc grand junction)

DOE Support\Managers\Ribeiro\5-13-13 BA Submission Ltr to USFWS

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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-6-RO-95-F-001-GJ423
TAILS 06E24100-2013-F-0096

August 13, 2013

Tracy A. Ribeiro
U.S. Department of Energy
Office of Legacy Management
11025 Dover Street, Suite 1000
Westminster, Colorado 80021-5573

Dear Ms. Ribeiro:

In accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.), and the Interagency Cooperation Regulations (50 CFR 402), the Fish and Wildlife Service (Service) reviewed your May 14, 2013 final biological assessment (BA) to evaluate whether continued management of the U.S. Department of Energy's (DOE) Uranium Leasing Program (ULP) (involving exploration, mine development and operations, and reclamation for a period of 10 or more years) would have adverse effects on listed species under the ESA. The final BA dated May 14, 2013, is part of the ongoing consultation started in concert with a programmatic environmental impact statement (PEIS). The proposed action is for an approximate area of 25,000 acres located in Mesa, Montrose, and San Miguel Counties in southwest Colorado. A total of 14 species either listed or proposed for listing were considered in your BA for section 7 consultation, along with an additional three species that are candidates for listing.

Colorado River Endangered Fishes

DOE has determined that ULP activities **may affect, and are likely to adversely affect**, the endangered Colorado River fish (bonytail *(Gila elegans)*, Colorado pikeminnow (*Ptychocheilus lucius)*, humpback chub *(Gila Cypha)*, razorback sucker *(Xyrauchen texanus)*) and their critical habitat. The proposed action will cause an average annual depletion of 19.3 acre-feet per year to the Dolores River in the Upper Colorado River Basin and thus **may adversely affect** the endangered Colorado River fish and their critical habitat. Water depletions associated with ULP are addressed in a June 4, 2010 intra-Service biological opinion (BO) for water depletions less than 100 acre-feet in the upper Colorado River basin. A Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin was initiated on January 22, 1988. The Recovery Program was intended to be the reasonable and prudent alternative to avoid jeopardy and destruction or adverse modification of critical habitat to the endangered fishes

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caused by depletions from the Upper Colorado River Basin. In order to further define and clarify the process of the Recovery Program, a section 7 agreement was implemented on October 15, 1993, by the Recovery Program participants. Incorporated into this agreement is a Recovery Implementation Program Recovery Action Plan (RIPRAP) which identifies actions currently believed to be required to recover the endangered fishes in the most expeditious manner.

Included in the Recovery Program was the requirement that a depletion fee would be paid by water users to help support the Recovery Program. The ULP fits under the umbrella of the June 4, 2010 re-issued BO that addresses small water depletions and exempts the depletion fee for depletions of 100 acre-feet or less. We have determined that the Recovery Program has made sufficient progress toward recovery to serve as Conservation Measures (formally reasonable and prudent alternatives) for new and historic project depletions of 100 acre-feet or less. Therefore, the depletion fee for the ULP is waived and further consultation is not required.

It is particularly important to avoid contamination of surface and ground water that flows into the Dolores River and in turn into critical habitat in the Colorado River. Uranium mining can contaminate surrounding drainages with uranium, other radioactive contaminants, ammonia, and selenium. The construction of mining facilities may also increase sedimentation in down gradient streams. The implementation of mitigation measures and Best Management Practice's (BMP's) described in Table 2-5 of the ULP BA related to aquatic habitats and water quality will reduce water quality impacts to the extent that they are insignificant

The 2010 BO determined that small water depletions addressed in the BO are not likely to jeopardize the continued existence of the endangered fish and not likely to destroy or adversely modify designated critical habitat.

The determination in this document is based on the information provided by the DOE. If new information becomes available, if a new species becomes listed, if incidental take occurs, if the total average annual amount of water depleted by this project changes, or if any other project element changes which alters the operation of the project from that which is described in your correspondence and which may affect any endangered or threatened species in a manner or to an extent not considered in this BO (see 50 CFR 402.16), formal section 7 consultation must be reinitiated. The DOE should condition its approval documents to retain jurisdiction should section 7 consultation need to be reinitiated.

Mexican Spotted Owl and Southwest Willow Flycatcher

DOE has determined that ULP activities **may affect, but are not likely to adversely affect**, the Mexican spotted owl (*Strix occidentalis lucida)*, and Southwestern willow flycatchers (*Empidonax traillii extimus)*. Therefore, pursuant to the ESA, DOE has requested the Service's concurrence with the effects determination. The Service concurs with the DOE's determination for these species because of the conservation measures described in Table 2-5 (pages 15-20 of the BA) will be implemented during all project phases. DOE assessed that suitable habitat for the southwestern willow flycatcher is unlikely to occur in the vicinity of the lease tracts as the species has not been observed near these areas. Although a Mexican spotted owl occurrence was documented near ULP Lease Tract 12, this bird was most likely migrating as no suitable

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breeding habitat such as canyon lands and old growth forests exist on this tract. The Service recommends that surveys be conducted (as described in G17, Table 2-5) prior to any on-the-ground ULP activities, to insure that southwestern willow flycatchers and Mexican spotted owls are not present before irretrievable/irreversible commitment of mining company resources occurs. And as described in Table 2-5 (G12), if any federally listed threatened and endangered species are found during any phase of the project, you must consult with the Service as required by Section 7 of the ESA and determine an appropriate course of action to avoid, minimize, or mitigate impacts.

Candidate and Proposed Species

We would like to call DOE's attention to the proposed rule to list the Gunnison sage-grouse (*Centrocercus minimus)* as endangered, plus the proposed designation of critical habitat which were recently published in the Federal Register on January 13, 2013 (USFWS a & b, 2013). Your BA states that the Paradox lease tracts occur as near as 168 ft from the current Gunnison sage-grouse range in the Dry Creek Basin. However, on page 48 (Figure 3-4), the map shows that the western portion of the tract block consisting of the 5a-9 tracts overlaps with the current range of the Gunnison sage-grouse, which in that area, is also proposed critical habitat. Either the map is incorrect or the description in the text is incorrect. Similarly, north of Egnar, proposed critical habitat in the unoccupied range is overlapped by tracts 16 and/or 16A. In your letter of March 20, 2013, you have requested concurrence on your effect determination of not likely to adversely affect for the Gunnison sage-grouse. The Gunnison sage-grouse is currently a proposed species for listing. The DOE is not required to conference with the Service unless you determine that the proposed action is likely to jeopardize the continued existence of the Gunnison sage-grouse section 7(a)(4). All other conferencing regarding a proposed species and proposed critical habitat is voluntary on the DOE's and the Service's part. We appreciate your consideration and analysis of effects on the Gunnison sage-grouse. By your determination we assume that you have determined that your project does not jeopardize the continued existence of the Gunnison sage-grouse, but has some lesser effects. Currently, due to limited staff resources, the Service is not able to engage in voluntary conferencing on the Gunnison sage-grouse, but again we appreciate your analysis of the effects to the Gunnison sage-grouse from the proposed ULP. Should the proposal to list the species become final, all aspects of the ESA (including section 7 consultation) will apply.

You have requested concurrence on determination that the proposed project may affect, but is not likely to adversely affect the yellow-billed cuckoo (*Coccyzus americanus)*. The yellow billed cuckoo is a Federal candidate for listing and is not subject to required section 7 consultation or conferencing under the ESA. Currently, the Service is not able to engage in voluntary conferencing on the yellow billed cuckoo, but we appreciate your analysis of the effects to the cuckoo from your proposed action. The Service is preparing a proposed rule for the yellow billed cuckoo that is expected to be available no later than the end of this fiscal year. Consequently, DOE may need to initiate a conference when proposed, or a consultation if listed, with site specific consultations as necessary.

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Similarly, you have requested concurrence on your determination that the proposed project may affect, but is not likely to adversely affect the Gunnison's prairie dog (*Cynomys gunnisoni*). The Gunnison's prairie dog is also a Federal candidate for listing and is not subject to required section 7 consultation or conferencing under the ESA. You have determined that the current Gunnison's prairie dog range intersects or is in the vicinity of Uravan, Paradox, and Slick Rock ULP lease tracts. The Service recommends that surveys be conducted (as described in G17, Table 2-5) prior to any on-the-ground ULP activities to avoid impacts to Gunnison's prairie dog.

Other Listed Species and designated critical habitat

DOE has determined that ULP activities are expected to have **no effect** on eight species including; *Eriogonum pelinophilum* (clay-loving wild buckwheat), *Sclerocactus glaucus* (Colorado hookless cactus), *Phacelia submutica* (DeBeque phacelia), Uncompahgre fritillary butterfly (*Boloria acrocnema*), greenback cutthroat trout (*Oncorhynchus clarki stomias*), Black-footed ferret (*Mustela nigripes)*, Canada lynx (*Lynx canadensis*), and North American wolverine (*Gulo gulo luscus*), and on the designated critical habitat for five species (clay-loving wild buckwheat, Debeque phacelia, Mexican spotted owl, southwestern willow flycatcher, and Canada lynx). The Service does not have any information indicating otherwise. The regulations implementing section 7 of the ESA (Interagency Cooperation) do not authorize or require the Service to review or concur with no effect determinations for listed species or designated critical habitat. However, we appreciated your providing us the no effect determination for our information, even if not required to do so under the ESA.

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

Rare Plants

We would like to take this opportunity to call attention to plant species with a ranking from the Colorado Natural Heritage Program of G1 or G2 because these have been identified as the most imperiled and rarest plants in Colorado. These species include: *Astragalus equisolensis* (horseshoe milkvetch), *Camissonia eastwoodia* (Eastwood evening-primrose or Grand Junction suncup), *Cryptantha gypsophila* (Gypsum Valley cateye), *Erigeron kachinensis* (Kachina daisy), *Lupinus crassus* (Payson lupine), and *Lygodesmis doloresensis* (Dolores River skeletonplant). In the past, we have been petitioned to list several of these species including the horseshoe milkvetch, Gypsum Valley cateye, and the Dolores River skeletonplant. We did negative 90-day findings for all three species, but all are species of concern. Recent genetic tests suggest that the Gypsum Valley cateye is rarer than previously thought, being confined only to the Gypsum Valley. Actions associated with the leasing should be conducted in a manner to promote conservation of these species.

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Migratory Birds

DOE has informed the Service that no in situ mining will occur with the ULP. Thus, effects connected with in-situ mining were not included in the ULP BA. The potential for uranium, radionuclides, selenium and other contaminants to impact migratory birds should be assessed for retention ponds that capture surface water, and for sedimentation ponds receiving water pumped from mines. Uranium bearing formations are usually associated with seleniferous strata (Boon 1989). Waterborne selenium concentrations ≥ 2 µg/L are considered hazardous to the health and long-term survival of fish and wildlife (Lemly 1996). Additionally, water with more than 20 µg/L is considered hazardous to aquatic birds (Skorupa and Ohlendorf 1991). Chronic effects of selenium manifest themselves in immune suppression to birds (Fairbrother et al. 1994) which can make affected birds more susceptible to disease and predation. Selenium toxicity will also cause embryonic deformities and mortality (See et al. 1992, Skorupa and Ohlendorf 1991, Ohlendorf 2002)

If submerged aquatic vegetation and/or aquatic invertebrates are present in ponds with high waterborne selenium concentrations, extremely high dietary levels of this contaminant can be available to aquatic migratory birds. Ramirez and Rogers (2000, 2002) documented selenium concentrations ranging from 434 to 508 µg/g in *Potamogeton vaginatus* (pondweed) collected from a uranium mine wastewater storage reservoir that had waterborne selenium concentrations ranging from 260 to 350 µg/L.

Annual monitoring of retention and sedimentation ponds should be conducted to determine waterborne selenium concentrations and to determine if submerged aquatic vegetation and/or aquatic invertebrates are present and provide a pathway for selenium bioaccumulation by birds using the evaporation ponds. If submerged aquatic vegetation and/or aquatic invertebrates are present in the evaporation pond and waterborne selenium is > 2 µg/L, please contact our office for further guidance.

Along with the previously mentioned contaminants, high salt concentrations may also occur in retention and sedimentation ponds, as well as at ponds at milling facilities. As water evaporates, ponds become increasingly saline; ultimately resulting in accumulation of evaporates/precipitates. On page S-67 of your March 2013 draft PEIS, it is recommended that mine-water treatment ponds should be fenced and netted to prevent use by wildlife including birds and bats. Contrary to what is stated on page 67 of your BA, birds do not avoid acidic and saline conditions in ponded water, and both situations can result in providing attractive nuisance ponds that result in avian mortality. There are numerous publications that address salt toxicity to birds. Wobeser and Howard (1987) discussed mortality of waterfowl on a hypersaline lake with a conductivity of 77,000-90,000 µmhos/cm. Windingstad et al. (1987) reported salt toxicosis in waterfowl in a lake with sodium concentrations over 17,000 mg/L. Salt toxicosis is associated with high sodium concentrations in bird brains, and they can suffer general dehydration, hemorrhages, salt encrustation of feathers, ocular lens opacities, and eventual mortality (Meteyer et al., 1997). Fencing (Table 2-5, D11), lining (Table 2-5, D4), **and** netting these ponds that contain high concentrations of salt and contaminants are the best management practices that provide barriers to prevent exposure to birds and other wildlife, and avoid take under the Migratory Bird Treaty Act. Please visit www.fws.gov/mountain-prairie/contaminants/oilpits.htm

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for more information on pond netting.

Thank you for your cooperation in this consultation and your interest in conserving endangered species. If we can be of further assistance, please contact Barb Osmundson of the Western Colorado Field Office in Grand Junction at (970) 243-2778, extension 21.

Sincerely,

Patricia S. Gelatt
Western Colorado Supervisor

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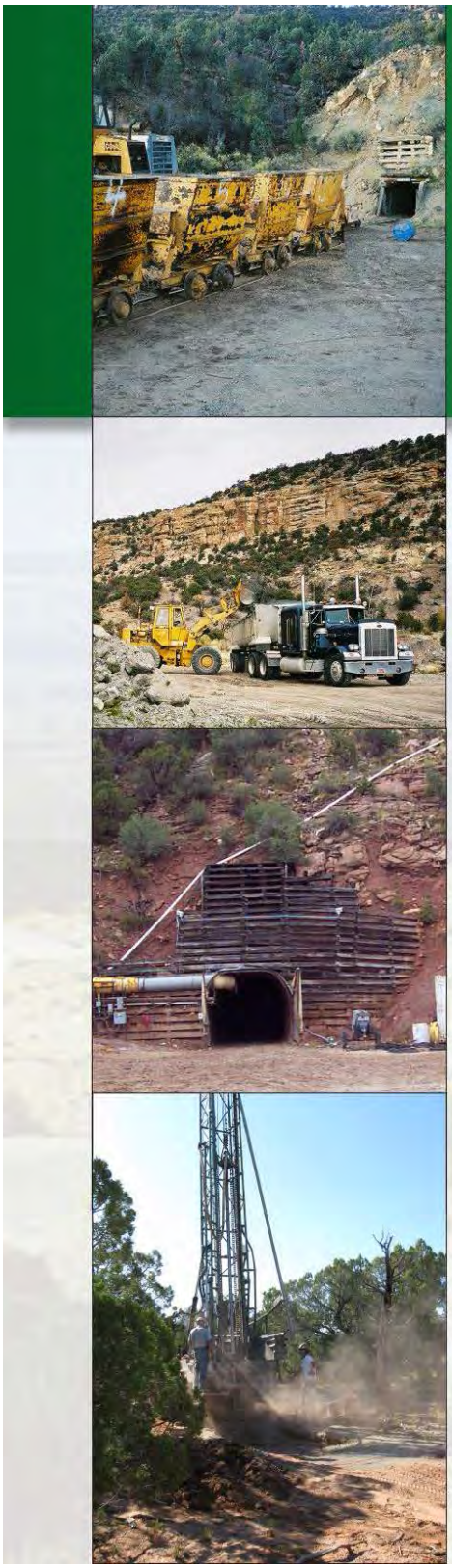

Final Biological Assessment for the U.S. Department of Energy Uranium Leasing Program

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NOTATION

ACRONYMS AND ABBREVIATIONS

BA	biological assessment
BLM	Bureau of Land Management
BMP	best management practice
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife (formerly CDOW)
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
ROW	right-of-way
ULP	Uranium Leasing Program
USC	*United States Code*
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WAPA	Western Area Power Administration

UNITS OF MEASURE

acre-ft	acre-foot (feet)
°C	degree(s) Celsius
cm	centimeter(s)
d	day
dBA	a-weighted decibel(s)
°F	degree(s) Fahrenheit
ft	foot (feet)
g	gram(s)
gal	gallon(s)
h	hour(s)
ha	hectare(s)
in.	inch(es)
kg	kilogram(s)
km	kilometer(s)
km^2	square kilometer(s)
L	liter(s)
lb	pound(s)

m	meter(s)
mGy	milligray
mi	mile(s)
mi^2	square mile(s)
oz	ounce(s)
pCi	picocurie(s)
yr	year(s)

1 INTRODUCTION

This document serves as the biological assessment (BA) for the U.S. Department of Energy's (DOE's) proposed action to implement the Uranium Leasing Program (ULP) under which DOE administers tracts of land (lease tracts) in western Colorado for exploration, development, and the extraction of uranium and vanadium ores. This BA was prepared by DOE as part of its compliance with the Endangered Species Act of 1973, as amended (ESA; see 16 USC §1531 et seq. in *United States Code*). A BA evaluates the potential effects of an agency's proposed action on species that are federally listed as threatened or endangered (and species that are proposed for such listing) and on designated and proposed critical habitat and determines whether any such species or habitats are likely to be adversely affected by the proposed action (see 50 CFR 402.12 in the *Code of Federal Regulations*). This BA is being provided to the U.S. Fish and Wildlife Service (USFWS) to document DOE's conclusions and the rationale to support those conclusions regarding the effects of the proposed action on protected resources, and it may be used by the USFWS in developing a biological opinion (Opinion) if it is determined that the proposed action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat.

1.1 SUMMARY

A total of 14 species listed or proposed for listing under the ESA are considered for Section 7 consultation in this BA; an additional 3 species that are candidates for listing under the ESA are discussed in coordination with USFWS conservation objectives. Required compliance measures, mitigation measures, and suggested best management practices (BMPs) (listed and defined in Table 2-5) for ULP mining activities would aid in eliminating, reducing, or offsetting impacts to these species. With the implementation of these measures, ULP activities are expected to have **no effect** on 8 species (clay-loving wild buckwheat, Colorado hookless cactus, Debeque phacelia, Uncompahgre fritillary butterfly, greenback cutthroat trout, black-footed ferret, Canada lynx, and North American wolverine) and on the designated critical habitat for 5 species (clay-loving wild buckwheat, Debeque phacelia, Mexican spotted owl, southwestern willow flycatcher, and Canada lynx). It has been determined that ULP activities **may affect, but are not likely to adversely affect,** 5 species (Mexican spotted owl, southwestern willow flycatcher, Gunnison sage-grouse, western yellow-billed cuckoo, and Gunnison's prairie dog). It has been determined that ULP activites **may affect, and are likely to adversely affect** the 4 Colorado River endangered fish species (bonytail, Colorado pikeminnow, humpback chub, and razorback sucker) and their critical habitat. Additional conservation measures are proposed to reduce or mitigate impacts to the Colorado River endangered fish. The cumulative impact assessment evaluates the incremental impact of other nonfederal activities within a 50-mi (80-km) area surrounding the ULP lease tracts. Cumulative effects of the ULP are not likely to jeopardize federally listed species or interfere with USFWS recovery efforts for these species.

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2 PROPOSED ACTION

2.1 DESCRIPTION OF THE ACTION AREA

At present, DOE manages 31 lease tracts under its ULP. These lease tracts are located in Mesa, Montrose, and San Miguel Counties, Colorado, on public lands administered by the Bureau of Land Management (BLM) under the provisions of Public Land Order 459 and others. Of these 31 lease tracts, 29 have active leases, and 2 do not. Lease Tracts 8A and 14 (composed of Tracts 14-1, 14-2, and 14-3) are currently not leased. Lease Tract 8A is a small tract that is isolated and may be located entirely outside the uranium-bearing formation, which could indicate a lack of ore. There was some interest in Lease Tracts 14-1 and 14-2 by potential lessees in the past; however, the third tract (14-3, which lies east of 14-1) is located almost entirely within the Dolores River corridor and was never leased. Table 2-1 lists the 31 lease tracts and the acreage, the current lease holder(s), and the field status of each tract. Figure 2-1 shows the locations of the lease tracts.

The ULP lease tracts are located primarily within the Colorado Plateaus Level III ecoregion (Chapman et al. 2006). An ecoregion is an area in which the ecosystems have a general similarity. The Colorado Plateaus ecoregion is characterized by a rugged tableland of mesas, plateaus, mountains, and canyons, often with abrupt changes in local relief (Chapman et al. 2006). Habitat types within this ecoregion include Douglas-fir forest and woodlands of pinyon-juniper and Gambel oak, as well as sagebrush steppe, desert shrubland, and salt desert scrub. The ULP lease tracts could support a variety of vegetation types; the predominant ones are pinyon-juniper woodlands and sagebrush-dominated shrublands.

Each of the lease tracts is located, at least in part, within the Semiarid Benchlands and Canyonlands Level IV ecoregion. Sandy soils support sagebrush steppe with warm season grasses, such as galleta grass (*Pleuraphis jamesii*) and blue grama (*Bouteloua gracilis*), and shrubs, primarily black sagebrush (*Artemisia nova*), winterfat (*Krascheninnikovia lanata*), mormon tea (*Ephedra viridis*), fourwing saltbush (*Atriplex canescens*), and shadscale (*Atriplex confertifolia*). Stony soils support pinyon-juniper woodlands of two-needle pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). Scattered woodlands of Gambel oak (*Quercus gambelii*) occur at the higher elevations.

Western portions of Lease Tracts 11, 11A, and 12 include the Monticello-Cortez Uplands and Sagebrush Valleys Level IV ecoregion. Sagebrush steppe occurs on broad areas of silty soils and is characterized by Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), western wheatgrass (*Pascopyrum smithii*), and Indian ricegrass (*Achnatherum hymenoides*) (Chapman et al. 2006). Scattered pinyon-juniper woodlands occur on shallow or stony soils along the rims of benches and minor escarpments. Two-needle pinyon pine, antelope bitterbrush (*Purshia tridentata*), and serviceberry (*Amelanchier* sp.) also occur in some areas.

A small area in the eastern portion of Lease Tract 13 is located within the Shale Deserts and Sedimentary Basins Level IV ecoregion. This arid ecoregion generally supports sparse mat saltbush shrubland and salt desert scrub (Chapman et al. 2006). Characteristic species include

TABLE 2-1 Status Summary of the 31 DOE ULP Lease Tracts before October 18, 2011

	Lease Tract No.	Acreage	Lessee	County	Status[a]
1	10	638	Golden Eagle Uranium, LLC	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
2	11	1,303	Cotter Corporation	San Miguel	One new underground mine permitted and being developed; reclamation of previously disturbed areas needed.
3	11A	1,297	Golden Eagle Uranium, LLC	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
4	12	641	Colorado Plateau Partners	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
5	13	1,077	Gold Eagle Mining, Inc.	San Miguel	Three existing, permitted underground mines; reclamation of previously disturbed areas is needed.
6	13A	420	Cotter Corporation	San Miguel	Exploration plan (one hole) approved; drilling and reclamation of the explored area are completed.
7	14 (1, 2, 3)	971	Not applicable	San Miguel	Lease tract has not been leased.
8	15	350	Gold Eagle Mining, Inc.	San Miguel	One existing underground mine; reclamation of previously disturbed areas is needed.
9	15A	172	Golden Eagle Uranium, LLC	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
10	16	1,790	Golden Eagle Uranium, LLC	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
11	16A	585	Energy Fuels Resources Corp.	San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
12	5	151	Gold Eagle Mining, Inc.	Montrose	One existing, permitted underground mine; reclamation of previously disturbed areas is needed.

TABLE 2-1 (Cont.)

	Lease Tract No.	Acreage	Lessee	County	Status[a]
13	5A (1, 2)	25	Golden Eagle Uranium, LLC	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
14	6	530	Cotter Corporation	Montrose	One existing permitted underground mine; reclamation of previously disturbed areas is needed.
15	7	493	Cotter Corporation	Montrose	Two existing permitted mines—one underground mine and one large open-pit mine; reclamation of previously disturbed areas is needed.
16	8	955	Cotter Corporation	Montrose	One existing permitted underground mine; reclamation of previously disturbed areas is needed.
17	8A	78	Not applicable	Montrose	Lease tract has not been leased.
18	9	1,037	Cotter Corporation	Montrose	One existing permitted underground mine; reclamation of previously disturbed areas is needed.
19	17 (1, 2)	475	Golden Eagle Uranium, LLC	Montrose and San Miguel	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
20	18	1,181	Cotter Corporation	Montrose	One existing permitted underground mine; reclamation of previously disturbed areas is needed.
21	19	662	Energy Fuels Resources Corp.	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
22	19A	1,204	Energy Fuels Resources Corp.	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
23	20	627	Energy Fuels Resources Corp.	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
24	21	651	Cotter Corporation	Montrose	Exploration plan (two holes) approved; drilling and reclamation of the explored area are completed; no area needs to be reclaimed under current conditions.

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TABLE 2-1 (Cont.)

