

# APPENDIX 14—COMMITTED CONSERVATION MEASURES AND BEST MANAGEMENT PRACTICES FOR FEDERALLY LISTED SPECIES

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## CONSERVATION MEASURES

Utah BLM is committed to the conservation of federally listed species. Pursuant to the Endangered Species Act (ESA), this means that BLM will endeavor to use necessary methods and procedures to improve the status of federally listed species and their habitats to a point where the provisions of the ESA are no longer necessary. This includes ensuring that BLM actions requiring permits or approvals are consistent with the objectives of approved recovery plans for listed species.

Conservation measures are part of the programmatic Section 7 consultation with USFWS. BLM, in coordination with USFWS, developed the following list of species-specific conservation measures for activities that will be implemented under this RMP. All implementation proposals potentially impacting listed species will consider these conservation measures. Incorporating these measures will help the BLM meet the standard of “may affect, but not likely to adversely affect” for species listed under the ESA. Where BLM determines that deviation, modification, or waiver of these conservation measures is prudent and necessary, early coordination and Section 7 consultation with USFWS will be necessary. BLM will reinitiate Section 7 consultation at the project level, as necessary, to ensure proper management of listed species.

Conservation measures were developed for the following listed species inhabiting (or potentially inhabiting) lands managed by the Richfield Field Office (RFO):

- Ute ladies’-tresses (*Spiranthes diluvialis*)
- Wright fishhook cactus (*Sclerocactus wrightiae*)
- San Rafael and Winkler cacti (*Pediocactus spp.*)
- Maguire daisy (*Erigeron maguirei*)
- Last chance townsendia (*Townsendia aprica*)
- Barneby reed-mustard (*Schoenocrambe barnebyi*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Colorado River endangered fish
  - Colorado pikeminnow (*Ptychocheilus lucius*)
  - Humpback chub (*Gila cypha*)
  - Bonytail chub (*Gila elegans*)
  - Razorback sucker (*Xyrauchen texanus*)
- Mexican spotted owl (*Strix occidentalis lucida*)
- Utah prairie dog (*Cynomys parvidens*)
- Southwestern willow flycatcher (*Empidonax trailii extimus*).

## Ute ladies’-tresses (*Spiranthes diluvialis*)

### Conservation Measures

To minimize effects to the federally threatened Ute ladies’-tresses, the BLM, in coordination with USFWS, developed the following avoidance and minimization measures. Integration of and adherence to these measures will help ensure the activities carried out during oil and gas development (including but

not limited to drilling, production, and maintenance) are in compliance with the ESA. Ute ladies'-tresses habitat is provided some protection under Executive Orders 11990 (wetland protection) and 11988 (floodplain management), as well as Section 404 of the Clean Water Act. Although plants, habitat, or populations may be afforded some protection under these regulatory mechanisms, the following conservation measures should be included in the Plan of Development:

1. Pre-project habitat assessments will be completed across 100 percent of the project disturbance area, including areas where hydrology might be affected by project activities, within potential habitat<sup>1</sup> prior to any ground disturbing activities to determine if suitable Ute ladies'-tresses habitat is present.
2. Within suitable habitat<sup>2</sup>, site inventories will be conducted to determine occupancy. Inventories:
  - a. Must be conducted by qualified individual(s) and according to BLM and Service accepted survey protocols,
  - b. Will be conducted in suitable and occupied<sup>3</sup> habitat for all areas proposed for surface disturbance or areas that could experience direct or indirect changes in hydrology from project activities,
  - c. Will be conducted prior to initiation of project activities and within the same growing season, at a time when the plant can be detected, and during appropriate flowering periods (usually August 1<sup>st</sup> and August 31<sup>st</sup> in the Uintah Basin; however, surveyors should verify that the plant is flowering by contacting a BLM or FWS botanist or demonstrating that the nearest known population is in flower),
  - d. Will occur within 300' from the centerline of the proposed right-of-way for surface pipelines or roads; and within 300' from the perimeter of disturbance for the proposed well pad including the well pad,
  - e. Will include, but not be limited to, plant species lists, habitat characteristics, source of hydrology, and estimated hydroperiod, and
  - f. Will be valid until August 1<sup>st</sup> the following year.
3. Design project infrastructure to minimize direct or indirect impacts to suitable habitat both within and downstream of the project area:
  - a. Alteration and disturbance of hydrology will not be permitted,
  - b. Reduce well pad size to the minimum needed, without compromising safety,
  - c. Limit new access routes created by the project,

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<sup>1</sup> Potential habitat is defined as areas that satisfy the broad criteria of the species habitat description; usually determined by preliminary, in-house assessment.

<sup>2</sup> Suitable habitat is defined as areas that contain or exhibit the specific components or constituents necessary for plant persistence, determined by field inspection and/or surveys, and may or may not contain Ute ladies'-tresses. Habitat descriptions can be found in Recovery Plans and Federal Register Notices for the species at <<http://www.fws.gov/endangered/wildlife.html>>.

<sup>3</sup> Occupied habitat is defined as areas currently or historically known to support Ute ladies'-tresses; synonymous with "known habitat."

- d. Roads and utilities should share common right-of-ways where possible,
  - e. Reduce width of right-of-ways and minimize the depth of excavation needed for the road bed,
  - f. Construction and right-of-way management measures should avoid soil compaction that would impact Ute ladies' tresses habitat,
  - g. Off-site impacts or indirect impacts should be avoided or minimized (i.e. install berms or catchment ditches to prevent spilled materials from reaching occupied or suitable habitat through either surface or groundwater),
  - h. Place signing to limit off-road travel in sensitive areas,
  - i. Stay on designated routes and other cleared/approved areas, and
  - j. All disturbed areas will be re-vegetated with species approved by FWS and BLM botanists.
4. Within occupied habitat, project infrastructure will be designed to avoid direct disturbance and minimize indirect impacts to populations and to individual plants:
- a. Follow the above (#3) recommendations for project design within suitable habitats,
  - b. Buffers of 300 feet minimum between right of way (roads and surface pipelines) or surface disturbance (well pads) and plants and populations will be incorporated,
  - c. Surface pipelines will be laid such that a 300-foot buffer exists between the edge of the right of way and the plants, using stabilizing and anchoring techniques when the pipeline crosses habitat to ensure the pipelines don't move towards the population,
  - d. Before and during construction, areas for avoidance should be visually identifiable in the field, e.g., flagging, temporary fencing, rebar, etc.,
  - e. Where technically and economically feasible, use directional drilling or multiple wells from the same pad.
  - f. Designs will avoid altering site hydrology and concentrating water flows or sediments into occupied habitat.
  - g. Place produced oil, water, or condensate tanks in centralized locations away from occupied habitat, with berms and catchment ditches to avoid or minimize the potential for materials to reach occupied or suitable habitat.
  - h. Minimize the disturbed area of producing well locations through interim and final reclamation. Reclaim well pads following drilling to the smallest area possible.
5. Occupied Ute ladies'-tresses habitats within 300 feet of the edge of the surface pipelines' ROWs, 300 feet of the edge of the roads' ROWs, and 300 feet from the edge of the well pad shall be monitored for a period of 3 years after ground disturbing activities. Monitoring will include annual plant surveys to determine plant and habitat impacts relative to project facilities. Habitat impacts include monitoring any changes in hydrology due to project related activities. Annual

reports shall be provided to the BLM and USFWS. To ensure desired results are being achieved, minimization measures will be evaluated and may be changed after a thorough review of the monitoring results and annual reports during annual meetings between the BLM and USFWS.

