NATIONAL CONSERVATION LANDS

Dominguez-Escalante National Conservation Area Science Plan

March 15, 2019

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SECTION 1 – INTRODUCTION AND SCIENTIFIC MISSION

PURPOSE OF NCL SCIENCE PLANS

The BLM's National Conservation Lands (NCL), formally known as the National Landscape Conservation System was administratively established in 2000 and legislatively codified in the Omnibus Public Land Management Act of 2009 (PL 111-11). This system encompasses nearly 900 units spread across approximately 34 million acres of public lands managed by the Bureau of Land Management (BLM). The BLM is mandated to conserve, protect and restore the outstanding cultural, ecological, and scientific values of NCL units. Scientific investigation can aid in the conservation, protection, and restoration of these lands, and therefore, science is strategically planned and organized within NCL units.

The objectives of NCL units' science plans are to:

- Identify the scientific mission of the unit;
- Summarize past scientific efforts in the unit and identify the priority needs and management issues within the unit that can be addressed by scientific inquiry;
- Define a strategy for accomplishing the scientific goals of the unit;
- Develop science protocols to, for example, ensure that scientific inquiry does not negatively impact the long term sustainability of the unit and its resources;
- Create a system to organize scientific reports; and,
- Help and promote the integration of science into management.

The science plans of NCL units are considered 'living' documents and should be revised and updated frequently (e.g. 3-5 years). Scientific needs that emerge during the course of implementing a science plan may be added to the plan on an as-needed basis to meet the unit's scientific mission.

Science has been defined within the BLM several times (e.g. BLM 2007, BLM 2008a), but is essentially the study of natural and social phenomena using repeatable observations or experiments. In the context of land management, scientific data are collected, analyzed, and/or synthesized to increase knowledge and support decision-making. Within NCL units, there is an expectation for 'identifying science needed to address management issues, communicating those needs to science providers, and incorporating the results into the decision making process' (BLM 2007).

UNIT AND GEOGRAPHIC AREA DESCRIPTION

In 2009, Dominguez-Escalante National Conservation Area (D-E NCA) including the Dominguez Canyon Wilderness Area, was created with the following purpose:

'The purposes of the Conservation area are to conserve and protect for the benefit and enjoyment of present and future generations;

(1) The unique and important resources and values of the land, including the geological, cultural, archaeological, paleontological, natural, scientific, recreational wilderness, wildlife, riparian, historical, educational, and scenic resource of the public land; and

(2) the water resources of streams, based on seasonally available flows, that are necessary to support aquatic, riparian, and terrestrial species and communities.

From: Omnibus Public Land Management Act of 2009, Subtitle E- Dominguez-Escalante National Conservation Area. Public Law 111-11 (Section 2402).

D-E NCA is part of the Colorado Plateau and Uncompahgre Plateau eco-regions as defined by the Environmental Protection Agency (Gallant et al 1989). There are numerous other conservation areas in the nearby vicinity (including NCL units, National Park Service's monuments and national parks, etc.

The unit encompasses 210,172 surface acres of BLM administered public land, a nearly 30 mile stretch of the Gunnison River, and includes 66,280 acres within the Dominguez Canyon Wilderness (Figure 1). D-E NCA is located within the BLM's Southwest Colorado District with the southwest boundary bordering the Uncompahgre National Forest and the northwest boundary bordering Colorado Highway 141. Dominguez Escalante NCA is split between the Grand Junction and Uncompahgre Field Offices, in Mesa, Monstrose and Delta Counties.

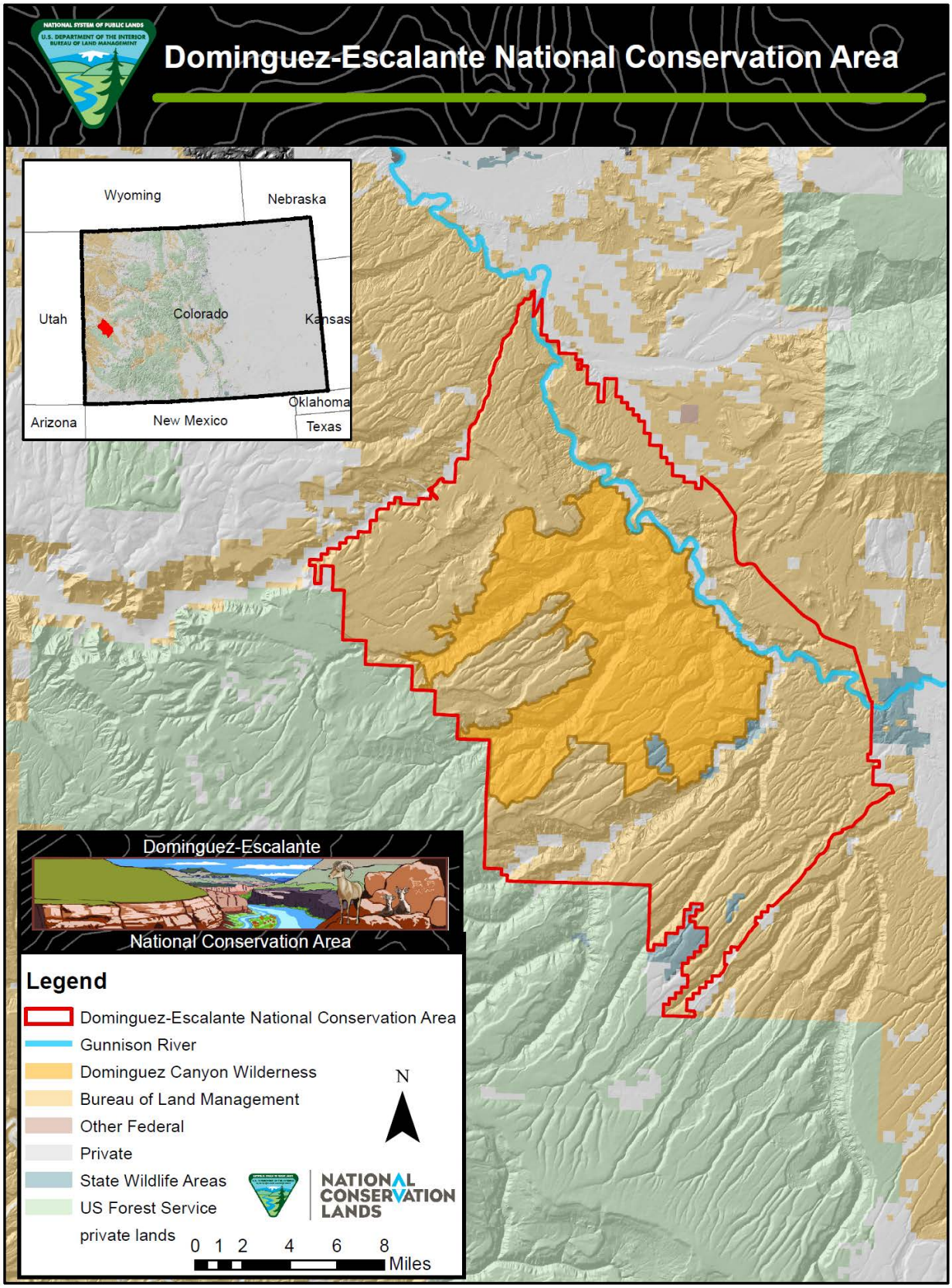

FIGURE 1 MAP OF DOMINGUEZ-ESCALANTE NATIONAL CONSERVATION AREA AND SURROUNDING AREA.

SCIENTIFIC MISSION

This science plan along with the Resource Management Plan will be used as the basis for conducting science in the D-E NCA. Scientific efforts within D-E NCA should support the conservation, protection, and restoration of the values identified in the designating language. Specifically, as stated in the D-E NCA Approved Resource Management Plan and Record of Decision (BLM 2017), the goals and objectives with regards to science in D-E NCA are:

SCI-GOAL-01: Encourage, support, and conduct scientific research within the D-E NCA to improve understanding, management, and protection of the D-E NCA's resources.

SCI-OBJ-01: Encourage, support, and conduct scientific research while minimizing disturbance and consumption of resources and maximizing benefits to the management goals of the D-E NCA and to the scientific community.

SCI-OBJ-02: Improve baseline knowledge of the species present in the D-E NCA, and general understanding of the ecosystem processes (e.g., food web dynamics, vegetation succession, and water dynamics); cycles (e.g., fire return and nutrient cycles) and anthropogenic influences (e.g., grazing, recreation) at work in the D-E NCA.

SCI-OBJ-03: Improve baseline knowledge and general understanding of geological, cultural, historical, archaeological, and paleontological resources.

SCI-OBJ-04: Improve understanding of the social, economic, and recreational benefits associated with the D-E NCA.

SECTION 2 – SCIENTIFIC BACKGROUND

BACKGROUND INFORMATION AND SCIENTIFIC INVESTIGATIONS

The following is a brief summary of the past scientific research that has occurred within the unit; this summary is not meant to be exhaustive or static. While general research on the many more topics is available, no specific past studies within D-E NCA were identified for this science plan.

TABLE 1 PUBLISHED RESEARCH DIRECTLY RELATED TO D-E NCA.

Resource	Publications
Geology and Paleontology	Kirkham et al. 2002; O'Sullivan 1992; Darling et al. 2009; Lockley et al. 2014a,b,c
Non-special status Fish and Wildlife	Bishop 2007; Anderson 1992
Vegetation	Eisenhart 2004

ON-GOING MONITORING OF RESOURCES

In addition to the scientific investigations identified above, ongoing monitoring of resources is a large portion of the science conducted in D-E NCA. Monitoring can be useful for determining a number of background conditions, trends, etc. Monitoring data collected and methods used within D-E NCA are outlined in the D-E NCA Monitoring Plan (Appendix 3).

SECTION 3 - IDENTIFICATION AND PRIORITIZATION OF MANAGEMENT QUESTIONS AND SCIENCE NEEDS

SCIENTIFIC NEEDS

The scientific needs of D-E NCA are based on pressing management questions and continually change as management decisions are made and new concerns arise. Thus, the scientific needs will remain fluid and opportunities for research should remain open and inclusive. D-E NCA's current science needs as determined in the RMP and through specialist input are listed in Table 1. Darker colors represent higher priorities.

TABLE 2 SCIENCE NEEDS BY TOPIC AREA.

Resource		RMP Science management actions	RMP implementation Priorities for science	Science Plan Extension Action Items
PHYSICAL RESOURCES	Geological and Paleontological Resources	**SCI-MA-05:** Continue baseline and trend monitoring and encourage and support research both internally and from external sources. See Geological and Paleontological Resources, section 2.1.1 (GPA), and Cultural Resources, section 2.1.8 (CUL), for resource-specific monitoring guidance.	Conduct geological mapping for outstanding geologic features in the following areas: •Escalante Canyon •East Creek •Other areas with potential for damage to outstanding geologic features	Conduct geological mapping, through partnerships if appropriate, for outstanding geologic features in the following areas: •Escalante Canyon •East Creek •Escalante triangle
			Create partnerships to conduct geological mapping for outstanding geologic features in the following areas: •Escalante Canyon •East Creek •Other areas with potential for damage to outstanding geologic features	•Other areas with potential for damage to outstanding geologic features
			Continue compilation and analysis of available paleontological and geological resource data and literature to provide for informed understanding of these resources within and/or near the D-E NCA.	Review and summary of past Geological information for D-E NCA.
			If these areas can be protected in doing so, provide interpretive sites at the following locations: •Gunnison Gravels site •Escalante Canyon •Young Egg Locality	Compile information for sites: •Gunnison Gravels site •Escalante Canyon •Young Egg Locality

			•Burrit Bone Bed locality	•Burrit Bone Bed locality
			Develop signs and pamphlets for public visitation of paleo sites, especially in the Dinosaur Diamond.	Compile information relevant to D-E NCA and Dinosaur Diamond.
BIOLOGICAL RESOURCES	Forests and Woodlands - Pinyon-Juniper Woodlands- Ponderosa Pine	**SCI-MA-02:** Continue basic trend and baseline monitoring and encourage and support research both internally and from external sources that inform management decisions. Research would include smaller 'pilot' projects, as well as longer term, larger projects. Research would be used to inform management decisions and actions.	Inventory the historic extent of ponderosa pine woodlands.	Inventory the historic extent of ponderosa pine woodlands.
	Sagebrush shrublands	**SCI-MA-02:** Continue basic trend and baseline monitoring and encourage and support research both internally and from external sources that inform management decisions. Research would include smaller 'pilot' projects, as well as longer term, larger projects. Research would be used to inform management decisions and actions. **SCI-MA-03:** Encourage research, both internally and externally that addresses priority species and vegetation objectives and evaluates priority species and vegetation rankings (Appendix A and Appendix G).	Apply vegetation treatments to reintroduce and/or increase cover of sagebrush in old vegetation treatment areas where it was removed.	
			Apply vegetation treatments to reintroduce and/or increase cover of sagebrush in old vegetation treatment areas where it was removed and/or to reintroduce native grass, forb and shrub species in old vegetation treatment areas where crested wheatgrass is now a dominant species.	Prior to completing vegetation treatments: establish research or pilot plots in the D-E NCA to determine successful treatment prescriptions (exemption: noxious and/or invasive weed treatments); or ensure that likely outcomes are known on the basis of other tests conducted in the region.
				Use existing research or pilot plots from the D-E NCA or surrounding region to inform vegetation treatment prescriptions in this vegetation type.