	Lease Tract No.	Acreage	Lessee	County	Status[a]
25	22	224	Golden Eagle Uranium, LLC	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
26	22A	409	Golden Eagle Uranium, LLC	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
27	23 (1, 2, 3)	596	Golden Eagle Uranium, LLC	Montrose	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
28	24	201	Energy Fuels Resources Corp.	Montrose	Exploration plan (eight holes) approved; drilling and reclamation of explored area are completed; no area needs to be reclaimed under current conditions.
29	25	639	Cotter Corporation	Montrose	Exploration plan (one hole) approved; drilling and reclamation of explored area are completed; no area needs to be reclaimed under current conditions.
30	26	3,989	Energy Fuels Resources Corp.	Mesa	Exploration plan (six holes) approved; drilling and reclamation of the explored area are completed, mine re-entry plan is approved, bulkhead partially removed, and assessment completed; portal is resecured; reclamation of previously disturbed areas is needed.
31	27	1,766	Energy Fuels Resources Corp.	Mesa	No recent (post-1995) activity conducted; no area needs to be reclaimed under current conditions.
Total		25,137			

[a] On October 18, 2011, a federal district court stayed the 31 leases, and enjoined DOE from approving any activities on ULP lands. On February 27, 2012, the court amended its injunction to allow DOE, other federal, state, or local governmental agencies, and the ULP lessees to conduct only those activities on ULP lands that are absolutely necessary, as described in the court's Order. See *Colorado Environmental Coalition v. Office of Legacy Management*, No. 08-cv-01624, 2012 U.S. DIST. LEXIS 24126 (D. Colo. Feb. 27, 2012).

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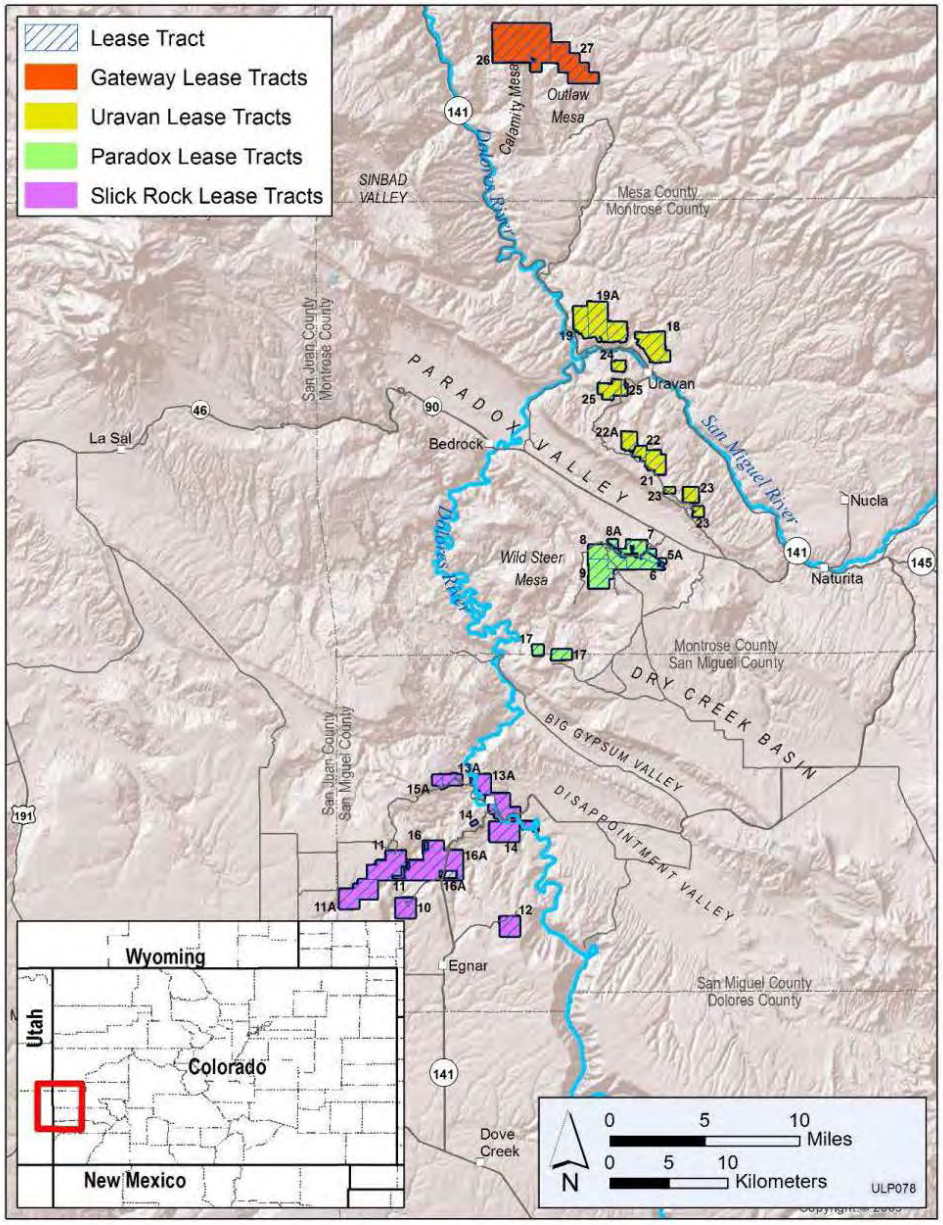

FIGURE 2-1 Locations of the ULP Lease Tracts

mat saltbush (*Atriplex corrugata*), shadscale, Nuttall's saltbush (*Atriplex nuttallii*), blackbrush (*Coleogyne ramosissima*), fourwing saltbush, Wyoming big sagebrush, bud sagebrush (*Picrothamnus desertorum*), galleta grass, and desert trumpet (*Baileya multiradiata*). The alkaline soils of floodplains support greasewood (*Sarcobatus vermiculatus*), alkali sacaton (*Sporobolus airoides*), seepweed (*Suaeda* sp.), and shadscale. Badland areas support little or no vegetation.

A small portion in the northeast corner of Lease Tract 26 is located within the Sedimentary Mid-Elevation Forests Level IV ecoregion of the Southern Rockies Level III ecoregion. This ecoregion supports ponderosa pine (*Pinus ponderosa*) forest, aspen (*Populus tremuloides*) forest, and Gambel oak woodland (Chapman et al. 2006). Some areas include mountain mahogany (*Cercocarpus* sp.) and two-needle pinyon pine. Shrubs occurring within the habitats of this ecoregion include antelope bitterbrush (*Purshia tridentata*), fringed sage (*Artemisia frigida*), serviceberry, and snowberry (*Symphoricarpos* sp.). Grasses within these habitats include Arizona fescue (*Festuca arizonica*), bluegrass (*Poa* sp.), junegrass (*Koeleria macrantha*), needlegrasses (*Stipa* spp.), mountain muhly (*Muhlenbergia montana*), pine dropseed (*Blepharoneuron tricholepis*), and mountain brome (*Bromus marginatus*).

Land cover types described and mapped under the Southwest Regional Gap Analysis Project (USGS 2004) are used to evaluate plant communities in and near the lease tracts (Figure 2-2). Each cover type encompasses a range of similar plant communities. The predominant vegetation community in most of the tracts is Colorado Plateau Pinyon-Juniper Woodland. Large areas of Inter-Mountain Basins Big Sagebrush Shrubland occur in Lease Tracts 9, 12, 19A, 20, and 21. Colorado Plateau Pinyon-Juniper Shrubland occurs over large areas of Lease Tracts 13, 13A, 14-1, and 18. Large areas of Rocky Mountain Gambel Oak-Mixed Montane Shrubland occur in Lease Tracts 10 and 12.

Lease Tracts 19A, 20, and 21 consist primarily of a composite of Colorado Plateau Pinyon-Juniper Woodland and Inter-Mountain Basins Big Sagebrush Shrubland. Lease tracts 13A, 14, and 18 are composed primarily of Colorado Plateau Pinyon-Juniper Woodland and Colorado Plateau Pinyon-Juniper Shrubland. Lease Tract 12 is a mosaic of Inter-Mountain Basins Montane Sagebrush Steppe, Inter-Mountain Basins Big Sagebrush Shrubland, and Rocky Mountain Gambel Oak-Mixed Montane Shrubland. Lease Tract 13 is a mosaic of Colorado Plateau Pinyon-Juniper Woodland, Colorado Plateau Pinyon-Juniper Shrubland, Inter-Mountain Basins Greasewood Flat, Inter-Mountain Basins Shale Badland, and Inter-Mountain Basins Mixed Salt Desert Scrub.

Rocky Mountain Lower Montane Riparian Woodland and Shrubland occurs along segments of Calamity Creek in Lease Tracts 26 and 27, along the Dolores River in Lease Tract 13, and along the withdrawn area of the northwest section of Lease Tract 13A. A small area of introduced riparian and wetland vegetation occurs in the northwest corner of Lease Tract 18 along Atkinson Creek.

Wetland areas are typically inundated or have saturated soils for at least a portion of the growing season (Cowardin et al. 1979). Wetlands generally support plant communities that are adapted to saturated soil conditions; however, stream beds, mudflats, gravel beaches, and rocky

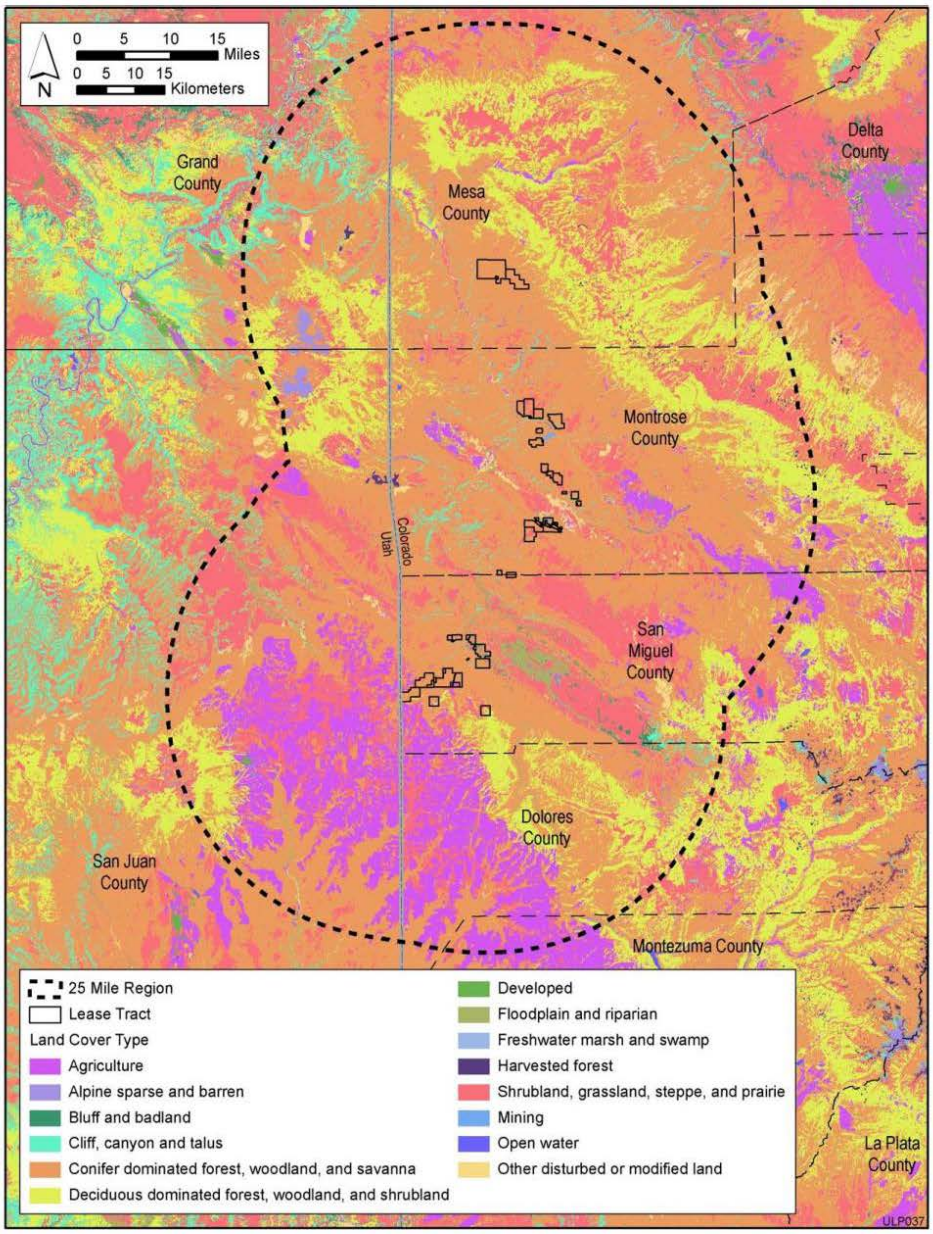

FIGURE 2-2 Land Cover Types in the Vicinity of the DOE Lease Tracts (USGS 2004)

shores are wetland areas that may not be vegetated. Although surface flows provide the water source for some wetlands (such as many riverine marshes), other wetlands (such as springs and seeps) are supported by groundwater discharge. Wetlands are often associated with perennial water sources, such as springs, perennial segments of streams, or lakes and ponds. However, some wetlands, such as vernal pools, have seasonal or intermittent sources of water. Wetlands in the area of the lease tracts are mapped by the National Wetlands Inventory (USFWS 2009i). Digital data are not available for this area of Colorado; nevertheless, wetlands are mapped and identified by type. Some wetlands occurring in these areas may not be mapped because of the inherent limitations of high-altitude image interpretation. Riverine wetlands occur in many canyon areas within the tracts, including along the Dolores River and named creeks. Small palustrine wetlands occur in several tracts, typically as a result of a dike or impoundment, and may represent livestock watering ponds.

2.2 DESCRIPTION OF THE PROPOSED ACTION

DOE is completing a programmatic environmental impact statement (PEIS) under the National Environmental Policy Act (NEPA) for the ULP. DOE's proposed action in the PEIS is to decide whether to continue the ULP for the remainder of the 10-year period covered by a previous NEPA review in July 2007 and, if it decides to continue the ULP, to determine which alternative to adopt in order to manage the ULP during that period. The preferred alternative in the PEIS is to continue the ULP with exploration, mine development and operation, and reclamation at the 31 lease tracts for the next 10-year period or for another reasonable period. This BA evaluates the actions associated with the preferred alternative of the PEIS.

2.2.1 Production and Surface Disturbance

Based on analyses of a reasonably foreseeable development scenario (as presented in the PEIS), it was assumed that there would be a total of 19 mines operating under the ULP at various production rates at the same time during what would be considered the peak year of operations. It is further assumed that there would be a smaller number of mines in operation in the years other than the peak year, and that this peak year could occur more than once (that is, there could be multiple years with the same number of mines operating at similar ore production rates). These assumptions are developed based on a review of information on past mining that have occurred at the ULP lease tracts, and on current expectations of the ULP lessees about the mining that they would likely conduct in the near future. Table 2-2 presents the assumed number of mines and associated production rates. The size of the mine (i.e., small, medium, large, or very large) was assigned on the basis of the assumed ore production rate. The disturbed surface area, which varies somewhat depending on the size of the mine, is also presented in the table.

The ore generated from the DOE ULP lease tracts could be taken to either of two mills for processing: White Mesa Mill or the proposed Piñon Ridge Mill. The White Mesa Mill is currently the only conventional uranium mill operating in the United States. This mill was originally licensed to operate by the U.S. Nuclear Regulatory Commission on March 31, 1980; it currently possesses 15 license amendments that allow it to process 18 different alternative ore

TABLE 2-2 Number of Mines, Ore Production Rates, and Disturbed Surface Areas Assumed for the Peak Year of Operations

Parameter Assumed	Parameter Value per Size of Mine				
	Small	Medium	Large	Very Large[a]	Total for All Sizes
Number of mines	6	10	2	1	19
Ore production rate (tons/d)	300 (50 per mine)	1,000 (100 per mine)	400 (200 per mine)	300	2,000[b]
Total disturbed surface area (acres)	60 (10 per mine)	150 (15 per mine)	40 (20 per mine)	210[a]	460[c]

[a] The one very large mine that is assumed is an open-pit mine (on Lease Tract 7), which has been explored and developed but is currently not in operation. The area developed is about 210 acres.

[b] Total tonnage per day that is assumed to be produced exceeds the milling capacity of 1,500 tons per day assumed to be available (at White Mesa and Piñon Ridge Mills) for processing uranium ore from the ULP lease tracts, but it is further assumed that the excess tonnage produced could be stockpiled for a few days, since the mills process ore 7 days per week, while production typically occurs on only 5 days per week.

[c] Total additional area that would be disturbed is 250 acres, since 210 acres from the open-pit mine is already accounted for from previous mining disturbance.

feeds. The White Mesa Mill also operates under a groundwater discharge permit and an air quality approval order. The mill is located off U.S. Highway 191, approximately 6 mi (10 km) south of Blanding, Utah.

The nearest ULP lease tract is Lease Tract 11A, which is approximately 33 mi (53 km) northeast of the mill. The White Mesa Mill also processes ore from the Colorado Plateau and Arizona Strip. The White Mesa Mill is licensed to process an average of 2,000 tons of ore per day and produce 8 million lb (3.6 million kg) of uranium oxide per year (Denison Mines 2012a).

2.2.2 Water

The potential for impacts on surface water and groundwater in the vicinity of the DOE ULP lease tracts during mine development and operations would result from erosion, runoff, dewatering, and groundwater-contamination-related causes. The impacts associated with consumptive water use, chemical spills, and wastewater could be minimized through permitting and BMP implementation. The lease tracts closest to the Dolores River and San Miguel River have the greatest potential for affecting water quality because of their proximity to perennial water bodies. The lease tracts located in the Slick Rock and Uravan lease tracts are the closest to the Dolores River and San Miguel River, respectively. Lease Tract 13 encompasses a 3-mi (5-km) reach of the Dolores River and is where erosion poses the greatest threat to water quality. An increase in erosion and runoff may increase the potential of sediment and pollutant loadings

to nearby rivers. Possible pollutants may include sediment-associated compounds, chemical dust control compounds, fuels and other chemicals used in mining, and mineral leachates. As recently evaluated by the CDPHE (2012a,b), the existing impaired surface water that exceeds Colorado standards is mainly located upstream and not associated with the DOE ULP lease tracts. During future mine development and operations, impacts of erosion by runoff are considered to be moderate in some areas near Lease Tracts 13 and 18. However, the potential of sediment and pollutant loadings could be minimized by implementing a stormwater control system, a diversion ditch, a sedimentation pond, and an appropriate monitoring system.

Consumptive water use during mine development and operations is primarily for use by the workers (e.g., showers and drinking water) and for dust suppression. Water consumption estimates for each of the various mine sizes during the peak year are provided in Table 2-3. It is assumed that for the peak year of operations that there would be a total of 19 mines of varying sizes (six small, 10 medium, two large and one very large) operating at the same time. In total, it is assumed that peak year mining activities under the ULP would require approximately 6,300,000 gal (19 acre-ft) of water over the course of the year (Table 2-3). These estimates were conservatively determined based on information and assumptions from previous ULP mining operations. Since local surface water and groundwater sources are scarce and often of poor quality, it is assumed that most of the water supply would be trucked to the site from sources outside the lease tracts. However, it is expected that water would come from the same hydrologic basin as that for the ULP lease tracts (Dolores River Basin) and that the consumed water would also be discharged within the same hydrologic basin. Although local water sources (surface water or groundwater) are not abundantly available in most ULP lease tracts, the source of water used by the lessees to support ULP activities may come from pumping withdrawals on or off the lease tract and would be purchased. The surface water and groundwater sources in the Dolores River Basin where the ULP lease tracts occur are considered over-appropriated by the Colorado Division of Water Resources (CDWR 2007). Therefore, water used to support ULP activities would likely come from purchased sources.

As many as four retention pond systems are assumed to be used for peak ULP mining activities. These pond systems would be primarily intended to capture surface water and prevent sediment from entering nearby streams and drainages. There are currently two pond systems in use at existing ULP mine sites (located at medium-size mines). Therefore, as many as two additional pond systems may be created in lease tracts during the proposed ULP. The volume, discharge, and retention values for the two pond systems that currently exist are provided in Table 2-4. Estimated time to fill these pond systems ranges between 50 and 63 days.

2.3 POTENTIALLY APPLICABLE MITIGATION MEASURES AND BEST MANAGEMENT PRACTICES

Under the proposed ULP, various measures would be implemented by developers during each mining phase to reduce the potential for ecological impacts. Measures may include required mitigation measures to reduce or offset impacts, as well as measures that may not be required but are deemed to be BMPs in the industry (e.g., some may be discretionary). Some required measures are established to comply with existing policy and regulations. These measures are

TABLE 2-3 Peak Water Requirements Assumed for the ULP Mines[a]

Mine Size	No. of Mines	Monthly Water Volume per Mine (gal)[b]	Total Monthly Water Volume (gal)	Total Monthly Water Volume (acre-ft)
Small[c]	6	7,600	46,000	0.14
Medium[d]	10	31,000	310,000	0.95
Large[e]	2	46,000	92,000	0.28
Very large (pit)[f]	1	160,000	160,000	0.49
	Seasonal Water Use[g]		gal	acre-ft
	Monthly (summer)		3,600,000	11
	Monthly (winter)		2,700,000	8.3
	Yearly		6,300,000	19

[a] All volume and use values are rounded up to two significant figures.

[b] Assumes all water is drawn from within the Dolores River Basin regardless of whether it is withdrawn from the mine site or trucked into the site.

[c] Water use assumptions for small mines are based on mine SM-18.

[d] Water use assumptions for medium mines are based on mine JD-8.

[e] For large mines, usage is assumed to be 1.5 times that of a medium-size mine.

[f] Water use assumptions for the extra-large pit mine are based on mine JD-7, for 6 months only.

[g] Assumes that the monthly usage is consistent year-round, except at the very-large open pit mine. At that mine, water would be used only during the summer months (6 months) for dust suppression activities.

TABLE 2-4 Pond Volume, Discharge, and Retention Estimates for the Two Two-Pond Systems Currently at the ULP Mine Sites[a]

Lease Tract	Pond Volume (gal)	Discharge Rate		Retention Time (months)
		gal/minute	gal/month	
JD-7	330,000	3.6	160,000	2.1
JD-9	470,000	6.4	280,000	1.7

[a] All values are rounded up to two significant figures.

listed by project phase in Table 2-5. The table notes whether DOE would consider each measure a required mitigation measure, a compliance measure, or a BMP. Although some BMPs may be discretionary, the effect determinations presented in Section 3.2 (summarized in Table 3-3) are provided based on the assumption that all measures listed in Table 2-5 will be implemented as part of the ULP.

1 **TABLE 2-5 Measures to Reduce Impacts of ULP Activities on Ecological Resources**

	Measure Description	Compliance Measure[a]	Mitigation Measure[b]	BMP[c]
	General Multiphase Measures (G) – Measures that apply to all project phases			
G1	Minimize the surface footprint of disturbed areas (buildings, roads, storage areas, stockpile areas, and loading areas) within the lease tracts to the extent possible. Use existing roads and disturbed areas to the extent possible (before constructing new roads or disturbing new areas). If access roads need to be constructed, improve and maintain them so they minimize the potential for wildlife/vehicle collisions and facilitate the movement of wildlife through the project area.		X	
G2	Observe practices used to handle and manage hazardous materials and other waste (such as during refueling and equipment maintenance) to minimize or prevent spills in order to reduce the potential for impacts on ecological resources.			X
G3	Containerize solid waste and manage it in accordance with state and local regulations.	X		
G4	Avoid areas with unstable slopes in an effort to minimize or reduce the impacts from runoff and sedimentation on aquatic biota.		X	
G5	Establish buffer zones around sensitive habitats, and either exclude project facilities and activities from those areas or modify them within those areas, to the extent practicable.		X	
G6	Employ noise reduction devices (e.g., mufflers) to minimize impacts on wildlife and sensitive species populations. Use explosives only at specified times and specified distances from sensitive wildlife or surface waters, as established by DOE or other federal and state agencies. Operators should ensure that all equipment is adequately muffled and maintained in order to minimize disturbance to wildlife. As practicable, do not leave vehicles and equipment idling, since this not only contributes to air pollution but also produces noise that can have impacts on wildlife.			X
G7	Avoid project-related traffic on unpaved surfaces to the extent possible and reduce speeds to lessen fugitive dust emissions			X
G8	Protect plants, wildlife, and their habitats from fugitive dust through measures included in a dust abatement plan.			X

2

1
2

TABLE 2-5 (Cont.)