6. Reinitiation of section 7 consultation with USFWS will be sought immediately if any loss of plants or occupied habitat for the Ute ladies'-tresses is anticipated as a result of project activities.

Additional site-specific measures may also be employed to avoid or minimize effects to the species. These additional measures will be developed and implemented in consultation with USFWS to ensure continued compliance with the ESA.

## **Wright fishhook cactus (*Sclerocactus wrightiae*)**

### **Conservation Measures**

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Wright fishhook cactus (*Sclerocactus wrightiae*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the USFWS.

1. Prior to surface disturbing activities in habitat for the species, presence/absence surveys of potentially affected areas will be conducted in accordance with established protocols.
2. Appropriate avoidance/protection/mitigation will be used to manage potential impacts of similar subsequent projects. These measures should include, but are not be limited to:
  - the stabilization of soils to minimize or avoid impacts related to soil erosion;
  - marking/flagging of suitable and/or occupied habitat (including predetermined buffers) prior to development to avoid trampling by crew members or equipment during disturbance related activities; and
  - require project proponents to conduct surveys and monitoring actions using BLM-approved specialists to document population effects and individual impacts.
3. BLM shall continue to document new populations of Wright fishhook cactus as they are encountered.
4. To assist and support recovery efforts, BLM will minimize or avoid surface disturbances in habitats that support the species.
5. BLM will encourage and assist project proponents in development and design of their proposed actions in order to avoid direct disturbance to populations or individuals where feasible. Designs should consider water flow, slope, appropriate buffer distances, possible fencing needs, and pre-activity flagging of sensitive areas that are planned for avoidance.
6. BLM will consider emergency OHV closure or additional restrictions to protect, conserve, and recover the species.

7. In areas where dispersed recreational uses are identified as threats to populations of the species, BLM will consider the development of new recreational facilities/opportunities that concentrate dispersed recreational use away from habitat, especially occupied habitat.
8. Cultural and paleontological survey/recovery technicians (i.e., archeologists and/or paleontologists), conducting work in the vicinity of known populations, will be educated in the identification of listed species in order to avoid inadvertent trampling or removal during survey, mapping, or excavation of cultural or paleontological resources.
9. Areas of viable habitat, in the vicinity of populations considered for prescribed burning, will be surveyed according to established protocols for new or undocumented populations of the species.
10. Lands being considered for exchange or disposal that contain suitable habitat for the species will be surveyed for undocumented populations, according to established protocols, prior to approval of such disposal. Lands supporting populations shall not be disposed of unless it is determined that the action will not threaten the survival and recovery of the species in accordance with the ESA and BLM Guidance and Policy Manual 6840 – *Special Status Species Management*.
11. BLM will encourage the avoidance of key habitats during livestock herding and trailing activities on BLM administered lands. (Key habitats are those that are deemed necessary for the conservation of the species including, but not necessarily limited to, designated critical habitat and other occupied or unoccupied habitats considered important for the species survival and recovery as determined in coordination with the USFWS).
12. As funding permits, BLM will consider research opportunities to determine whether the mortality to recruitment ratio of 2.5 to 1, observed by Kass (2001) persists within studied populations. These observed ratios have resulted in the decline and ultimate loss of some populations. Therefore, future research might study how widespread the decline may be. To accomplish this, several populations should be selected that represent a range of habitats, locations, proximity to potential threats and relative population sizes. Populations should be monitored for changes in number and overall condition to determine whether these observed mortality rates are characteristic of the species throughout its range.
13. As funding permits, monitoring will be continued on the Hebe Devil Dizzy Gypsum Mine area to assess long-term survival and viability of transplanting populations of Wright fishhook cactus.

## **San Rafael and Winkler Cacti (*Pediocactus spp.*)**

### **Conservation Measures**

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the San Rafael (*Pediocactus despainii*) and Winkler cactus (*Pediocactus winkleri*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the USFWS.

1. Prior to surface disturbing activities in habitat for the species, presence/absence surveys of potentially affected areas will be conducted in accordance with established protocols.

2. Appropriate avoidance/protection/mitigation will be used to manage potential impacts of similar subsequent projects. These measures should include, but are not be limited to:
  - the stabilization of soils to minimize or avoid impacts related to soil erosion;
  - marking/flagging of suitable and/or occupied habitat (including predetermined buffers) prior to development to avoid trampling by crew members or equipment during disturbance related activities; and
  - require project proponents to conduct surveys and monitoring actions using BLM approved specialists to document population effects and individual impacts.
3. BLM shall continue to document new populations of San Rafael and Winkler cacti as they are encountered.
4. To assist and support recovery efforts, BLM will minimize or avoid surface disturbances in habitats that support the species.
5. BLM will encourage and assist project proponents in development and design of their proposed actions in order to avoid direct disturbance to populations or individuals where feasible. Designs should consider water flow, slope, appropriate buffer distances, possible fencing needs, and pre-activity flagging of sensitive areas that are planned for avoidance.
6. BLM will consider emergency OHV closure or additional restrictions to protect, conserve, and recover the species.
7. In areas where dispersed recreational uses are identified as threats to populations of the species, BLM will consider the development of new recreational facilities/opportunities that concentrate dispersed recreational use away from habitat, especially occupied habitat.
8. Cultural and paleontological survey/recovery technicians (i.e., archeologists and/or paleontologists), conducting work in the vicinity of known populations, will be educated in the identification of listed species in order to avoid inadvertent trampling or removal during survey, mapping, or excavation of cultural or paleontological resources.
9. Areas of viable habitat, in the vicinity of populations considered for prescribed burning, will be surveyed according to established protocols for new or undocumented populations of the species.
10. Lands being considered for exchange or disposal that contain suitable habitat for the species will be surveyed for undocumented populations, according to established protocols, prior to approval of such disposal. Lands supporting populations shall not be disposed of unless it is determined that the action will not threaten the survival and recovery of the species in accordance with the ESA and BLM Guidance and Policy Manual 6840 – *Special Status Species Management*.
11. BLM will encourage the avoidance of key habitats during livestock herding and trailing activities on BLM administered lands. (Key habitats are those that are deemed necessary for the conservation of the species including, but not necessarily limited to, designated critical habitat and other occupied or unoccupied habitats considered important for the species survival and recovery as determined in coordination with the USFWS).
12. As additional funding becomes available, BLM should develop a travel management plan specifically for areas of occupied and potential habitat for San Rafael and Winkler cactus.

13. As additional funding becomes available, BLM will conduct or encourage monitoring studies in areas to which topsoil has been placed with the intention of transferring the seed bank from San Rafael and Winkler cactus populations, to mitigate population losses from development activities. The purpose of these studies would be to evaluate mitigation measures for effectiveness in reestablishing populations of the species.