			Prior to completing vegetation treatments: establish research or pilot plots in the D-E NCA to determine successful treatment prescriptions (exemption: noxious and/or invasive weed treatments); or ensure that likely outcomes are known on the basis of other tests conducted in the region. Use existing research or pilot plots from the D-E NCA or surrounding region to inform vegetation treatment prescriptions in this vegetation type.	
	Desert Shrub/Saltbush		Use vegetation treatments (e.g., introduction of biological controls, chemical treatments, seeding) to improve native vegetation composition and structure in desert shrub/saltbush communities. Prior to completing vegetation treatments: establish research or pilot plots in the D-E NCA to determine successful treatment prescriptions (exemption: Noxious and/or invasive weed treatments); or ensure that likely outcomes are known on the basis of other tests conducted in the region. Use existing research or pilot plots from the D-E NCA or tests being conducted in similar habitats to inform vegetation treatment prescriptions in this vegetation type.	Prior to completing vegetation treatments: establish research or pilot plots in the D-E NCA to determine successful treatment prescriptions (exemption: Noxious and/or invasive weed treatments); or ensure that likely outcomes are known on the basis of other tests conducted in the region. Use existing research or pilot plots from the D-E NCA or tests being conducted in similar habitats to inform vegetation treatment prescriptions in this vegetation type.

	Mountain Shrublands	**SCI-MA-02:** Continue basic trend and baseline monitoring and encourage and support research both internally and from external sources that inform management decisions. Research would include smaller 'pilot' projects, as well as longer term, larger projects. Research would be used to inform management decisions and actions.	Use planned and unplanned fire and vegetation treatments, as appropriate, to maintain or improve the current diversity of age classes in mountain shrub communities.	Study the effectiveness of planned and unplanned fire towards management goals.
	Desert bighorn sheep	**SCI-MA-03:** Encourage research, both internally and externally that addresses priority species and vegetation objectives and evaluates priority species and vegetation rankings (Appendix A and Appendix G).	Manage domestic sheep grazing to provide effective separation from wild sheep using (as guidance) BLM Manual 1730, Management of Domestic Sheep and Goats to Sustain Wild Sheep; the WAFWA recommendations for domestic sheep and goat management in wild sheep habitat; and the interagency MOU for wild sheep management. If monitoring indicates that mitigation measures are not effective at providing effective separation between domestic and wild sheep in an allotment or an area of an allotment, then require at least one of the following: 1. Implement additional measures (using the WAFWA recommendations as guidance) intended to improve effectiveness. 2. Remove the area from the allotment. 3. Combine that portion with adjacent cattle allotment.	Support CPW in bighorn sheep research efforts; effectiveness of grazing Best Management Practices (BMPs), and other population stressors, including recreation impacts.

			4. Convert allotment to cattle. Prioritize allotments with high risk of contact for site-specific grazing permit environmental analysis.	
			Support CPW in bighorn sheep research efforts; effectiveness of BMPs, etc.	
		SCI-MA-04: Focus monitoring on the resources identified as purposes of the D-E NCA. See individual resource sections for resource-specific monitoring guidance.	Monitoring population to determine if mitigation measures are effective.	Monitoring population to determine if mitigation measures are effective.
	All other special status species and communities	**SCI-MA-02:** Continue basic trend and baseline monitoring and encourage and support research both internally and from external sources that inform management decisions. Research would include smaller 'pilot' projects, as well as longer term, larger projects. Research would be used to inform management decisions and actions.	Where bat roosting, maternity sites and winter hibernacula occur, require bat gates for closing abandoned mine lands.	Determine likely bat roosting and maternity sites. Where bat roosting, maternity sites and winter hibernacula occur. Assess effectiveness of gates for bat use and excluding humans at AML sites. If there are cave sites with significant bat resources with human disruption, consider methods of excluding humans.
			Develop and implement a cliff raptor survey and climbing management plan.	Inventory and monitor cliff raptor nesting sites and determine effects of recreational climbing on cliff nesting raptors.
			Develop and implement an inventory & monitoring program for special status species (SS-2)	Support studies considering habitat of special status (Threatened, Endangered, or sensitive) species.

HERITAGE RESOURCES	Cultural Resources	**SCI-MA-05:** Continue baseline and trend monitoring and encourage and support research both internally and from external sources. See Geological and Paleontological Resources, section 2.1.1 (GPA), and Cultural Resources, section 2.1.8 (CUL), for resource-specific monitoring guidance.	Manage scientifically and publicly valuable archaeological and cultural resources through documentation and nomination to the NRHP and completion of cultural resource management plans.	Support studies considering scientifically and publicly valuable archaeological and cultural resources.
			Strive to conduct Section 110 (of NHPA) surveys on 100 or more acres per year.	Support studies that provide surveys or additional information about cultural resources, especially those deemed scientifically important.
			Prioritize Section 110 efforts on inventory of areas that are likely to contain the most scientifically valuable archaeological resources, testing of "needs data" sites and research excavation of eligible sites.	
RECREATION RESOURCES	Recreation	**SCI-MA-06:** Use a variety of tools and techniques (including but not limited to surveys, economic studies, focused discussions) to determine social and economic non-market as well as market economic benefits of the NCA. Implement appropriate monitoring and inventory as funding allows. Engage partners to accomplish goals, as appropriate. Conduct monitoring and inventories with affected communities (on-site visitors, local communities, partners, etc.) to increase understanding of recreation activity, setting and outcome preferences.	Use a variety of tools and techniques (including but not limited to surveys, economic studies, focused discussions) to determine social and economic non-market as well as market economic benefits of the NCA.	Use a variety of tools and techniques (including but not limited to surveys, economic studies, focused discussions) to determine social and economic non-market as well as market economic benefits of the NCA.
			Implement appropriate monitoring and inventory as funding allows.	Implement appropriate monitoring and inventory as funding allows.
			Engage partners to accomplish goals, as appropriate.	Engage partners to accomplish goals, as appropriate.
			Conduct monitoring and inventories with affected communities (on-site visitors, local communities, partners, etc.) to increase understanding of recreation activity, setting and outcome preferences.	

SECTION 4 – MEETING SCIENCE NEEDS

INTERNAL ORGANIZATION

Internal organization is necessary to strategically identify and address science in D-E NCA. A science coordinator has been established in D-E NCA to coordinate all scientific efforts in the unit. The NCA ecologist will serve as the science coordinator, and will coordinate with appropriate specialists as needed to address science within D-E NCA.

The role of the science coordinator is to:

1) Coordinate and collaborate to identify and prioritize D-E NCA's science needs;

2) Serve as the contact person for scientific inquiries within D-E NCA.

3) Ensure that partners and collaborators are familiar and engaged with D-E NCA's documented science needs and conduct outreach to scientific organizations to expand science partner base;

4) Coordinate with staff to approve science proposals;

5) Engage and remain engaged with partners and collaborators working within D-E NCA;

6) Ensure that results of scientific inquiries are available to BLM staff, in appropriate formats, including progress and final reports;

7) Communicate results of scientific inquiries to researchers, staff, and managers both within and outside of the BLM, and to the general public when appropriate; and,

8) As necessary, coordinate and collaborate to update and revise the D-E NCA science plan.

Additionally, the science coordinator will:

9) Conduct needed monitoring and scientific inquiries, as time permits, within D-E NCA;

10) Interpret long-term data and periodically publish results, as appropriate.

COLLABORATION AND PARTNERS

It is imperative that D-E NCA have good working relationships with a variety of partners that can assist in the diverse scientific needs of D-E NCA. As scientific study is often not part of the work that BLM field staff performs, partnering with numerous outside entities can greatly increase the BLM's ability to use science to improve management decisions and actions.

Furthermore, collaboration between BLM offices and with other government agencies, universities, and science partners can ensure that all parties have a clear and common understanding of management needs. This type of collaboration can aid in the sharing of information, which can help to save time and resources by reducing duplicative effort, and can

help to improve outcomes on broad scales by addressing common problems with common solutions.

As management questions and needs are not bound by jurisdictional boundaries, the success of management efforts in one geographical area will often be dependent on management efforts in another area. Regular conversations, inter-agency work groups, and attendance at regional and national meetings can help foster these relationships and collaborative opportunities.

There are numerous potential partners for scientific study. When appropriate, D-E NCA will coordinate research needs through the cooperative networks and with appropriate partners. This science plan will be available on the BLM science program website and provided to partners on request.

SECTION 5 – SCIENCE PROTOCOLS

SCIENCE GUIDELINES

It is anticipated that three main types of science are likely to occur within D-E NCA:

1) Assessment, inventory, and monitoring;

2) Solicited science addressing management questions/science needs; and,

3) Unsolicited contributed scientific studies.

General guidelines that apply to all of types of science in D-E NCA include:

1) All scientific investigation must comply with relevant laws and regulations.

2) All non-permitted external scientific investigations must be authorized, according to the procedures described below and as stated in the RMP.

   a. The final decision maker for granting authorization will be the D-E NCA manager.

3) Science should not impact the long-term health or sustainability of the resources of D-E NCA, especially the values for which D-E NCA was designated.

   a. If impacts are anticipated, appropriate mitigation measures will be required and the potential gains should be carefully considered and weighed against potential impacts.

4) A balance must be maintained between research and education, and preservation and protection of D-E NCA resources.

   SCI-MA-01: The general management approach regarding collection would be to prohibit collection of materials from the D-E NCA except when specimens are unique, uncommon, or scientifically or educationally significant, and when there are significant benefits to understanding the D-E NCA's purposes, management goals, or significant advances in general scientific understanding to be gained by collection, or when the site is vulnerable to vandalism or theft and there is no preferred in situ method of protecting the site. Significant as determined on a case-by-case basis by the appropriate resource specialist(s).

5) Scientists initiating research projects within D-E NCA should be aware of existing data within the BLM and should incorporate these data into projects whenever possible.

6) Proposed research within the Dominguez Canyon Wilderness Area should comply with appropriate laws and regulations including the Wilderness Act of 1964 and BLM wilderness policy (Manual 6340)

a. Proposals must be carefully evaluated for legal and policy compliance, scientific merit, and impacts and benefits (Landres 2000). A set of worksheets may be used to ensure that scientific proposals are evaluated in a consistent way and should be completed for each scientific proposal considered within the wilderness area (found here: http://www.wilderness.net/index.cfm?fuse=toolboxes&sec=resSciAct).

7) D-E NCA staff should use all available monitoring protocols to achieve adequate monitoring of the resources of D-E NCA (see Appendix C).

SCIENCE AUTHORIZATIONS

Scientific study within D-E NCA will be authorized as stated in the D-E NCA RMP.

SCI-AU-01: Require a permit or authorization from BLM for all research (paleontological, cultural, and other). Require reports as part of the permitting and authorization process.

The process described below is not meant to replace or duplicate these processes. When a prior process is already in place, it will take precedence and researchers will only need to complete one permitting process. The process outlined below will only take affect when no other permitting process applies. However, permits and authorizations will be shared between appropriate BLM state office and field office staff for research taking place within D-E NCA.

All requests should be carefully considered, weighing potential benefits and costs. The following process has been adapted from other NCL units.

1. Scientist submits proposal to D-E NCA science coordinator.
    a. Proposals must include:
        i. Investigators
            1. Contact information for the principal investigator including name, title and affiliation, email address and phone number.
            2. Names and affiliations for additional investigators.
            3. Investigator qualifications relevant to the proposed project.
        ii. Summary of proposed research (not to exceed 5 pages) including
            1. A brief explanation of background information including clear study objectives;
            2. Rationale for research; include a description of the importance and relevance of the issue to be investigated to science and to the NCA.
            3. Research methods and proposed location(s) including methods and protocols, proposed collections, and proposed data analysis.

4. Schedule of work including a timeline for field work, analysis, reporting, and completion dates.

5. Outline of public outreach effort, if appropriate.

6. Describe the proposed products to be generated as part of the project (publications, reports, collections, GIS data, etc.)

7. Budget including a brief outline of expenses associated with the project and expected funding source(s).

2. The proposal will be considered by the D-E NCA science coordinator for completeness. The coordinator will consult with staff specialists, as appropriate, to determine if the proposal is:

a. Complete;

b. Conforms to the D-E NCA Science Guidelines (including all relevant laws and regulations);

c. Conforms to the D-E NCA Resource Management Plan.

3. The science coordinator will brief the D-E NCA manager on the review of the science proposal. Subsequently, the D-E NCA manager (or the manager's designee) will grant or deny authorization to conduct the scientific investigation.

4. If a proposal is denied authorization:

a. A letter of denial will be provided to the scientist, and will include justification for the denial.

5. If a proposal is granted authorization:

a. A determination will be made as to what, if any, NEPA analysis is necessary.

b. A letter of authorization will be provided to the scientist, signed by the D-E NCA manager (or the manager's designee). The authorization may include stipulations such as NEPA analysis requirements, time limits, geographic limits, reporting requirements, and public outreach requirements.

c. The proposal will be added to an internal tracking document of on-going scientific investigations in D-E NCA, accessible by all D-E NCA staff.

d. Reporting requirements for all scientific investigations will require:

i. Progress reports (at least annually), filed with the science coordinator;

1. Progress reports should include status of the investigation and preliminary findings when possible.

ii. Final reports, filed with the science coordinator;

1. Final report should include:

a. Research background and results;

b. Discussion of the results including how the results are relevant to the NCL unit and potential management decisions;

c. A summary of the public outreach effort if appropriate;

d. Raw data where appropriate; and,

e. Electronic copies of any published papers resulting from the scientific investigation.

iii. Manager's summary report

1. Manager's summary reports are brief presentations (in any appropriate format) of research results to BLM managers, which ensure that:
    a. Management questions are answered;
    b. Managers have a full understanding of scientific findings; and,
    c. Managers can incorporate these findings into their management decisions.

iv. If results of research are not sensitive material (for example some cultural and paleontological studies), a public outreach component.

6. The authorization is routed to D-E NCA and GJFO and/or UFO staff.
    a. Copies of the authorization will be made available to BLM staff, for example on the shared drive.
        i. Sensitive topics, for example location of specific cultural or paleontological sites, should be excluded from public information for protection of resources.
7. Research is initiated.
    a. Research must be conducted according to the stipulations outlined in the authorization.
8. Research is completed, and final report is filed with the science coordinator.

SECTION 6 – ORGANIZATION AND COMMUNICATION OF COMPLETED SCIENCE

INTERNAL ORGANIZATION OF COMPLETED SCIENCE

All reports, as described in Section 5, submitted to the D-E NCA science coordinator will be stored and organized on a shared drive, or via a similar medium (e.g. a Sharepoint site), accessible by all D-E NCA staff. The science coordinator should aim to organize periodic presentations of scientific results to D-E NCA staff.