	Measure Description	Compliance Measure[a]	Mitigation Measure[b]	BMP[c]
G9	Assign a qualified biologist to be responsible for overseeing compliance with all mitigation measures related to the protection of ecological resources throughout all project phases, particularly in areas requiring avoidance or containing sensitive biological resources, such as sensitive species and important habitats. Additional qualified biological monitors could be assigned during all project phases, as determined through coordination with the BLM, USFWS, and Colorado Parks and Wildlife (CPW, formerly the Colorado Division of Wildlife or CDOW)			X
G10	Provide all personnel with information necessary to identify and protect ecological resources (especially sensitive species). Provide them with knowledge of relevant mitigation measures before they enter the project work site. This practice would reduce the collection, harassment, or disturbance of plants, wildlife, and their habitats (particularly sensitive species) by educating employees and contractors about applicable state and federal laws, by providing instruction, and by increasing awareness.			X
G11	Implement measures to mitigate and monitor impacts on sensitive species developed in coordination with the appropriate federal and state agencies (e.g., BLM, USFWS, and CPW).		X	
G12	If any federally listed threatened and endangered species are found during any phase of the project, consult with the USFWS as required by Section 7 of the ESA and determine an appropriate course of action to avoid or mitigate impacts.	X		
G13	To protect bats, implement measures developed in coordination with the appropriate federal and state agencies (e.g., BLM, USFWS, and CPW).		X	
G14	Implement measures to protect birds (including migratory species protected under the Migratory Bird Treaty Act) developed in coordination with the appropriate federal and state agencies (e.g., BLM, USFWS, and CPW).	X		
G15	Implement measures to protect raptors developed in coordination with the appropriate federal and state agencies (e.g., BLM, USFWS, and CPW).		X	
G16	Implement measures to ensure compliance with the regulatory requirements of the Bald and Golden Eagle Protection Act developed in coordination with the USFWS.	X		

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TABLE 2-5 (Cont.)

	Measure Description	Compliance Measure[a]	Mitigation Measure[b]	BMP[c]
G17	Schedule activities to avoid, minimize, or mitigate impacts on wildlife. For example, avoid crucial winter ranges, especially during the periods when they are used. If there are plans to conduct activities during bird breeding seasons, a nesting bird survey should be conducted first. If active nests are detected, the nest area should be flagged, and no activity should take place near the nest (at a distance determined in coordination with the USFWS) until nesting is completed (i.e., until nestlings have fledged or the nest has failed) or until appropriate agencies agree that construction can proceed with the incorporation of agreed-upon monitoring measures. Coordinate the timing of activities with BLM, USFWS, and CPW. Prior to authorization of ground-disturbing activities, a habitat suitability analysis would be done, and for habitats found suitable, a protocol survey would be done. If nesting birds are found, seasonal and year-round buffers would be established with USFWS coordination.		X	
G18	Minimize increases in the number of nuisance animals (e.g. pets, raccoons, coyotes, and other wildlife) and pests in the project area, particularly any individuals or species that could affect human health and safety or that could adversely affect native plants and animals. A Nuisance Animal and Pest Control Plan could be developed that could identify nuisance and pest species likely to occur in the area, the risks associated with these species, species-specific control measures, and monitoring requirements.			X
G19	Minimize the number of areas where wildlife could hide or be trapped (e.g., open sheds, pits, uncovered basins, and laydown areas). For example, cap uncovered pipes at the end of each workday to prevent animals from entering the pipes. If a sensitive species is discovered inside a component, do not move that component, or, if it must be moved, move it only to remove the animal from the path of activity, until the animal has escaped.			X
G20	Monitor the potential for an increase in the predation of sensitive species from ravens and other species that are attracted to developed areas and that use tall structures opportunistically to spot vulnerable prey. Also address the monitoring of ravens and other predators in the nuisance animal and pest control plan.			X
G21	Develop a Noxious Weed and Invasive Plant Control Plan to characterize how the establishment of invasive and noxious weeds in project area would be managed.		X	
G22	Ensure vegetation management is consistent with applicable regulations and agency policies for the control of noxious weeds and invasive plant species.	X		

TABLE 2-5 (Cont.)

	Measure Description	Compliance Measure[a]	Mitigation Measure[b]	BMP[c]
Exploration (E) – Measures that apply to exploration activities				
	Other than the general multiphase measures, there are no exploration-specific mitigation measures.			
Mine Development and Operations (D) – In addition to general multiphase measures, measures that apply to mine development and operational activities				
D1	Do not locate project activities in or near occupied habitats of sensitive animal species. Establish buffer zones around these areas (e.g., identified in the land use plan or substantiated by best available information or science) to prevent any destructive impacts associated with project activities.			X
D2	Restrict activities at existing mine sites so that they do not further encroach toward perennial streams (e.g., the Dolores River and San Miguel River). Do not allow new mining activities within 0.25 mi (0.4 km) of perennial streams.		X	
D3	Design any necessary stream crossings to provide in-stream conditions that allow for and maintain the uninterrupted movement and safe passage of fish during all project periods. If stream crossings are required, take care to minimize the removal of any deadfall and overhanging vegetation, which provide shelter and shade to aquatic organisms.		X	
D4	Divert water pumped from mines to a lined sedimentation pond (or pond system) for treatment. Locate settling ponds in topographically low areas but not in any areas that are along drainages or near naturally flowing water.		X	
D5	Locate diversion structures upstream of the mine site to intercept surface water flow or shallow groundwater and channel it around the site. Tailor the location and length of the ditch to site-specific conditions, taking into account the location of mine waste-rock piles, site topography, and surface flow patterns.		X	
D6	Require any developers using on-site groundwater supplies to conduct a hydrologic study to further characterize the upgradient and downgradient aquifers, the groundwater flowing into the mine, the groundwater connections between the mine and areas outside the mine, the eventual fate of the water flowing from the mine, and any groundwater impacts from mining operations.			X

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TABLE 2-5 (Cont.)

	Measure Description	Compliance Measure[a]	Mitigation Measure[b]	BMPs[c]
D7	Install groundwater monitoring wells downgradient of ore stockpile pads to monitor groundwater presence, abundance, and quality in compliance with EPA and U.S. Geological Survey standards.			X
D8	Identify storm water control and pollution measures in a Storm Water Pollution Prevention Plan. Develop a wastewater management plan to characterize how wastewater generated from mine operations would be treated and discharged. The plan should include requirements for obtaining necessary discharge permits, such as National Pollution Discharge Elimination System (NPDES) permits. Follow monitoring requirements and NPDES regulations pertaining to the concentrations of potential pollutants released. Implementing the wastewater management plan would minimize the amount of contaminants entering aquatic habitats and reduce the potential for adverse effects on aquatic biota.		X	
D9	Locate the ore storage area on topographically high ground so ore does not come into contact with flowing or ponded water. Grade the ore storage area, and construct an earthen berm around it. Divert any runoff from the ore storage area to a sedimentation pond (or pond system) for testing and treatment.	X		
D10	Design lighting to provide the minimum amount of illumination needed to achieve safety and security objectives. Minimize the amount of off-site lighting. Turn off all unnecessary lighting at night to limit attracting migratory birds or sensitive species.			X
D11	Build fences (as practicable) to exclude livestock and wildlife from all mine facilities.			X
D12	Contain any runoff from mine waste-rock piles.			X
D13	Limit the use of herbicides to nonpersistent, immobile substances. Use only those herbicides that have a low toxicity to wildlife and untargeted native plant species, as determined in consultation with the USFWS. Do not use any herbicides near or in surface water, streams (including ephemeral, intermittent, or perennial streams), riparian areas, or wetlands. Determine setback distances in coordination with federal and state resource management agencies. Before beginning any herbicide treatments, ensure that a qualified biologist has conducted surveys of bird nests and of sensitive species to identify the special measures or BMPs that are necessary to avoid and minimize impacts on migratory birds and sensitive species. The herbicides to be used would be approved by BLM and county weed control staff. The state, county, and BLM listed species scheduled for eradication that are found in the project area would be eradicated and reported to the county weed inspector.			X

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TABLE 2-5 (Cont.)

	Measure Description	Compliance Measure[a]	Mitigation Measure[b]	BMPs[c]
Reclamation (R) – In addition to general multiphase measures, measures that would also apply to reclamation activities. Measures D10 through D13 above also apply to reclamation activities.				
R1	Before mine entrances are closed after reclamation, conduct a summer and winter bat survey to determine the number and species of bats that could potentially occupy a site. Depending on the results of the surveys, undertake actions that could include the installation of bat gates.		X	
R2	Implement measures for revegetation, soil stabilization, and erosion reduction to ensure that all temporary use areas are restored. Promptly reseed disturbed sites upon project completion to minimize erosion and the establishment of noxious weeds.		X	
R3	If bat surveys under R1 indicate no presence of bats, promptly close off all mine openings when finished with mining activities before bats have an opportunity to establish roosts or hibernacula.		X	
R4	Use native, locally occurring species for reestablishing vegetation. Refer to Table 3-2 for the native seed mixture approved for reseeding on the DOE ULP lease tracts.			X

[a] Compliance measures are those measures needed to fulfill regulatory requirements.

[b] Mitigation measures are those measures required by DOE to reduce or offset impacts and that are not needed to fulfill regulatory requirements.

[c] BMPs are those practices and activities generally implemented within the industry to conserve resources. These BMPs are not required by DOE but may be implemented to further reduce impacts.

3 EFFECTS OF THE URANIUM LEASING PROGRAM

This section summarizes potential impacts associated with site exploration, mine development and operations, and reclamation under the proposed ULP that could occur to species that are endangered, threatened under the ESA, or those species that are proposed or candidates for listing under the ESA. Required compliance measures, mitigation measures, and suggested BMPs for all projects under the ULP are identified in Section 2.3. Mining activities under the ULP can generally be considered under the three project phases just mentioned: (1) exploration, (2) mine development and operations, and (3) reclamation. Possible ecological impacts on different groups of biota that could result from ULP activities are summarized in Table 3-1. These impacts would be lessened to the extent that the listed activities could be avoided, minimized or mitigated.

The types of ecological resources that could be affected by ULP activities would depend on the specific location of the proposed project and its environmental setting. Ecological resources that could be affected include plants, terrestrial and aquatic invertebrates, fish, and terrestrial and avian wildlife, as well as their habitats. These groups of biota include species that are endangered, threatened, proposed, or candidates for listing under the ESA in the region surrounding the ULP lease tracts. General impacts on federally-listed, proposed, and candidate species associated with ULP activities are described in the text that follows, as are specific evaluations of mining impacts on federally listed species.

3.1 COMMON EFFECTS OF URANIUM MINING ON SPECIES AND HABITATS

3.1.1 Exploration

Potential impacts on federally-listed, proposed, and candidate species related to site exploration are listed in Table 3-1. Although some disturbance from mine exploration has occurred in each of these lease tracts, new exploration could occur in either disturbed or undisturbed areas of each lease tract. Exploration activities generally include drilling one or more bore holes for geologic sampling followed by reclamation of the explored area. Impacts from site exploration would result from the disturbance of soils, vegetation, and wildlife as a result of the presence and operation of exploration equipment. Impacts would include the removal of some vegetation, the potential loss of habitat for some wildlife species, and the indirect impacts from fugitive dust generation, noise, and the physical presence of humans and exploration equipment on wildlife species. Impacts on ephemeral drainages crossed by heavy equipment could also result in sediment deposition to downstream wetlands and water bodies. However, impacts would generally be temporary and at a smaller spatial scale than those occurring during other project phases. Some mortality to vegetation and less mobile wildlife could occur at the exploration site, and vehicles could collide with wildlife.

TABLE 3-1 General Ecological Effects on Different Groups of Biota during Various Uranium Mining Phases

Potential Effect	Project Activity	Project Phase	Biota Potentially Affected[a]						
			Plants	Arthropods	Mollusks	Fish	Amphibians and Reptiles	Birds	Mammals
Habitat disturbance	Vehicle and foot traffic; geological sampling; access road development; site clearing and grading	Exploration, mine development and operations, reclamation	+	+	+	–	+	+	+
Injury or mortality of biota	Vehicle and foot traffic; geological sampling; access road development; site clearing and grading	Exploration, mine development and operations, reclamation	+	+	+	–	+	+	+
Erosion, sedimentation, and runoff to nearby wetland habitats	Site clearing and grading; access road construction and mine development; vehicle and foot traffic	Exploration, Mine development and operations, reclamation	+	+	+	+	+	–	–
Exposure to contaminants	Accidental uranium ore spills and releases of oil, fuel, and other materials	Exploration, Mine development and operations, reclamation	+	+	+	+	+	+	+
Fugitive dust damage to plant surfaces and impairment of photosynthesis; respiratory impairment in wildlife	Site clearing and grading; access road construction and mine development; exposure to tailings and other waste piles	Exploration, Mine development and operations, reclamation	+	+	–	–	+	+	+
Introduction of invasive plant species	Vehicle traffic, access road development, site clearing and grading	Exploration, mine development and operations, reclamation	+	+	+	+	+	+	+

TABLE 3-1 (Cont.)

Potential Effect	Project Activity	Project Phase	Biota Potentially Affected[a]						
			Plants	Arthropods	Mollusks	Fish	Amphibians and Reptiles	Birds	Mammals
Behavioral disturbance	Vehicle and foot traffic; geological sampling; access road development; site clearing and grading; human presence	Exploration, mine development and operations, reclamation	–	–	–	–	+	+	+

[a] "+" indicates effects could potentially occur for at least some biota; "–" indicates no biota expected to be affected.

3.1.2 Mine Development and Operations

Potential impacts on ecological resources (including threatened, endangered, and sensitive species) related to mine development and operations are listed in Table 3-1. Mine development and operations are assumed to occur in each of the lease tracts under the proposed ULP. The overall impact of mine development and operations on vegetation and wildlife populations would depend on the locations of the mine site and mining activities, the relative abundance and rarity of the species that are affected, the types of habitat present, and the length of time that the effects or stressors would persist. Generally, the magnitude of an impact on threatened, endangered, and sensitive species is directly related to the amount of surface disturbance. Ground disturbance would range from 10 acres (4 ha) for small mines to 20 acres (8 ha) for large mines, with one 210-acre (81-ha) open-pit mine (Table 2-2).

Direct impacts on vegetation, wildlife, and their habitats associated with the development of mines include direct mortality to vegetation and less mobile wildlife and the destruction of habitat. Vegetation and habitats within the development footprint of the projects, utility rights of way (ROWs), access roads, and other infrastructure would be destroyed. These direct impacts could include destruction and fragmentation of habitats from site clearing and excavation, the storage of waste rock and topsoil materials, and the placement of infrastructure (buildings, ROWs, access roads, etc.).

Direct mortality from vehicle collisions could occur along access and haul roads, especially in wildlife concentration areas or migration corridors. When roads cut across migration corridors, the effects can be dangerous for both animals and humans. No mapped migration corridors for big game species occur on any of the lease tracts. Amphibians, being somewhat small and inconspicuous, are vulnerable to road mortality when they migrate between wetland and upland habitats. Reptiles are vulnerable on roads they use for thermal cooling and heating. Sage grouse are susceptible to road mortality in spring because they often fly to and from leks near ground level. They are also susceptible to vehicular collisions along dirt roads because they sometimes use them to take dust baths (Strittholt et al. 2000). In general, the species most vulnerable to vehicle collisions are day-active, slow-moving species (Hels and Buchwald 2001). However, road kills rarely cause population-level impacts. Avoidance of habitats near roads, especially due to traffic noise, tends to have a greater ecological impact than does mortality from vehicular collisions (Forman and Alexander 1998). Ore haul truck speeds would generally be slow on county or other dirt roads, which would minimize these trucks' potential to collide with big game.

Indirect impacts on vegetation, wildlife, and their habitats could result from exposure to contaminants, fugitive dust, erosion and sedimentation, the facilitated spread of invasive species, and behavioral effects resulting from the presence of humans and mining equipment (which also involves factors such as lighting and noise). These factors might reduce the function and quality of remaining habitats adjacent to mine sites. Although habitats adjacent to a mine site might remain unaffected, wildlife still might tend to make less use of these areas (primarily because of the disturbance that would occur within the project site). This indirect habitat loss impact could be of greater consequence than direct habitat loss (Sawyer et al. 2006). A utility line might also lead to a loss of usable feeding areas for those species that avoid close proximity to these

facilities due to their use by predators (BirdLife International 2003). For example, common ravens (*Corvus corax*) and some birds of prey might become more common along utility lines because of the presence of perch and nest sites (Knight and Kawashima 1993). Access road construction could create habitat for species, such as the horned lark (*Eremophila alpestris*), that are common along dirt roadways where they can forage on windblown seeds (Ingelfinger and Anderson 2004).

Based on the industry practice of considering ore with less than 0.05% of uranium as potential waste rock that could remain on a waste-rock pile on the surface (but graded, covered with top soil material, and revegetated) after reclamation, the assumed concentration of uranium that might be present in the waste rock is about 24 pCi/g as an average value; and the potential radiation exposure to plants to this concentration of uranium would be of low concern. Wetlands on the lease tracts might be affected by exploration, development, and operations; however, these impacts would be minimized under the direction of Executive Order 11990, "Protection of Wetlands," and under Section 404 of the Clean Water Act, where applicable. Although direct impacts on wetlands and bodies of water are unlikely, indirect impacts on these wetlands could occur. The implementation of minimization measures and mitigation measures identified in Section 2.3 and any additional BMPs would minimize the potential for indirect impacts on wetlands and bodies of water.

Mining activity might increase the exposure of wildlife to uranium and other radioactive decay products and to other chemical elements. Negative impacts on animals from uranium radionuclides occur from 0.2 to 40 mGy/h for terrestrial invertebrates, 0.14 to 40.0 mGy/h for birds, and 0.004 to 40.0 mGy/h for mammals (Hinck et al. 2010). The potential magnitude of impacts would be influenced by the life history strategy, habitat requirements, and mass of the organism (Hinck et al. 2010). Some birds might be at greater risk to radiation exposure than other wildlife due to their foraging and ingestion of grit, which would increase their radiation dose (Driver 1994). Species that spend considerable amounts of time underground in caves, mines, or burrows could potentially inhale, ingest, or be directly exposed to uranium and other radionuclides while digging, eating, preening, and/or hibernating. Herbivores could also be exposed by ingesting radionuclides that aerially deposited on vegetation or concentrated in surface waters at or near mine sites (BLM 2011b).

The accidental spill of uranium or vanadium ore into an ephemeral stream or, more notably, a perennial stream or river, such as the Dolores or San Miguel River, could pose a localized short-term impact on the aquatic resources. However, the potential for such an event is extremely low. For example, SENES (2009) determined that the frequency of a rollover and/or crash of an ore truck at a water crossing en route to the proposed Piñon Ridge Mill would be 8.4×10^{-5}/yr. In addition to uranium and vanadium, the ore contains other potentially toxic elements, such as aluminum, arsenic, barium, copper, iron, lead, manganese, selenium, and zinc. Most ore solids would settle in the body of water within a short distance from a spill site (Edge Environmental, Inc. 2009). It is expected that expedient and comprehensive cleanup actions would be required under U.S. Department of Transportation regulations and that an emergency response plan would be in place to respond to accidents and cargo spills (Edge Environmental, Inc. 2009). Overall, the potential for impacts on aquatic biota from an accidental spill would be minor to negligible.

Fugitive dust would be generated during site clearing, excavation, processing, and use of access roads. Deposition of fugitive dust could reduce photosynthesis and productivity in plant communities near project areas. Prolonged exposure to fugitive dust could alter a plant community's composition, reducing the occurrence of species less tolerant of disturbance, resulting in habitat degradation. Open-pit mines would generate greater levels of fugitive dust than would underground mines, since most of the project area would consist of exposed soils, rock materials, and operating mining equipment. Because fugitive dust would be produced throughout the life of the project, the deposition of fugitive dust could constitute a long-term impact on vegetation and wildlife habitat. Little information is available about the effects of fugitive dust on wildlife; however, fugitive dust emissions under the proposed ULP are not expected to result in any long-term individual-level or population-level effects on wildlife.

Disturbed soils could provide an opportunity for the introduction and spread of invasive species or noxious weeds. Seeds of these species could be inadvertently brought to a project site from infested areas by vehicles or equipment used at the site. Invasive species or noxious weeds might also colonize disturbed soils from established populations in nearby areas. Vehicle traffic to and from mine sites might contribute to the spread of seeds and propagules of these species, which could lead to expanding populations along roadways. Invasive species or noxious weeds might alter fire regimes, including increasing the frequency and intensity of wildfires, particularly as a result of the establishment of annual grasses such as cheatgrass (*Bromus tectorum*). Habitats that are not adapted to frequent or intense fires could experience long-term reductions in function and distribution.

Soils disturbed by land clearing or excavation might be subject to erosion. Soil erosion might also occur in areas where biological soil crusts are disturbed by equipment or foot traffic. The destruction of biological soil crusts could also alter nutrient cycling and availability, reduce water infiltration, reduce germination of native species, and increase the occurrence of non-native species, thereby affecting plant community characteristics (Fleischner 1994; Belnap et al. 2001; Gelbard and Belnap 2003; Rosentreter et al. 2007). Soil compaction from the operation of heavy equipment could reduce the infiltration of precipitation or snowmelt and result in increased runoff and subsequent erosion. Erosion could result in the localized loss of plant communities in areas where topsoil was lost and might include areas outside the mine site. Erosion might result in sedimentation in downgradient upland or wetland habitats and increased sediment deposition in ephemeral drainages or riparian habitats of receiving streams. Effects might include mortality or reduced growth of plants, changes in species composition, or reduced biodiversity. Species more tolerant of disturbance, including invasive species, might become dominant in affected plant communities.

Changes in surface drainage patterns, such as the elimination of ephemeral drainages (not likely to occur) or other changes in runoff patterns, could alter hydrologic characteristics of downstream wetland or riparian habitats and could result in changes in plant community composition or distribution. Increases in the volumes or velocities of flows could result in the erosion of substrates or vegetation in downstream habitats, while decreased flows could result in dessication of habitats. Underground mines would be less likely to result in large changes to surface water flow patterns and associated impacts on plant communities than would open-pit mines, which cause extensive modifications to landscape surfaces. The storage of waste-rock

material for underground mines, however, could disrupt surface drainage patterns. Leachate from waste-rock storage areas could affect the quality of surface water or groundwater and affect downgradient habitats. Groundwater pumped from mines could affect habitats receiving surface water flows as a result of reduced water quality or increased flow velocities or volumes. As discussed in Section 2.2.2, although local surface and groundwater availability is expected to be scarce, it is assumed that purchased water trucked in to the project site would be obtained from sources within the same hydrologic basin as the lease tracts.

Mining operations could affect groundwater flows if excavations intercepted groundwater resources. Reductions in groundwater flows could affect downgradient habitats that depend on groundwater discharges, such as springs, seeps, or streams with flows supplemented or maintained by groundwater. Plant communities could be degraded as a result of reductions in water availability.

During mine development and operations, wildlife disturbance might be of greater concern than habitat loss (Arnett et al. 2007). The response of wildlife to disturbances caused by noise and human presence would be species-specific. Responses for a given species could be affected by the physiological or reproductive conditions of individuals; their distance from the disturbance; and the type, intensity, and duration of the disturbance. Wildlife could respond to a disturbance in various ways, including attraction, habituation, or avoidance (Knight and Cole 1991). All three behaviors can be considered adverse impacts. Wildlife might cease foraging, mating, or nesting near areas where the disturbance occurred. For example, disturbance near active sage grouse leks could lead to lek abandonment, displacement, and reduced reproduction. In contrast, wildlife such as bears, foxes, and squirrels can habituate to disturbances and might be attracted to human activities, primarily when a food source was accidentally or deliberately made available.

Regular or periodic disturbance could cause adjacent areas to be less attractive to wildlife and result in long-term reduction of wildlife use in areas exposed to a repeated variety of disturbances, such as noise. Principal sources of noise would include vehicle traffic, the operation of machinery, and blasting. The potential effects of noise on wildlife could include acute or chronic physiological damage to the auditory system, increased energy expenditure, physical injury incurred during panicked responses, interference with normal activities (e.g., feeding), and impaired communication (AMEC Americas Limited 2005; Larkin 1996; Salt and Hullar 2010; USFWS 2011d). The response of wildlife to noise would vary by species; the animal's physiological or reproductive condition; distance; and the type, intensity, and duration of the disturbance.

Much of the research on wildlife-related noise effects has focused on birds. This research has shown that noise might affect territory selection, territorial defense, dispersal, foraging success, fledging success, and song learning (e.g., Reijnen and Foppen 1994; Foppen and Reijnen 1994; Larkin 1996). Some studies (e.g., Reijnen and Foppen 1994; Foppen and Reijnen 1994; Reijnen et al. 1995, 1996, 1997) have shown reduced densities of a number of species in forest habitats (26 of 43 species) and grassland habitats (7 of 12 species) adjacent to roads, with effects detectable from 66 to 11,581 ft (20 to 3,500 m) from the roads. Reijnen et al. (1996) identified a threshold effect sound level of 47 dBA for all species combined

and of 42 dBA for the most sensitive species. The observed reductions in population density are attributed to a reduction in habitat quality caused by elevated noise levels. This threshold sound level of 42 to 47 dBA, which is somewhat below the U.S. Environmental Protection Agency (EPA)-recommended limit for residential areas, is at or below the sound levels generated by truck traffic that would likely occur at distances of 250 ft (76 m) or more from the mine area or access roads, or the levels generated by typical construction equipment at distances of 2,500 ft (760 m) or more from the mine site.

Noise can reduce bird nesting success and alter species interactions, resulting in different avian communities (Francis et al. 2009). On the basis of a review of the literature by Hockin et al. (1992), the effects of disturbance on bird breeding and breeding success include reduced nest attendance, nest failures, reduced nest building, increased predation on eggs and nestlings, nest abandonment, inhibition of laying, increased absence from the nest, reduced feeding and brooding, exposure of eggs and nestlings to heat or cold, retarded chick development, and lengthening of the incubation period. The most adverse impacts associated with noise could occur if critical life-cycle activities are disrupted (e.g., mating and nesting). For instance, disturbance of birds during the nesting season can result in nest or brood abandonment. The eggs and young of displaced birds would be more susceptible to cold or predators.