## **Maguire Daisy (*Erigeron maguirei*)**

### **Conservation Measures**

The following conservation measures provide guidance for avoiding, minimizing, or reducing potential adverse impacts to the Maguire daisy from implementing actions authorized in this RMP. This list is not all-inclusive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of Section 7 consultation with USFWS:

1. Prior to approving surface disturbing activities in species habitat, survey for the presence of the species in potentially affected areas in accordance with established protocols.
2. Use appropriate avoidance, protection, and mitigation measures to manage potential impacts of similar, subsequent projects. Measures include, but are not be limited to:
  - a. Stabilizing soils to minimize or avoid impacts related to soil erosion
  - b. Marking/flagging of suitable and/or occupied habitat (including predetermined buffers) prior to development to avoid trampling by crew members or equipment during disturbance-related activities
  - c. Requiring project proponents to conduct surveys and monitoring actions using BLM-approved specialists to document impacts to populations and individuals.
3. Continue documenting new populations of Maguire daisy as they are encountered.
4. To assist and support recovery efforts, minimize or avoid surface disturbances in habitats that support the species.
5. Encourage and assist project proponents in developing and designing their proposed actions to avoid directly disturbing populations or individuals. Designs should consider water flow, slope, appropriate buffer distances, possible fencing needs, and pre-activity flagging of sensitive areas that are planned for avoidance.
6. Consider emergency OHV area closures or other OHV restrictions needed to protect, conserve, and recover the species.
7. In areas where recreational uses are identified as threats to populations of the species, consider developing new recreational facilities and/or opportunities that would direct dispersed recreational uses away from habitat, especially occupied habitat.
8. Cultural and paleontological survey/recovery technicians (e.g., archaeologists and paleontologists) working in the vicinity of known populations would be educated in the

identification of listed species in order to avoid inadvertent trampling or removal during survey, mapping, or excavation of cultural or paleontological resources.

9. Survey areas of viable habitat in the vicinity of populations within areas being considered for prescribed burning for new or undocumented populations of the species.
10. Lands being considered for land tenure adjustments that contain suitable habitat for the species would be surveyed, according to established protocols prior to approval of the land tenure adjustment action. Lands supporting populations would not be disposed of unless it is determined that the action would not threaten the survival and recovery of the species in accordance with the ESA and BLM Guidance and Policy Manual 6840, Special Status Species Management.
11. Encourage the avoidance of key habitats during livestock herding and trailing activities on public lands. Key habitats are those that are deemed necessary for the conservation of the species, including, but not limited to, designated critical habitat and other occupied or unoccupied habitats considered important for the species survival and recovery as determined in coordination with USFWS.

## **Last Chance *Townsendia* (*Townsendia aprica*)**

### **Conservation Measures**

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Last chance townsendia (*Townsendia aprica*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the USFWS.

1. Prior to surface disturbing activities in habitat for the species, presence/absence surveys of potentially affected areas will be conducted in accordance with established protocols.
2. Appropriate avoidance/protection/mitigation will be used to manage potential impacts of similar subsequent projects. These measures should include, but are not be limited to:
  - the stabilization of soils to minimize or avoid impacts related to soil erosion;
  - marking/flagging of suitable and/or occupied habitat (including predetermined buffers) prior to development to avoid trampling by crew members or equipment during disturbance related activities; and
  - require project proponents to conduct surveys and monitoring actions using BLM approved specialists to document population effects and individual impacts.
3. BLM shall continue to document new populations of Last chance townsendia (*Townsendia aprica*) as they are encountered.
4. To assist and support recovery efforts, BLM will minimize or avoid surface disturbances in habitats that support the species.
5. BLM will encourage and assist project proponents in development and design of their proposed actions in order to avoid direct disturbance to populations or individuals where feasible. Designs

should consider water flow, slope, appropriate buffer distances, possible fencing needs, and pre-activity flagging of sensitive areas that are planned for avoidance.

6. BLM will consider emergency OHV closure or additional restrictions to protect, conserve, and recover the species.
7. In areas where dispersed recreational uses are identified as threats to populations of the species, BLM will consider the development of new recreational facilities/opportunities that concentrate dispersed recreational use away from habitat, especially occupied habitat.
8. Cultural and paleontological survey/recovery technicians (i.e., archeologists and/or paleontologists), conducting work in the vicinity of known populations, will be educated in the identification of listed species in order to avoid inadvertent trampling or removal during survey, mapping, or excavation of cultural or paleontological resources.
9. Areas of viable habitat, in the vicinity of populations considered for prescribed burning, will be surveyed according to established protocols for new or undocumented populations of the species.
10. Lands being considered for exchange or disposal that contain suitable habitat for the species will be surveyed for undocumented populations, according to established protocols, prior to approval of such disposal. Lands supporting populations shall not be disposed of unless it is determined that the action will not threaten the survival and recovery of the species in accordance with the ESA and BLM Guidance and Policy Manual 6840 – *Special Status Species Management*.
11. BLM will encourage the avoidance of key habitats during livestock herding and trailing activities on BLM administered lands. (Key habitats are those that are deemed necessary for the conservation of the species including, but not necessarily limited to, designated critical habitat and other occupied or unoccupied habitats considered important for the species survival and recovery as determined in coordination with the USFWS).

## **Barneby Reed-Mustard (*Schoenocrambe barnebyi*)**

### **Conservation Measures**

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Barneby reed-mustard (*Schoenocrambe barnebyi*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the USFWS.

1. Prior to surface disturbing activities in habitat for the species, presence/absence surveys of potentially affected areas will be conducted in accordance with established protocols.
2. Appropriate avoidance/protection/mitigation will be used to manage potential impacts of similar subsequent projects. These measures should include, but are not limited to:
  - the stabilization of soils to minimize or avoid impacts related to soil erosion;

- marking/flagging of suitable and/or occupied habitat (including predetermined buffers) prior to development to avoid trampling by crew members or equipment during disturbance related activities; and
  - require project proponents to conduct surveys and monitoring actions using BLM approved specialists to document population effects and individual impacts.
3. BLM shall continue to document new populations of each species as they are encountered.
  4. To assist and support recovery efforts, BLM will minimize or avoid surface disturbances in habitats that support the species.
  5. BLM will encourage and assist project proponents in development and design of their proposed actions in order to avoid direct disturbance to suitable habitat, populations or individuals where feasible. Designs should consider water flow, slope, appropriate buffer distances, possible fencing needs, and pre-activity flagging of sensitive areas that are planned for avoidance.
  6. BLM will consider emergency OHV closure or additional restrictions to protect, conserve, and recover the species.
  7. In areas where dispersed recreational uses are identified as threats to populations of the species, BLM will consider the development of new recreational facilities/opportunities that concentrate dispersed recreational use away from habitat, especially occupied habitat.
  8. Cultural and paleontological survey/recovery technicians (i.e., archeologists and/or paleontologists), conducting work in the vicinity of known populations, will be educated in the identification of listed species in order to avoid inadvertent trampling or removal during survey, mapping, or excavation of cultural or paleontological resources.
  9. Areas of viable habitat, in the vicinity of populations considered for prescribed burning, will be surveyed according to established protocols for new or undocumented populations of the species.
  10. Lands being considered for exchange or disposal that contain suitable habitat for the species will be surveyed for undocumented populations, according to established protocols, prior to approval of such disposal. Lands supporting populations shall not be disposed of unless it is determined that the action will not threaten the survival and recovery of the species in accordance with the ESA and BLM Guidance and Policy Manual 6840 – *Special Status Species Management*.
  11. BLM will encourage the avoidance of key habitats during livestock herding and trailing activities on BLM administered lands. (Key habitats are those that are deemed necessary for the conservation of the species including, but not necessarily limited to, designated critical habitat and other occupied or unoccupied habitats considered important for the species survival and recovery as determined in coordination with the USFWS).