CONTRIBUTIONS TO BROADER BLM ORGANIZATIONS OF COMPLETED SCIENCE

The D-E NCA science coordinator will comply, in a timely manner, with all requests for completed scientific investigations, information, and/or reports from BLM Field Offices, District Offices, State Offices, and Washington D.C. Office.

COMMUNICATING SCIENTIFIC RESULTS TO THE PUBLIC

The science coordinator will strive to make information on science projects within D-E NCA accessible to the general public. The format to present material may include but is not limited

to: links to short informational videos or written descriptions of scientific inquiries occurring within D-E NCA, public presentations, and citations of published research papers.

The general public has a vested interest in D-E NCA, which is heavily utilized by varied outdoor enthusiasts. Thus, sharing what research is occurring (or has occurred) within D-E NCA and why it is occurring (or has occurred) should be a priority, and can help avoid confusion and discontent that can stem from misunderstandings about the nature of scientific inquiries. However, while communication with the public is important, sensitive information about certain scientific projects may need to be kept confidential to ensure the protection of these resources.

SECTION 7 – INTEGRATING SCIENCE INTO MANAGEMENT

INTEGRATING SCIENTIFIC FINDINGS INTO MANAGEMENT DECISIONS

It is the responsibility of the science coordinator to ensure that scientific findings are communicated to managers and specialists. Managers can then use scientific information as they deem appropriate.

Written progress reports, final reports, published papers, and manager's summary will all be available to decision-makers, as described in Section 6, to help inform decisions. Furthermore, direct dialogue between scientists and managers will be encouraged.

SECTION 8 – SIGNATURE PAGE

SIGNTAURE PAGE

I approve the Dominguez-Escalante National Conservation Area Science Plan.

This plan will be used as the basis for conducting science in the Dominguez-Escalante NCA and Dominguez Canyon Wilderness. "Science" is defined in Section 1 of this plan.

As a living and working document, this plan will be updated no less than every five years, preferably more frequently. Scientific needs that emerge during the course of implementing this plan may be added to the plan on an as-needed basis to meet the unit's scientific mission.

3/29/19

M. Nikki Grant-Hoffman, Science Coordinator — Date
Dominguez-Escalante National Conservation Area

3/29/19

Collin Ewing, NCA Manager — Date
Dominguez-Escalante National Conservation Area

D-E NCA References

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APPENDIX 1 UNIT'S LEGISLATION: OMNIBUS PUBLIC LAND MANAGEMENT ACT OF 2009, PUBLIC LAW 111-11

Legislation Designating Dominguez-Escalante National Conservation Area and Dominguez Canyon Wilderness Area

Omnibus Public Land Management Act of 2009, Subtitle E—
Dominguez-Escalante National Conservation Area
Public Law 111-11

SEC. 2401. DEFINITIONS. (16 USCS 460zzz)

In this subtitle:

(1) Conservation area.--The term "Conservation Area" means the Dominguez-Escalante National Conservation Area established by section 2402(a)(1).

(2) Council.--The term "Council" means the Dominguez-Escalante National Conservation Area Advisory Council established under section 2407.

(3) Management plan.--The term "management plan" means the management plan developed under section 2406.

(4) Map.--The term "Map" means the map entitled "Dominguez-Escalante National Conservation Area" and dated September 15, 2008.

(5) Secretary.--The term "Secretary" means the Secretary of the Interior.

(6) State.--The term "State" means the State of Colorado.

(7) Wilderness.--The term "Wilderness" means the Dominguez Canyon Wilderness Area designated by section 2403(a).

SEC. 2402. DOMINGUEZ-ESCALANTE NATIONAL CONSERVATION AREA. (16 USCS 460zzz-1)

(a) Establishment.--
(1) In general.--There is established the Dominguez-Escalante National Conservation Area in the State.

(2) Area included.--The Conservation Area shall consist of approximately 209,610 acres of public land, as generally depicted on the Map.

(b) Purposes.--The purposes of the Conservation Area are to conserve and protect for the benefit and enjoyment of present and future generations--

(1) the unique and important resources and values of the land, including the geological, cultural, archaeological, paleontological, natural, scientific, recreational, wilderness, wildlife, riparian, historical, educational, and scenic resources of the public land; and

(2) the water resources of area streams, based on seasonally available flows, that are necessary to support aquatic, riparian, and terrestrial species and communities.

(c) Management.—

(1) In general.--The Secretary shall manage the Conservation Area—

(A) as a component of the National Landscape Conservation System;

(B) in a manner that conserves, protects, and enhances the resources and values of the Conservation Area described in subsection (b); and

(C) in accordance with—

(i) the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.);

(ii) this subtitle; and

(iii) any other applicable laws.

(2) Uses.—

(A) In general.--The Secretary shall allow only such uses of the Conservation Area as the Secretary determines would further the purposes for which the Conservation Area is established.

(B) Use of motorized vehicles.—

(i) In general.--Except as provided in clauses (ii) and (iii), use of motorized vehicles in the Conservation Area shall be allowed—

(I) before the effective date of the management plan, only on roads and trails designated for use of motor vehicles in the management plan that applies on the date of the enactment of this Act to the public land in the Conservation Area; and

(II) after the effective date of the management plan, only on roads and trails designated in the management plan for the use of motor vehicles.

(ii) Administrative and emergency response use.--Clause (i) shall not limit the use of motor vehicles in the Conservation Area for administrative purposes or to respond to an emergency.

(iii) Limitation.--This subparagraph shall not apply to the Wilderness.

SEC. 2403. DOMINGUEZ CANYON WILDERNESS AREA. (16 USCS 460zzz-2; 16 U.S.C. 1132 note.)

(a) In General.--In accordance with the Wilderness Act (16 U.S.C. 1131 et seq.), the approximately 66,280 acres of public land in Mesa, Montrose, and Delta Counties, Colorado, as generally depicted on the Map, is designated as wilderness and as a component of the National Wilderness Preservation System, to be known as the "Dominguez Canyon Wilderness Area".

(b) Administration of Wilderness.--The Wilderness shall be managed by the Secretary in accordance with the Wilderness Act (16 U.S.C. 1131 et seq.) and this subtitle, except that—

(1) any reference in the Wilderness Act to the effective date of that Act shall be considered to be a reference to the date of enactment of this Act; and

(2) any reference in the Wilderness Act to the Secretary of Agriculture shall be considered to be a reference to the Secretary of the Interior.

SEC. 2404. MAPS AND LEGAL DESCRIPTIONS. (16 USCS 460zzz-3)

(a) In General.--As soon as practicable after the date of enactment of this Act, the Secretary shall file a map and a legal description of the Conservation Area and the Wilderness with—

(1) the Committee on Energy and Natural Resources of the Senate; and

(2) the Committee on Natural Resources of the House of Representatives.

(b) Force and Effect.--The Map and legal descriptions filed under subsection (a) shall have the same force and effect as if included in this subtitle, except that the Secretary may correct clerical and typographical errors in the Map and legal descriptions.

(c) Public Availability.--The Map and legal descriptions filed under subsection (a) shall be available for public inspection in the appropriate offices of the Bureau of Land Management.

SEC. 2405. MANAGEMENT OF CONSERVATION AREA AND WILDERNESS. (16 USCS 460zzz-4)

(a) Withdrawal.--Subject to valid existing rights, all Federal land within the Conservation Area and the Wilderness and all land and interests in land acquired by the United States within the Conservation Area or the Wilderness is withdrawn from—

(1) all forms of entry, appropriation, or disposal under the public land laws;

(2) location, entry, and patent under the mining laws; and

(3) operation of the mineral leasing, mineral materials, and geothermal leasing laws.

(b) Grazing.—

(1) Grazing in conservation area.--Except as provided in paragraph (2), the Secretary shall issue and administer any grazing leases or permits in the Conservation Area in accordance with the laws (including regulations) applicable to the issuance and administration of such leases and permits on other land under the jurisdiction of the Bureau of Land Management.

(2) Grazing in wilderness.--The grazing of livestock in the Wilderness, if established as of the date of enactment of this Act, shall be permitted to continue—

(A) subject to any reasonable regulations, policies, and practices that the Secretary determines to be necessary; and

(B) in accordance with—

(i) section 4(d)(4) of the Wilderness Act (16 U.S.C. 1133(d)(4)); and

(ii) the guidelines set forth in Appendix A of the report of the Committee on Interior and Insular Affairs of the House of Representatives accompanying H.R. 2570 of the 101st Congress (H. Rept. 101-405).

(c) No Buffer Zones.—
(1) In general.--Nothing in this subtitle creates a protective perimeter or buffer zone around the Conservation Area.
(2) Activities outside conservation area.--The fact that an activity or use on land outside the Conservation Area can be seen or heard within the Conservation Area shall not preclude the activity or use outside the boundary of the Conservation Area.

(d) Acquisition of Land.—
(1) In general.--The Secretary may acquire non-Federal land within the boundaries of the Conservation Area or the Wilderness only through exchange, donation, or purchase from a willing seller.
(2) Management.--Land acquired under paragraph (1) shall—
(A) become part of the Conservation Area and, if applicable, the Wilderness; and
(B) be managed in accordance with this subtitle and any other applicable laws.

(e) Fire, Insects, and Diseases.--Subject to such terms and conditions as the Secretary determines to be desirable and appropriate, the Secretary may undertake such measures as are necessary to control fire, insects, and diseases—
(1) in the Wilderness, in accordance with section 4(d)(1) of the Wilderness Act (16 U.S.C. 1133(d)(1)); and
(2) except as provided in paragraph (1), in the Conservation Area in accordance with this subtitle and any other applicable laws.

(f) Access.--The Secretary shall continue to provide private landowners adequate access to inholdings in the Conservation Area.

(g) Invasive Species and Noxious Weeds.--In accordance with any applicable laws and subject to such terms and conditions as the Secretary determines to be desirable and appropriate, the Secretary may prescribe measures to control nonnative invasive plants and noxious weeds within the Conservation Area.

(h) Water Rights.—
(1) Effect.--Nothing in this subtitle—
(A) affects the use or allocation, in existence on the date of enactment of this Act, of any water, water right, or interest in water;
(B) affects any vested absolute or decreed conditional water right in existence on the date of enactment of this Act, including any water right held by the United States;
(C) affects any interstate water compact in existence on the date of enactment of this Act;
(D) authorizes or imposes any new reserved Federal water rights; or
(E) shall be considered to be a relinquishment or reduction of any water rights reserved or appropriated by the United States in the State on or before the date of enactment of this Act.
(2) Wilderness water rights.—
(A) In general.--The Secretary shall ensure that any water rights within the Wilderness required to fulfill the purposes of the Wilderness are secured in accordance with subparagraphs (B) through (G).

(B) State law.—
(i) Procedural requirements.--Any water rights within the Wilderness for which the Secretary pursues adjudication shall be adjudicated, changed, and administered in accordance with the procedural requirements and priority system of State law.
(ii) Establishment of water rights.—
(I) In general.--Except as provided in subclause (II), the purposes and other substantive characteristics of the water rights pursued under this paragraph shall be established in accordance with State law.
(II) Exception.--Notwithstanding subclause (I) and in accordance with this subtitle, the Secretary may appropriate and seek adjudication of water rights to maintain surface water levels and stream flows on and across the Wilderness to fulfill the purposes of the Wilderness.
(C) Deadline.--The Secretary shall promptly, but not earlier than January 2009, appropriate the water rights required to fulfill the purposes of the Wilderness.
(D) Required determination.--The Secretary shall not pursue adjudication for any instream flow water rights unless the Secretary makes a determination pursuant to subparagraph (E)(ii) or (F).
(E) Cooperative enforcement.—
(i) In general.--The Secretary shall not pursue adjudication of any Federal instream flow water rights established under this paragraph if—
(I) the Secretary determines, upon adjudication of the water rights by the Colorado Water Conservation Board, that the Board holds water rights sufficient in priority, amount, and timing to fulfill the purposes of the Wilderness; and
(II) the Secretary has entered into a perpetual agreement with the Colorado Water Conservation Board to ensure the full exercise, protection, and enforcement of the State water rights within the Wilderness to reliably fulfill the purposes of the Wilderness.
(ii) Adjudication.--If the Secretary determines that the provisions of clause (i) have not been met, the Secretary shall adjudicate and exercise any Federal water rights required to fulfill the purposes of the Wilderness in accordance with this paragraph.
(F) Insufficient water rights.--If the Colorado Water Conservation Board modifies the instream flow water rights obtained under subparagraph (E) to such a degree that the Secretary determines that water rights held by the State are insufficient to fulfill the purposes of the Wilderness, the Secretary shall adjudicate and exercise Federal water rights required to fulfill the purposes of the Wilderness in accordance with subparagraph (B).
(G) Failure to comply.--The Secretary shall promptly act to exercise and enforce the water rights described in subparagraph (E) if the Secretary determines that—
(i) the State is not exercising its water rights consistent with subparagraph (E)(i)(I); or
(ii) the agreement described in subparagraph (E)(i)(II) is not fulfilled or complied with sufficiently to fulfill the purposes of the Wilderness.
(3) Water resource facility.—
(A) In general.--Notwithstanding any other provision of law and subject to subparagraph (B), beginning on the date of enactment of this Act, neither the President nor any other officer, employee, or agent of the United States shall fund, assist, authorize, or issue a license or permit for the development of any new irrigation and pumping facility,

reservoir, water conservation work, aqueduct, canal, ditch, pipeline, well, hydropower project, transmission, other ancillary facility, or other water, diversion, storage, or carriage structure in the Wilderness.

(B) Exception.--Notwithstanding subparagraph (A), the Secretary may allow construction of new livestock watering facilities within the Wilderness in accordance with—

(i) section 4(d)(4) of the Wilderness Act (16 U.S.C. 1133(d)(4)); and

(ii) the guidelines set forth in Appendix A of the report of the Committee on Interior and Insular Affairs of the House of Representatives accompanying H.R. 2570 of the 101st Congress (H. Rept. 101-405).