During winter, the average mean flush distance for several raptor species is 387 ft (120 m) from people walking and 246 ft (75 m) from vehicles (Holmes et al. 1993). Disturbance from light traffic (e.g., 1 to 12 vehicles per day) during the breeding season might reduce nest-initiation rates and increase distances moved from sage grouse leks during nest site selection (Lyon and Anderson 2003). The density of sagebrush obligate passerines was reduced by 39% to 60% within a 328-ft (100-m) buffer around dirt roads with traffic volumes ranging from 10 to 700 vehicles per day. However, traffic volumes alone might not explain the observed effect. The birds might also have been responding to edge effects, habitat fragmentation, and increases in other passerine species along the road corridors. Thus, declines might persist even after traffic subsides, lasting until road areas are reclaimed and fully vegetated (Ingelfinger and Anderson 2004).

Various adverse effects of noise on raptors occur, but for some species, the effects are temporary because the raptors habituate to the noise (Brown et al. 1999; Delaney et al. 1999). As reviewed by Hockin et al. (1992), the effects of noise disturbance on bird breeding and breeding success include reduced nest attendance, nest failures, reduced nest building, increased predation on eggs and nestlings, nest abandonment, inhibition of laying, increased absence from the nest, reduced feeding and brooding, exposure of eggs and nestlings to heat or cold, retarded chick development, lengthened incubation period, increased physiological stress, increased energy expenditures, habitat avoidance, decreased population or nesting densities, altered species composition, and disruption and disorientation of movements. The most severe impacts associated with noise could occur if critical life-cycle activities are disrupted (e.g., mating and nesting). For instance, disturbance of birds during the nesting season could result in nest or brood abandonment.

Lighting could also disturb wildlife in the mine area. Lights directly attract migratory birds (particularly in inclement weather and during other low-visibility conditions), and they

could indirectly attract birds and bats by attracting flying insects. Lighting may be needed at mining facilities to security reasons and to light exploration drilling and mining operations. Any ULP-related activities that involve lighting have the potential to affect birds and bats, as well as their invertebrate prey.

3.1.3 Reclamation

General impacts on ecological resources (including threatened, endangered, and sensitive species) related to reclamation activities are listed in Table 3-1. Reclamation activities would generally occur on previously disturbed areas and would be associated primarily with covering the waste-rock pile and re-grading developed areas. Indirect impacts associated with reclamation activities could include the deposition of fugitive dust, erosion, sedimentation, and the introduction of non-native species, including noxious weeds.

Reclamation would restore habitat and establish ecological conditions suitable for plant and wildlife species. The effectiveness of any reclamation activities would depend on the specific actions taken. The best results would occur where the original site topography, hydrology, soils, and vegetation patterns are reestablished. During reclamation, topsoil would be seeded following final surface preparation. The seed mix approved by DOE, in consultation with BLM, for use in reclamation of all lease tracts is given in Table 3-2. Vegetation reestablishment might not be possible under all situations. The establishment of native vegetation communities that existed before development (e.g., pinyon-juniper woodlands and sagebrush shrublands) on the reclaimed sites could take up to several decades.

TABLE 3-2 Seed Mixture Approved for Reseeding on the DOE ULP Lease Tracts

Species		Broadcast Application Rate (lb PLS/acre)[a]
Scientific Name	Common Name	
Pascopyrum smithii	Arriba western wheatgrass	4.0
Elymus trachycaulus ssp. *trachycaulus*	Slender wheatgrass	2.0
Oryzopsis (=Achnatherum) hymenoides	Paloma Indian ricegrass	4.0
Bouteloua gracilis	Hachita blue grama	2.0
Hilaria (=Pleuraphis) jamesii (florets)	Galleta grass	2.0
Stipa (=Hesperostipa) comata	Needleandthread grass	1.0
Stipa (=Nassella) viridula	Lodorm green needlegrass	2.0
Linum lewisii	Lewis flax	1.0
Penstemon cyanocaulis[b]	Bluestem penstemon	0.5
Sphaeralcea coccinea or *Sphaeralcea parvifolia*	Scarlet or parvifolia globemallow	0.3
Atriplex canescens	Rincon fourwing saltbush	3.0
Ceratoides (=Krascheninnikovia) lanata	Winterfat	1.0

[a] PLS = pure live seed.

[b] If *P. cyanocaulis* (bluestem penstemon) is unavailable, replace with *P. bandera* (Rocky Mountain penstemon).

Overall, reclamation impacts on vegetation and wildlife would be minor and of relatively short duration.

3.2 SPECIES THAT MAY BE AFFECTED UNDER THE PROPOSED ACTION

This section discusses the distribution, ecology, and life history of federally listed, proposed, and candidate species and their critical habitat (if applicable) that might occur in the region including and surrounding the ULP lease tracts and the potential for impacts as they relate to the proposed action. The ESA requires the action agencies (i.e., DOE) to consider the direct and indirect impacts of the proposed action on species and critical habitats, together with the effects of other activities that are interrelated to or interdependent with that action, that would be added to the environmental baseline (50 CFR 402.02). Impacts on the species under discussion can be short-term (one or two reproductive seasons) or long-term (affecting several generations). They can be direct (an immediate effect to an individual, population, or its habitat) or indirect (an effect that might occur over time or result from other actions). In addition, cumulative impacts might affect some of the species. For purposes of this BA, cumulative effects are defined as they are in 50 CFR 402.02, as "those effects of future Tribal, State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." A summary of potential impacts and avoidance, minimization, and mitigation measures that are used to develop effect determinations for each species is provided in Section 2.3.

For all species evaluated in this BA, natural history information provided by the USFWS (2012a), CPW (2012), and NatureServe (2012), along with recorded observations (quad-level) from the Colorado Natural Heritage Program (CNHP 2011b), are used to determine the potential for species or their habitat to occur in the affected area under the proposed action. For terrestrial vertebrates, the distribution of predicted suitable habitat was evaluated to provide additional information on the potential distribution of species habitat. Predicted suitable habitat for terrestrial vertebrates was determined from animal distribution models from the Southwest Regional Gap Analysis Program (SWReGAP) (USGS 2007). This information was used to determine the potential presence of suitable habitat in the vicinity of the ULP lease tracts. It is important to note that these GAP models (inferred predicted suitable habitat distributions) are available only for the terrestrial vertebrates considered in this BA. Species are discussed below in taxonomic (plants to mammals) and alphabetic order by common name. A summary of the effect determinations for all species evaluated in this BA is provided in Table 3-3.

3.2.1 Endangered, Threatened, and Proposed Species

Fourteen species that are listed as threatened or endangered under the ESA or that are proposed for listing have the potential to occur in the ULP counties evaluated in this BA or within the ULP affected area. These species include the following: three plants (clay-loving wild buckwheat, Colorado hookless cactus, and Debeque phacelia), one invertebrate (Uncompahgre fritillary butterfly), five fish (bonytail, Colorado pikeminnow, greenback cutthroat trout, humpback chub, and razorback sucker), three birds (Gunnison sage-grouse, Mexican spotted owl

1 **TABLE 3-3 Summary of Effects Determination for Listed and Candidate Species**

Species	Status[a]	Critical Habitat[b]	Effect Determination[c]	Rationale[d]
Species that are listed or proposed for listing under the ESA				
Plants				
Clay-loving wild buckwheat (*Eriogonum pelinophilum*)	E	N	NE NE (critical habitat)	1 1
Colorado hookless cactus (*Sclerocactus glaucus*)	T	N	NE	1
Debeque phacelia (*Phacelia submutica*)	T	Y, proposed	NE NE (critical habitat)	1 1
Invertebrates				
Uncompahgre fritillary butterfly (*Boloria acrocnema*)	E	N	NE	1
Fish				
Colorado River Endangered Fish Bonytail (*Gila elegans*) Colorado pikeminnow (*Ptychocheilus lucius*) Humpback chub (*Gila cypha*) Razorback sucker (*Xyrauchen texanus*)	E	Y	LAA LAA (critical habitat)	2 2
Greenback cutthroat trout (*Oncorhynchus clarki* ssp. *stomias*)	T	N	NE	1
Birds				
Gunnison sage-grouse (*Centrocercus minimus*)	P	N	NLAA	3
Mexican spotted owl (*Strix occidentalis lucida*)	T	Y	NLAA NE (critical habitat)	3 1
Southwestern willow flycatcher (*Empidonax traillii extimus*)	E	Y, designated and proposed	NLAA NE (critical habitat)	3 1
Mammals				
Black-footed ferret (*Mustela nigripes*)	E, XN	N	NE	4
Canada lynx (*Lynx Canadensis*)	T	Y	NE NE (critical habitat)	1 1

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TABLE 3-3 (Cont.)

Species	Status[a]	Critical Habitat[b]	Effect Determination[c]	Rationale[d]
Species that are candidates for listing under the ESA				
Birds				
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	C	N	NLAA	3
Mammals				
Gunnison's prairie dog (*Cynomys gunnisoni*)	C	N	NLAA	3
North American wolverine (*Gulo gulo luscus*)	C	N	NE	1

[a] Status definitions are as follows: E = listed as endangered under the ESA, T = listed as threatened under the ESA, P = proposed for listing under the ESA, XN = experimental nonessential population as defined under Section 10(j) of the ESA, C = candidate for listing under the ESA.

[b] If designated critical habitat for a species is known to occur, that is indicated with a "Y" for yes; if it is not known to occur, that is indicated with an "N" for no. Some species have proposed critical habitat that has not been finalized.

[c] The effect determinations are defined as follows: NE = no effect, NLAA = may affect but not likely to adversely affect, LAA = may affect and likely to adversely affect.

[d] The rationale for the effect determinations is as follows:

1. The species is endemic to a particular habitat or region outside the ULP affected area, or the specific habitats required by the species (including designated critical habitat, if applicable) are not present in the ULP affected area. The proposed ULP will have no effect on this species or its designated critical habitat (if applicable).
2. The species or its habitat (including designated critical habitat, if applicable) may occur in the ULP affected area. Activities associated with the proposed ULP are likely to impact the species or its habitat (including designated critical habitat, if applicable) and the proposed mitigation measures and BMPs are not likely to completely offset or eliminate some of these impacts. The proposed ULP may affect, and is likely to adversely affect this species and its critical habitat (if applicable).
3. The species or its habitat (including designated critical habitat, if applicable) may occur in the ULP affected area. However, impacts are considered to be relatively minor and can be minimized or avoided through the implementation of required minimization and mitigation measures and BMPs. The proposed ULP may affect, but is not likely to adversely affect this species or its habitat (including designated critical habitat, if applicable).
4. The black-footed ferret is presumed extirpated from southwestern Colorado. Nonessential experimental (XN) populations are unlikely to occur in the ULP affected area. Although the ULP affected area has not been block-cleared for the black-footed ferret, the proposed ULP is likely to have no effect on the black-footed ferret.

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and southwestern willow flycatcher), and two mammals (black-footed ferret and Canada lynx). The habitat requirements, distribution relative to the ULP affected area, and effects determination for each of these species are described below. A summary of the effects determinations for these species is provided in Table 3-3.

3.2.1.1 Plants

3.2.1.1.1 Clay-Loving Wild Buckwheat. The clay-loving wild buckwheat (*Eriogonum pelinophilum*) is a long-lived, low-growing, rounded subshrub that has dark green inrolled leaves that look needlelike and clusters of white to cream-colored flowers. It is pollinated by more than 50 species, including native bees and ants. Flowering occurs from late May to early September, and individual flowers only last fewer than 3 days (USFWS 2009a).

The clay-loving wild buckwheat is endemic to the rolling clay hills and flats near Delta and Montrose Counties, Colorado. It grows in whitish, alkaline, clay soils of the Mancos shale formation that are relatively barren of vegetation at elevations ranging from 5,179 to 6,445 ft (1,579 to 1,965 m). It occurs in the greatest density and frequency away from other shrubs. It is found within swales or drainages that are moister than surrounding areas. Plants sometimes associated with the clay-loving wild buckwheat include mat saltbrush, black sagebrush, shadscale, and Gardner's saltbrush (USFWS 2009a).

The clay-loving wild buckwheat was listed as endangered on July 13, 1984; approximately 120 acres (49 ha) in Delta County, Colorado, was also designated as critical habitat on that date (USFWS 1984). The current range of the clay-loving wild buckwheat is roughly 576 acres (233 ha) (USFWS 2009a). The current population size of the clay-loving wild buckwheat is roughly 278,000 individuals (USFWS 2009a).

The greatest threat to the clay-loving wild buckwheat is habitat loss and fragmentation from urban development (NatureServe 2012). Potential threats that might be associated with mining activities include surface disturbance from construction of facilities and roads as well as increased vehicle traffic and human presence. Other threats include agricultural development, nonnative invasive plants, livestock use, oil and gas development, and herbicide use (USFWS 2009a).

According to the CNHP, the nearest recorded occurrences of clay-loving wild buckwheat are in eastern Montrose County, approximately 40 mi (64 km) east of the ULP lease tracts. The nearest designated critical habitat in central Delta County is greater than 50 mi (80 km) northeast of the ULP lease tracts (Figure 3-1). Given the endemism of this species in Delta and Montrose Counties, it is unlikely that this species, its habitat, and designated critical habitat could occur in the ULP affected area. For this reason, uranium mining under the ULP will have **no effect** on the clay-loving wild buckwheat. Similarly, uranium mining under the ULP will have **no effect** on designated critical habitat for the clay-loving wild buckwheat.

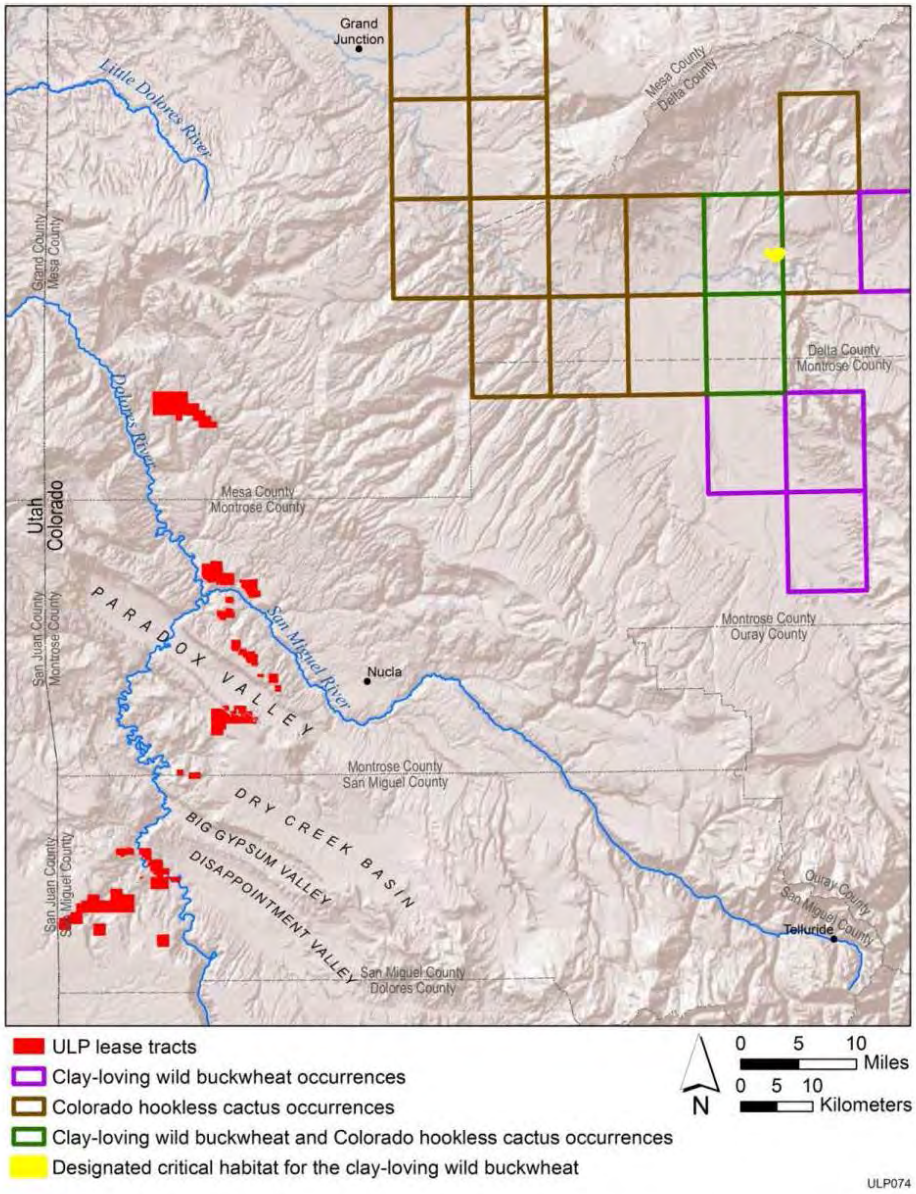


FIGURE 3-1 Recorded Quad-Level Occurrences of the Clay-Loving Wild Buckwheat and Colorado Hookless Cactus, and Locations of Designated Critical Habitat for the Clay-Loving Wild Buckwheat, in the Vicinity of the ULP Lease Tracts

3.2.1.1.2 Colorado Hookless Cactus. The Colorado hookless cactus *(Sclerocactus glaucus)* was previously part of a larger complex of *S. glaucus*; however, this complex was split into three distinct species in 2009. All three species are listed as threatened under the ESA (USFWS 2009b). The Colorado hookless cactus is a barrel-shaped cactus that is from 1.2 to 4.8 in. (3.0 to 12.2 cm) tall. The stem is ribbed, with hooked spines radiating out from areoles along the ribs. It produces pink to violet bell or funnel-shaped flowers and short, barrel-shaped fruit from April to May (USFWS 2010a). After blooming, the cactus may shrink below the ground or become a dull grayish-green color, making the plant very hard to identify.

The Colorado hookless cactus is endemic to western Colorado in Delta, Montrose, Mesa, and Garfield Counties. Its range is estimated to be around 1,700–2,100 mi^2 (4,400–5,440 km^2) (USFWS 2010a; NatureServe 2012). The total known population is estimated to number more than 19,000 plants (USFWS 2010a). There are currently two population centers of the Colorado hookless cactus that may be morphologically and genetically distinct. The two populations are on alluvial river terraces of the Gunnison and Colorado Rivers, and in the Plateau and Roan Creek drainages. These populations are typically found at elevations ranging from 3,937 to 6,562 ft (1,200 to 2,000 m) (CNHP 2011a; USFWS 2011a). Populations are most abundant on south-facing slopes.

The Colorado hookless cactus was listed as threatened on November 13, 1979 (USFWS 1979). A recovery plan for the Colorado hookless cactus was created on April 14, 2010 (USFWS 2010a) that identified these recovery needs: (1) surveying to accurately document populations and suitable habitat, (2) protecting and restoring habitat and corridors to provide connectivity, and (3) protecting individual plants from direct and indirect threats. Critical habitat for the Colorado hookless cactus has not been designated.

Potential threats to the Colorado hookless cactus that may be associated with mining activities include surface disturbances from construction of facilities and roads as well as increased vehicle traffic and human presence. Construction associated with mining can fragment and destroy Colorado hookless cactus habitat. Roads and associated infrastructure can disturb individuals and habitat. The potential increase in the use of access roads by off-road vehicles could increase erosion, fugitive dust, soil compaction, and sedimentation and could crush cacti. The accumulation of dust on cacti could lead to a decrease in plant growth and water use efficiency. Increased erosion, soil compaction, and sedimentation could kill cacti. An increase in human presence could lead to the illegal collection and loss of individual plants. Other threats to the Colorado hookless cactus include livestock grazing (grazing occurs on 94% of the Colorado hookless cactus's potential habitat) and competition with invasive weed species (USFWS 2010a).

According to the CNHP, the nearest recorded occurrences of Colorado hookless cactus are in southern Delta County, approximately 23 mi (37 km) east of the nearest ULP lease tract (Lease Tract 27) (Figure 3-1). However, surveys for this species have not documented any individuals near any of the ULP lease tracts (Holsinger 2012). Given the endemism of this species to alluvial terraces of the Gunnison and Colorado Rivers, it is unlikely for this species or its habitat to occur in the ULP affected area. For this reason, uranium mining under the ULP will have **no effect** on the Colorado hookless cactus.

3.2.1.1.3 Debeque Phacelia. The Debeque phacelia *(Phacelia submutica)* is a low-growing annual herb with small white, tube-shaped flowers hidden within leaves (USFWS 2011b). Stems are usually 0.8 to 3 in. (2.0 to 7.6 cm) long, deep red, and covered in stiff hairs. Leaves are also covered with stiff hairs and are reddish when mature and egg shaped. The plant shows yearly variation in abundance due to environmental factors, with no plants growing one year and thousands growing the next. Seeds can remain dormant for up to 5 years. It flowers between late April and late June and sets seed from mid-May through late June (USFWS 2011b).

Habitat requirements of the Debeque phacelia include clay soils from the Atwell Gulch and Shire members of the Wasatch Formation that have little other vegetation (generally less than 10% plant coverage) at elevations ranging from 5,080 to 7,100 ft (1,548 to 2,164 m). The shrink-swell action of clay soils is essential to the species because seed banks are maintained in cracks formed in the soil. It has been found associated with other plants, including cheatgrass, pointed gumweed, Gordon's buckwheat, Nuttall's povertyweed, and tufted evening primrose. It is generally found on moderately steep slopes, benches, and ridge tops adjacent to valley floors (USFWS 2011b).

The Debeque phacelia was listed as threatened on July 27, 2011 (USFWS 2011c). On that date, the USFWS proposed to designate 24,987 acres (10,112 ha) within nine units in Mesa and Garfield Counties, Colorado, as critical habitat for this species (USFWS 2011b). On March 27, 2012, the USFWS revised the proposed designation to include a total of 25,484 acres (10,313 ha) of critical habitat in Mesa and Garfield Counties (USFWS 2012b). There are currently nine known populations of the Debeque phacelia. It is estimated that the current population size may be as large as 68,371 if climatic conditions are favorable (USFWS2011b). The estimated total number of plants ranges from 7,767 to 68,371 per year (USFWS 2011c). The current range of the Debeque phacelia is centered on DeBeque, Colorado, in Mesa and Garfield Counties. A polygon around all nine populations of the Debeque phacelia covers 86,230 acres (34,896 ha), with 626 acres (253 ha) being actually occupied by plants (USFWS 2011b).

Potential threats to the Debeque phacelia that may be associated with mining activities include surface disturbance from construction of facilities and roads as well as increased vehicle traffic and human presence. The disturbance of seed banks from within the soil will be detrimental to the Debeque phacelia (NatureServe 2012). Other threats to this species include livestock grazing and oil and gas development (USFWS 2011c).

According to the CNHP, the nearest recorded occurrences of Debeque phacelia are in central Mesa County, Colorado, approximately 45 mi (72 km) northeast of the nearest ULP lease tract (27). The locations of the proposed critical habitat units are approximately 53 mi (85 km) northeast of ULP Lease Tract 27 (Figure 3-2). This species has specific habitat requirements for clay soils in the Wasatch Formation; these habitats do not occur in the ULP affected area. For this reason, uranium mining under the ULP will have **no effect** on the Debeque phacelia or on proposed critical habitat for the plant.