## **Bald Eagle (*Haliaeetus leucocephalus*)**

### **Conservation Measures**

The following conservation measures provide guidance for avoiding, minimizing, or reducing potential adverse impacts to the bald eagle from implementing actions authorized in this RMP. This list is not all-inclusive. Additional conservation measures, or other modified versions of these measures, may be

applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of Section 7 consultation with USFWS:

1. Implement restrictions on all authorized (permitted) activities that may adversely impact bald eagles, their breeding habitat, roosting sites, or known winter concentration areas to avoid or minimize the impacts. Measures were adapted from guidance published in the Utah Field Office *Guidelines for Raptor Protection from Human and Land Use Disturbances* (USFWS 2002), and from coordination between BLM and USFWS. Measures include, but are not limited to seasonal and/or daily timing limitations and/or spatial buffers as follows:
  - a. Temporary activities<sup>4</sup> or habitat alterations that could disturb nesting bald eagles would be restricted from January 1 to August 31 within 1 mile of nest sites. Exceptions would be considered where no nesting behavior is initiated prior to June 1.
  - b. Temporary activities or habitat alterations that could disturb bald eagles would be restricted within one-half mile of known eagle winter roost areas from November 1 to March 31. In addition, require daily activities approved through subsequent consultation within these spatial buffers to start after 9 a.m. and terminate at least 1 hour before sunset to ensure that bald eagles using these roosts have the opportunity to vacate their roost in the morning and return undisturbed in the evening.
  - c. Allow no permanent<sup>5</sup> structures within 1 mile of bald eagle nest sites or within one-half mile of bald eagle winter concentration areas (roosts).
  - d. Where activities are authorized within breeding habitats or known winter concentration areas, monitoring efforts would document what, if any, impacts occur during project implementation and to what extent the species was affected. Utilize the monitoring results in designing and implementing future projects as part of the adaptive management process.
2. For all project-related survey and monitoring actions:
  - a. Provide monitoring reports to the RFO within 15 days of completion of surveys or monitoring efforts. Reports must follow BLM-specified formats for written and automated databases.
  - b. Any detection of bald eagle presence during survey or monitoring efforts to the authorized officer within 48 hours of detection.
3. Conduct appropriately timed surveys in suitable bald eagle nesting habitat or identified concentration areas in accordance with approved protocols prior to any activities that may disturb bald eagles. Surveys would only be conducted by BLM-approved individuals or personnel.
4. In coordination with cooperating agencies and/or partners (e.g., Utah Division of Wildlife Resources [UDWR] and USFWS), verify annual status (active versus inactive) of all known bald eagle nests and other identified eagle concentration areas on BLM-administered lands.

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<sup>4</sup> Temporary activities are defined as those that are completed prior to the start of the following raptor breeding season, leaving no permanent structures and resulting in no permanent habitat loss.

<sup>5</sup> Permanent activities continue for more than one breeding season and/or cause a loss of habitat or displace individuals through disturbance (e.g., creation of a permanent structure including but not limited to well pads, roads, pipelines, and electrical powerlines).

5. When project proposals that may affect threatened and endangered species are received, coordinate with USFWS at the earliest possible date so that USFWS can provide conservation measures needed to minimize or avoid impacts.
6. BLM-administered lands within 1 mile of bald eagle nests or identified communal winter roosts should be retained in federal ownership. If it is imperative that these lands be transferred out of public ownership, make every effort to include conservation easements in conveyance documents or seek voluntary conservation restrictions to protect the bald eagles and support their conservation.
7. Notify proponents of BLM-authorized actions that roadside carrion can attract foraging bald eagles and potentially increase the risk of vehicle collisions with eagles feeding on carrion. When carrion is found on roads, notify the appropriate agency for its removal.
8. Require powerlines to be constructed to standards and guidelines identified by the Avian Protection Plan (APP) Guidelines (USFWS and APLIC 2005).
9. Provide educational information to project proponents and the general public pertaining to the following topics:
  - a. Appropriate vehicle speeds and the associated benefit of reduced vehicle collisions with wildlife
  - b. Use of lead shot (particularly over water bodies)
  - c. Use of lead fishing weights
  - d. General ecological awareness of habitat disturbance.
10. Since bald eagles often prey upon aquatic species, periodically review water quality records (e.g., Utah Department of Environmental Quality [UDEQ], UDWR, and U.S. Geological Survey [USGS]) from monitoring stations at or near important bald eagle habitats (e.g., nests, roosts, and concentration areas) on BLM-administered lands for conditions that could adversely affect eagles or their prey. If water quality problems are identified, contact the appropriate jurisdictional entity to cooperatively monitor the condition and/or take corrective action.

## **Colorado Pikeminnow (*Ptychocheilus lucius*), Humpback Chub (*Gila cypha*), Bonytail Chub (*Gila elegans*), and Razorback Sucker (*Xyrauchen texanus*)**

### **Conservation Measures**

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Colorado pikeminnow, Humpback chub, bonytail, and razorback sucker, herein referred to as the Colorado River fishes. This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the USFWS.

1. Monitoring of impacts of site-specific projects authorized by the BLM will result in the preparation of a report describing the progress of each site-specific project, including implementation of any associated reasonable and prudent measures or reasonable and prudent alternatives. This will be a requirement of project proponents and will be included as a condition of approval (COA) on future proposed actions that have been determined to have the potential for take. Reports will be submitted annually to the USFWS - Utah Field Office, beginning after the first full year of implementation of the project, and shall list and describe:
  - Any unforeseen direct or indirect adverse impacts that result from activities of each site-specific project;
  - Estimated levels of impact or water depletion, in relation to those described in the original project-level Consultation effort, in order to inform the Service of any intentions to reinitiate Section 7 Consultation; and
  - Results of annual, periodic monitoring which evaluates the effectiveness of any site-specific terms and conditions that are part of the formal Consultation process. This will include items such as an assessment of whether implementation of each site-specific project is consistent with that described in the BA, and whether the project has complied with terms and conditions.
2. The BLM shall notify the USFWS immediately of any unforeseen impacts detected during project implementation. Any implementation action that may be contributing to the introduction of toxic materials or other causes of fish mortality must be immediately stopped until the situation is remedied. If investigative monitoring efforts demonstrate that the source of fish mortality is not related to the authorized activity, the action may proceed only after notification of USFWS authorities.
3. Unoccupied, suitable habitat areas should be protected in order to preserve them for future management actions associated with the recovery of the Endangered Colorado River Fish, as well as approved reintroduction, or relocation efforts.
  - BLM will avoid impacts where feasible, to habitats considered most representative of prime suitable habitat for these species.
  - Surface disturbing activities will be restricted within ¼ mile of the channel centerline of the Colorado, Green, Duchesne, Price, White, and San Rafael Rivers
  - Surface disturbing activities proposed to occur within floodplains or riparian areas will be avoided unless there is no practical alternative or the development would enhance riparian/aquatic values. If activities must occur in these areas, construction will be designed to include mitigation efforts to maintain, restore, and/or improve riparian and aquatic conditions. If conditions could not be maintained, offsite mitigation strategies should be considered.
4. BLM will ensure project proponents are aware that designs must avoid as much direct disturbance to current populations and known habitats as is feasible. Designs should include:
  - protections against toxic spills into rivers and floodplains;
  - plans for sedimentation reduction;
  - minimization of riparian vegetation loss or degradation;
  - pre-activity flagging of critical areas for avoidance;
  - design of stream-crossings for adequate passage of fish; and
  - measures to avoid or minimize impacts on water quality at the 25-year frequency runoff