(4) Conservation area water rights.--With respect to water within the Conservation Area, nothing in this subtitle—

(A) authorizes any Federal agency to appropriate or otherwise acquire any water right on the mainstem of the Gunnison River; or

(B) prevents the State from appropriating or acquiring, or requires the State to appropriate or acquire, an instream flow water right on the mainstem of the Gunnison River.

(5) Wilderness boundaries along Gunnison river.—

(A) In general.--In areas in which the Gunnison River is used as a reference for defining the boundary of the Wilderness, the boundary shall—

(i) be located at the edge of the river; and

(ii) change according to the river level.

(B) Exclusion from wilderness.--Regardless of the level of the Gunnison River, no portion of the Gunnison River is included in the Wilderness.

(i) Effect.--Nothing in this subtitle—

(1) diminishes the jurisdiction of the State with respect to fish and wildlife in the State; or

(2) imposes any Federal water quality standard upstream of the Conservation Area or within the mainstem of the Gunnison River that is more restrictive than would be applicable had the Conservation Area not been established.

(j) Valid Existing Rights.--The designation of the Conservation Area and Wilderness is subject to valid rights in existence on the date of enactment of this Act.

SEC. 2406. MANAGEMENT PLAN. (16 USCS 460zzz-5)

(a) In General.--Not later than 3 years after the date of enactment of this Act, the Secretary shall develop a comprehensive management plan for the long-term protection and management of the Conservation Area.

(b) Purposes.--The management plan shall—

(1) describe the appropriate uses and management of the Conservation Area;

(2) be developed with extensive public input;

(3) take into consideration any information developed in studies of the land within the Conservation Area; and

(4) include a comprehensive travel management plan.

SEC. 2407. ADVISORY COUNCIL. (16 USCS 460zzz-6)

(a) Establishment.--Not later than 180 days after the date of enactment of this Act, the Secretary shall establish an advisory council, to be known as the "Dominguez-Escalante National Conservation Area Advisory Council".

(b) Duties.--The Council shall advise the Secretary with respect to the preparation and implementation of the management plan.

(c) Applicable Law.--The Council shall be subject to—
(1) the Federal Advisory Committee Act (5 U.S.C. App.); and
(2) the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.).

(d) Members.--The Council shall include 10 members to be appointed by the Secretary, of whom, to the extent practicable—
(1) 1 member shall be appointed after considering the recommendations of the Mesa County Commission;
(2) 1 member shall be appointed after considering the recommendations of the Montrose County Commission;
(3) 1 member shall be appointed after considering the recommendations of the Delta County Commission;
(4) 1 member shall be appointed after considering the recommendations of the permittees holding grazing allotments within the Conservation Area or the Wilderness; and
(5) 5 members shall reside in, or within reasonable proximity to, Mesa County, Delta County, or Montrose County, Colorado, with backgrounds that reflect—
(A) the purposes for which the Conservation Area or Wilderness was established; and
(B) the interests of the stakeholders that are affected by the planning and management of the Conservation Area and Wilderness.

(e) Representation.--The Secretary shall ensure that the membership of the Council is fairly balanced in terms of the points of view represented and the functions to be performed by the Council.

(f) Duration.--The Council shall terminate on the date that is 1 year from the date on which the management plan is adopted by the Secretary.

SEC. 2408. AUTHORIZATION OF APPROPRIATIONS. (16 USCS 460zzz-7)

There are authorized to be appropriated such sums as are necessary to carry out this subtitle.

APPENDIX 2 BLM COLORADO SENSITIVE SPECIES LIST

Common Name	Scientific Name	Designation of other agencies: CNHP Global and State Ranking: G_/ S_; Forest Service Sensitive: FS; Colorado Parks and Wildlife: SGCN Tier_, and State Listed S_.	Occurrence in BLM Districts/ Field Offices/NLCS Units					
			Northwest Dist.		Southwest Dist.		Front Range Dist.	
			FO	NLCS	FO	NLCS	FO	NLCS
MAMMALS								
Townsend's big-eared bat	*Corynorhinus townsendii pallescens*	G3G4T3T4/S2, FS, SGCN Tier 1, SC	GJ, CRV, WR	DENCA, MCNCA	TR, UN	CANM, DENCA, GGNCA	SLV, RG	BC
Gunnison's prairie dog	*Cynomys gunnisoni*	G5/S5, FS, SGCN Tier 1			GN, TR, UN		SLV, RG	BC
White-tailed prairie dog	*Cynomys leucurus*	G4/S4, FS, SGCN Tier 1	GJ, K, LS, WR	DENCA	UN	DENCA, GGNCA		
Black-tailed prairie dog	*Cynomys ludovicianus*	G4/S3, FS, SGCN Tier 1, SC					RG	
Spotted bat	*Euderma maculatum*	G4/S2, FS, SGCN Tier 1	CRV, GJ, LS, WR	DENCA	TR, UN	CANM, DENCA, GGNCA	SLV	
Allen's (Mexican) big-eared bat	*Idionycteris phyllotis*	G4/S2S3, FS, SGCN Tier 2			TR, UN	CANM	SLV	
Fringed myotis	*Myotis thysanodes*	G4/S3, FS, SGCN Tier 1	GJ, CRV, WR	DENCA	TR, UN	CANM, DENCA, GGNCA	RG, SLV	BC
Rocky mountain bighorn sheep	*Ovis canadensis*	G4S4, SGCN Tier 2	K, GJ, CRV		UN GU TR	GGNCA	SLV RG	BC
Desert bighorn sheep	*Ovis canadensis nelsoni*	G4T4; FS, SGCN Tier 2	GJ	DENCA MCNCA	TR, UN	DENCA,		
Kit fox	*Vulpes macrotis*	G4/S1, FS, SGCN Tier 1, SE	GJ	DENCA MCNCA	UN	DENCA, GGNCA		
Swift fox	*Vulpes velox*	G3/S3, FS, SGCN Tier 1, SC					RG, SLV	
BIRDS								

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Common Name	Scientific Name	Designation of other agencies: CNHP Global and State Ranking: G_/ S_; Forest Service Sensitive: FS; Colorado Parks and Wildlife: SGCN Tier_, and State Listed S_.	Occurrence in BLM Districts/ Field Offices/NLCS Units					
			Northwest Dist.		Southwest Dist.		Front Range Dist.	
			FO	NLCS	FO	NLCS	FO	NLCS
Northern goshawk	*Accipter gentilis*	G5/S3B, FS, SGCN Tier 1	GJ, CRV, K, LS, WR		GN, TR, UN		SLV, RG	BC
Golden Eagle	*Aquila chrysaetos*	G5/S3S4B, SGCN Tier 1, population stable, [ranking in other states: S4 in AZ, ID, NV, UT, WY]	GJ, CRV, K, LS, WR	MCNCA DENCA	GN, TR, UN	CANM, DENCA, GGNCA	SLV, RG	BC
Burrowing owl	*Athene cunicularia*	G4/S4B, FS, ST, SGCN Tier 1	GJ, LS, WR, K	MCNCA DENCA	TR, UN GU	CANM, DENCA, GGNCA	SLV RG	BC
Ferruginous hawk	*Buteo regalis*	G4/S3BS4N, FS, SGCN Tier 1, SC	GJ, LS, K, WR CRV	DENCA MCNCA	TR, UN GU	DENCA, GGNCA	SLV, RG	BC
Greater sage-grouse	*Centrocercus urophasianus*	*Federal Candidate*, G3G4/S4, FS, SGCN Tier 1, SC	GJ, CRV, K, LS, WR					
Western snowy plover (breeding only)	*Charadrius alexandrinus nivosus*	G3T3/S1B, SGCN Tier 1, SC					SLV, RG	
Mountain plover	*Charadrius montanus*	G3/S2B, FS, SGCN Tier 1, SC	LS, K, WR	MCNCA			SLV, RG	
Black swift	*Cypseloides niger*	G4/S3B, FS, SGCN Tier 2	CRV		GN, TR		SLV	

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Common Name	Scientific Name	Designation of other agencies: CNHP Global and State Ranking: G_/ S_; Forest Service Sensitive: FS; Colorado Parks and Wildlife: SGCN Tier_, and State Listed S_.	Occurrence in BLM Districts/ Field Offices/NLCS Units					
			Northwest Dist.		Southwest Dist.		Front Range Dist.	
			FO	NLCS	FO	NLCS	FO	NLCS
American peregrine falcon	*Falco peregrinus anatum*	G4T4/S2B, FS, SGCN Tier 1, SC	LS, CRV, WR, K GJ	DENCA MCNCA	TR, UN GU	CANM, DENCA, GGNCA	SLV RG	BC
Bald eagle	*Haliaeetus leucocephalus*	G5/S1B/S3N, FS, SGCN Tier 1, SC	GJ, CRV, LS, WR, K	MCNCA DENCA	GN, TR, UN	DENCA, GGNCA CANM	SLV, RG	BC
Long-billed curlew (breeding only)	*Numenius americanus*	G5/S2B, FS, SGCN Tier 1, SC					SLV RG	
White-faced ibis (breeding only)	*Plegadis chihi*	G5/S2B, SGCN Tier 2					SLV RG	
American white pelican (breeding only)	*Pelecanus erythrorhynchos*	G4/S1B, SGCN Tier 2, population stable					SLV, RG	
Brewer's sparrow	*Spizella berweri*	G5/S4B, SGCN Tier 1	GJ, K, LS, WR CRV	DENCA MCNCA	GN, TR, UN	CANM, DENCA, GGNCA	SLV, RG	BC
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbian*	G4T3/S2, FS, SGCN Tier 1, population trend stable, SC [ranking in other states: S1 in ID, NV, OR, and WY]	LS, WR, K CRV		TR,			
FISH								
Bluehead sucker	*Catostomus discobolus*	G4/S4, FS, SGCN Tier 2	GJ, CRV, K, LS, WR	DENCA MCNCA	TR, UN	CANM, DENCA, GGNCA		

Common Name	Scientific Name	Designation of other agencies: CNHP Global and State Ranking: G_/ S_; Forest Service Sensitive: FS; Colorado Parks and Wildlife: SGCN Tier_, and State Listed S_.	Occurrence in BLM Districts/ Field Offices/NLCS Units					
			Northwest Dist.		Southwest Dist.		Front Range Dist.	
			FO	NLCS	FO	NLCS	FO	NLCS
Flannelmouth sucker	*Catostomas latipinnis*	G3G4/S3, FS, SGCN Tier 2	GJ, CRV, K, LS, WR	DENCA MCNCA	TR, UN	CANM, DENCA, GGNCA		
Mountain sucker	*Catostomas platyrhynchus*	G5/S2?, FS, SGCN Tier 2, SC	CRV, LS, WR					
Rio Grande sucker	*Catostomus plebeius*	G3G4/S1, FS, SGCN Tier 1, SE					SLV	
Arkansas darter	*Etheostoma cragini*	*Federal Candidate*, G3G4/S2, SGCN Tier 1, ST					RG	
Rio Grande chub	*Gila pandora*	G3/S1?, FS, SGCN Tier 1, SC					SLV	
Roundtail chub	*Gila robusta*	G3/ S2, FS, SGCN Tier 1, SC	GJ, CRV, LS, WR	DENCA MCNCA	TR, UN	CANM, DENCA, GGNCA		
Colorado River cutthroat trout	*Oncorhynchus clarki pleuriticus*	G4T3/S3, FS, SGCN Tier 1, SC	GJ, CRV, K, LS, WR	DENCA	GN, TR, UN	DENCA, GGNCA		
Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	G4T3/S3, FS, SGCN Tier 1, SC					SLV,	
REPTILES								
Midget faded rattlesnake	*Crotalus viridis concolor*	G5T4/S3?, SGCN Tier 2, SC	GJ, CRV, LS, WR	DENCA MCNCA	UN, TR	DENCA, GGNCA		
Longnose leopard lizard	*Gambelia wislizenii*	G5/S1, SGCN Tier 2, SC	GJ	MCNCA	TR, UN	CANM		
Common kingsnake	*Lampropeltis getula*	G5/S1, SGCN Tier 2, SC					RG	
Massasauga	*Sistrurus catenatus*	G3G4/S2, FS, SGCN Tier 1, SC					RG	

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Common Name	Scientific Name	Designation of other agencies: CNHP Global and State Ranking: G_/ S_; Forest Service Sensitive: FS; Colorado Parks and Wildlife: SGCN Tier_, and State Listed S_.	Occurrence in BLM Districts/ Field Offices/NLCS Units					
			Northwest Dist.		Southwest Dist.		Front Range Dist.	
			FO	NLCS	FO	NLCS	FO	NLCS
AMPHIBIANS								
Northern cricket frog	*Acris crepitans*	G5/SH, SGCN Tier 2, SC					RG	
Boreal toad	*Anaxyrus boreas boreas*	G4T1Q/S1, FS, SGCN Tier 1, SE,	LS, WR CRV KR		GN, TR		SLV RG	BC
Canyon treefrog	*Hyla arenicolor*	G5/ S2, SGCN Tier 2	GJ	DENCA MCNCA	TR, UN	DENCA, GGNCA		
Plain's leopard frog	*Rana blairi*	G5/S3, FS, SGCN Tier 1, SC					RG	
Northern leopard frog	*Rana pipiens*	G5/S3, FS, SGCN Tier 1, SC	GJ, CRV, K, LS, WR	DENCA MCNCA	TR, UN GN	DENCA, GGNCA CANM	RG, SLV	BC
INVERTEBRATES								
Butterfly, Great Basin silverspot	*Speyeria nokomis nokomis*	G3T1/S1, FS, SGCN Tier 2	GJ		TR, UN			
PLANTS								
Narrow-stem gilia	*Aliciella stenothyrsa (Gilia stenothyrsa)*	G3/S1	GJ, WR					
Jones' bluestar	*Amsonia jonesii*	G4/S1	GJ	MCNCA	TR			
Rydberg's golden columbine	*Aquilegia chrysantha var. rydbergii*	G4T1/S1; FS					RG	
Crandall's rockcress	*Arabis crandallii (Boechera crandallii)*	G4/S2			UN		RG	BC
Dwarf milkweed	*Asclepias uncialis*	G3G4/T2T3/S2; FS					RG	
Gunnison milkvetch	*Astragalus anisus*	G3/G2			GN			
DeBeque milkvetch	*Astragalus debequaeus*	G2/S2	GJ, CRV					
Horseshoe milkvetch	*Astragalus equisolensis*	G5T1/S1	GJ					
Debris milkvetch	*Astragalus detritalis*	G3/S2	WR					