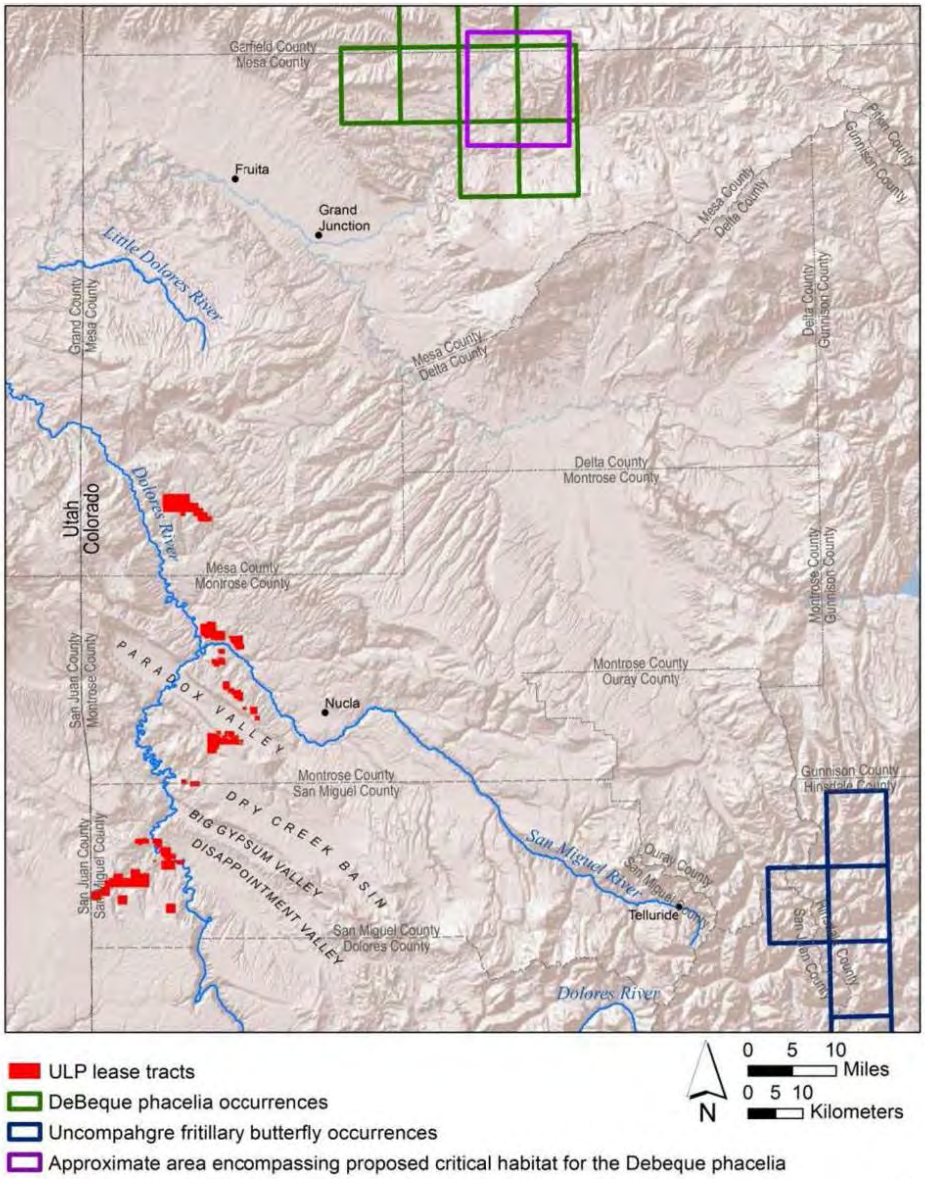


FIGURE 3-2 Recorded Quad-Level Occurrences of the Debeque Phacelia and Uncompahgre Fritillary Butterfly, and Locations of Proposed Critical Habitat for the Debeque Phacelia, in the Vicinity of the ULP Lease Tracts

3.2.1.2 Invertebrates

3.2.1.2.1 Uncompahgre Fritillary Butterfly. The Uncompahgre fritillary butterfly (*Boloria acrocnema*) is a butterfly (family Nymphalidae) that has a wing span of 1 to 1.2 in. (2 to 3 cm). Males have rusty brown wings with criss-crossed black bars. Females have lighter wings. The hind wing has a white jagged bar dividing the brown inner half and the purple-grey outer surface. The body is brownish black. Females lay eggs on the snow willow (*Salix nivalis*), and the larvae feed on that plant. Adults consume nectar from a range of flowering alpine plants. The butterfly has a biennial life history; eggs are laid in one year; the insects are caterpillars in the following year; and they mature into adults the next year. Adults live only 1 to 2 weeks (USFWS 2011d).

The Uncompahgre fritillary butterfly has the smallest total range of any North American butterfly species. Its habitat is limited in distribution to the San Juan Mountains and southern Sawatch Range in southwestern Colorado. All known colonies occur on public lands. Habitat requirements for this species include the snow willow, which provides food and shelter at elevations above 12,400 ft (3,780 m) (USFWS 1994a, 2011d; NatureServe 2012).

The Uncompahgre fritillary butterfly was listed as an endangered species on June 24, 1991 (USFWS 1991a). A recovery plan was finalized on March 17, 1994 (USFWS 1994a). Critical habitat for this species has not been designated. Currently, 11 known colonies of the butterfly exist (USFWS 2009c). Only 3 of those colonies are monitored, and the current population of those colonies is estimated to number between 3,400 and 23,000 (USFWS 2011d). The overall population size is currently unknown. The current range is estimated to be between 24,710 and 61,776 acres (10,000 and 25,000 ha) in size (NatureServe 2012).

The current threats to the Uncompahgre fritillary butterfly are minor and include collection by people and habitat degradation from widening of hiking trails and sheep grazing (USFWS 2011d). Potential threats to this species that may be associated with mining activities include habitat disturbance from construction of facilities and roads as well as increased vehicle traffic and human presence.

According to the CNHP, the nearest recorded occurrences of the Uncompahgre fritillary butterfly are approximately 60 mi (96 km) east of the ULP lease tracts (Figure 3-2). As discussed, this species has specific habitat requirements for alpine willow communities; these habitats do not occur in the ULP affected area. For this reason, uranium mining under the ULP will have **no effect** on the Uncompahgre fritillary butterfly.

3.2.1.3 Fish

3.2.1.3.1 Colorado River Endangered Fish. Four listed species of fish that inhabit the Colorado River Basin may occur in the ULP affected area: the bonytail, Colorado

pikeminnow, humpback chub, and razorback sucker. Each of these fish species historically inhabited tributaries of the Colorado River system, including portions of the Dolores and San Miguel Rivers in the ULP project counties. Current populations of these Colorado River endangered fish species no longer inhabit these tributary rivers in the vicinity of the ULP lease tracts. However, populations of these species, suitable habitat, and designated critical habitat for these species occur in the Colorado River, which is downgradient from all ULP lease tracts and is connected to several lease tracts (primarily Lease Tracts 13, 13A, and 14) by the Dolores River (Figure 3-3).

Direct impacts on the Colorado River endangered fish or their habitat associated with ULP activities would not occur. However, potential indirect threats to these species that might be associated with mining activities under the ULP include impacts on water quality and water withdrawals. Uranium mining can contaminate surrounding drainages and bodies of water with uranium, other radioactive contaminants, and other contaminants such as ammonium, which can negatively affect aquatic biota. Some contaminants can bio-accumulate in fish species (Karp and Metzler 2006; Fresques 2008; Metzler et al. 2008). The toxicity of uranium mill tailings has been shown to negatively affect aquatic biota in the Colorado River system (USFWS 1990). The effects of ammonium include reduced growth rate, reduced gamete production, body deformities and malformations, and degenerative gill and kidney appearance and function. The construction of mining facilities may also increase the amount of sediment in downgradient streams and rivers (Leyda 2011), which could also affect habitat quality (including designated critical habitat).

Water depletions associated with uranium mining may contribute to the destruction or adverse modification of designated critical habitat for the Colorado pikeminnow (USFWS 2011e) and could also affect all other Colorado River endangered fish. As discussed in Section 2.2.2 and Table 2-3, as much as 19.3 acre-ft of water may be needed to support ULP activities during the peak production year. It is assumed that all water would come from sources within the Dolores River Basin and may be obtained from pumping withdrawals on or off the lease tract, the purchase of municipal supplies, or the purchase and relinquishment of existing groundwater rights. Surface water and groundwater sources in the region surrounding the ULP lease tracts are over-appropriated according to the Colorado Division of Water Resources (CDWR 2007), and the USFWS considers actions that could result in a net water depletion in the upper Colorado River Basin to adversely affect the endangered fish and their designated critical habitat. Although the estimated peak annual water demand from the ULP activities (19.3 acre-ft) represents a relatively small depletion to the Colorado River, the volume exceeds the USFWS *de minimis* threshold of 0.1 acre-ft per year (USFWS 2009j)and requires ESA Section 7 consultation.

Other threats to the Colorado River endangered fish that might be associated with ULP activities include physical stream alteration, competition with and predation by introduced species, and pollution. Indirect impacts on the Dolores River and other tributaries to the Colorado River from ULP-related water withdrawals, runoff, sedimentation, or exposure to contaminants might be possible, which could affect these species and their habitats (including designated critical habitat) in the Colorado River (Table 3-1).

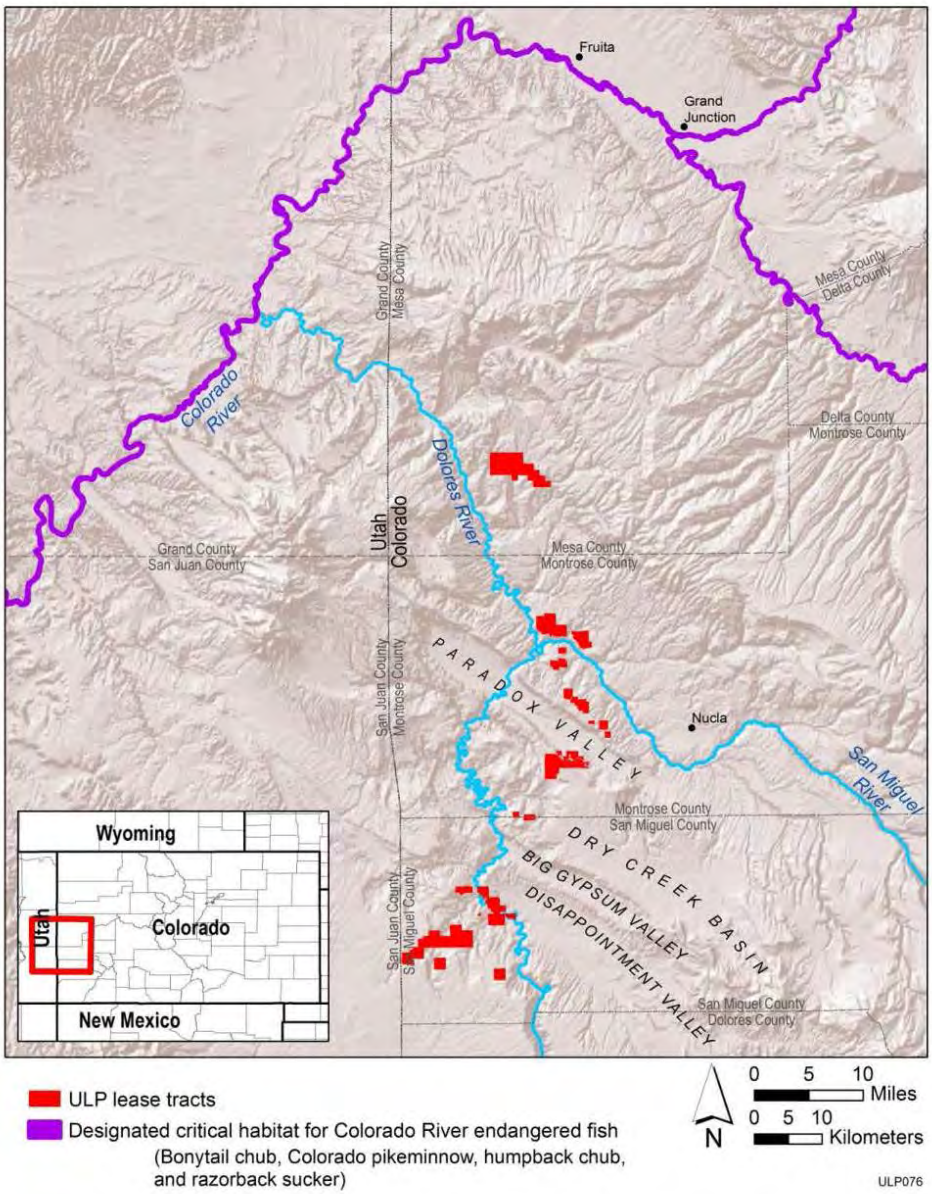


FIGURE 3-3 Locations of Designated Critical Habitat for the Colorado River Endangered Fish Species in the Vicinity of the ULP Lease Tracts

The implementation of mitigation measures and BMPs identified in Table 2-5, particularly those related to aquatic habitats and water quality (G4, D2, D3, D4, D5, D6, D7, D8, D9, D12), would reduce impacts of water quality and quantity to the Colorado River endangered fish species. Indirect impacts related to water contamination are expected to be minimized with the measures identified in Table 2-5 to levels that would not adversely affect the species or their habitats. Impacts related to water withdrawal and consumption from the Upper Colorado River Basin are possible (i.e., there are no measures to completely eliminate or offset water withdrawals from the Colorado River Basin). For this reason, it is determined that the proposed ULP **may affect, and is likely to adversely affect, both the Colorado River endangered fish and their critical habitat**.

Several conservation measures have been identified from previous Biological Assessments and Biological Opinions for related federal activities to offset or reduce negative impacts of project-related water use on Colorado River endangered fish. These conservation measures may be adopted to reduce ULP-related impacts on endangered fish. These conservation measures include the following:

- If water pumping is necessary, pump water from off-channel locations (e.g., ponds and ditches) not directly connected to mainstem rivers such as the Dolores River and

- Require water users to sign Recovery Agreements that state the water users won't interfere with the implementation of recovery actions and the USFWS will provide ESA compliance. The DOE will ensure Recovery Agreements are initiated by the lessees, or on the behalf of the lessees via a representative group, with the USFWS as appropriate.

The USFWS may provide other alternatives to help projects reduce affects from their activities during the consultation process. The natural history, habitat requirements, and listing history for each of these species is provided in the following text.

Bonytail. The bonytail (*Gila elegans*) is a species of fish in the family Cyprinidae. It is endemic to the Colorado River Basin. This species has a very slender, round, and long caudal peduncle; a subterminal mouth; and fins that are large and falcate. Adults have a relatively flat, concave head and a smooth dorsal hump and back. Young fish are typically silver-gray with white bellies. Adults have a dark olive back that contains small iridescent highlights (Mueller 2006). Adults grow to be about 21.7 in. (55 cm) in length and weigh 2.4 lb (1.1 kg) (USFWS 2002a). Hatchery-reared bonytail become sexually mature after 2 years (NatureServe 2012). The diet of the bonytail is unknown, but it is hypothesized that they eat insects, fishes, and plants (NatureServe 2012).

The historic range of the bonytail is unknown because it was extirpated from many areas before surveys were conducted, but it was common in warm-water reaches of larger rivers from Mexico to Wyoming (USFWS 2002a). Currently, no self-sustaining populations of bonytail exist in the wild, and only a small number of adults exist in the wild in Lake Mohave, Lake Havasu, and in the Green River and upper Colorado River subbasins (USFWS 2002a). The current

population size is estimated to be between 1 and 1,000 individuals (NatureServe 2012). Hatchery-reared adults have been released into rivers in the upper basin, but results indicate low survival and no reproduction or recruitment (USFWS 2002a).

The habitat requirements of the bonytail are uncertain, but the species has been observed in pools and eddies on mainstem rivers. Habitats necessary for conservation of the bonytail include river channels and flooded, ponded, or inundated riverine habitats (USFWS 2002a; BIO-WEST 2005). Bonytails in rivers probably spawn in spring over rocky substrates, and spawning in reservoirs has been observed over rocky shoals and shorelines (USFWS 2002a). Spawning was observed to occur in June and July at water temperatures of about 64.4°F (18°C) (USFWS 1994b). It is hypothesized that flooded bottomland habitats are important as nursery habitats for young (USFWS 2002a).

The bonytail was listed as an endangered species on April 23, 1980 (USFWS 1980). A recovery plan was approved on August 1, 2002 (USFWS 2002a). Approximately 312 mi (502 km) of river in the Colorado River Basin were designated as critical habitat for the bonytail on March 21, 1994. The critical habitat spans five states and includes portions of the Colorado, Green, and Yampa Rivers in the Upper Basin and the Colorado River in the Lower Basin (USFWS 1994b). The nearest location of designated critical habitat is within the Colorado River in Grand County, Utah, approximately 29 mi (46.4 km) northwest of the northern-most ULP lease tracts (Figure 3-3).

Colorado Pikeminnow. The Colorado pikeminnow (*Ptychocheilus lucius*) is a species of fish in the family Cyprinidae. It is a long-distance migrator, travelling an average of 411 mi (658 km). It reaches a maximum length of 5.9 ft (1.8 m) and weight of 79 lb (36 kg) and lives over 40 years (USFWS 2002b). It is an elongated fish, with a greenish, slender body with gold flecks on the dorsal surface. The mouth is large and nearly horizontal, with slender teeth (USFWS 2007). Reproduction occurs after 5 to 7 years (NatureServe 2012). Juveniles feed mainly on zooplankton and insect larvae, while larger fish (bigger than 4 in. [10 cm]) feed mainly on other fish (USFWS 2007; NatureServe 2012).

Spawning occurs in river canyons when water flows decline from June to August and when water temperatures are between 64.4 and 73.4°F (18 and 23°C) (USFWS 1994b, 2002b). Optimal temperature for egg hatching is 68°F (20°C) (NatureServe 2012). Adult habitats after spawning include pools, deep runs, and eddies maintained by high spring flows. Larvae drift downstream to nutrient-rich nursery backwaters (USFWS 2002b). Young of the year prefer shallow, alongshore, ephemeral backwaters with little or no current and silt or sand substrates (NatureServe 2012; USFWS 2007). When juveniles reach about 8 in. (20 cm) in length, they prefer deeper water with a faster velocity (USFWS 2007). During the winter, adults are most common in shallow, ice-covered shorelines (USFWS 1994b). Temperature tolerances range from less than 50°F to 95°F (10°C to 35°C) (USFWS 2007).

The Colorado pikeminnow is endemic to the Colorado River Basin. It was extirpated from the Lower Basin in the 1970s, but experimental introductions have been made into the Verde River in the Lower Basin. Currently, three wild reproducing populations occur in the Green River, San Juan River, and upper Colorado River subbasins. Current population estimates

are between 6,600 and 8,900 total for the three populations (6,000 to 8,000 in the Green River; 600 to 900 in the upper Colorado River; 19 to 50 in the San Juan River) (USFWS 2002b).

The Colorado pikeminnow was listed as an endangered species on March 11, 1967. An original recovery plan was approved on August 28, 2002, and the current recovery goals were approved on July 27, 2006 (USFWS 2002b). Approximately 1,148 mi (1,848 km) of river in the Colorado River Basin were designated as critical habitat for the Colorado pikeminnow on March 21, 1994. The critical habitat spans three states and includes portions of the Colorado, Green, Yampa, White, and San Juan Rivers in the Upper Basin (USFWS 1994b). The nearest location of designated critical habitat is within the Colorado River in Grand County, Utah, approximately 29 mi (46 km) northwest of the northern-most ULP lease tracts (Figure 3-3).

Humpback Chub. The humpback chub (*Gila cypha*) is a freshwater fish species in the family Cyprinidae. This species is less than 19.7 in. (50 cm) in total length. It has silvery sides and a brown back. Adults have a distinctive dorsal hump, a long snout, and small eyes. Humpback and roundtail chubs can look very similar, and the young in particular do not possess easily identifiable morphological differences (USFWS 1990). The humpback chub reproduces from May to July, depending on the location. Spawning occurs when water temperatures are near 68°F (20°C) and when spring water flows are at their highest (USFWS 1994b). Young and adults are bottom feeders and consume mainly insects and other invertebrates, but algae and fish are occasionally consumed.

The humpback chub is found in river canyons in a variety of habitats, including pools, riffles, and eddies. It has also been found near boulder-strewn canyons, travertine dams, rocky runs, riffles, and rapids (USFWS 1994b). Adult humpback chub inhabit deep (1 to 15 ft [0.3 to 4.6 m]) river regions, but young are generally found in shallower areas (less than 9.8 ft [3.0 m]) (USFWS 2002c).

The humpback chub is endemic to the Colorado River Basin and is presently restricted to remote, whitewater canyons. Human-made alterations to the Colorado River may have caused the humpback chub to disappear from certain areas before its presence was documented (USFWS 1990). Because of this uncertainty, the historical distribution of the humpback chub is not well known, but the earliest known record of the species is from the Grand Canyon from around 4,000 B.C. (USFWS 1990, 1994b).

The humpback chub was listed as an endangered species on March 11, 1967. An original recovery plan was approved on August 22, 1979, and the current second revised recovery plan was approved on September 19, 1990 (USFWS 1990). A revised recovery plan was approved on August 1, 2002 (USFWS 2002c). Approximately 379 mi (610 km) of river in the Colorado River Basin were designated as critical habitat for the humpback chub on March 24, 1994. The critical habitat spans three states and includes portions of the Colorado, Green, and Yampa Rivers in the Upper Basin and the Colorado and Little Colorado Rivers in the Lower Basin (USFWS 1994b). The largest remaining population of humpback chub in the Colorado River Basin occurs in the Little Colorado and Colorado Rivers in the Grand Canyon (USFWS 1994b). The nearest location of designated critical habitat is within the Colorado River in Grand County, Utah, approximately 29 mi (46.4 km) northwest of the northern-most ULP lease tracts (Figure 3-3).

Razorback Sucker. The razorback sucker (*Xyrauchen texanus*) is a species of fish in the family Catostomidae. This species has a long, high hump behind the head. The head and body are dark, and the sides are brownish, fading to a yellowish white abdomen. It reaches lengths of 36 to 39 in. (91 to 99 cm) and weighs up to 12 lb (5.4 kg) (USFWS 2007). The diet of adults includes planktonic crustaceans, diatoms, filamentous algae, midge larvae, and detritus.

Habitat requirements of the razorback sucker in rivers include deep runs, eddies, backwaters, and flooded off-channel environments in spring; runs and pools, often in shallow water associated with submerged sandbars, in summer; and low-velocity runs, pools, and eddies in winter (USFWS 2002d). Adults may travel long distances to spawning sites, and spawning usually occurs in rivers over gravel, cobble, or sand substrates during spring runoff at temperatures higher than 57.2°F (14°C) (USFWS 1991b, 2002d). Spawning can also occur over rocky shoals and shorelines. Young require nursery environments with quiet, warm, shallow water, such as tributary mouths, backwaters, or inundated floodplain habitats in rivers, such as coves or shorelines in reservoirs (USFWS 2002d).

The razorback sucker is endemic to the Colorado River Basin. The historic range of the razorback sucker extended through 3,500 mi (5,600 km) of the Colorado River Basin throughout Arizona, California, Colorado, Nevada, New Mexico, Utah, Wyoming, Baja California Norte, and Sonora of Mexico (USFWS 1991b). Currently, the razorback sucker inhabits only about 25% of its historical range in the upper Colorado River basin (USFWS 1991b, 2002d). Most wild fish are now found in Lake Mohave, which represents the largest population within the lower basin (USFWS 2007). This population dropped from 60,000 individuals in 1991 to 9,000 in 2000 (USFWS 2002d). Razorback suckers are currently found in small numbers in the Green River, upper Colorado River, and San Juan River subbasins; in the lower Colorado River; in reservoirs of Lakes Mead and Mohave; and in small tributaries of the Gila River subbasin (USFWS 2002d).

The razorback sucker was listed as an endangered species on October 23, 1991. A recovery plan was approved on August 28, 2002 (USFWS 2002d). Approximately 1,724 mi (2,758 km) of river in the Colorado River Basin was designated as critical habitat for the razorback sucker on March 21, 1994. The critical habitat spans six states and includes 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 (USFWS 1994b). The nearest location of designated critical habitat is within the Colorado River in Grand County, Utah, approximately 29 mi (46.4 km) northwest of the northernmost ULP lease tracts (Figure 3-3).

3.2.1.3.2 Greenback Cutthroat Trout. The greenback cutthroat trout (*Oncorhynchus clarki* ssp. *stomias*) is a species of fish in the family Salmonidae. It is one of the most colorful subspecies of cutthroat trout (USFWS 1998). This species is characterized by dark, round spots on the sides and tail and two colorful blood-red stripes on each side of the throat under the jaw (USFWS 2011f). Mature males have crimson red along the ventral region during spawning season (USFWS 1998). The diet of the greenback cutthroat trout includes mainly aquatic and terrestrial insects, but these fish are opportunistic feeders (USFWS 2009d; Coleman and CNHP 2007). Males spawn at age two, and females reach sexual maturity when they reach a

length of about 7 in. (18 cm), usually after their third or fourth summer (USFWS 2011f; Coleman and CNHP 2007). They spawn in spring or early summer, depending on the elevation. Females dig redds in the gravel bed of streams, where they deposit eggs. Spawning occurs when water reaches about 41 to 46°F (5 to 8°C) (Coleman and CNHP 2007). Larger females can lay up to 6,000 eggs (USFWS 2009d).

The greenback cutthroat trout is the rarest of the cutthroat trout species. The historic range of the greenback cutthroat trout is not known, but it is hypothesized that all mountain and foothill habitats of the South Platte and Arkansas River drainages in Colorado are included (USFWS 2009d). Only nine naturally occurring populations are known to have persisted, but many additional populations have been established in lakes and streams from being introduced (USFWS 1998). The most stable population occurs in Rocky Mountain National Park (NatureServe 2012). Currently, 145 populations in 142 mi (228 km) of streams and 412 acres (167 ha) of lakes have been documented within greenback historic range (USFWS 2011f).

Habitat requirements of the greenback cutthroat trout differ depending on the life stage. Juveniles need the protective cover and low-velocity flow found in side channels and small tributaries. Spawning occurs in riffles with clean gravel. Overwintering fish prefer deep water, low-velocity flow, and protective cover. Adults prefer slow water areas for resting and fast water areas for feeding, with protective cover from boulders, logs, overhanging vegetation, or undercut banks (USFWS 2009d). Greenbacks also usually require clear, cold, well oxygenated water (USFWS 2009d).

The greenback cutthroat trout was listed as endangered in 1973 and reclassified as threatened on April 18, 1978 (USFWS 1978). A recovery plan was approved on March 1, 1998 (USFWS 1998). Critical habitat for this species has not been designated.

According to the CNHP, the nearest recorded occurrences of the greenback cutthroat trout are more than 100 mi (160 km) east of the ULP lease tracts. As discussed, this species is primarily restricted to headwater streams of the South Platte and Arkansas River drainages; these habitats do not occur in the ULP affected area. For these reasons, uranium mining under the ULP will have **no effect** on the greenback cutthroat trout. The species is not likely to occur in any aquatic habitats downstream from the ULP lease tracts.