5. Prior to surface disturbing activities, specific principles will be considered to control erosion. These principles include:
  - Conduct long-range transportation planning for large areas to ensure that roads will serve future needs. This will result in less total surface disturbance.
  - Avoid, where possible, surface disturbance in areas with high erosion hazards.
  - Avoid mid-slope location of drill pads, headwalls at the source of tributary drainages, inner valley gorges, excessively wet slopes such as those near springs and avoid areas where large cuts and fills would be required.
  - Design and locate roads to minimize roadway drainage areas and to avoid modifying the natural drainage areas of small streams.
6. Where technically and economically feasible, project proponents will use directional drilling or multiple wells from a single pad to reduce surface disturbance and eliminate drilling in suitable riparian habitat. Ensure that such drilling does not intercept or degrade alluvial aquifers. Drilling will not occur within 100 year floodplains that contain listed fish species or their designated critical habitats.
7. The Utah Oil and Gas Pipeline Crossing Guidance (BLM National Science and Technology Center), or other applicable guidance, will be implemented for oil and gas pipeline river/stream crossings.
8. In areas adjacent to 100-year floodplains, particularly in systems prone to flash floods, BLM will analyze the risk for flash floods to impact facilities. Potential techniques may include the use of closed loop drilling and pipeline burial or suspension as necessary to minimize the potential for equipment damage and resultant leaks or spills.
9. Water depletions from any portion of the Upper Colorado River drainage basin above Lake Powell are considered to adversely affect and adversely modify the critical habitat of these endangered fish species. Section 7 consultation will be completed with the Service prior to any such water depletions.
10. Design stream-crossings for adequate passage of fish (if present), minimum impact on water quality, and at a minimum, a 25-year frequency run-off.

## **Mexican Spotted Owl (*Strix occidentalis lucida*)**

### **Conservation Measures**

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Mexican spotted owl (*Strix occidentalis lucida*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the USFWS.

1. BLM will place restrictions on all authorized (permitted) activities that may adversely affect the Mexican spotted owl in identified PACs, breeding habitat, or designated critical habitat, to reduce the potential for adverse impacts to the species. Restrictions and procedures have been adapted

from guidance published in the Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances (USFWS 2002b), as well as coordination between BLM and the Service. Measures include:

- a. Surveys, according to USFWS protocol, will be required prior to any disturbance related activities that have been identified to have the potential to impact Mexican spotted owl, unless current species occupancy and distribution information is complete and available. All surveys must be conducted by USFWS certified individuals, and approved by the BLM authorized officer.
- b. Assess habitat suitability for both nesting and foraging using accepted habitat models in conjunction with field reviews. Apply the appropriate conservation measures below if project activities occur within 0.5 mile of suitable owl habitat, dependent in part on if the action is temporary<sup>6</sup> or permanent<sup>7</sup>:

For all temporary actions that may impact owls or suitable habitat:

- If action occurs entirely outside of the owl breeding season, and leaves no permanent structure or permanent habitat disturbance, action can proceed without an occupancy survey.
- If action will occur during a breeding season, survey for owls prior to commencing activity. If owls are found, activity should be delayed until outside of the breeding season.
- Eliminate access routes created by a project through such means as raking out scars, revegetation, gating access points, etc. For all permanent actions that may impact owls or suitable habitat:

For all permanent actions that may impact owls or suitable habitat:

- Survey two consecutive years for owls according to established protocol prior to commencing of activity.
- If owls are found, no actions will occur within 0.5 mile of identified nest site.
- If nest site is unknown, no activity will occur within the designated Protected Activity Center (PAC).
- Avoid placing permanent structures within 0.5 mi of suitable habitat unless surveyed and not occupied.
- Reduce noise emissions (e.g., use hospital-grade mufflers) to 45 dBA at 0.5 mile from suitable habitat, including canyon rims (Delaney et al. 1997). Placement of permanent noise-generating facilities should be determined by a noise analysis to ensure noise does not encroach upon a 0.5 mile buffer for suitable habitat, including canyon rims.
- Limit disturbances to and within suitable owl habitat by staying on designated routes.
- Limit new access routes created by the project.

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<sup>6</sup>Temporary activities are defined as those that are completed prior to the start of the following raptor breeding season, leaving no permanent structures and resulting in no permanent habitat loss.

<sup>7</sup> Permanent activities continue for more than one breeding season and/or cause a loss of owl habitat or displaces owls through disturbances, e.g., creation of a permanent structure including but not limited to well pads, roads, pipelines, electrical power line.

2. BLM will, as a condition of approval (COA) on any project proposed within identified PACs, designated critical habitat, or within spatial buffers for Mexican spotted owl nests (0.5 mile), ensure that project proponents are notified as to their responsibilities for rehabilitation of temporary access routes and other temporary surface disturbances, created by their project, according to individual BLM Field Office standards and procedures, or those determined in the project-specific Section 7 Consultation.
3. BLM will require monitoring of activities in designated critical habitat, identified PACs, or breeding habitats, wherein it has been determined that there is a potential for take. If any adverse impacts are observed to occur in a manner, or to an extent that was not considered in the project-specific Section 7 Consultation, then consultation must be reinitiated.
  - Monitoring results should document what, if any, impacts to individuals or habitat occur during project construction/implementation. In addition, monitoring should document successes or failures of any impact minimization, or mitigation measures. Monitoring results would be considered an opportunity for adaptive management, and as such, would be carried forward in the design and implementation of future projects.
4. For all survey and monitoring actions:
  - Reports must be provided to affected field offices within 15 days of completion of survey or monitoring efforts.
  - Report any detection of Mexican spotted owls during survey or monitoring to the authorized officer within 48 hours.
5. BLM will, in areas of designated critical habitat, ensure that any physical or biological actors (i.e., the primary constituent elements), as identified in determining and designating such habitat, remains intact during implementation of any BLM-authorized activity.
6. For all BLM actions that “*may adversely affect*” the primary constituent elements in any suitable Mexican spotted owl habitat, BLM will implement measures as appropriate to minimize habitat loss or fragmentation, including rehabilitation of access routes created by the project through such means as raking out scars, revegetation, gating access points, etc.
7. Where technically and economically feasible, use directional drilling from single drilling pads to reduce surface disturbance, and minimize or eliminate need to drilling in canyon habitats suitable for Mexican spotted owl nesting.
8. Prior to surface disturbing activities in Mexican spotted owl PACs, breeding habitats, or designated critical habitat, specific principles should be considered to control erosion.

These principles include:

- Conduct long-range transportation planning for large areas to ensure that roads will serve future needs. This will result in less total surface disturbance.
- Avoid surface disturbance in areas with high erosion hazards to the greatest extent possible. Avoid mid-slope locations, headwalls at the source of tributary drainages, inner valley gorges, and excessively wet slopes such as those near springs. In addition, avoid areas where large cuts and fills would be required.
- Locate roads to minimize roadway drainage areas and to avoid modifying the natural drainage areas of small streams.