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Common Name	Scientific Name	Designation of other agencies: CNHP Global and State Ranking: G_/ S_; Forest Service Sensitive: FS; Colorado Parks and Wildlife: SGCN Tier_, and State Listed S_.	Occurrence in BLM Districts/ Field Offices/NLCS Units					
			Northwest Dist.		Southwest Dist.		Front Range Dist.	
			FO	NLCS	FO	NLCS	FO	NLCS
Duchesne milkvetch	*Astragalus duchesnensis*	G3/S1S2	LS, WR					
Grand Junction milkvetch	*Astragalus linifolius*	G3Q/S3	GJ	DENCA	UN	DENCA		
Skiff milkvetch	*Astragalus microcymbus*	G1/S1 Federal candidate			GN			
Ferron's milkvetch	*Astragalus musiniensis*	G3/S1	GJ					
Naturita milkvetch	*Astragalus naturitensis*	G2G3/S2S3	GJ, CRV	DENCA	TR, UN	DENCA		
Fisher milkvetch	*Astragalus piscator*	G2G3	GJ					
San Rafael milkvetch	*Astragalus rafaelensis*	G3Q/S1	GJ		UN			
Ripley's milkvetch	*Astragalus ripleyi*	G3/S2; FS					SLV	
Sandstone milkvetch	*Astragalus sesquiflorus*	G3/S1?			UN			
Grand Junction suncup	*Camissonia eastwoodiae*	G2/S1	GJ	MCNCA				
Slender spiderflower	*Cleome multicaulis*	G2G3/S2S3					SLV	
Crescent bugseed	*Corispermum navicula*	G1?/S1	K					
Tufted cryptantha	*Cryptantha caespitosa (Oreocarya caespitosa)*	G3/S2	LS, WR					
Gypsum Valley cateye	*Oreocarya revealii*	G2/S2	GJ		TR			
Osterhout's cryptantha	*Cryptantha osterhoutii (Oreocarya osterhoutii)*	G3/S1S2	GJ	MCNCA	GN			
Rollins' cryptantha	*Cryptantha rollinsii (Oreocarya rollinsii)*	G4/S2	WR					
Fragile rockbrake	*Cryptogramma stelleri*	G5/S2	K		TR		SLV	
Uinta Basin springparsley	*Cymopterus duchesnensis*	G3/S1	LS					
Kachina fleabane	*Erigeron kachinensis*	G2/S1	GJ		TR			
Singlestem buckwheat	*Eriogonum acaule*	G3/S1	LS					
Brandegee's buckwheat	*Eriogonum brandegeei*	G1G2/S1S2; FS					RG	BC
Comb Wash buckwheat	*Eriogonum clavellatum*	G2/S1			TR			
Colorado buckwheat	*Eriogonum coloradense*	G3/S2			GN		RG	

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Common Name	Scientific Name	Designation of other agencies: CNHP Global and State Ranking: G_/ S_; Forest Service Sensitive: FS; Colorado Parks and Wildlife: SGCN Tier_, and State Listed S_.	Occurrence in BLM Districts/ Field Offices/NLCS Units					
			Northwest Dist.		Southwest Dist.		Front Range Dist.	
			FO	NLCS	FO	NLCS	FO	NLCS
Grand buckwheat	*Eriogonum contortum*	G3/S2	GJ	MCNCA				
Ephedra buckwheat	*Eriogonum ephedroides*	G3/S1	WR					
Woodside buckwheat	*Eriogonum tumulosum*	G3Q/S2	LS					
Clay hill buckwheat	*Eriogonum viridulum*	G4Q/S1	LS					
Tufted frasera	*Frasera paniculata*	G4/S1	GJ					
Cathedral Bluff dwarf gentian	*Gentianella tortuosa*	G3?/S1	WR					
Lone Mesa snakeweed	*Gutierrezia elegans*	G1/S1			TR			
Piceance bladderpod	*Physaria parviflora*	G2/S2	GJ, WR					
Pagosa Springs bladderpod	*Physaria pruinosa*	G2/S2; FS			TR			
Uncompaghre bladderpod	*Physaria vicina*	G2/S2		DENCA	UN	DENCA, GGNCA		
Adobe desertparsley	*Lomatium concinnum*	G2G3/S2S3			UN	GGNCA		
Canyonlands biscuitroot	*Lomatium latilobum (Aletes latilobus)*	G1/S1	GJ	MCNCA				
Paradox lupine	*Lupinus crassus*	G2/S2			UN			
Dolores River skeletonplant	*Lygodesmia grandiflora* var. *doloresensis*	G1G2/S1S2	GJ	MCNCA	TR			
Gold blazingstar	*Mentzelia chrysantha (Nuttallia chrysantha)*	G2/S2					RG	
Royal Gorge blazingstar	*Mentzelia densa (Nuttallia densa)*	G2/S2					RG	
Roan cliffs blazingstar	*Mentzelia rhizomata (Nuttallia argillosa, Mentzelia argillosa)*	G2/S2	GJ, CRV					
Rock-loving neoparrya	*Neoparrya lithophila (Aletes lithophilus)*	G3/S3; FS					SLV, RG	
Flaming Gorge evening	*Oenothera acutissima*	G2/S2	LS,					

This Attachment is not Section 508 compliant.
Please contact Carol Dawson for information and access if needed.

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Common Name	Scientific Name	Designation of other agencies: CNHP Global and State Ranking: G_/ S_; Forest Service Sensitive: FS; Colorado Parks and Wildlife: SGCN Tier_, and State Listed S_.	Occurrence in BLM Districts/ Field Offices/NLCS Units					
			Northwest Dist.		Southwest Dist.		Front Range Dist.	
			FO	NLCS	FO	NLCS	FO	NLCS
primrose			WR					
Bessey Locoweed	*Oxytropis besseyi var. 0obnapiformis*	G5T2/S2	WR					
Few-flower ragwort	*Packera pauciflora*	G4G5/S1S2					RG	
Colorado feverfew	*Parthenium ligulatum (Bolophyta ligulata)*	G3/S2	LS, WR					
Aromatic Indian breadroot	*Pediomelum aromaticum*	G3/S2	GJ	MCNCA	TR, UN			
Degener's beardtongue	*Penstemon degeneri*	G2/S2					RG	
Gibbens' beardtongue	*Penstemon gibbensii*	G1G2/S1	LS					
Graham's beardtongue	*Penstemon grahamii*	G2/S1	WR					
Harrington's beardtongue	*Penstemon harringtonii*	G3/S3; FS	CRV, K					
White River beardtongue	*Penstemon scariosus* var. *albifluvis*	G4T1/S1	WR					
Yampa beardtongue	*Penstemon acaulis var. yampaensis (Penstemon yampaensis)*	G3/T2/S2	LS					
Cushion bladderpod	*Physaria pulvinata*	G1/S1			TR			
Pale blue-eyed grass	*Sisyrinchium pallidum*	G2G3/S2	K				RG, SLV	
Rock tansy	*Sphaeromeria capitata*	G3/S1	LS					
Cathedral Bluff meadow-rue	*Thalictrum heliophilum*	G2/S2, FS	GJ, CRV, WR					
Hairy Townsend daisy	*Townsendia strigosa*	G4/S1	LS, GJ					
Rolland's bulrush	*Trichophroum pumilum (Scirpus rollandii)*	G5/S2			GN		RG	

*Field Offices:
CRV = Colorado River Valley
GJ = Grand Junction

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GN = Gunnison
K = Kremmling
LS = Little Snake
RG = Royal Gorge
SLV = San Luis Valley
TR = Tres Rios
UN = Uncompahgre
WR = White River

*NLCS Units:
BC – Browns Canyon National Monument
CANM = Canyons of the Ancients NM
DENCA = Dominguez-Escalante NCA
GGNCA = Gunnison Gorge NCA
MCNCA = McInnis Canyons NCA

APPENDIX 2 DOMINGUEZ-ESCALANTE NATIONAL CONSERVATION AREA MONITORING PLAN

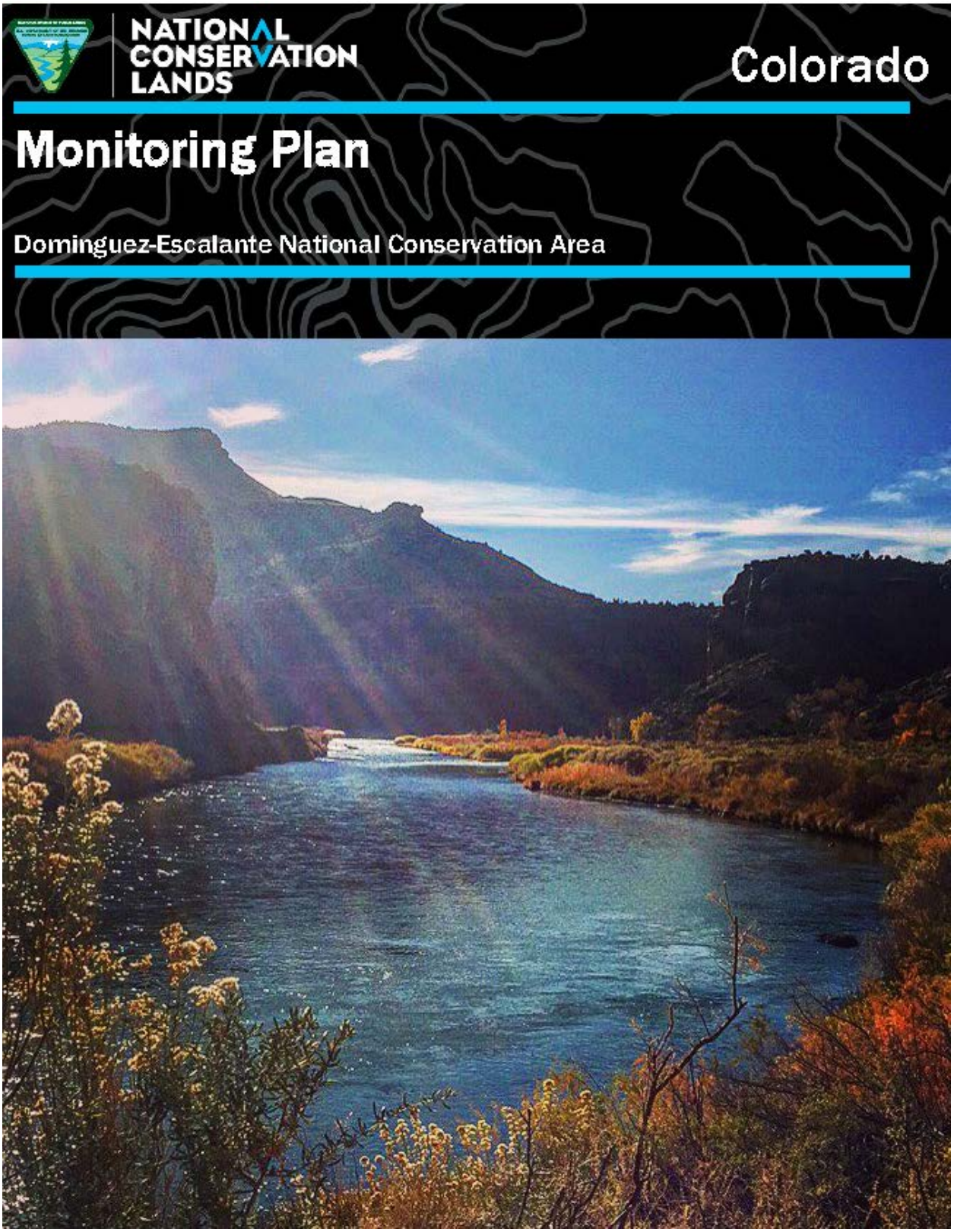
NATIONAL
CONSERVATION
LANDS
Colorado
Monitoring Plan
Dominguez-Escalante National Conservation Area

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Table of Contents

Introduction

The Dominguez-Escalante National Conservation Area (D-E NCA) consists of 210,172 acres of land that is managed by both the Grand Junction and Uncompaghre Field Offices. The Resource Management Plan (RMP) for D-E NCA was completed in January of 2017. This plan identifies monitoring protocols to meet the newly established RMP objectives. The purpose of this plan is to serve as a guideline for transitioning the current monitoring practices to a more uniform set of methods and document monitoring methods that will provide data to address RMP objectives. This document was created in accordance with the Instruction Memorandum 2016-139, which provides guidance on the use of quantitative data to determine RMP effectiveness. This plan is intended to be continuously updated, as new policies and monitoring methods are released. The Monitoring Plan for the D-E NCA was prepared with the help of the Grand Junction and Uncompahgre Field Offices (GJFO and UFO) in Colorado.

Monitoring based on Objectives:

Geological and Paleontological Resources:

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective: "GPA-OBJ-01: Maintain the unique geological and paleontological purposes of the D-E NCA by identifying, protecting and preserving fossil sites and unique geologic landforms." (U.S. Department of the interior. 2017), the following monitoring guidelines will be followed:

- For surveying methods, see Paleo Survey Protocols (Appendix A).
- For Paleo Locality Form, see Appendix A.
- 100 acres at minimum will be surveyed per year inside DE-NCA.