3.2.1.4 Birds

3.2.1.4.1 Gunnison Sage-Grouse. The Gunnison sage-grouse (*Centrocercus minimus*) is one of two sage-grouse species in the family Phasianidae; the other is the greater sage-grouse *(C. urophasianus)*. The Gunnison sage-grouse weighs about a third less than the greater sage-grouse, but the males of both species possess conspicuous filoplumes and yellow-green air sacs on the chest during the breeding season. Sage-grouse gather on leks during the spring, where males establish territories and strut for approximately 6 weeks. Sage-grouse are polygamous, and males do not provide any parental care. The majority of females establish nests within 4 mi (6.5 km) of an active lek. Gunnison sage-grouse lay about six to seven eggs and have one of the

lowest nest success rates of all upland game bird species (ranging from 10% to 63%) (Gunnison Sage-Grouse Rangewide Steering Committee 2005).

Sage-grouse are typically found in large expanses of sagebrush-dominated habitats. Various habitats such as riparian meadows, agricultural lands, and native grasses and forbs are also used if intermixed with sagebrush (USFWS 2010b). The Gunnison sage-grouse relies heavily on sagebrush for nesting, shelter, and food throughout the year. Forbs and insects are eaten during the summer and early fall, but its diet consists entirely of sage brush during the winter (USFWS 2006a).

Gunnison sage-grouse historically occupied 21,370 mi^2 (55,350 km^2) throughout southwestern Colorado, northwestern New Mexico, northeastern Arizona, and southeastern Utah (USFWS 2006a). Currently, only seven widely scattered and isolated populations occur in Colorado and Utah, occupying 1,511 mi^2 (3,913 km^2) in the Gunnison Basin, San Miguel Basin, Monticello-Dove Creek, Pinon Mesa, Crawford, Cerro Summit-Cimarron-Sims Mesa, and Poncha Pass (USFWS 2010b). Gunnison sage-grouse now occupy about 10% of the habitat that existed before the arrival of European settlers (BLM 2010). The breeding population size was estimated to be fewer than 4,000 individuals in 2000, with the largest population (2,000 to 3,000 individuals) occurring primarily in Gunnison and Saguache Counties in Colorado. The remaining six populations have fewer than 300 breeding individuals (NatureServe 2012).

The Gunnison sage-grouse became a candidate for federal listing on September 28, 2010 (USFWS 2010b). The listing of this species was determined to be warranted but was precluded by higher-priority listing actions. The USFWS assigned a listing priority number of 2 to this species because threats have a high magnitude and are imminent. On November 21, 2012, the USFWS submitted a rule to propose this species as endangered under the ESA (USFWS 2012d).

The main threat to the Gunnison sage-grouse is the fragmentation and degradation of sagebrush habitats due to conversion to cropland, energy development, and urban development (NatureServe 2012). Potential threats that may be associated with ULP activities include direct habitat loss, fragmentation, and degradation as well as direct disturbance of nests or leks. Mining may directly alter sagebrush habitat distribution and quality, as a result of the development of mining pits, mining infrastructure, access roads, and overburden placement in sagebrush habitats. Fragmentation of these habitats could force sage-grouse to choose less optimal habitats. The construction of any substantial structure or road, as well as the use of access roads, can cause the increased deposition of dust on plants and the invasion of non-native plants, potentially affecting the abundance and quality of sagebrush. Increased noise and traffic from human presence may also lead to a disruption of normal grouse behavior and productivity (Gunnison Sage-Grouse Rangewide Steering Committee 2005). Other threats include fencing (increases mortality because birds can collide with it and it increases the number of perch sites for nest predators), fires (increases weeds and degrades suitable habitat), and domestic grazing (changes plant communities and soils) (USFWS 2010b).

According to the CNHP, the nearest recorded occurrences of the Gunnison sage-grouse are from San Miguel County, Colorado, approximately 5 mi (8 km) southeast of the Paradox lease tracts (Lease Tract 17). According to the SWReGAP habitat suitability model, potentially

suitable habitat for the Gunnison sage-grouse may occur on or in the vicinity of all ULP lease tracts; however, none of the ULP lease tracts intersect the current range of this species (Figure 3-4). According to range data provided by the CPW Natural Diversity Information Source (CPW 2011), the Paradox lease tracts (5A, 6, 7, 8, 8A, 9, and 17) occur as near as 168 ft (51 m) from the current Gunnison sage-grouse range in the Dry Creek Basin. Portions of the species' current range occur adjacent to several Paradox lease tracts (Figure 3-4). Because the species' current range does not intersect any of the lease tract areas, ULP activities are unlikely to directly affect this species. Impacts on this species from ULP activities may still occur in the form of indirect effects or impacts on potentially suitable unoccupied habitat. However, it has been determined that with the implementation of all mitigation measures and BMPs identified in Table 2-5, uranium mining under the ULP **may affect, but is not likely to adversely affect,** the Gunnison sage-grouse.

3.2.1.4.2 Mexican Spotted Owl. The Mexican spotted owl *(Strix occidentalis lucida)* is one of three subspecies of the spotted owl *(S. occidentalis)* (USFWS 2011g). They are medium-sized owls without ear tufts (USFWS 2011g). They have dark eyes and an ashy-chestnut brown body with white and brown spots on their abdomen, back, and head (USFWS 2011h). Wing and tail feathers are dark brown with lighter brown and white bars (USFWS 2011g). Owls younger than 5 months old have a downy appearance. Subadults (5 to 26 months old) look like adults but have pointed tail feathers with a white terminal band. Adult tail feathers have rounded tips, and the terminal band is mottled brown and white (USFWS 2011g). Females are generally larger than males (USFWS 2011h). Most Mexican spotted owls are nonmigratory, but some individuals migrate to lower elevations during the winter (USFWS 2011g). The diet of Mexican spotted owls consists mainly of small and medium-sized rodents, but they also consume bats, birds, reptiles, and arthropods (USFWS 2011g).

Habitat requirements of the Mexican spotted owl include forested mountains and canyonlands. Forests used by the Mexican spotted owl are generally uneven-aged, are multistoried, and have high canopy cover. Larger trees (with an average diameter of 24 in. [61 cm]) are usually chosen for nesting sites. In canyon lands, important features for the Mexican spotted owl include steep canyon walls with isolated pinnacles and rims with large vertical cliffs. The canyon habitats also often include a variety of desert scrub and riparian vegetation communities. Cliff faces contain numerous caves and ledges that create protected microsites for nesting and roosting (USFWS 2011g). Foraging occurs in a wide range of habitats, including managed and unmanaged forests, pinyon-juniper woodlands, mixed-conifer and ponderosa pine forests, cliff faces and terraces between cliffs, and riparian zones.

Mexican spotted owls rely on existing structures for nesting (e.g., nests built by other birds on cliffs, debris platforms in trees, and tree cavities). Courtship begins in March; females lay 1 to 3 eggs in late March or early April; and incubation lasts about 30 days (USFWS 2011g). The current range of the Mexican spotted owl is nearly the same as the historical range and is estimated to include 7,720 to 965,250 mi^2 (20,000 to 2,500,000 km^2) across Utah, Colorado, Arizona, New Mexico, and the western portions of Texas, and several states in Mexico (NatureServe 2012; USFWS 2011g).

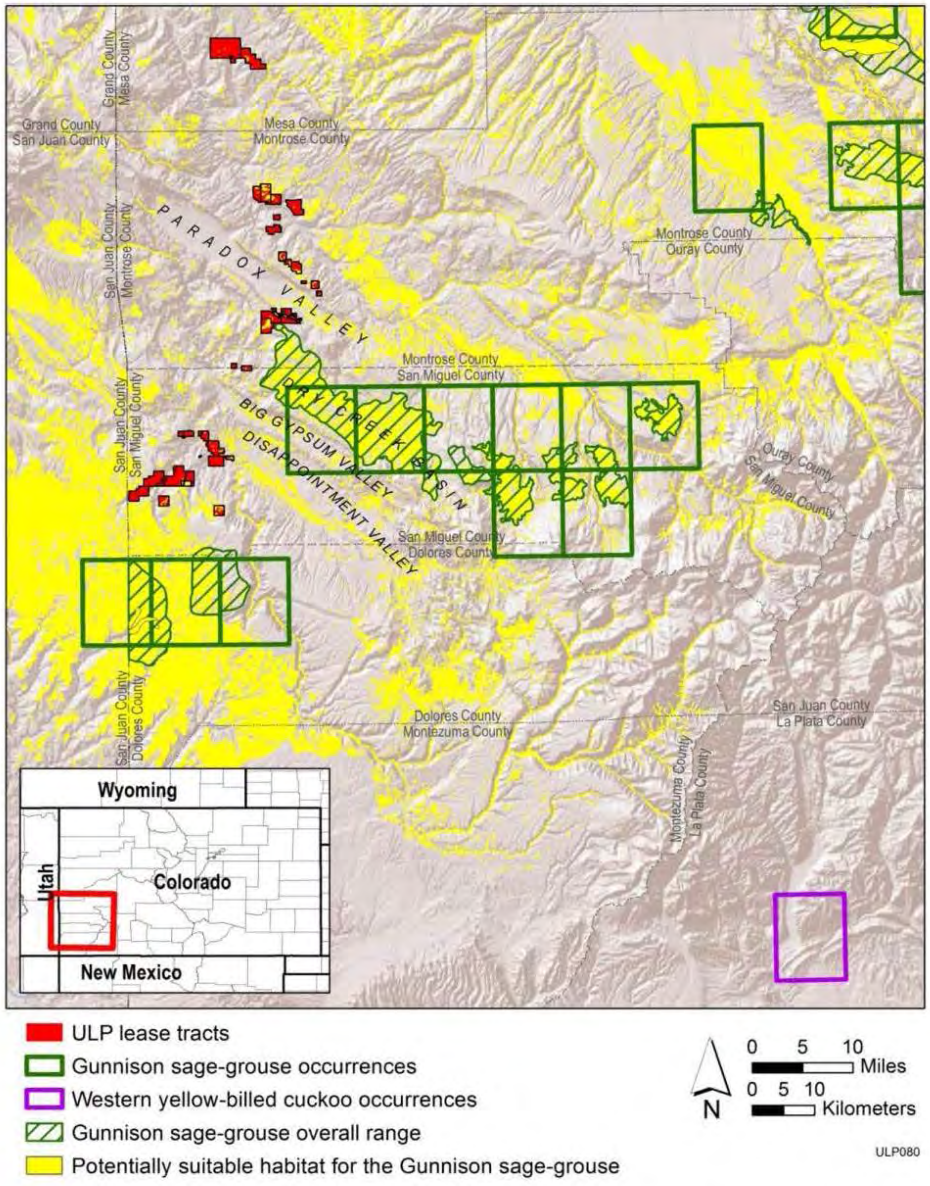


FIGURE 3-4 Recorded Quad-Level Occurrences and Distribution of Potentially Suitable Habitat for the Gunnison Sage-Grouse and Western Yellow-Billed Cuckoo in the Vicinity of the ULP Lease Tracts

The Mexican spotted owl has experienced a long-term population decline of 30–50% (NatureServe 2012). Currently, 1,301 owl sites (used repeatedly by a single or a pair of owls for nesting, roosting, or foraging) are known in the U.S. portion of the owl's range (USFWS 2011g). The current population size is estimated to be 1,000 to 2,500 individuals. A little more than half of the U.S. population occurs in the Upper Gila Mountains Recovery Unit in Arizona and New Mexico. Many populations occur in isolated mountain ranges separated by large areas of unforested land (NatureServe 2012).

The Mexican spotted owl was listed as threatened on March 16, 1993 (USFWS 1993). A draft recovery plan was made available for comment on June 28, 2011 (USFWS 2011g). Approximately 7,239 mi^2 (18,749 km^2) of critical habitat was designated in Arizona, Colorado, New Mexico, and Utah on June 6, 1995. The designated critical habitat was changed first on February 1, 2001 (USFWS 2001a), and again on August 31, 2004 (USFWS 2004). Currently, critical habitat includes approximately 13,514 mi^2 (35,000 km^2) of habitat in Arizona, Colorado, New Mexico, and Utah (USFWS 2004).

The greatest threat to the Mexican spotted owl has been loss of habitat due to even-aged timber management (NatureServe 2012). Potential threats that may be associated with ULP activities include increased mortality, loss or fragmentation of habitat, and a decreased ability to hunt. Increased vehicle traffic associated with mining operations could increase the number of owls killed as a result of collisions with vehicles. The construction of mining facilities and access roads could remove or fragment Mexican spotted owl habitat. Recent research on acoustic predators (bats and owls) shows that even low levels of traffic noise mask the rustling sounds of rodents and reduce the ability of the predators to hear them. The noise of the mine operations may have a similar effect and prevent the owls from catching prey (Leyda 2011). Other threats include forest fires, predation, starvation, disease, and parasites (USFWS 2011g).

According to the CNHP, the nearest recorded occurrences of the Mexican spotted owl are from southern San Miguel County, Colorado. This quad-level occurrence intersects ULP Lease Tract 12. According to the SWReGAP habitat suitability model, potentially suitable habitat for this species may occur on and in the vicinity of all ULP lease tracts. However, this habitat is represented by migratory habitat as no suitable canyonlands and old growth forests occur on the lease tracts. Designated critical habitat for the Mexican spotted owl does not occur in the vicinity of the ULP lease tracts. However, designated critical habitat does occur in San Juan County, Utah, as close as 28 mi (45 km) west of the ULP lease tracts (Figure 3-5).

Mining activities under the ULP have the potential to affect the Mexican spotted owl and potentially suitable habitat for the Mexican spotted owl (Table 3-1; Figure 3-5). However, it has been determined that with the implementation of all mitigation measures and BMPs identified in Table 2-5, uranium mining under the ULP **may affect, but is not likely to adversely affect,** populations of the Mexican spotted owl. Uranium mining under the ULP is determined to have **no effect** on designated critical habitat for the Mexican spotted owl.

3.2.1.4.3 Southwestern Willow Flycatcher. The southwestern willow flycatcher *(Empidonax traillii extimus)* is one of four willow flycatcher subspecies *(E. traillii)*. This

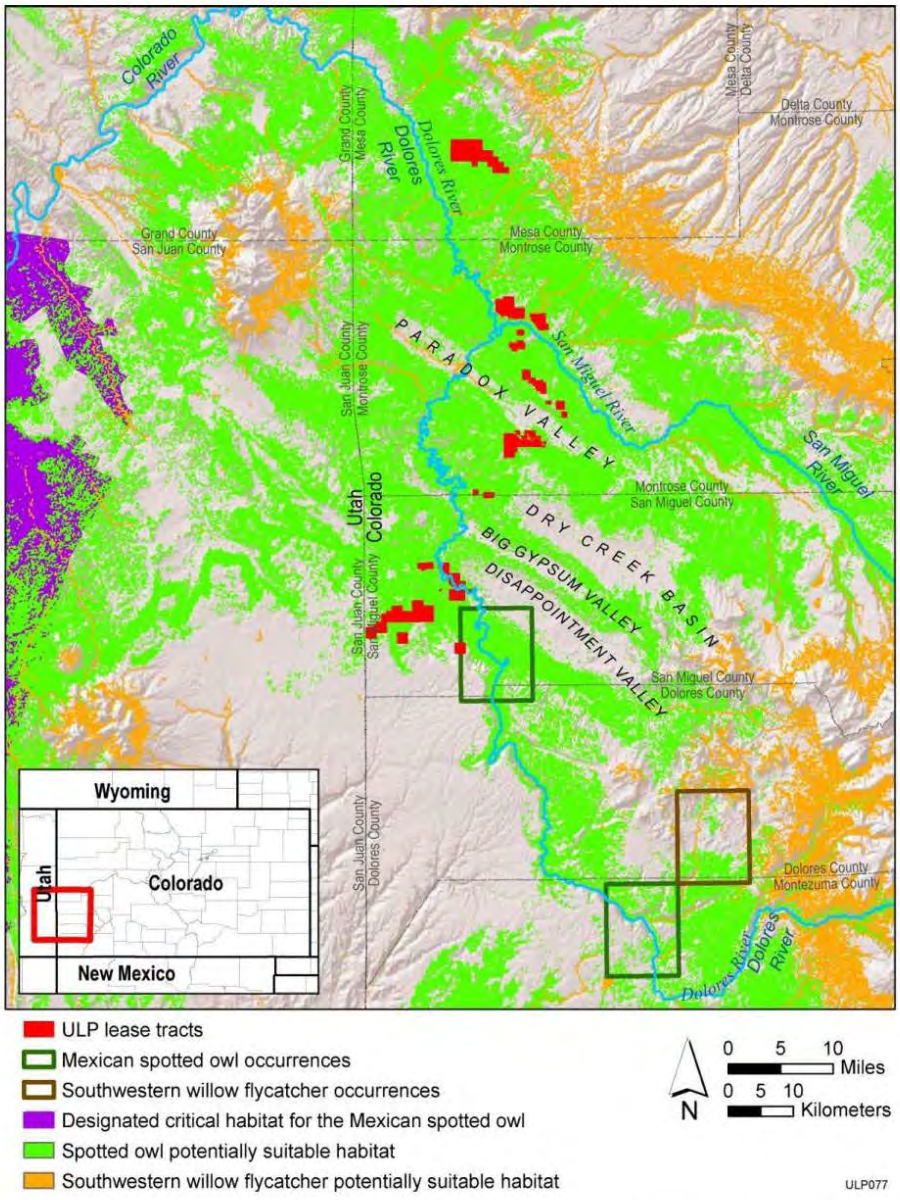


FIGURE 3-5 Recorded Quad-Level Occurrences and Distribution of Potentially Suitable Habitat for the Mexican Spotted Owl and Southwestern Willow Flycatcher, and Locations of Designated Critical Habitat for the Mexican Spotted Owl, in the Vicinity of the ULP Lease Tracts

subspecies is distinguished by subtle differences in color, morphology, and habitat use (USFWS 2002e). The southwestern willow flycatcher is less than 6 in. (15 cm) in length, weighs about 0.4 oz (12 g), and has a brownish-olive body, whitish throat, pale olive breast, pale yellow belly, and two light wing bars (USFWS 2002e, 2011i; NatureServe 2012). The bill is depressed and wide at the base (NatureServe 2012). The flycatchers mainly eat insects, including wasps, bees, moths, caterpillars, and butterflies; sometimes they eat berries as well (NatureServe 2012).

The southwestern willow flycatcher is a neotropical migrant that travels from breeding grounds in the United States to wintering grounds in Central and South America (USFWS 2005a). Essential habitat includes forested wetlands or scrub-shrub wetlands for breeding, foraging, migrating stopovers, dispersing, and shelter (USFWS 2005a). The flycatchers breed in southern California, southern Nevada, southern Utah, southern Colorado, Arizona, and New Mexico from sea level to around 8,000 ft (2,438 m) above sea level. Nesting occurs primarily in dense, swampy thickets of willow, buttonbush, tamarisk, vines, or other plants from 6.5 to 98 ft (2 to 30 m) in height (NatureServe 2012; USFWS 2005a). Nesting has been observed in patches ranging from 0.2 to 173 acres (0.2 to 70 ha) (USFWS 2005a). Nesting occurs from early June through the end of July. The clutch size is usually three or four, and both parents take care of the young (NatureServe 2012).

The current range of the southwestern willow flycatcher is similar to the historical range, but suitable habitat within that range has been greatly reduced (USFWS 2002e). The current range is estimated to be 7,700 to 965,250 mi^2 (20,000 to 2,500,000 km^2), and the population is found in relatively small, isolated, widely dispersed locales (NatureServe 2012). In 2000, 53% of the southwestern willow flycatchers were distributed across only 10 sites (USFWS 2002e). The population has experienced a long-term decline of 30–50%, and it is estimated to consist of between 1,200 and 1,300 pairs (NatureServe 2012).

The southwestern willow flycatcher was listed as an endangered species on March 29, 1995 (USFWS 2002e). A recovery plan was approved on August 30, 2002 (USFWS 2002e). Approximately 603 river mi (964 river km) were designated as critical habitat for the southwestern willow flycatcher on July 22, 1997 (USFWS 1997). On October 19, 2005, the designated critical habitat was amended to include a total of 741 mi (1,186 km) of critical habitat (USFWS 2005a). The currently designated critical habitat includes portions of Arizona, California, Nevada, New Mexico, and Utah. On August 8, 2011, the USFWS proposed to revise critical habitat for the species to include a total of 2,090 mi (3,364 km) of critical habitat in the states of Arizona, California, Colorado, Nevada, New Mexico, and Utah. The currently designated and the proposed critical habitat for the southwestern willow flycatcher does not occur in the vicinity of the ULP lease tracts.

The greatest threat to the southwestern willow flycatcher is loss or degradation of riparian habitat (USFWS 2002e). Potential threats to the southwestern willow flycatcher that may be associated with ULP activities include habitat loss or degradation associated with facility construction and operations, impacts on riparian habitats associated with project-related water withdrawals from the Upper Colorado River Basin, and increased human presence. Direct habitat loss might result from the construction of mining facilities and access roads. Water withdrawals from surface water or groundwater sources to support mining activities might affect riparian

habitats for the southwestern willow flycatcher. Human disturbances at nesting sites due to human presence or traffic noise may result in nest abandonment (USFWS 2011i). Additional threats include fire, livestock grazing, and brood parasitism by the brown-headed cowbird (USFWS 2002e).

According to the CNHP, the nearest recorded occurrences of the southwestern willow flycatcher are from southern Dolores County, Colorado, approximately 35 mi (56 km) southeast of the ULP lease tracts (Figure 3-5). Although the SWReGAP habitat suitability model predicted potentially suitable habitat for this species in the vicinity of all ULP lease tracts, particularly along the Dolores and San Miguel Rivers (Figure 3-5), suitable habitat is unlikely to occur in the vicinity of the lease tracts as the species has not been observed in the vicinity of these areas. Neither designated nor proposed critical habitat for the southwestern willow flycatcher occurs in the vicinity of the ULP lease tracts.

Mining activities under the ULP have the potential to affect the southwestern willow flycatcher and potentially suitable habitat for it (Table 3-1; Figure 3-5). However, it has been determined that with the implementation of all mitigation measures and BMPs identified in Table 2-5, uranium mining under the ULP **may affect, but is not likely to adversely affect,** populations of the southwestern willow flycatcher. Uranium mining under the ULP is determined to have **no effect** on designated or proposed critical habitat for the southwestern willow flycatcher.

3.2.1.5 Mammals

3.2.1.5.1 Black-Footed Ferret. The black-footed ferret (*Mustela nigripes*) is the only ferret species native to North America. It is brownish in color with a slightly paler belly, and its face mask, legs, and the tip of its tail are black (NatureServe 2012; USFWS 2003). It is about 24 in. (60 cm) in length and weighs up to 2.4 lb (1.1 kg) (USFWS 2003). In captivity, the black-footed ferret reproduces in March and early April, and the gestation period is around 45 days. The average litter size is 3.5, and young disperse in the fall. Some females can reproduce as yearlings. Black-footed ferrets are nocturnal and can remain inactive for up to 6 days during the winter. Their main food item is prairie dogs, but ground squirrels, rabbits, deer mice, voles, pocket gophers, birds, and insects are also sometimes consumed (NatureServe 2012; USFWS 1988).

Historically, the black-footed ferret range extended throughout Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, Wyoming, Alberta, and Saskatchewan. The current range is estimated to be between 39 and 97 mi^2 (100 and 250 km^2) (NatureServe 2012). The black-footed ferret relies on prairie dog colonies for food, shelter, and denning and has only been found in the vicinity of colonies of black-tailed prairie dogs, white-tailed prairie dogs, and Gunnison's prairie dogs (USFWS 2003). Black-footed ferret habitat is the same habitat as that used by prairie dogs and includes grasslands, steppe, and shrub steppe. Prairie dog holes serve as resting and birth sites. Between

99 and 148 acres (40 and 60 ha) of prairie dog colony are needed to support one ferret (NatureServe 2012).

By the early 1970s, the black-footed ferret was near extinction due to the intentional poisoning of and introduction of disease to prairie dogs (USFWS 2003). Remaining ferrets are used for captive breeding, and a few reintroductions have successfully established reproducing populations (NatureServe 2012). The population size is now estimated to be between 250 and 1,000 individuals. As of 2005, approximately 400 reintroduced individuals are alive in the wild (NatureServe 2012).

The black-footed ferret was listed as an endangered species on March 11, 1967 (USFWS 1988). A recovery plan was approved on August 8, 1988 (USFWS 1988). The species may be extirpated from the state of Colorado, with the exception of reintroduced populations in the northwestern portion of the state (CPW 2012; USFWS 2012c). Black-footed ferrets were released in the Wolf Creek Management Area in Moffat and Rio Blanco Counties, Colorado, between 2001 and 2006 (BLM 2008a). These populations are considered to be experimental, nonessential populations under Section 10(j) of the ESA. It is unlikely that these experimental nonessential populations will occur in the affected area of the ULP lease tracts. The area of western Colorado containing the ULP lease tracts has not been block-cleared for black-footed ferrets (USFWS 2009h). If populations do occur in the vicinity of the ULP lease tracts, however, they will be considered as an endangered population under the ESA.

Primary threats to the black-footed ferret include prairie dog poisoning and shooting, canine distemper, sylvatic plague, and predation (USFWS 1988). Potential threats to black-footed ferrets or their potential habitat that may be associated with ULP activities include increased mortality due to collisions with vehicles and loss of habitat due to the construction of mining facilities and access roads.