9. Project developments should be designed, and located to avoid direct or indirect loss or modification of Mexican spotted owl nesting and/or identified roosting habitats.
10. Water production associated with BLM authorized actions should be managed to ensure maintenance or enhancement of riparian habitats.

## Utah Prairie Dog (*Cynomys parvidens*)

### Conservation Measures

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Utah prairie dog (*Cynomys parvidens*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the USFWS.

1. Surveys according to approved protocols and procedures will be required prior to surface disturbance unless species occupancy and distribution information is complete, current, and available. Surveys would be conducted by BLM-approved biologists. In the event species occurrence is verified, the project proponent may be required to modify operational plans, at the discretion of the authorized officer, to include additional, appropriate protection measures or practices for the minimization of impacts to the Utah prairie dog and its habitat.
2. BLM will restrict surface disturbing activities within 0.5 mile of active Utah prairie dog colonies when and where necessary, upon the recommendation of BLM FO staff biologists to BLM management and as necessary in coordination or consultation with USFWS.
3. No permanent surface disturbance or facility will be allowed within 0.5 mile of potentially suitable Utah prairie dog habitat, as identified and mapped by the Utah Division of Wildlife Resources or BLM, since 1976.
4. Unavoidable surface disturbing activities in Utah prairie dog habitat should be conducted between April 1 and September 30 (the period when prairie dogs are most likely to be found above ground). BLM projects will be designed to avoid direct disturbance to Utah prairie dog populations and habitat wherever possible. Designs should consider flow of water, slope, buffers, possible fencing, and pre-activity flagging of critical areas for avoidance.
5. Reclamation and restoration efforts in Utah prairie dog habitat will be conducted using native seed, unless otherwise specified in coordination with USFWS.
6. As funding allows, BLM should complete a comprehensive assessment locating and mapping OHV use areas that interface with Utah prairie dog populations. Comparison of GIS layers for Utah prairie dog populations and OHV use should give BLM personnel another tool to manage and/or minimize impacts from OHV use near known Utah prairie dog populations and habitat. Based on the information that is developed via GIS applications, appropriate actions should be taken to prevent OHV use in occupied territories.
7. BLM will consider emergency OHV closures or additional restrictions to protect, conserve, and recover the species.

8. Where technically and economically feasible, the use of directional drilling or drilling of multiple wells from a single pad will be required to reduce surface disturbance in Utah prairie dog habitat.
9. For existing facilities, BLM and facility operators, will consider if fencing infrastructure on well pads (e.g., drill pads, tank batteries, and compressors) would be needed to protect equipment from burrowing activities. In addition, BLM and project proponents should consider if future surface disturbing activities would be required at the site.
10. BLM will provide educational information for project proponents and the general public pertaining to appropriate vehicle speeds and the associated benefit of reduced vehicle collisions with wildlife, and to improve general ecological awareness of habitat disturbance.
11. Project related vehicle maintenance activities will be conducted in maintenance facilities. Should it become necessary to perform vehicle or equipment maintenance on-site, these activities will avoid identified Utah prairie dog colonies or within a 350-foot distance from colonies. Precautions shall be taken to ensure that contamination of maintenance sites by fuels, motor oils, grease, etc. does not occur and such materials are contained and properly disposed of off-site. Inadvertent spills of petroleum based or other toxic materials shall be cleaned up and removed immediately.
12. BLM will coordinate with interested private and governmental agencies and landowners to identify voluntary opportunities to modify current land stewardship practices that may have detrimental impacts on the Utah prairie dog and its habitat.
11. BLM-authorized equipment and vehicles planned for use within Utah prairie dog habitat will be cleaned to minimize the spread of noxious weeds or other undesirable vegetation types.

## Southwestern Willow Flycatcher (*Empidonax trailii extimus*)

### Conservation Measures

The following list of measures provides species-specific guidance intended to avoid, minimize, or reduce potential adverse impacts from implementation of BLM actions under the authority of current Utah BLM LUPs on the Southwestern willow flycatcher (*Empidonax trailii extimus*). This list is not comprehensive. Additional conservation measures, or other modified versions of these measures, may be applied for any given BLM-authorized activity upon further analysis, review, coordination efforts, and/or appropriate levels of section 7 consultation with the USFWS.

1. Surveys will be required prior to operations that “*may adversely affect*” the Southwestern willow flycatcher unless species occupancy data and distribution information is complete and available. Surveys will only be conducted by BLM-approved personnel. In the event species occurrence is verified, project proponents may be required to modify operational plans at the discretion of the authorized officer. Modifications may include appropriate measures for minimization of adverse effects to the Southwestern willow flycatcher and its habitat.
2. BLM will monitor and restrict, when and where necessary, authorized or casual use activities that “*may adversely affect*” the Southwestern willow flycatcher, including but not limited to, recreation, mining, and oil and gas activities. Monitoring results should be considered in the design and implementation of future projects.

3. To monitor the impacts of BLM-authorized projects determined “*likely to adversely affect*” the Southwestern willow flycatcher, BLM should prepare a short report describing progress, including success of implementation of all associated mitigation. Reports shall be submitted annually to the USFWS Utah Field Office by March 1<sup>st</sup> beginning one full year from date of implementation of the proposed action. The report shall list and describe the following items:
  - Any unforeseen adverse effects resulting from activities of each site-specific project (may also require reinitiation of formal Consultation);
  - When, and if, any level of anticipated incidental take is approached (as allowed by separate Incidental Take Statements of site-specific Formal Section 7 Consultation efforts);
  - When, or if, the level of anticipated take (as allowed by separate Incidental Take Statements from site-specific formal consultations) is exceeded; and
  - Results of annual, periodic monitoring which evaluate the effectiveness of the reasonable and prudent measures or terms and conditions of the site-specific Consultation.
4. BLM should avoid granting activity permits or authorizing development actions in Southwestern willow flycatcher habitat. Unoccupied potential habitat should be protected in order to preserve them for future management actions associated with the recovery of the Southwestern willow flycatcher.
5. BLM will ensure project design incorporates measures to avoid direct disturbance to populations and suitable habitats where possible. At a minimum, project designs should include consideration of water flows, slope, seasonal and spatial buffers, possible fencing, and pre-activity flagging of critical areas for avoidance.
6. The BLM will continue to address illegal and unauthorized OHV use and activity upon BLM administered lands. In order to protect, conserve, and recover the Southwestern willow flycatcher in areas of heavy unauthorized use, temporary closures, or use restrictions beyond those which are already in place, may be imposed. As funding allows, BLM should complete a comprehensive assessment of all OHV use areas that interface with Southwestern willow flycatcher populations. Comparison of Southwestern willow flycatcher populations and OHV use areas using GIS would give BLM personnel another tool to manage and/or minimize impacts.
7. All surface disturbing activities should be restricted within a 0.25 mile buffer from suitable riparian habitats and permanent surface disturbances should be avoided within 0.5 mile of suitable Southwestern willow flycatcher habitat.
  - Unavoidable ground disturbing activities in occupied Southwestern willow flycatcher habitat should only be conducted when preceded by current year survey, should only occur between August 16 and April 30 (the period when Southwestern willow flycatcher are not likely to be breeding), and should be monitored to ensure that adverse impacts to Southwestern willow flycatcher are minimized or avoided, and to document the success of project specific mitigation/protection measures. As monitoring is relatively undefined, project specific requirements must be identified.
8. BLM will properly consider nesting periods for Southwestern willow flycatcher when conducting horse gathering operations in the vicinity of habitat.