Noxious and Invasive Weeds

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective: "INV-OBJ-01: Manage lands in the planning area under integrated pest management strategies to support biological, cultural and recreation objectives." (U.S. Department of the interior. 2017), the following monitoring guidelines will be followed:

- Invasive plant inventories/surveys will be conducted at geographically selected disturbed areas (e.g. roads, developed recreation sites, irrigation ditches, range developments, riparian areas) inside the Dominguez-Escalante National Conservation Area.
- Surveys will focus on priority invasive plant species from the state listed species and selected BLM species of concern (see Appendix B).
- The National Invasive Species Information Management System (NISIMS) database will be used for data collection and reporting of invasive species.
- Inventories will be conducted as time and funding allow.

- Surveying methods will include all information for NISIMS. For additional guidance, refer to the NISIMS 2.5 User Guide found on the BLM NISIMS website at https://www.blm.gov/sites/blm.gov/files/NISIMS_25_User_Guide.pdf

Future Projects:

- Currently there is no formal written protocol on surveying invasive plant species.

Wilderness Study Areas and Wilderness

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective: "WSA-OBJ-01: Preserve wilderness characteristics in WSAs in accordance with non-impairment standards as defined in BLM Manual 6330—Management of Wilderness Study Areas (BLM 2012e), until Congress either designates these lands as wilderness or releases them for other purposes." (U.S. Department of the interior. 2017), the Wilderness Study Area monitoring guidelines should be followed (see Appendix C).

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective: "WIL-OBJ-02: Enhance the rankings for priority species and vegetation attributes that are currently in "fair" or "poor" condition. (Appendix G)." (U.S. Department of the interior. 2017), the Wilderness monitoring guidelines should be followed (see Appendix C).

Livestock Grazing:

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective: "GRZ-OBJ-01: Meet the forage demands of livestock operations consistent with achieving the Colorado Public Land Health Standards (BLM 19978 and Appendix D) and consistent with recreational, biological, natural and cultural resource objectives." (U.S. Department of the interior. 2017), the following monitoring guidelines will be followed:

Trend

- To determine longer term trends in vegetation, Assessment Inventory and Monitoring (AIM) core methods (MacKinnon et al. 2011) will replace previous methods as the baseline monitoring method.
- Frequency, and Apparent Trend methods (Bedell 1998; BLM 1999) will continue to be collected at a subset of legacy sites (Appendix K) as time and funding allow.
- AIM core methods (MacKinnon et al. 2011) will be collected at additional points according to an intensified design or at targeted sites when overarching AIM sites are not sufficient for local data needs.
- Points will be chosen by a stratified random design to meet local data needs.
- Allotment monitoring will be prioritized by designated Improve, Custodial, and Maintain (ICM) categories (Appendix J), land health assessments, permit renewals, and existing data, and completed as time and funding allows.
- AIM teams provided by the district will collect baseline AIM points and assist in collecting intensified sampling/ targeted points as time and funding allows.

Utilization

- To determine short-term grazing use, the Key Species Method (BLM 1999) will be used.
- Utilization monitoring will be conducted annually at each allotment inside DENCA, as funding and staff time allow.
- Monitoring of allotments will be prioritized based on: Land health assessments, permit renewals, and existing monitoring data.

Compliance

- Compliance forms (Appendix D) will serve as a guideline for completing compliance checks on allotments. Range specialists completing the compliance checks will also be responsible for reading the terms and conditions found on the last page of the permit for additional checkpoints tied to the specific allotment/permit. Frequency of compliance checks will be determined primarily on past non-compliance.

Land Health Assessments

- Qualitative methods found in Interpreting Indicators of Rangeland Health (IIRH) (see Pellant et al., 2005), will be completed at targeted sites and used along with AIM data to make Land Health Assessments (LHA). IIRH methods will be conducted by an Inter-disciplinary Team when a Land Health Assessment is scheduled.

Bighorn Sheep

- Bighorn sheep will be monitored at sheep grazing allotments following sheep observation forms provided by Colorado Parks and Wildlife (Appendix D).
- Sheep grazing allotments will be surveyed once every grazing season for bighorn sheep, as time and funding allow. Specific protocols to be determined.

Additional Information:

- If an allotment falls on sage grouse habitat, AIM core methods (MacKinnon et al. 2011) in conjunction with Site-Scale (Fourth-Order) Measuring Techniques from the Habitat Assessment Framework method (see Stiver et al. 2015) will be collected.
- Grazing Permit renewal prioritizations should follow the guidelines listed in BLM Instruction Memorandum 2016-141.

Priority Species and Vegetation

Monitoring methods to address the following Priority Species and Vegetation (PSV) objectives can be found in the PSV Table (Appendix E).

Desert Shrub/Saltbush

"PSV-DSS-OBJ-01: Improve the plant composition of the D-E NCA's desert shrub/saltbush vegetation type to achieve public land health standards and move toward the following management targets:

- 80% (or more) of sampled acres contain adequate mixtures of warm and cold season grasses, shrubs and forbs

- 80% (or more) of sampled acres exhibit an acceptable composition of understory invasive plant species (<10% relative cover).
- 80% (or more) of sampled acres meet Land Health Standard 3." (U.S. Department of the interior. 2017)

Pinyon-Juniper Woodlands

"PSV-PJW-OBJ-01: Manage for public land health standards in the D-E NCA's pinyon-juniper woodlands and move toward the following conditions in the D-E NCA's pinyon-juniper woodlands:

- 55-75% of sampled acres are classified as old growth or late seral
- 95% (or more) of sampled acres contain adequate mixtures of warm and cold season grasses, shrubs, forbs and trees." (U.S. Department of the interior. 2017)

Sagebrush Shrublands

"PSV-SGS-OBJ-01: Improve the plant composition of the D-E NCA's sagebrush shrublands vegetation type to achieve public land health standards and move toward the following management targets:

- 80% (or more) of sampled acres contain adequate mixtures of warm and cold season grasses, shrubs and forbs
- 95% (or more) of sampled acres exhibit an acceptable composition of understory invasive plant
- species (<10% relative cover)
- 95% (or more) of sampled acres have acceptable levels (less than 50% relative understory cover)
- of crested wheatgrass
- 80% (or more) of sampled acres have moderate cover of sagebrush (10-30% cover)..." (U.S. Department of the interior. 2017)

Ponderosa Pine

" PSV-PPN-OBJ-01: Improve the fire regime condition class (FRCC) in ponderosa pine stands in order to achieve public land health standards and move toward the following management target:

- FRCC 2 trending toward 1." (U.S. Department of the interior. 2017)

Mountain Shrubland

"PSV-MTS-OBJ-01: Manage for public land health standards in the D-E NCA's mountain shrub communities, while maintaining the following condition:

- 15% (or more) of the D-E NCA's mountain shrub communities are within each of the following age classes: early, mid and late seral." (U.S. Department of the interior. 2017)

Riparian

"PSV-RIP-OBJ-01: Manage for public land health standards in the D-E NCA's riparian communities, while moving toward the following management target:

- 95% (or more) of sampled riparian miles are in PFC...." (U.S. Department of the interior. 2017)

Seeps and Springs

"PSV-SSP-OBJ-01: Manage the D-E NCA's seeps and springs in order to achieve public land health standards and move toward the following management targets:

- Stable 10-year trend of wetland/riparian area around naturally occurring seeps and springs
- Less than 5% of naturally occurring seeps and springs have evidence of trampling and human disturbance in the wetland area." (U.S. Department of the interior. 2017)

Aquatic Systems

"PSV-AQS-OBJ-01: Improve BLM management of the Gunnison River corridor in order to achieve public land health standards and move toward the following management target:

- 25% (or less) of the Gunnison River has evidence of channelization and riprap...." (U.S. Department of the interior. 2017)

Special Status Species and Natural Communities

Desert Bighorn Sheep

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective:"SSS-DBS-OBJ-02: Improve BLM management of domestic sheep grazing in the D-E NCA in order to meet public land health standards and reduce probability of association and disease transmission between domestic sheep/goats and desert bighorn sheep in accordance with BLM Manual MS-1730," (U.S. Department of the interior. 2017), the following monitoring guidelines will be followed:

- Bighorn sheep will be monitored at sheep grazing allotments following sheep observation forms provided by Colorado Parks and Wildlife (Attachment B).
- Sheep grazing allotments will be surveyed once every grazing season for bighorn sheep as time and funding allow. Specific protocols to be determined.
- For more monitoring guidelines, see the Priority Species and Vegetation Table (Appendix E).

Colorado Hookless Cactus

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective:"SSS-CHC-OBJ-02: Improve BLM management of the Colorado hookless cactus in order to meet public land health standards and move toward the following management targets:

- 80% (or more) of populations of hookless cactus show evidence of recruitment.
- Static or increasing population trend (20-year trend) in number of individual hookless cactus in known populations." (U.S. Department of the interior. 2017), the monitoring

methods found in the Demographic Monitoring of Colorado Hookless Cactus (Appendix F) will be followed.

All other Special Status Species

- For future T & E plant species and sensitive plant species, monitoring guidelines found in the Demographic Monitoring protocol by the Colorado State Office (see Appendix F) will be the standard protocol.
- Yellow Billed Cuckoo Calls (YBCC) will be conducted following the YBCC protocol released by U.S. Fish and Wildlife in 2015 (Halterman et al. 2015) as needed.
- If an AIM point falls on Sage Grouse habitat, supplemental height information along with sagebrush shape will be collected following the protocols found in the Sage-Grouse Habitat Assessment Framework (Stiver et al. 2015).

Fish and Wildlife Management (Non-Special Status)

Big Game

- For big game monitoring, browse conditions protocol will be a supplemental method ('add on') collected by AIM crews.
- Browse data will only be collected if a designated shrub falls on any of the 3 AIM transects.
- A one meter belt along the transect will be read and a Browse Study data sheet (see Appendix D) will be filled out by AIM crews.
- If pellets or animal tracks are found, it will be noted in the additional notes section of the data sheet.
- Training for browse study data collection will be provided by local specialists.

Raptors

- For cliff nesting species, the American Peregrine Falcon Monitoring Plan Protocol (U.S. Fish and Wildlife Service, 2003) will be conducted primarily through volunteers as time and funding allow. For data sheet, see Appendix D.

Fire and Fuels

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective:"WFM-OBJ-01: Use a full range of wildfire management actions when responding to unplanned ignitions, from full suppression to managing for multiple objectives including, but not limited to, resource benefit. " (U.S. Department of the interior. 2017), the following monitoring guidelines will be followed:

- For post-fire monitoring, Assessment Inventory and Monitoring (AIM) methods (MacKinnon et al. 2011) will be implemented.

Soils and Water Quality

In order to determine the RMP "SWQ-OBJ-04: Manage public land activities within the planning area in a manner that contributes to the long term improvement of surface and groundwater quality and minimizes or controls elevated levels of salts, sediment, selenium, and other

potential contaminant contributions from Federal lands (or Federal actions) to water resources." (U.S. Department of the interior. 2017), the following monitoring guidelines will be followed:

- AIM National Aquatic Monitoring Framework: Technical Reference 1735-1 (Bureau of Land Management 2015) will be used to collect hydrological data for water quality monitoring.
- Riparian PFC (Prichard et al., 1993, 1994, 1998, and 2003) supplement AIM Aquatic data when needed i.e. long-term monitoring sites with trending Proper Functioning Condition data.
- For soil monitoring, AIM core methods (MacKinnon et al. 2011) will be implemented.
- Frequency of soils and water quality monitoring will be conducted as time and funding allow.

Cultural Resources

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objectives: "CUL-OBJ-04: Promote public awareness, cultural resource education, and stewardship in the D-E NCA." (U.S. Department of the interior. 2017), the following monitoring guidelines will be followed:

- Site stewards will be trained by the designated field office archeologist during a field day along with following guidelines in the BLM Colorado Handbook for Cultural Resources (BLM 1998).
- Sites will be monitored via site stewards annually at a minimum. Sites with heavier traffic will have a goal of four visitations per year.
- Site Steward Quarterly Logs (Appendix D) will be the baseline site steward log.
- If a disturbance is documented, site stewards will fill out an additional BLM site steward monitoring form (Appendix D) for more details on the disturbance.

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective: "CUL-OBJ-07: Conduct Section 110 (of the NHPA) surveys." (U.S. Department of the interior. 2017), the following guidelines will be followed:

- Sites that are prone to vandalism and illegal unauthorized camping will receive regular patrols and BLM law enforcement rangers will fill out logs using site steward logs/ disturbance forms.

Additional Information:

- Site forms are not digitized so a site steward shared database is currently not needed.

Recreation

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective: "REC-OBJ-02: Reduce known or identified unhealthy or unsafe human-created conditions, and achieve a minimum level of conflict between recreation participants and between recreation and other resource uses." (U.S. Department of the interior. 2017), the following monitoring guidelines will be followed:

- For campsite monitoring along the Gunnison River, methods found in the Gunnison Gorge NCA Recreation Impact Monitoring (see Appendix G) will be used.
- Campsite monitoring will be conducted as time and funding allow.

Extensive Recreation Management Areas

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective: "In ERMAs, the BLM will monitor visitor use, visitor safety, and resource conditions through BLM staff, volunteers and recreation-tourism partnerships (e.g., towns, outfitters, recreation organizations, CPW). Monitoring methods include direct visitor contact, electronic traffic counters, visitor/community assessments, and physical resource condition measurements. "(U.S. Department of the interior. 2017), the following monitoring guidelines will be followed:

- Visitor and site data collected for D-E NCA recreation sites will be inputted into the Grand Junction Field Office database.
- For electronic traffic counters, 'Site Observation' forms (Appendix H) will be used for calibrating vehicle counters and developing accurate vehicle information. Traffic counter data will be collected as time and funding allow.
- Vehicle counter units will be maintained every 3-4 months at minimum following the guidelines listed in 'Maintaining Vehicle Counters' (Appendix H).
- To monitor the Physical condition of visitor facilities, information collected in the field at visitor facilities is entered into the Facilities Assessment Management System, Inventory and Deferred Maintenance Report.
- Social trail monitoring will be conducted every five years, as time and funding allow, through a partner or contractor.
- OHV crews collecting data on DE-NCA will follow the Recreation Monitoring Guidelines listed in Appendix H as time and funding allow.