Although the area surrounding the ULP lease tracts has not been cleared for black-footed ferrets, the species is presumably extirpated from the region. It is unlikely for populations (endangered or experimental, nonessential) of black-footed ferrets to occur in the affected area of the ULP lease tracts. For this reason, it has been determined that uranium mining under the ULP will have **no effect** on the black-footed ferret.

3.2.1.5.2 Canada Lynx. The Canada lynx *(Lynx canadensis)* is a medium-sized cat reaching 30 to 35 in. (76 to 89 cm) in length and weighing 18 to 23 lb (8.1 to 10.4 kg). It has large feet, long legs, tufts on its ears, and a short, black-tipped tail. During the winter, the lynx's fur is dense; it is grayish-brown mixed with buff or pale brown on the back and is grayish-white on the belly, legs, and feet. During the summer, its fur is more reddish to gray-brown (USFWS 2011k). Canada lynx prey on snowshoe hares, but if hare densities are low, they prey opportunistically on other small mammals (e.g., red squirrels, flying squirrels, ground squirrels, porcupines, beavers, mice, voles, shrews), birds, and fish (USFWS 2009f, 2011k). Home ranges are generally between 12 and 83 mi^2 (31 and 216 km^2) (USFWS 2009f). Breeding occurs in March and April for yearling females; litter sizes average three to four kittens. The male does not help with rearing the young (NatureServe 2012).

Habitat requirements of the Canada lynx include boreal forests, deciduous temperate forests, and subalpine forests that experience cold winters with deep, fluffy snow for extended periods. Hunting occurs in forests with dense understories. Denning occurs in forests where woody debris, such as logs and windfalls, provides protection for kittens (USFWS 2009f). The lynx density is lower in the contiguous United States than in Canada because of a smaller and patchier habitat range and an increased rate of competition for food (USFWS 2009f). Canada lynx in the contiguous United States occur in forested portions of Colorado, Idaho, Maine, Michigan, Minnesota, Montana, New Hampshire, New York, Oregon, Utah, Vermont, Washington, and Wisconsin. A lack of historic or current data on lynx in the contiguous United States makes it difficult to determine population estimates or trends for this region; however, the population is estimated to be fewer than 2,000 individuals (USFWS 2000; NatureServe 2012). The Canada lynx's current range (including Alaska and Canada) is estimated to be greater than 965,250 mi^2 (2,500,000 km^2) (NatureServe 2012).

The Canada lynx was listed as threatened on March 24, 2000 (USFWS 2000). On December 17, 2009, it became a candidate for federal listing in New Mexico; it was given a listing priority number of 12 because Canada lynxes regularly and frequently cross the state boundary between Colorado and New Mexico, which leaves them without federal protection in New Mexico (USFWS 2009g). A recovery plan for this species was outlined on September 14, 2005 (USFWS 2005b). On November 9, 2006, approximately 1,841 mi^2 (4,768 km^2) of habitat was designated as critical habitat for the Canada lynx (USFWS 2006b). On February 25, 2009, additional critical habitat was designated, bringing the total designated critical habitat to 39,000 mi^2 (101,010 km^2) in Maine, Minnesota, Montana, Wyoming, Idaho, and Washington (USFWS 2009f).

According to the CNHP, the nearest recorded occurrences of the Canada lynx are from Montezuma County, Colorado, approximately 35 mi (56 km) southeast of the ULP lease tracts. According to the SWReGAP habitat suitability model, potentially suitable habitat for the Canada lynx does not occur in the vicinity of the ULP lease tracts (Figure 3-6). Designated critical habitat for the Canada lynx does not occur in the vicinity of the ULP lease tracts. Given the species' preference for high-elevation coniferous forests, it is unlikely that the Canada lynx will occur in the affected area of the ULP lease tracts. For this reason, uranium mining under the ULP will have **no effect** on the Canada lynx or its critical habitat.

3.2.2 Candidate Species

Three species that are candidates for listing under the ESA have the potential to occur in the ULP counties evaluated in this BA. These species include one bird species, the western yellow-billed cuckoo, and two mammals, Gunnison's prairie dog and the North American wolverine. These species are discussed below. A summary of the effect determinations for these species is provided in Table 3-3.

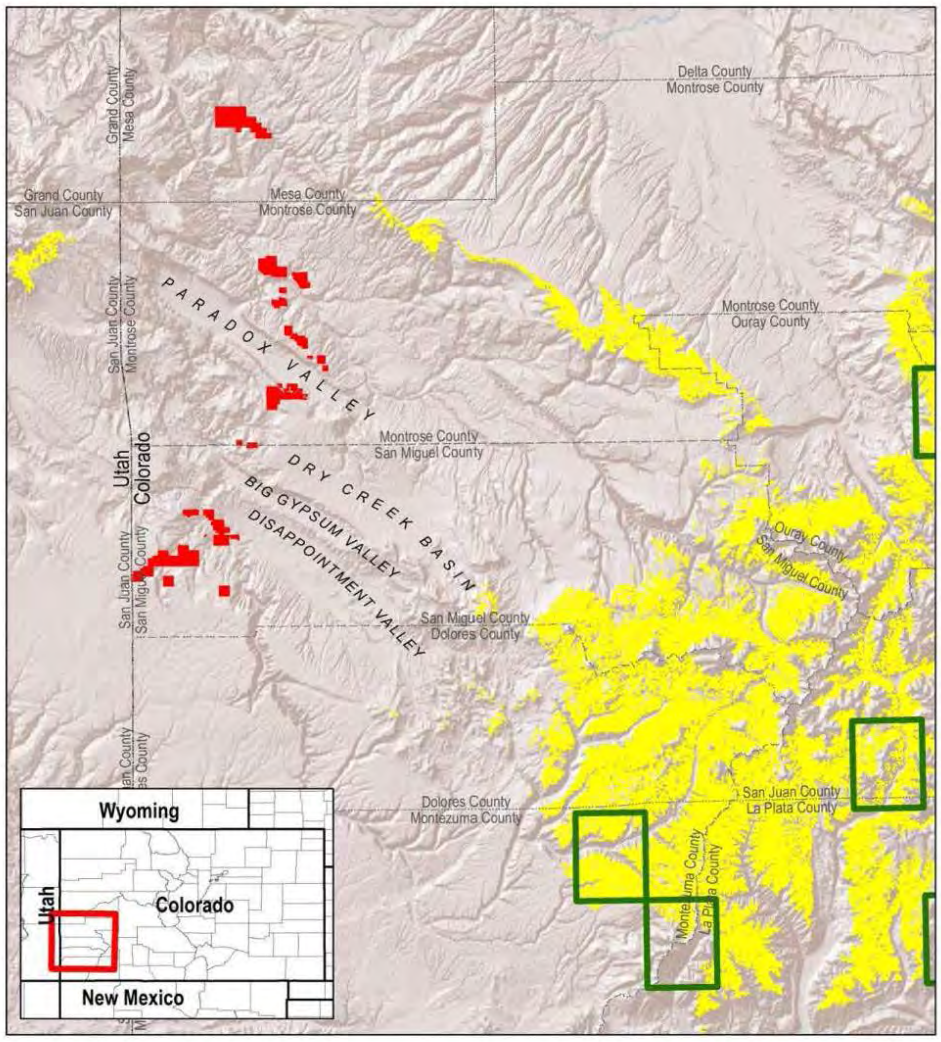


FIGURE 3-6 Recorded Quad-Level Occurrences and Distribution of Potentially Suitable Habitat for the Canada Lynx in the Vicinity of the ULP Lease Tracts

3.2.2.1 Birds

3.2.2.1.1 Western Yellow-Billed Cuckoo. The western yellow-billed cuckoo *(Coccyzus americanus occidentalis)* is one of two subspecies of yellow-billed cuckoo *(C. americanus)*. The western population of this species occurs in Washington, Oregon, California, Idaho, Nevada, Montana, Wyoming, Utah, Arizona, Colorado, New Mexico, Texas, British Columbia, and Mexico. The western yellow-billed cuckoo is around 12 in. (31 cm) in length, with a slender, long-tailed profile (USFWS 2009e). It is brownish above and white below, with rusty colored flight feathers. The upper mandible of the bill is black, and the lower mandible is yellow. The underside of the tail has pairs of large white spots (USFWS 2011j).

Breeding habitat for the western yellow-billed cuckoo consists of large tracts of deciduous riparian woodland, especially dense stands of cottonwood and willow; it can also include mesquite and salt-cedar in some areas. Nests are placed in dense covers of trees, shrubs, or vines; near water; and generally 5 to 42.5 ft (1.5 to 13 m) above the ground. Dense understory foliage appears to be an important factor in nest-site selection, while cottonwood trees are an important foraging habitat (USFWS 2009e). Nonbreeding habitats include various types of forest, woodland, and scrub (NatureServe 2012).

The western yellow-billed cuckoo arrives on breeding grounds in the United States from late May to June and begins fall migration to South America from August to late September (Wiggins 2005). While courting, males will often carry a food item to offer the females during copulation (Wiggins 2005). Clutch size varies from one to five eggs, and both parents build the nest, incubate the eggs, and feed the young. They feed primarily on slow-moving insects, including grasshoppers, caterpillars, and beetles (Wiggins 2005).

The western yellow-billed cuckoo historically bred throughout most of western North America, but it is now extirpated in western Canada, Washington, and Oregon and is rare and patchily distributed throughout most of the United States west of the Rocky Mountains. In western Colorado, the western yellow-billed cuckoo, which was never common in that area, appears to be disappearing (Wiggins 2005). It is estimated that there could be fewer than 2,000 breeding pairs across the entire range of the western yellow-billed cuckoo. It is estimated that this breeding population has declined by at least 90% since the end of the 19th century (NatureServe 2012).

The western yellow-billed cuckoo became a candidate for federal listing on October 30, 2001 (USFWS 2001b). The listing of this species was determined to be warranted but was precluded by higher-priority listing actions. The USFWS assigned a listing priority number of 3.

Primary threats include use of pesticides and loss or degradation of habitat due to agriculture, grazing, encroachment of invasive riparian plant species, and river management (USFWS 2001b). Potential threats to the western yellow-billed cuckoo that may be associated with mining activities include loss or fragmentation of breeding habitat due to construction of facilities or roads, noise disturbances, and impacts on riparian habitat from runoff, sedimentation, or water withdrawals.

According to the CNHP, the nearest recorded occurrences of the western yellow-billed cuckoo are from La Plata County, Colorado, approximately 50 mi (80 km) southeast of the southernmost ULP lease tracts (Figure 3-4). However, according to the CPW (2012), the species is known to occur in Mesa and Montrose Counties, Colorado, as a breeding resident. According to the SWReGAP habitat suitability model, potentially suitable habitat for this species does not occur in the vicinity of any ULP lease tracts. However, it is possible for the species to occur either as a transient or a breeding resident in riparian habitats along the Dolores and San Miguel Rivers in the vicinity of the ULP lease tracts, especially where cottonwood and willow stands are present. Activities associated with the ULP are not likely to directly affect the western yellow-billed cuckoo because direct impacts on this species and its habitat (riparian habitats) will be avoided. It has been determined that with the implementation of all mitigation measures and BMPs identified in Table 2-5, uranium mining under the ULP **may affect, but is not likely to adversely affect,** the western yellow-billed cuckoo.

3.2.2.2 Mammals

3.2.2.2.1 Gunnison's Prairie Dog. The Gunnison's prairie dog *(Cynomys gunnisoni)* is a large rodent that occurs from central Colorado to central Arizona, including small portions of northwest New Mexico and southeastern Utah. The species is divided into montane and prairie populations, which are separated by mountain ranges that almost completely limit prairie dog movement between populations. Genetic testing is currently being conducted to determine whether montane and prairie Gunnison's prairie dogs are populations or subspecies (USFWS 2011l). The Gunnison's prairie dog is darker overall and has less striking facial markings than the white-tailed prairie dog. It reaches a length of 11.8 to 15.4 in. (30 to 39 cm) and a weight of 0.6 to 3 lb (0.3 to 1.4 kg) (Seglund and Schnurr 2010). Females reproduce as yearlings, while only a quarter of males reproduce as yearlings (NatureServe 2012). Polygamous mating usually occurs in April and May, and one litter with an average size of six individuals is produced per year (USFWS 2011l; Seglund and Schnurr 2010). Colonies consist of 50 to 100 individuals. Only 50% of females survive their first year, and less than 15% survive to their second year. Their diet consists mainly of grasses, forbs, sedges, and shrubs, but insects are also consumed. Prairie dogs can exhibit months of inactivity during winter, and individuals in some parts of the range hibernate (NatureServe 2012).

Habitat requirements for the Gunnison's prairie dog include level to gently sloping (less than 30%) grasslands and semi-desert or montane shrublands at elevations of 6,000 to 12,000 ft (1,830 to 3,660 m) in high mountain valleys and plateaus. Burrows require well-drained soils and are usually found on slopes or in hummocks (Seglund and Schnurr 2010; USFWS 2011l). The montane portion of their habitat accounts for about 40% of the total potential habitat (USFWS 2008a).

The Gunnison's prairie dog has experienced a long-term population decline of 30% to 70% rangewide. Its current distribution is estimated to be between 100 and 8,000 mi^2 (260 and 20,700 km^2) in Arizona, Colorado, New Mexico, and Utah (USFWS 2011l). From 1916 to 2008, the habitat occupied by the Gunnison's prairie dog declined from 37,450 mi^2 (97,000 km^2) to

525–772 mi^2 (1,360–2,000 km^2). Only 3.6% of potential habitat is occupied in the montane portion of the range. The montane population of prairie dogs no longer has the metapopulation structure necessary to recover from catastrophic events because of its small size and its isolation in montane habitats (USFWS 2011l). The current total population size for prairie and montane populations is estimated to be between 100,000 and 1,000,000 (NatureServe 2012).

The Gunnison's prairie dog became a candidate for federal listing on February 5, 2008 (USFWS 2008a). The listing of this species was determined to be warranted but was precluded by higher-priority listing actions. The USFWS originally assigned a listing priority number of 2 to the species because threats have a high magnitude and are imminent (USFWS 2008a). On December 10, 2008, the listing priority was changed to 3 because listing of the Gunnison's prairie dog is warranted but precluded only in the montane region of its range within Colorado and New Mexico (USFWS 2008b).

The greatest threats to the Gunnison's prairie dog are habitat loss and fragmentation, overharvesting (e.g., recreational shooting), and the spread of sylvatic plague (USFWS 2010d). Potential threats to the Gunnison's prairie dog that may be associated with mining activities include the construction and presence of infrastructure and traffic, which could be direct sources of mortality and habitat fragmentation.

According to the CNHP, the nearest recorded occurrences of the Gunnison's prairie dog is from western Montrose County, Colorado, approximately 2 mi (3 km) west of the Paradox lease tracts (Figure 3-7). According to the SWReGAP habitat suitability model, potentially suitable habitat for the Gunnison's prairie dog may occur on or in the vicinity of all ULP lease tracts. According to range data provided by the CPW Natural Diversity Information Source (CPW 2011), the current Gunnison's prairie dog range intersects or is in the vicinity of the Uravan, Paradox, and Slick Rock ULP lease tracts (Figure 3-7). Activities associated with the ULP could directly and indirectly affect populations of the Gunnison's prairie dog through direct effects, such as mortality from vehicles and construction equipment or habitat loss and fragmentation, or through indirect effects, such as noise and visual impacts on behavior and the spread of diseases. However, the implementation of mitigation measures and BMPs identified in Table 2-5 will reduce the potential for these impacts. For these reasons, it has been determined that uranium mining under the ULP **may affect, but is not likely to adversely affect,** the Gunnison's prairie dog.

3.2.2.2.2 North American Wolverine. The North American wolverine *(Gulo gulo luscus)* is a subspecies of the wolverine *(G. gulo)*, which has a holarctic range. It is the largest terrestrial member of the weasel family; adult males weigh 26.5 to 40 lb (12 to 18 kg), and females weigh 17.5 to 26.5 lb (8 to 12 kg). Its appearance is similar to that of a small bear; it has a bushy tail; round head; short, rounded ears; small eyes; and claws used for digging and climbing (USFWS 2010c). Its body is dark brown and its head is paler, and two broad yellowish stripes run from its shoulders and join on the rump (NatureServe 2012).

The North American wolverine breeds at 2 years of age from late spring to early fall and has an average of 3.4 kits per litter. Due to high rates of spontaneous abortion, rates of successful

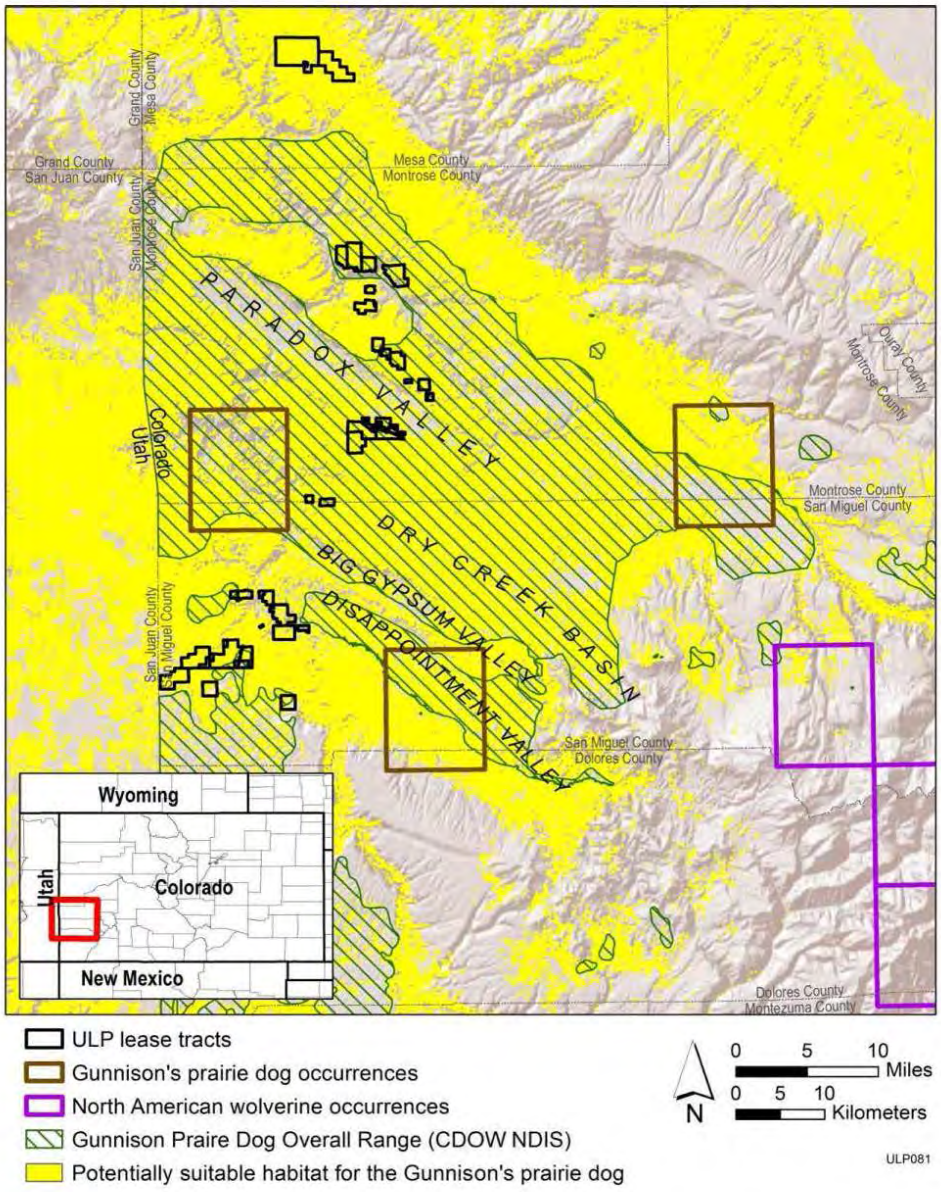


FIGURE 3-7 Recorded Quad-Level Occurrences and Distribution of Potentially Suitable Habitat for the Gunnison's Prairie Dog and North American Wolverine in the Vicinity of the ULP Lease Tracts

reproduction are among the lowest for mammals. Gestation lasts 30 to 40 days. Wolverines are opportunistic feeders that primarily consume carrion, but they will also eat small animals, birds, fruits, berries, and insects. They naturally occur at low densities, ranging from one wolverine per 25 mi^2 to one per 130 mi^2 (one per 65 km^2 to one per 337 km^2) (USFWS 2010c). The home range of a wolverine can range from 40 to 350 mi^2 (100 to 900 km^2) (USFWS 2011m).

Habitat requirements for the North American wolverine include 5 ft (1.5 m) of snow to excavate natal dens. Rocky sites, such as north-facing boulder talus and subalpine cirques in forest openings above 8,200 ft (2,500 m), are selected for dens. Wolverines occur within a wide variety of cold habitats that receive enough winter precipitation. Their range includes alpine, boreal, and arctic habitats, such as boreal forests, tundra, and high-elevation alpine regions (USFWS 2010c).

The North American wolverine occurs throughout Alaska, Canada, and high-elevation habitats of Washington, Idaho, Montana, Wyoming, California, and Colorado. The current population of North American wolverines in the contiguous United States is estimated to be between 250 and 300 individuals, with the largest population occurring in the Northern Rocky Mountains. It is believed that wolverines were entirely or nearly extirpated from the contiguous United States in the first half of the twentieth century, and that now, functioning populations have been reestablished in two regions: the North Cascades in Washington and the northern Rocky Mountains in Idaho, Montana, and Wyoming. Wolverines are also present in the southern Rocky Mountains and the Sierra Nevada Mountains, but reestablishment of populations has not occurred in these areas yet (USFWS 2010c).

The North American wolverine became a candidate for federal listing on December 14, 2010 (USFWS 2010c). The listing of this species was determined to be warranted but was precluded by higher-priority listing actions. The USFWS originally assigned a listing priority number of 6 to the species because threats have a high magnitude but are not imminent (USFWS 2011m).

The main threat to the North American wolverine is habitat loss due to climate change (USFWS 2011m). Other threats include loss of habitat due to human activities, such as winter and summer recreation, housing and industrial development, and extractive industries such as logging (USFWS 2010c). Given the species' preference for high-elevation, forested areas, it is unlikely that the North American wolverine will occur in areas of direct ULP activity.

According to the CNHP, the nearest recorded occurrences of the North American wolverine are from southern San Miguel County, Colorado, approximately 35 mi (56 km) east of the southernmost ULP lease tracts. According to the SWReGAP habitat suitability model, potentially suitable habitat for the North American wolverine does not occur in the vicinity of the ULP lease tracts (Figure 3-7). Given the species' preference for high-elevation forests, it is unlikely that it will occur in the affected area of the ULP lease tracts. For this reason, it has been determined that uranium mining under the ULP will have **no effect** on the North American wolverine.

4 CUMULATIVE EFFECTS

Consistent with 50 CFR 402.02, for purposes of this BA, "cumulative effects" are defined as "those effects of future Tribal, State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation."

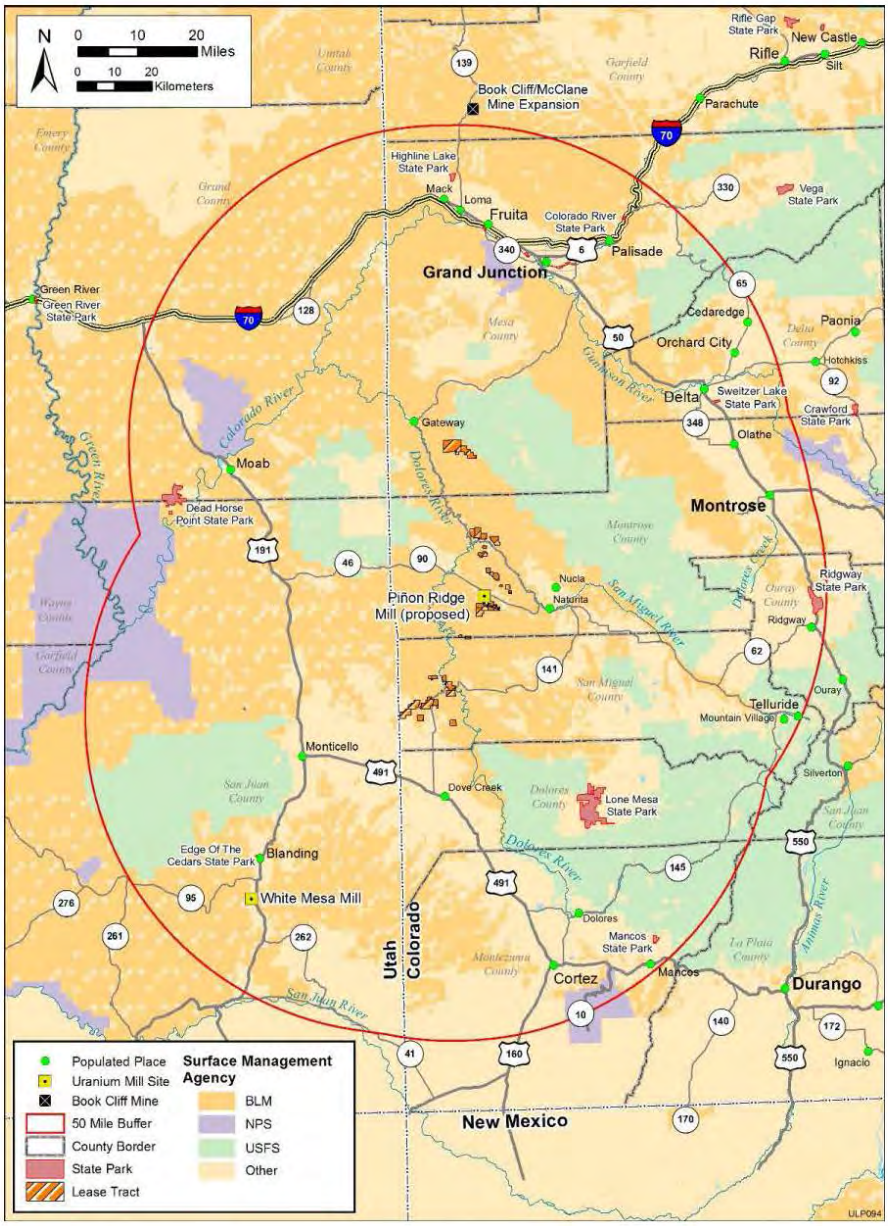
Cumulative impacts result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency (federal or nonfederal) or person that undertakes such actions. A cumulative impacts assessment accounts for both geographic (spatial) and time (temporal) considerations of past, present, and reasonably foreseeable actions. Geographic boundaries can vary by resource area, depending on the amount of time a potential impact remains in the environment, the extent to which that impact can migrate, and the magnitude of the impact. The region of influence for cumulative impacts for this analysis is defined as 50 mi (80 km) surrounding the ULP lease tracts (Figure 4-1). This area is conservatively defined to account for cumulative impacts on all ecological resources, which may extend beyond the project counties in Colorado (e.g., the Colorado River in Utah). The primary basis for including an action in the cumulative impacts analysis for this BA was whether the action will have some influence on the ecological resources in the same time and space as those affected by the implementation of the proposed action (i.e., which is to continue the ULP for the remainder of the 10-year lease period or for another reasonable period of time).