9. BLM will ensure that plans for water extraction and disposal are designed to avoid changes in the hydrologic regime that would likely result in loss or undue degradation of riparian habitat.
10. Native species will be preferred over non-native for revegetation of habitat in disturbed areas.
11. BLM will coordinate with other agencies and private landowners to identify voluntary opportunities to modify current land stewardship practices that may impact the Southwestern willow flycatcher and its habitats.
12. Limit disturbances to within suitable habitat by staying on designated routes.
13. Ground-disturbing activities will require monitoring throughout the duration of the project to ensure that adverse impacts to Southwestern willow flycatcher are avoided. Monitoring results should document what, if any, impacts to individuals or habitat occur during project construction/implementation. In addition, monitoring should document successes or failures of any impact minimization or mitigation measures. Monitoring results would be considered an opportunity for adaptive management and, as such, would be carried forward in the design and implementation of future projects.
14. Where technically and economically feasible, use directional drilling or multiple wells from the same pad to reduce surface disturbance and eliminate drilling in Southwestern willow flycatcher habitat.
15. Habitat disturbances (i.e., organized recreational activities requiring special use permits, drilling activities, etc.) will be avoided within 0.25 mile of suitable Southwestern willow flycatcher habitat from May 1 to August 15.
16. Grazing allotments that contain habitat for the species will be managed with consideration for recommendations provided by the Southwestern Willow Flycatcher Recovery Plan, and other applicable research.

## POTENTIAL BEST MANAGEMENT PRACTICES

Best management practices (BMP) are those land and resource management techniques determined to be the most effective and practical means of maximizing beneficial results and minimizing conflicts and adverse environmental impacts of management actions. BMPs could include, but are not limited to, structural and nonstructural controls, specific operations, and maintenance procedures. BMPs can be applied before, during, and after activities to reduce or eliminate adverse environmental impacts. BMPs are not one-size-fits-all solutions. BMPs should be matched and adapted through interdisciplinary analysis to determine which management practices would be necessary to meet the goals and objectives in the Resource Management Plan (RMP). The actual practices and mitigation measures that are best for a particular site are evaluated through the site-specific National Environmental Policy Act (NEPA) process and vary to accommodate unique, site-specific and local resource conditions.

BMPs described in this appendix are designed to assist in achieving the RMP objectives. These guidelines could apply, where appropriate, to all use authorizations, including projects initiated by the Bureau of Land Management (BLM). BMPs are dynamic, and should not be interpreted as specific direction at the same level as the RMP decisions. BMPs are selected and implemented as necessary, based on site-specific conditions, to meet resource objectives for specific management actions.

This appendix does not provide an exhaustive list of BMPs. Additional BMPs may be identified during an interdisciplinary process when evaluating site-specific management actions. Implementation and effectiveness of BMPs must be monitored to determine whether the practices are achieving RMP goals and objectives. Adjustments could be made as necessary to ensure RMP goals and objectives are met, as well as to conform with changes in BLM regulations, policy, direction, or new scientific information. BMPs may also be updated as new technology emerges. In addition, applicants can suggest alternate conditions that could accomplish the same result.

Because the management of environmental impacts is an ongoing process, continual refinement of BMP design is necessary. This process can be described in these five steps: (1) selection of design of a specific BMP; (2) application of the BMP; (3) monitoring; (4) evaluation; and (5) feedback. Data gathered through monitoring is evaluated and used to identify changes needed in BMP design or application or in the monitoring program.

BMPs have been developed and used by numerous energy companies and state and federal agencies throughout the nation. BLM and other agencies are continually gathering and developing BMPs and sharing them, allowing for the application of years of experience. Development and sharing of BMPs represents a commitment to the idea that smart planning and responsible follow-through manage and in some cases reduce impacts to resources, both now and in the future. The BMPs developed by other agencies could be considered in addition to those identified in this document. Other BMPs include those contained in the following documents and websites:

- *Utah's Forest Water Quality Guidelines: A Practical User's Guide for Landowners, Loggers, and Resource Managers* (State of Utah, Department of Natural Resources, Division of Forestry, Fire and State Lands). As of September 2007, an electronic version of this document was available at <http://extension.usu.edu/forestry/Management/UtFWQGuide/Assets/PDFDocs/UFWQGBOO.PDF>.
- *Coalbed Methane Best Management Practices: A Handbook – 2006 Update* (Western Governors' Association). As of September 2007, an electronic version of this document was available at [www.westgov.org/wga/initiatives/coalbed/](http://www.westgov.org/wga/initiatives/coalbed/).

- *Low-Volume Roads Engineering Best Management Practices Field Guide* (U.S. Forest Service). As of September 2007, an electronic version of this document was available at [www.blm.gov/bmp/field%20guide.htm](http://www.blm.gov/bmp/field%20guide.htm).
- *Water-Road Interaction Technology Series Documents* (U.S. Forest Service). As of September 2007, electronic versions of these documents were available at [www.stream.fs.fed.us/water-road/](http://www.stream.fs.fed.us/water-road/).
- *National Menu of Stormwater Best Management Practices* (U.S. Environmental Protection Agency). As of September 2007, electronic versions of these documents were available at <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>.
- *Technical Information Sheets: Specific and Detailed BMP Guidance* (Bureau of Land Management). As of September 2007, an electronic version of this document was available through hyperlinks at [www.blm.gov/bmp/Technical\\_Information.htm](http://www.blm.gov/bmp/Technical_Information.htm).
- *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development: The Gold Book* (Bureau of Land Management). As of September 2007, an electronic version of this document was available through hyperlinks at [www.blm.gov/bmp/Technical\\_Information.htm](http://www.blm.gov/bmp/Technical_Information.htm).

In addition, this appendix contains conservation measures identified jointly by the BLM and the U.S. Fish and Wildlife Service (USFWS) as needed to protect specific threatened or endangered species. These conservation measures are targeted to specific species and must be considered and applied as appropriate.

## Surface Disturbing Activities

- Evaluate areas subject to surface disturbance for the presence of cultural resources or values. This is usually accomplished through the completion of a cultural clearance. An on-the-ground inspection by a qualified archaeologist, historian, or paleontologist is required. In cases where cultural resources are found, the preferred response would be to modify the proposed action to avoid the cultural resource (avoidance). If avoidance is not possible, actions would be taken to preserve the data or value represented by the cultural resource (mitigation).
- Evaluate areas subject to surface disturbance for the presence of threatened, endangered, or candidate animal or plant species. This is usually accomplished through the completion of a biological clearance. An on-the-ground inspection by a qualified biologist is required. In cases where threatened, endangered, or candidate species are affected, the preferred response would be to modify the proposed action to avoid species or their habitat (avoidance). If avoidance of a threatened, endangered, or candidate species or its habitat is not possible, a Section 7 consultation with USFWS would be required, and a biological assessment would be prepared to recommend actions to protect the species or its habitat.
- Consider requiring special design and reclamation measures to protect scenic and natural landscape values. These may include transplanting trees and shrubs, mulching and fertilizing disturbed areas, use of low-profile permanent facilities, and painting to minimize visual contrasts. Surface disturbing activities may be moved to avoid sensitive areas or to reduce the visual effects of the proposal.
- Design above-ground facilities requiring painting to blend in with the surrounding environment.
- Implement reclamation concurrent with construction and site operations to the extent possible. Final reclamation actions shall be initiated within 6 months of the termination of operations unless otherwise approved in writing by the authorized officer.
- Ensure fill material is pushed into cut areas and up over back slopes. Depressions should not be left that would trap water or form ponds.