Future Projects:

- Colorado Canyons Association has begun a Social Trail Monitoring Program, but it has yet to be implemented in DE-NCA. For Trail Use Monitoring Data forms, see Appendix H.

Transportation and Travel Management

In order to determine RMP effectiveness and the ability of the BLM to meet RMP objective: TRV-OBJ-01: Manage the D-E NCA's route system to meet objectives for the purposes of the D-E NCA (including recreation), while allowing continued use of the D-E NCA for livestock grazing, land authorizations and access to non-Federal property." (U.S. Department of the interior. 2017), the guidelines listed in Appendix I will be followed.

Future Projects

For future monitoring projects (e.g. management actions not specifically listed here, AIM core methods (MacKinnon et al. 2011) will be used when applicable.

Partner Monitoring

Monitoring data collected by partner organizations/contractors has not been included into this plan. Some of the partner monitoring within the BLM includes: fish shocking, bighorn sheep surveys, and project-based clearance surveys. Methods will be determined by collaboration with partnering agencies along with project needs. Partners include but are not limited to: U.S. Fish and Wildlife, Colorado Parks and Recreation, U.S. Forest Service, and Tamarisk Coalition.

This monitoring plan along with supplemental manuals and forms can be located at:

S:\Programs\National Landscape Conservation System\DENCA\09-Monitoring\DENCA Monitoring Plan

List of Appendices

Appendix A: Paleo Survey Protocol and Paleo Locality Form

Paleo Survey Protocol for DE-NCA:

1. Review proposed activity plan and associated maps

2. Determine location and cross reference existing geologic maps to determine Potential Fossil Yield Category (PFYC) of underlying bedrock. Also note if known paleontological resource localities exist near proposed activity.

3. If PFYC of underlying bedrock is 4-5, a site survey must be completed by BLM official or BLM-permitted paleontologist where ground will be disturbed, with a 25m buffer surrounding the proposed disturbance. If fossils are found, locality forms should be filed with the CO SO and BLM FO with all information that can be determined about the fossil (location, rock formation, type of fossil, description, map, and photos if possible).

4. If no significant fossils are discovered in survey, stipulation for inadvertent discovery should be added to the proposal (basically, if fossil is uncovered during proposed action, all activity must cease until a BLM official or BLM Permitted Paleontologist can get to the site and determine what and if any mitigation must occur; once mitigation is completed, activity can resume).

5. If significant fossil(s) are discovered in survey, BLM official and/or BLM Permitted Paleontologist determine what and if any mitigation must occur, and begin mitigation. This can include rerouting trails/roads/other infrastructure, or collection/excavation of the resource.

6. All paleo surveys will be recorded using a locality form regardless of whether or not a fossil has been found.

7. All surveys need to be filed in the share drive under

S:\Programs\Geology and Paleontological Resources\Paleontology\DENCA\Surveys

Form 8270-3 (Temporary)

(May 1994)

United States

Department of the Interior

Bureau of Land Management

Paleontological Locality Form

1. Permit #/Permittee: No permit number /
2. Repository/Accn.#:
3. Locality #: ___ □ Plant Ξ Vertebrate Ξ Invertebrate □ Other
4. Formation (and subdivision, if known): _____
5. Age: Jurassic, ___ 6. Country: USA
7. BLM District: Southwest District, GJFO CO 8. Resource Area: _____
9. Map name: _____ 10. Map source: USGS
11. Map size: 24K 12. Map edition: _____
13. Latitude (deg., min., sec., direction):

_____

14. Longitude (deg., min., sec., direction):

_____

or: UTM Grid Zone: _12N___ ####### m E ######## m N

15. Survey (Sec., T & R): _____
16. Taxa Collected/observed:

17. Collector: Not collected 18. Date: _____
19. Remarks:

PALEONTOLOGY LOCALITY FORM INSTRUCTIONS

The data fields required in the Paleontology Locality Form should be recorded as shown in Guidelines and Standards for Fossil Vertebrate Databases;

1. Enter the number of the permit under which work was done and name of permittee.

2. Enter the name of the repository and accession number of this collection.

3. Enter the repository locality number for this site.

Indicate what kind(s) of fossils were found by checking the appropriate space(s).

4. Enter the name of the formation and any known subdivision (such as member, horizon, etc.). If the formation=s name is not known, enter the group name.

5. This field should include, at a minimum, the epoch. If the stage/age or North American Land Mammal Age is known, enter this data.

6, 7, 8. Self explanatory.

9. Enter the exact name of the 7.51 or other appropriate topographic map used in the field. submit with each, locality form a clear copy of the map showing the locality. Multiple localities may be shown on a single map.

10. Either the publisher of the map, e.g., USGS.

11. Enter the map scale as a fraction, e.g., 1/24000 or

1/62500, without commas or other punctuation.

12. Enter the date the map was published and/or revised.

13, 14. Enter the data as calculated or graphically determined (not estimated). If the locality is not a single point, enter the number of seconds of variance from the central point (e.g., 2'N, 3'W). The UTM Grid data may be used in place of latitude/longitude, or in addition.

. Enter the Section (and as many subdivisions as can reasonably be determined), Township (N or S), and Range (E or W).

. Make a general statement about taxa observed or collected at this locality, e.g., fish, turtle, oreodont, Hyracodon.

17. Enter the name(s) of the individual(s) who collected at this locality. This links the collection to a set of field notes.

18. Enter the date (or dates) when material was collected from this locality.

19. Describe the locality in relation to geologic, geographic, and topographic features. Do not include information on how to get to the locality. If this locality is in need of further work or mitigation, enter suggestions here.

Because this locality report is specific to BLM-administered lands, it is not necessary to indicate land status. However, institutions should indicate land status of localities in their records to facilitate searching for and retrieving particular data sets.

Appendix B: Colorado Noxious Weed List

Information for this appendix was taken from the Colorado Department of Agriculture (http://www.colorado.gov/ag/weeds).

List A

Species in Colorado that are designated by the Commissioner for eradication:

Common Name	Scientific Name
African rue	*Peganum harmala*
Camelthorn	*Alhagi pseudalhagi*
Common crupina	*Crupina vulgaris*
Cypress spurge	*Euphorbia cyparissias*
Dyer's woad	*Isatis tinctoria*
Giant salvinia	*Salvinia molesta*
Hydrilla	*Hydrilla verticillata*
Meadow knapweed	*Centaurea pratensis*
Mediterranean sage	*Salvia aethiopis*
Medusahead	*Taeniatherum caput-medusae*
Myrtle spurge	*Euphorbia myrsinites*
Orange hawkweed	*Hieracium aurantiacum*
Purple loosestrife	*Lythrum salicaria*
Rush skeletonweed	*Chondrilla juncea*
Sericea lespedeza	*Lespedeza cuneata*
Squarrose knapweed	*Centaurea virgata*
Tansy ragwort	*Senecio jacobaea*
Yellow starthistle	*Centaurea solstitialis*

List B

Species for which the Commissioner, in consultation with the State noxious weed advisory committee, local governments, and other interested parties, develops and implements State noxious weed management plans designed to stop the continued spread of these species:

Common Name	Scientific Name
Absinth wormwood	*Artemisia absinthium*
Black henbane	*Hyoscyamus niger*
Bouncingbet	*Saponaria officinalis*
Bull thistle	*Cirsium vulgare*

Common Name	
Canada thistle	*Cirsium arvense*
Chinese clematis	*Clematis orientalis*
Common tansy	*Tanacetum vulgare*
Common teasel	*Dipsacus fullonum*
Corn chamomile	*Anthemis arvensis*
Cutleaf teasel	*Dipsacus laciniatus*
Dalmatian toadflax- broad leaved	*Linaria dalmatica*
Dalmatian toadflax- narrow leaved	*Linaria genistifolia*
Dame's rocket	*Hesperis matronalis*
Diffuse knapweed	*Centaurea diffusa*
Eurasian watermilfoil	*Myriophyllum spicatum*
Hoary cress	*Cardaria draba*
Houndstongue	*Cynoglossum officinale*
Jointed goatgrass	*Aegilops cylindrica*
Leafy spurge	*Euphorbia esula*
Mayweed chamomile	*Anthemis cotula*
Moth mullein	*Verbascum blattaria*
Musk thistle	*Carduus nutans*
Oxeye daisy	*Chrysanthemum leucanthemum*
Perennial pepperweed	*Lepidium latifolium*
Plumeless thistle	*Carduus acanthoides*
Quackgrass	*Elytrigia repens*
Russian knapweed	*Acroptilon repens*
Russian-olive	*Elaeagnus angustifolia*
Salt cedar	*Tamarix chinensis, T. parviflora, and T. ramosissima*
Scentless chamomile	*Matricaria perforata*
Scotch thistle	*Onopordum acanthium*
Scotch thistle	*Onoporfum tauricum*
Spotted knapweed	*Centaurea maculosa*
Spurred anoda	*Anoda cristata*
Sulfur cinquefoil	*Potentilla recta*
Venice mallow	*Hibiscus trionum*
Wild caraway	*Carum carvi*
Yellow nutsedge	*Cyperus esculentus*
Yellow toadflax	*Linaria vulgaris*

List C

Species for which the Commissioner, in consultation with the State noxious weed advisory committee, local governments, and other interested parties, will develop and implement State

noxious weed management plans designed to support the efforts of local governing bodies to facilitate more effective integrated pest management on private and public lands. The goal of such plans will not be to stop the continued spread of these species but to provide additional education, research, and biological control resources to jurisdictions that choose to require management of List C species.

Common Name	Scientific Name
Chicory	*Cichorium intybus*
Common burdock	*Arctium minus*
Common mullein	*Verbascum thapsus*
Common St. Johnswort	*Hypericum perforatum*
Downy brome	*Bromus tectorum*
Field bindweed	*Convolvulus arvensis*
Halogeton	*Halogeton glomeratus*
Johnsongrass	*Sorghum halepense*
Perennial sowthistle	*Sonchus arvensis*
Poison hemlock	*Conium maculatum*
Puncturevine	*Tribulus terrestris*
Velvetleaf	*Abutilon theophrasti*
Wild proso millet	*Panicum miliaceum*
Redstem filaree	*Erodium cicutarium*

Appendix C: Wilderness and Wilderness Study Areas Monitoring Protocol

Wilderness Monitoring

The BLM follows the *Keeping it Wild 2* wilderness monitoring strategy to monitor trends in wilderness character across both Black Ridge Canyons and Dominguez Canyon Wilderness areas. This monitoring strategy is designed to be nationally consistent, and incorporates a wide variety of information and data from interdisciplinary resource programs into single framework describing what makes wilderness unique among all federal lands – its wilderness character.

This monitoring effort is based on the statutory requirements of The Wilderness Act of 1964. In both the Act's "Statement of Policy" (Section 2(a)) and "Use of Wilderness Areas" (Section 4(b)), managers are directed to "preserve wilderness character." Though never explicitly defined, "wilderness character" is circumscribed in the Act by four qualities required of wilderness areas, and a fifth quality which includes values the Act says "may" be present (Section 2(c)). The "qualities" of wilderness character are:

1) Untrammeled: A "trammel" is literally a net, snare, hobble, or other device that impedes the free movement of an animal. Here, used metaphorically, "untrammeled" refers to wilderness as essentially unhindered and free from modern human control or manipulation. The Wilderness Act defines wilderness as, "an area where the earth and its community of life are untrammeled by man," and is "affected primarily by the forces of nature."

2) Natural: Wilderness ecological systems are substantially free from the effects of modern civilization. It is "protected and managed so as to preserve its natural conditions."

3) Undeveloped: Wilderness has minimal evidence of modern human occupation or modification. It is land "retaining its primeval character and influence," "without permanent improvements or human habitation," "with the imprint of man's work substantially unnoticeable," and "where man himself is a visitor who does not remain."

4) Solitude or Primitive and Unconfined Recreation: Wilderness provides opportunities for people to experience natural sights and sounds, solitude, freedom, risk, and the physical and emotional challenges of self-discovery and self-reliance. It "has outstanding opportunities for solitude or a primitive and unconfined type of recreation" and "shall be administered...in such manner as will leave them unimpaired for future use and enjoyment as wilderness."

5) Unique / Supplemental: Wilderness areas "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." Though these values are not required of any wilderness, where they are present they are part of that area's wilderness character, and must be protected as rigorously as any of the four required qualities. These values may or may not overlap with the other four qualities. They are usually identified in the area's designating legislation, legislative history, original wilderness inventory, wilderness management plan, or at some other time after designation.

An interagency team developed fourteen indicators and suggested possible measures used to monitor trends in wilderness character, and a small interdisciplinary team of BLM employees selected the measures for those indicators to be used in BLM wilderness areas, and developed the techniques detailed to generate data for each measure. Baseline conditions were established in 2012 in Dominguez Canyon Wilderness and in 2016 in Black Ridge Canyons Wilderness. An abbreviated protocol is conducted annually to monitor any potential management concerns, with a full update conducted every five years to monitor trends in wilderness character.

Wilderness Study Areas

The BLM's management policy is to continue resource uses on lands designated as Wilderness Study Areas (WSAs) in a manner that maintains the area's suitability for preservation as wilderness. The BLM's policy will protect the wilderness characteristics of all WSAs in the same or better condition than they were on October 21, 1976 (or for Section 202 WSAs not reported to Congress, the date the WSA was designated), until Congress determines whether or not they should be designated as wilderness.