The primary uses of land within the immediate vicinity (10 mi [16 km]) of the ULP lease tract area are grazing, recreation, wildlife habitat, and uranium/vanadium exploration and development. Most of this land is managed and owned by the BLM. Most of the land that is within 50 mi (80 km) of the ULP lease tract area is owned by either the federal government or the states of Colorado or Utah. At the time of the preparation of this BA, no known large actions on BLM land are being planned.

In the analysis that follows, impacts of the proposed action are considered in combination with the impacts of past, present, and reasonably foreseeable future actions. This section begins with a description of reasonably foreseeable future actions in the area of cumulative effects (Figures 4-1 and 4-2), including those that are ongoing, under construction, or planned/proposed for future implementation.

4.1 REASONABLY FORESEEABLE FUTURE ACTIONS

Reasonably foreseeable future actions within the region of cumulative effects are discussed in the following sections. These actions are identified primarily from a review of the Schedule of Proposed Action for the San Juan National Forest and other relevant documents and data sources (Edge Environmental, Inc. 2009; USDA 2011b, 2012a). The actions listed are planned, under construction, or ongoing.



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2 **FIGURE 4-1 Region of Cumulative Impacts for the Proposed ULP**

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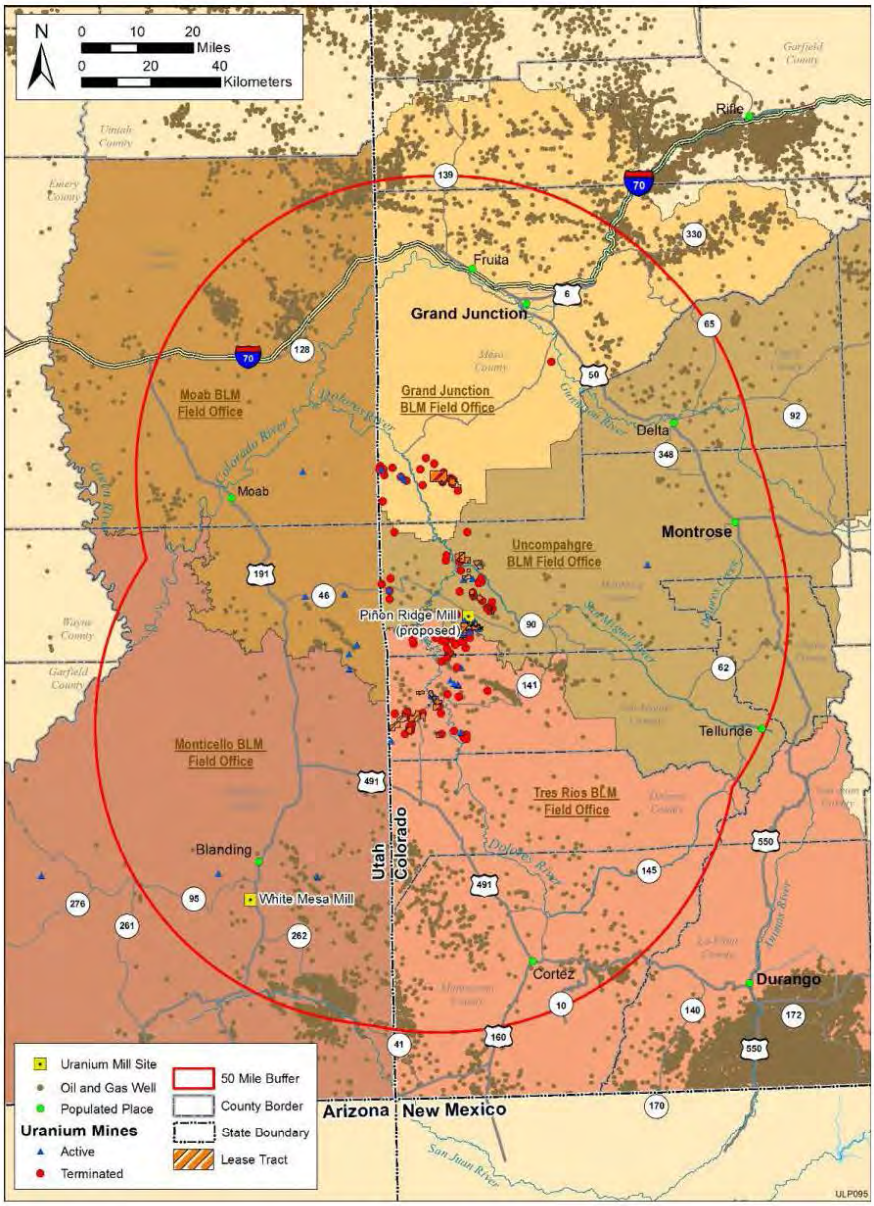

FIGURE 4-2 Uranium Mining and Oil/Gas Wells in the Region of Cumulative Impacts

4.1.1 Piñon Ridge Mill

Energy Fuels Resources Corporation has planned to construct the Piñon Ridge Mill in Paradox Valley, between Naturita and Bedrock in Montrose County, Colorado. In early 2011, the Colorado Department of Public Health and Environment (CDPHE) issued a final radioactive materials license to Energy Fuels Resources Corporation (which is the main asset of Ontario's Energy Fuels, Inc., located in Lakewood, Colorado), following CDPHE's preparation of a decision analysis and environmental impact analysis (CDPHE 2011). A group of plaintiffs then challenged that license by filing a lawsuit against CDPHE in Colorado's District Court for the City and County of Denver. On June 13, 2012, the court issued a decision in which it held that CDPHE had unlawfully issued the license without conducting the necessary administrative procedures. The court set aside CDPHE's action in issuing the license, remanded the case for further proceedings, and ordered CDPHE to convene an additional hearing which was scheduled for April 2013. On April 25, 2013, the CDPHE announced Energy Fuels Resources Corporation has met all the regulatory requirements for a radioactive materials license for the Piñon Ridge Uranium Mill in western Montrose County; Colorado State law requires the CDPHE to approve applications when such requirements are met (CDPHE 2013).

If this recently approved license application results in a license that is similar to the earlier license, Piñon Ridge Mill would process uranium and vanadium into uranium oxide concentrate (yellowcake) and vanadium oxide concentrate, respectively, by using the solvent extraction process (Energy Fuels Resources 2012a; Edge Environmental, Inc. 2009). The mill is expected to process ore from five to nine mines at any one time, and feeder mines are expected to change over the course of the mill's 40-year lifetime. A surge in uranium exploration, mining, and permitting is anticipated if the mill is constructed, including permitting and development of uranium/vanadium deposits controlled by Energy Fuels Resources (CDNR 2012; Energy Fuels Resources 2009; Edge Environmental, Inc. 2009).

Piñon Ridge Mill would be constructed on approximately 400 acres (162 ha) within an 880-acre (356-ha) property; the licensed (restricted) portion of the site would occupy approximately 300 acres (121 ha). Facilities would consist of a stockpile pad, process buildings, administration and maintenance buildings, waste management facilities (such as tailing cells and evaporation ponds), and ancillary facilities. Construction is expected to last for 21 months and employ 125 to 200 workers (at the peak of construction). During operations, the mill is projected to employ approximately 85 people around the clock. Operations are expected to last for 40 years (Edge Environmental, Inc. 2009; Energy Fuels Resources 2012a).

Host rock would be mined mostly from existing operations (owned and operated by Energy Fuels Resources) throughout Colorado. Ore would be shipped to Piñon Ridge Mill, stored at the ore stockpile pad, crushed and mixed with water to create a fine slurry, and leached with sulfuric acid, resulting in the precipitation of uranium oxide and vanadium oxide concentrates (500 tons per day). Uranium oxide concentrate would be shipped to a conversion plant, while vanadium oxide concentrate would be shipped to a plant that produces ferro-vanadium products (Edge Environmental, Inc. 2009).

In general, the proposed Piñon Ridge Mill would have a negligible to minor impact on federally-listed species. There were no federally listed (threatened, endangered, proposed, or candidate) species observed during wildlife surveys conducted during siting characterization. Four habitats of importance to area wildlife are identified on the project site, and the developer (Energy Fuels Resources) has proposed offsets to the proposed impacts. Indirect impacts could occur from degradation of habitat by the facility and increased traffic. Contents of evaporation ponds and tailing cells could be toxic to ecological resources, especially wildlife. No jurisdictional wetlands are located at the site, and no aquatic species or habitats occur at the site. Indirect impacts on vegetation could occur if the project displaced native herbivores or if invasive, non-native species became established in disturbed areas. Soil disturbance, vehicle traffic, and other project activities could promote the spread of invasive plants. Increased traffic and erection of fences would increase the potential for collisions with and mortality of terrestrial wildlife and some threatened and endangered species. Radiation dose rates to plants and animals in the vicinity of the facility would be below recommended limits, and exposures from inhalation would be minimal. Nonradiological impacts on biota would be minimized. Impacts on sagebrush-obligate species, such as the Gunnison sage-grouse, might occur; however, these impacts would be minimized through the implementation of mitigation measures and BMPs similar to those identified in Table 2-5.

4.1.2 Planned Uranium Exploration

Exploration for uranium typically involves the drilling of exploration holes ranging from 3 to 6 in. (7.6 to 15 cm) in diameter, and it is typically accompanied by the construction of mud pits (to collect drill cuttings and manage drilling fluids). Monitoring wells might also be required to monitor groundwater presence, quality, and depth. Surface disturbance is typically limited. As noted in Sections 2.2 and 3.1.1, uranium exploration activities are generally short-term (BLM 2009b) and are not expected to have significant impacts on listed species.

4.1.3 Construction of Agricultural Water Facilities (Ditch Bill Easements)

The Colorado Ditch Bill Act of 1986 (Public Law 99-545) authorizes the Secretary of Agriculture to issue permanent easements for water conveyance systems used for agricultural irrigation or livestock watering. Granting easements is not a USDA discretionary decision. An applicant meeting the criteria specified in the act is entitled to an easement, and the decision to grant it does not constitute a federal action subject to NEPA review. However, conditions of the easement (including operations and maintenance) might require NEPA review (USDA 2012b). Similarly, the Moab and Monticello Ditch Bills authorize easements in Utah.

A number of Ditch Bill easement applications occurring within the Grand Mesa, Uncompahgre, San Juan, and Manti-La Sal National Forest administrative areas are currently in the scoping process or on hold (USDA 2012a,c,d). While the granting of the easement is nondiscretionary, NEPA analysis is often performed on a group of easement applications to document any environmental concerns; determine whether there is a need to establish discretionary terms and conditions in an operations and maintenance plan; and protect

threatened, endangered, and sensitive species (USDA 2011c). The type and magnitude of impacts from Ditch Bill easements will depend on the location and nature of the projects. In many cases, a site visit and site-specific impact analysis will be necessary. Impacts representative of those that could occur as a result of the implementation of terms and conditions on a Ditch Bill easement include beneficial actions to improve resource conditions and habitat in easement areas (e.g., the stabilization of ground to prevent erosion and reduce sedimentation in downstream habitats and the control of noxious weeds) and to protect cultural resources. The establishment of an operations and maintenance plan will not result in incremental adverse impacts (USDA 2009).

4.1.4 Other Future Projects

Other proposed or planned nonfederal activities with the potential to contribute to cumulative impacts relate to utility corridors and ROW maintenance, water use and management, grazing and grazing management, and wildlife management. Some of these projects may not yet have a completed environmental assessment, so environmental impacts have not been quantified.

4.2 PAST AND PRESENT ACTIONS

Some of the activities described in this section are past actions with the potential for future reactivation; they are considered a past action by default.

4.2.1 White Mesa Mill

The White Mesa Mill, located 6 mi (10 km) south of Blanding, Utah, is the only conventional uranium mill currently operating in the United States. The mill precipitates uranium oxide concentrate (yellowcake) and vanadium oxide concentrate from host rock. It is licensed to process 2,000 tons of ore per day and produce 8 million lb (3.6 million kg) of uranium oxide per year. The mill is also licensed to process and reclaim uranium from alternative feed materials, including uranium-bearing waste materials derived from uranium conversion, metal processing facilities, and U.S. government cleanup projects. The mill began processing conventional ore in 2011 after years of processing only alternative feeds (Denison Mines 2012a). In 2011, the mill produced approximately 1.0 million lb (0.45 million kg) of uranium oxide and 1.3 million lb (0.6 million kg) of vanadium oxide (Denison Mines 2012b; EIA 2010).

The mill was originally licensed by the Nuclear Regulatory Commission to Energy Fuels Resources, Inc., on August 7, 1979 (Source Materials License SUA-1358); the license was renewed in 10-year increments in 1987 and 1997. The State of Utah assumed regulatory oversight in 2004, and the license was reissued in 2005. Denison Mines assumed ownership of the mill in 2006, and it submitted an application in 2007 for renewal of the state license (UDEQ 2012; Denison Mines 2012a). Denison Mines possesses 15 license amendments allowing the mill to process 18 different alternative feeds (Denison Mines 2012b). At full capacity, the mill employs approximately 150 people (Denison Mines 2012a). In April 2012, Energy Fuels

Resources and Denison Mines announced that all of Denison's mining assets in the United States (including the White Mesa Mill) will be acquired by Energy Fuels Resources (Energy Fuels Resources 2012a–e; *Denver Post* 2012). This acquisition was completed in June 2012.

Three other uranium mills exist in the United States; all have been on standby since the end of 2010 (EIA 2012).

The continued operation of the White Mesa Mill could affect ecological resources. It is expected that impacts from suspended particulate matter will be negligible. Construction noise and increased human activity might cause wildlife to migrate away from the project vicinity. Fencing around the tailings impoundment will exclude large animals, and the acidity/salinity of the water will make it unattractive for waterfowl. However, no impacts on endangered plant or animal species are expected (Denison Mines 2012a).

4.2.2 Uranium Mining

4.2.2.1 Daneros Mine

The Daneros project, a conventional underground mine initially proposed by Utah Energy Corporation in 2008, is located in Bullseye Canyon, San Juan County, Utah. The BLM issued final approval for the mine permit in May 2009 for 7 years of mine operations. The Daneros Mine, which is expected to produce 500,000 lb (23,000 kg) of uranium oxide per year for processing at the White Mesa Mill, is the state's first new uranium mine in 30 years. The mine was acquired by Denison Mines through its acquisition of White Canyon Uranium Ltd. in 2011. The Denison's United States uranium mining and milling assets were acquired by Energy Fuels Resources, Inc. in mid-2012.

Anticipated adverse environmental impacts associated with the mine project include radioactive dust and gas emissions, soil disturbance and vegetation clearing, water use, and the displacement of desert bighorn sheep and degradation of their habitat. None of these impacts are considered significant.. Additional traffic from mining operations is not expected to have a noticeable impact on local roads (BLM 2009b).

4.2.2.2 La Sal Mines Complex

Denison's La Sal Mines complex is a collection of four separate, existing underground uranium mines (Pandora, La Sal, Snowball, and Beaver Shaft) in the vicinity of La Sal, Utah (San Juan County). The complex has been operated since the 1970s and is part of a series of underground mines previously operated by Atlas Minerals and UMETCO Minerals Corporation. Surface facilities are located on both private and public lands administered or managed by the BLM and State of Utah (CDM 2010). As of 2012, the complex is one of two actively producing mines in the state (Edge Environmental, Inc. 2009; UDNR 2012). Ore produced at the complex is shipped to the White Mesa Mill for processing. Denison submitted a request in 2010 to amend

its plan of operations to include the expansion of Pandora Mine, further exploration activities within the complex, and the drilling of vent holes on private and public land. These activities are expected to take place in three phases between 2011 and 2030.

4.2.2.3 Whirlwind Mine

Energy Fuels Resources' Whirlwind Mine is located 5 mi (8 km) southwest of Gateway in Mesa County; it is in the Beaver Mining District and spans the Colorado/Utah border. The mine comprises two formerly closed uranium-vanadium mines: the Urantah Decline Mine and Packrat Mine. The mining claim block encompasses 4,890 acres (1,979 ha), but the mine is underground and is permitted for 24 acres (10 ha) of surface disturbance. Surface facilities include two portal areas containing ore stockpiles, waste-rock stockpiles, topsoil stockpiles, a water treatment plant, fuel and oil storage, support buildings, monitoring areas, ventilation shafts, and power drops (BLM 2008b).

The BLM completed an environmental assessment for the proposed Whirlwind Mine project in 2008. Having found no significant impact on the surrounding area, the BLM authorized restoration of the mine and the resumption of ore production. Energy Fuels Resources completed construction of the mine in 2009 but announced late that year that the mine will be put into maintenance status (BLM 2008b; Energy Fuels Resources 2012c; CDNR 2011).

The Whirlwind Mine is one of several mines expected to provide ore to the proposed Piñon Ridge Mill (Edge Environmental, Inc. 2009; CDPHE 2011). Ore could also be transported to the White Mesa Mill for processing. If the mine is reopened and operates at full capacity, it will employ 24 workers covering three 8-hour shifts, 5 days per week. Initial ore production using the room and pillar mining technique is expected to reach 100 tons per day, increasing to 200 tons per day as the market demand increases. The life expectancy of the mine is 10 years (BLM 2008b; Energy Fuels Resources 2012c).

4.2.2.4 Other Uranium Mining and Uranium Exploration

The Uravan Mineral Belt in western Colorado includes an estimated 1,200 historic mines, with production dating back to the 1890s. Total uranium ore production in Colorado was estimated to be over 255,000 lb (116,000 kg) in 2005, all originating from four Cotter Corporation mines in the Uravan Mineral Belt near Nucla and Naturita. The Cotter JD-7 open-pit mine is adjacent to the Piñon Ridge Mill site. All four mines ceased production in November 2005, partly due to high energy costs and the high cost of transporting ore to Cañon City for milling. As of December 2011, Cotter was not seeking to renew its radioactive materials license for the Cañon City Mill and had initiated closure of the facility (CDNR 2012).

Denison's Sunday Mine Complex began producing uranium in San Miguel County in 2007; ore from these mines was shipped to the White Mesa Mill near Blanding. Production at these mines ceased in 2009 due to declining uranium prices, but the BLM Tres Rios Field Office is currently preparing an environmental assessment for reopening the complex. Limited uranium

production began at Bluerock Energy's J-Bird Mine in Montrose County in 2008, but production ceased when the mine was transferred to Rimrock Exploration and Development. The mine remains in maintenance status, and no production is anticipated in the immediate future (CDNR 2011). Bluerock sought approval of a plan of operations for Cone Mountain Mine (south of Gateway), but the company ceased development activity later in the same year (Argus 2008a,b). The Prince Albert, Last Chance, and Return Mines may have had limited production for testing within the last four years. Denison's United States uranium mining and milling assets were acquired by Energy Fuels Resources, Inc. in mid-2012.

There are 33 actively permitted uranium mine projects in Colorado, and one new permit is under review. No uranium production was reported from 2009 to 2011, and none of the actively permitted mine projects is producing at this time. Of the 33, 24 are in maintenance status, 7 are being (or have been) reclaimed, and 2 are conducting development activities. In September 2011, all uranium operators were notified by the Colorado Division of Reclamation, Mining and Safety of the requirement to submit an environmental protection plan, file for an exemption, or commence final site reclamation by October 2012 (CDNR 2012).

There are 12 permitted uranium mines in Utah; only 2 (Daneros and La Sal) are actively producing (UDNR 2012). Several former underground uranium mines are located in the Red Canyon watershed (near the operating Daneros Mine) and other areas of the state that are outside the region of cumulative impacts. Small, remote mining operations that have not been reclaimed are not considered to be a significant human health hazard; the impacts on wildlife will be minor, and low precipitation levels make it unlikely that hazardous concentrations of radioactive minerals and other compounds will significantly affect local watershed characteristics (BLM 2011a).

Although environmental impacts will vary for each uranium mining project, potential environmental impacts from a uranium mine are described in Section 3.1.

Uranium exploration (i.e., drilling) activities are generally short-term and not expected to have direct or significant cumulative environmental or public health effects, provided there are no extraordinary circumstances (e.g., the presence of federally listed threatened or endangered species in the vicinity of the project area; the presence of floodplains or wetlands that will be affected within the project area; the presence of Wilderness Areas, Wilderness Study Areas, or National Recreation Areas near the project area; the presence of Native American religious or cultural sites, archaeological sites, or historic properties within the project area) (USDA 2011a). Uranium exploration activities typically involve few workers, low traffic volumes, and no emissions (Edge Environmental, Inc. 2009).

4.2.2.5 Coal Mining

The 20-acre (8-ha) New Horizon Mine near Nucla is a surface coal mine owned and managed by Western Fuels Association, a not-for-profit, national fuel supply cooperative. The mine is the exclusive coal supplier to the Nucla Station power plant (5 mi [8 km] southeast), producing approximately 350,000 to 400,000 tons of coal per year (Tri-State 2012a). The coal

mined from the Dakota sandstone is higher in ash and sulfur content than are the types of coal mined in other parts of Colorado. The mine employed 23 miners in 2007 (CDNR 2008).

As of 2010, there were no actively producing Utah coal mines within the region of cumulative effects (UDNR 2011).

Other permitted activities in the region of cumulative effects include the mining of sand/gravel, borrow material, sandstone, gold, and quartz/granite (over 4,650 acres or 1,880 ha), as well as the mining and exploration of copper and the mining of limestone quarries (BLM 2011a). The Lisbon Valley Copper Mine resumed operations after receiving BLM approval on its revised plan of operations in 2011.

4.3 CUMULATIVE IMPACTS FROM THE PROPOSED ACTION

Potential impacts from the proposed ULP are considered in combination with impacts from past, present, and reasonably foreseeable future nonfederal actions. As mentioned previously, the region of influence for the cumulative impacts analysis is conservatively assumed to be within a 50-mi (80-km) radius.

The impacts on federally listed species discussed in Section 3 indicate the proposed ULP activities are expected to have **no effect** on 8 species (clay-loving wild buckwheat, Colorado hookless cactus, Debeque phacelia, Uncompahgre fritillary butterfly, greenback cutthroat trout, black-footed ferret, Canada lynx, and North American wolverine) and on the designated critical habitat for 5 species (clay-loving wild buckwheat, Debeque phacelia, Mexican spotted owl, southwestern willow flycatcher, and Canada lynx). In addition, the proposed ULP activities **may affect, but are not likely to adversely affect,** 5 species (Mexican spotted owl, southwestern willow flycatcher, Gunnison sage-grouse, western yellow-billed cuckoo, and Gunnison's prairie dog). It has been determined that ULP activites **may affect, and are likely to adversely affect** the 4 Colorado River endangered fish species (bonytail, Colorado pikeminnow, humpback chub, and razorback sucker) and their critical habitat. For all species, impacts would be reduced by the implementation of BMPs or mitigation measures identified in Table 2-5 and determined in project-specific mine plans.

The available information on the potential impacts from these various projects is summarized in Sections 4.1 and 4.2; however, information for most of the projects was either not available or was qualitative in nature.

The ecological evaluations accounted for measures, including compliance measures and mitigation measures described in Section 2.3, to prevent or minimize any adverse impacts and meet applicable federal, state, and local requirements.

With the implementation of mitigation measures and BMPs identified in Table 2-5, as well as the implementation of any necessary conservation measures determined through consultation with the USFWS, the potential cumulative impacts from uranium-mining-related projects are not likely to jeopardize any federally listed species (including species that are

candidates or proposed for listing) or significantly reduce the viability of these populations in the region of cumulative impacts. Cumulative effects of the ULP would not interfere with ongoing USFWS recovery efforts for listed species.

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