## Mineral Exploration and Development

- Reduce impacts to wildlife and visual resources by applying the following, as appropriate:

- Directional drilling of oil and gas wells
- Drilling of multiple wells from a single pad
- Closed drilling systems
- Cluster development
- Below-ground wellheads
- Remote well monitoring
- Piping of produced liquids to centralized tank batteries off site to reduce traffic to individual wells
- Transportation planning (e.g., to reduce road density and traffic volumes)
- Compensatory mitigation
- Noise reduction techniques and designs
- Installation of raptor anti-perch devices in Greater sage-grouse habitat
- Monitoring of wildlife populations during drilling operations
- Avoidance of human activity between 8 p.m. and 8 a.m. from March 1 through May 15 within one-quarter mile of the perimeter of occupied Greater sage-grouse leks
- Onsite bioremediation of oil field wastes and spills
- Removal of trash, junk, waste, and other materials not in current use.
- Reclaim all disturbed surface areas promptly, performing concurrent reclamation as necessary, and minimize the total amount of all surface disturbance.
- Ensure all surface soil is stripped prior to conducting operations, stockpiled, and reapplied during reclamation, regardless of soil quality. Minimize the length of time soil remains in stockpiles and the depth or thickness of stockpiles.
- Strip and separate soil surface horizons where feasible and reapply in proper sequence during reclamation.
- Establish vegetation cover on soil stockpiles that are to be in place longer than 1 year.
- Construct and rehabilitate temporary roads to minimize total surface disturbance, consistent with intended use.
- Consider temporary measures such as silt fences, straw bales, or mulching to trap sediment in sensitive areas until reclaimed areas are stabilized with vegetation.
- Reshape to the approximate original contour all areas to be permanently reclaimed, providing for proper surface drainage.

## Road Design and Maintenance

- Keep access roads to a minimum and use to only when necessary.
- Design roads to minimize total disturbance, conform with topography, and minimize disruption of natural drainage patterns.
- Locate roads on stable terrain, such as ridgetops; natural benches; and flatter transitional slopes near ridges, valley bottoms, and moderate sideslopes, and away from slumps, slide-prone areas, concave slopes, clay beds, and where rock layers dip parallel to the slope. Locate roads on well-drained soil types; avoid wet areas.
- Construct roads for surface drainage by using outslopes, crowns, grade changes, drain dips, waterbars, and/or insloping to ditches as appropriate. Maintain drain dips, waterbars, road crown, insloping, and outsloping, as appropriate, during road maintenance. Grade roads only as necessary.
- Sloping the road base to the outside edge for surface drainage is normally recommended for local spurs or minor collector roads where low traffic volume and lower traffic speeds are anticipated. This is also recommended in situations where long intervals between maintenance will occur and where minimum excavation is wanted. Outsloping is not recommended on steep slopes. Sloping the road base to the inside edge is an acceptable practice on roads with steep sideslopes and

where the underlying soil formation is very rocky and not subject to appreciable erosion or failure.

- Crown and ditching is recommended for arterial and collector roads where traffic volume, speed, intensity, and user comfort are considerations. Recommended gradients range from 0 percent to 15 percent where crown and ditching may be applied, as long as adequate drainage away from the road surface and ditch lines is maintained.
- In soil types with a low sand component, construct roads when soils are dry and not frozen, if possible. When these types of soils or road surfaces become saturated to a depth of three inches, BLM-authorized activities should be limited or cease unless otherwise approved by the authorized officer.
- Retain vegetation between roads and streams to filter runoff caused by roads.
- Use culverts that pass, at a minimum, a 50-year storm event and/or have a minimum diameter of 13 inches for permanent stream crossings and a minimum diameter of 18 inches for road cross-drains.
- Strip and stockpile topsoil ahead of construction of new roads, if feasible. Reapply soil to cut and fill slopes prior to revegetation.
- Use existing roads whenever possible rather than constructing new road systems.

## Right-of-Way and Utility Corridors

- Ensure rights-of-way (ROW) and utility corridors use areas adjoining or adjacent to previously disturbed areas whenever possible.
- Stabilize disturbed areas within road ROWs and utility corridors with vegetation practices designed to hold soil in place and minimize erosion. Reestablish vegetation cover to increase infiltration and provide additional protection from erosion.
- Construct sediment barriers when needed to slow runoff, allow deposition of sediment, and prevent transport from the site. Straining or filtration mechanisms may also be employed for the removal of sediment from runoff.

## Noxious Weed Management

- To reduce the potential for the introduction of noxious weeds, clean off all equipment with pressure washing prior to operating on BLM lands. Removal of all dirt, grease, and plant parts that may carry noxious weed seeds or vegetative parts is required and may be accomplished with a pressure hose.
- Ensure all seed, hay, straw, mulch, or other vegetation material transported and used on public land weed free zones for site stability, rehabilitation, or project facilitation is free of noxious weeds and noxious weed seed as certified by a qualified federal, state, or county officer.

## Reducing Impacts to Visual Resource Management Class II and Class III Areas

- Bury distribution powerlines and flow lines in or adjacent to access roads.
- Use repetition of elements of form, line, color, and texture to blend facilities with the surrounding landscape.
- Paint all above-ground structures not requiring safety coloration an environmental color two shades darker than the surrounding environment.
- Reclaim and recontour all disturbed areas, including access roads, to the original contour or a contour that blends with the surrounding topography.
- Avoid facility placement on steep slopes, ridge tops, and hilltops.

- Reclaim unused well pads within 1 year.

## Developed Recreation

- Construct recreation sites and provide appropriate sanitation facilities to minimize impacts to resource values, maximize public health and safety, and minimize user conflicts related to approved activities and access within an area as appropriate.
- Use public education and/or physical barriers (such as rocks, posts, and vegetation) to direct or preclude uses and to minimize impacts to resource values.

## Riparian/Wetland Areas

- Avoid locating roads, trails, and landings in wetlands.
- Locate, identify, and mark riparian management areas during design of projects that may cause adverse impacts to riparian management areas.
- Keep open water free from slash.
- Avoid equipment operation in areas of open water, seeps, and springs.
- Use low ground pressure equipment (floatation tires or tracked) as necessary to minimize rutting and compaction.

## Water Developments

- Actual work in springs and stream beds will be done by hand where possible. If machinery is needed in these areas, it will be selected to minimize disturbance.
- After construction of spring head boxes, troughs, pipelines, and well sites, the areas will be cleaned up and refuse removed.
- Cuts, fills, and excavations will be dressed and seeded to blend with surroundings. Pipelines will be buried where possible.
- Original water sources will be protected, fenced if required, and an off-stream watering supply will be provided near the site.
- Size of storage tanks and troughs will be designed to accommodate expected needs of livestock and wildlife using each water source.
- Water will be left at the site for wildlife. Wells will be cased to prevent cave-ins and well sites will be fenced.
- Storage structures will be designed to provide water for wildlife. Drinking ramps will be installed and heights will not prohibit young wildlife from obtaining water.

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