All WSAs are monitored to ensure continued suitability for designation as wilderness at a frequency that will ensure compliance with the non-impairment standard described in section 1.6.C of MTS 6330. Use patterns in the Wilderness Study Areas within the GJFO realize highly seasonal variation, and monitoring within these areas will follow these seasonal use trends. All monitoring is ground-based utilizing GJFO staff, interns and/or volunteers, according to the following schedule:

WSA	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Black Ridge Canyons/Black Ridge West					X	X	X	X	X	X		
Demaree Canyon	X		X		X		X		X	X	X	
Dominguez Canyon	X		X		X		X		X		X	
Little Bookcliffs	X		X	X	X		X		X	X		
The Palisade		X		X		X		X	X	X	X	
Sewemup Mesa		X		X		X		X	X	X	X	

Appendix D: Forms and Data Sheets

- Browse Study
- Compliance Form
- Bighorn Survey Data Sheet
- Raptor Nest Database Field Form
- Site Steward Quarterly log
- Site Steward Additional Monitoring Form

Browse Study

Date:_____ Recorder:_____

Species	Age Class					Hedge Class					
	Y	M	Dec	Dd	Resp	1	2	3	4	5	6

Plot:_____ Observer:_____

Definitions: Hedge classes—availability= under 4' tall. 1=all available, little or no hedging, 2=all available, severely hedged, 4=partly available, little or no hedging, 5=partly available moderately hedged, 6=partly available severely hedged, 7=mostly unavailable, 8=unavailable. Availability: all available=<4' tall, partly available= over 4' tall with some herbage under 4'. Unavailable = herbage 4' tall.

Browse shrubs= Mountain shrub species, sagebrushes, saltbushes, rabbitbrushes, mormonteas, horsebrushes, willows, oak, cottonwoods, riparian woody species

Additional notes:

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
COMPLIANCE INSPECTION FORM

Inspection Date: _____ Inspector(s): _____
Allotment No: _____ Allotment Name: _____
Authorization No: _____ Operator Name: _____
Office: LLCOS09000 - DOMINGUEZ-ESCALANTE NCA

INSPECTION FINDINGS:

Livestock observed on allotment? (Circle one) Yes No

Where? (pasture, lat/long, etc.)	Number and kind	Brands - brand location, earmarks, tags etc.

Comments (improvement condition, salt placement, etc.)

_____

_____

_____

_____

_____

_____

_____

_____

Is the operator out of compliance? (Circle one) Yes No
If "Yes" identify how the operator is out of compliance (Circle one or more):

Number of Livestock	Kind of Livestock	Place of Use	Period of Use	Other

Date Printed: 11/16/2017
Corresponding Comp_ID as of 11/16/2017 : NONE

S-62 Bighorn Survey

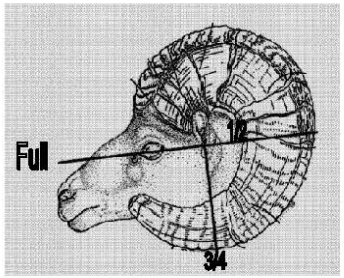
Observer(s):

Date:

Start time:

Route:

Weather conditions:



Bighorn groups

Location	UTMs (NAD 1983) Easting	Northing	Dist to group (units)	Bearing	Time	Yearling Ewes	Adult Ewes	Lambs	Rams <1/2 curl	1/2 curl	5/8 curl	3/4 curl	7/8 curl	Full curl	Comments (coughing, feeding, getting water, etc.)

Additional comments/observations:

COLORADO PARKS and WILDLIFE
RAPTOR NEST DATABASE
Field Form

Section A: General Information

Date: _____/_____/_____
MM DD YYYY

Nest ID: ___ ___ ___ ___ ___ (administratively assigned, leave blank if unknown or if nest is new)

Site Name: _____

Observer's Name: _____ _____
First Last

Observer's Affiliation (check):
- ☐ Public employee (agency _____)
- ☐ Non-governmental (affiliation_____)
- ☐ Volunteer (agency/organization (_____)

Is this information being collected for a specific monitoring or research study?
- ☐ No ☐ Yes (study name:_____)

Section B: Nest Location Information

Is this observation (check one):
- ☐ A new (or previously unreported) nest?
- ☐ A new alternate nest site an existing reported nest site?
- ☐ Improved location, substrate, or other information for an existing reported nest?
- ☐ None of the above (proceed to Section C)

County: _____

UTM X: ___ ___ ___ ___ ___ ___ UTM Y: ___ ___ ___ ___ ___ ___ ___

UTM Datum (check one): ☐ NAD 27 ☐ NAD 83 ☐ WGS 84

Zone (check one): ☐ 12 ☐ 13

Coordinates are (check one):
- ☐ Exact (taken with GPS at nest location; or accurately derived from digital mapped data)
- ☐ Approximate (estimated; taken by GPS from nearby observation point; or taken from paper map. *Provide details in "Comments" below*)

Nest Substrate (check one):
- ☐ Cliff
- ☐ Rock/Earthen pinnacle
- ☐ Rock Out-crop
- ☐ Ground
- ☐ Shrub, species _____
  - ☐ Live
  - ☐ Dead
- ☐ Tree, species _____
  - ☐ Live
  - ☐ Dead
- ☐ Manmade structure, description _____

Land Ownership (check one):
- ☐ Private ☐ Public (management agency _____)

Comments: (e.g., additional location information or site description):

(OVER)

Section C: Nest Status Information

Species (check one):

- ☐ Turkey Vulture
- ☐ White-tailed Kite
- ☐ Mississippi Kite
- ☐ Northern Goshawk
- ☐ Sharp-shinned Hawk
- ☐ Cooper's Hawk
- ☐ Red-tailed Hawk
- ☐ Swainson's Hawk
- ☐ Ferruginous Hawk
- ☐ Northern Harrier
- ☐ Golden Eagle
- ☐ Bald Eagle
- ☐ Osprey
- ☐ Prairie Falcon
- ☐ Peregrine Falcon
- ☐ American Kestrel
- ☐ American Crow*
- ☐ Common Raven*
- ☐ Chihuahuan Raven*
- ☐ Barn Owl
- ☐ Eastern Screech Owl
- ☐ Western Screech Owl
- ☐ Flammulated Owl
- ☐ Great Horned Owl
- ☐ Northern Pygmy Owl
- ☐ Boreal Owl
- ☐ Burrowing Owl
- ☐ Mexican Spotted Owl
- ☐ Long-eared Owl
- ☐ Short-eared Owl
- ☐ Northern Saw-whet Owl
- ☐ Accipiter sp.
- ☐ Buteo sp
- ☐ Owl sp.
- ☐ Scrape – large
- ☐ Scrape – small
- ☐ Stick nest – large
- ☐ Stick nest – small
- ☐ Unknown
- ☐ Other**_____

** Occupancy by Corvids should only be noted if they are occupying a previously-built raptor nest*
*** Provide details of the observation in "Comments" below.*

Nest Status (check):

- ☐ Undetermined
- ☐ Occupied Nest
  - ☐ Intact
  - ☐ Failed
- ☐ Unoccupied Nest
  - ☐ Intact
  - ☐ Dilapidated
- ☐ Destroyed

Existing or Potential Threats (add details in comments):

- ☐ Yes
- ☐ No

Number of eggs: _____ Number of nestlings: _____(estimate age)

Number of fledging-age young: _____

How was survey conducted (check one):

☐ Ground ☐ Aircraft (type _____)

Comments: (e.g., existing or potential threats, additional nest status information, behavioral information)

Additional Peregrine Falcon Survey Information

Observation Post: UTM X: ___ ___ ___ ___ ___ ___ UTM Y: ___ ___ ___ ___ ___ ___ ___

UTM Datum (check one): ☐ NAD 27 ☐ NAD 83 ☐ WGS 84

Zone (check one): ☐ 12 ☐ 13

Observation conditions (visibility, precipitation, wind, etc.):

Detailed directions to observation post:

Approximate nesting phase (determined how?):

Peregrines Present: (define as adult male, adult female, subadult male, subadult female, or subadult unknown, and number of each):

Behaviors observed:

Nest observed:
☐ Yes
☐ No

Feeding at nest observed:
☐ Yes
☐ No

Eggs observed
☐ Yes
☐ No
☐ Unknown

Return to: David Klute, Colo. Div. of Wildlife, 6060 Broadway, Denver, CO 80216

Site Steward Quarterly Activity Log

Name: Affiliation: Quarter 1st 2nd 3rd 4th

Site #	Site Name	Date of Visit	Time spent	Vandalism Y/N	Site Condition	Deterioration

1. Site ID = Smithsonian Number. If no number has been assigned, contact the land managing agency and the State Historic Preservation Office.

2. Time spent: Include travel time, time spent on-site, report preparation and any public education/outreach efforts. Round up to nearest ½ hour

3. For Vandalism and Site Deterioration use the following codes: 01. Potholes/Looting. 02. Artifact Removal. 03. Erosion. 04. Rock Art Removal. 05. Rock Art Defacement. 06. Rock Art Damage. 07. off Road Travel. 08. Cattle Trampling. 09. Artifact Piles 10. Camping/Fire Rings. ll. Sign Removal. 12. Stone Features removed. 13. Stone Features Added. 14. Bulldozer/Backhoe. 15. Other (Please specify).

4. Site Condition = Excellent, Good Fair, Poor, Obliterated.

Please return this form to: Area Archaeologist, Bureau of Land Management, Uncompahgre Field Office, Montrose, Colorado 81401

This form should be submitted at least once per year by the end of the Fiscal year (by October 1st of the calendar year)

Site Assessment Form

Grand Valley Site Steward Program

Attach photos (specific photos of damages if applicable, and general photos). Re-creations of previous photos are recommended so that changes can be easily seen.
Describe changes on back of form. Document with photos.

Site Number:	
Date	
Steward name	
Steward number	
Contact phone	
Contact email	
Agency office	
Activity	

Human Impacts	General site	Within features	Comments
Recent footprints			
Trails present			
Collector's piles			
Campfires			
Litter			
Graffiti			
Vehicle tracks			
Excavation			
Other disturbance			

Animal Impacts	General site area	Within site	Comments (indicate livestock or wildlife)
Trails			
Contact damage			
Trampling of artifacts			
Bedding areas			
Manure			
Rodent burrows			

Environmental	General site area	Within site	Comments
Erosion			
Rock fall			
Roof / floor / wall fall			
Deteriorating features			
Fire			

Rock Art Impacts (% surface affected)				Interpretive Signs		Describe
Alteration/defacement		Obliteration		Damage?		
Bullet holes		Paint		Graffiti		
Chalking		Attempted removal		Paint		
Construction activities		Complete removal		Scratches		
Graffiti		Smoke blackening		Bullet holes		
Livestock		Other		Other		

Additional notes:

Appendix E: Priority Species and Vegetation Table

Priority Species or Vegetation	Attribute	Indicator	Existing Data Source	Indicator Standards				Current Condition	Monitoring Method
				Poor	Fair	Good	Very Good		
Desert Shrub/Saltbush									
Desert +Shrub/ Saltbush	Vegetation structural composition	Percentage of sampled acres containing adequate mixtures of warm and cold season grasses, shrubs and forbs	Land health assessments	Less than 60% of sampled acres	60-79% of sampled acres	80-94% of sampled acres	95% or more of sampled acres	Poor	AIM
	Plant species composition/ dominance	Percentage of sampled acres meeting land health standard **3**	Land health assessments	Less than 60% of sampled acres	60-79% of sampled acres	80-94% of sampled acres	95% or more of sampled acres	Poor	AIM
	Understory invasive species	Percentage of sampled acres exhibiting an acceptable composition of understory invasive plant species (<10% relative cover)	Land health assessments	Less than 60% of sampled acres	60-79% of sampled acres	80-94% of sampled acres	95% or more of sampled acres	Poor	AIM
	Percent hedging by big game and livestock	Vigor	Land health assessments (UFO only)	> 50 percent of sites with most of the palatable shrubs severely hedged	25-50 percent of sites with most of the palatable shrubs severely hedged	10-24 percent of sites with most of the palatable shrubs severely hedged	less than 10 percent of sites with most of the palatable shrubs severely hedged	Very good	Browse Study
	Disturbance regime	Percentage of sampled acres in early seral stage	Ecological site inventory (GJFO) and land health assessments (UFO)	Greater than 39% of sampled acres	1-7% or 3339% of sampled acres	8-14% or 2632% of sampled acres	15-25% of sampled acres	Good	AIM + Remote Sensing
Pinyon-Juniper Woodlands									

Priority Species or Vegetation	Attribute	Indicator	Existing Data Source	Indicator Standards					
				Poor	Fair	Good	Very Good	Current Condition	Monitoring Methods
Pinyon-Juniper Woodlands	Age class structure	Percentage of acres of pinyon-juniper woodlands classified as old growth (GJFO) or late seral (UFO)	Ecological site inventory (GJFO) and PhD dissertation work (UFO)	Less than 35% or more than 95% of sampled acres	35-45% or 8695% of sampled acres	46-55% or 7685% of sampled acres	55-75% of sampled acres	Good	AIM + Remote Sensing
	Vegetation structural composition	Percentage of sampled acres containing adequate mixtures of warm and cold season grasses, shrubs and forbs	Land health assessments	Less than 60% of sampled acres	50-79% of sampled acres	80-94% of sampled acres	95% or more of sampled acres	Good	AIM
	Dominance of crested wheatgrass	Percentage of sampled acres with acceptable levels (less than 50% relative understory cover) of crested wheatgrass	Land health assessments	Less than 60% of sampled acres	60-79% of sampled acres	80-94% of sampled acres	95% or more of sampled acres	Very Good	AIM

Priority Species or Vegetation	Attribute	Indicator	Existing Data Source	Indicator Standards				Current Condition	Monitoring Methods
				Poor	Fair	Good	Very Good		
Sagebrush Shrublands									
Sagebrush Shrublands	Age class structure	Percentage of acres that have decadent sagebrush	Land health assessments	More than 50% of sampled acres	20-50% of sampled acres	5-20% of sampled acres	Less than 5% of sampled acres	Good	AIM, HAF
	Vegetation Structural Composition	Percentage of sampled acres containing adequate mixtures of warm and cold season grasses, shrubs and forbs (adequate as described by Ecological Site Descriptions and the Gunnison Sage Grouse Rangewide Conservation Plan guidelines)	Land health assessments	Less than 60% of sampled acres	60-79% of sampled acres	80-94% of sampled acres	95% or more of sampled acres	Poor	AIM, HAF
	Dominance of crested wheatgrass	Percentage of sampled acres with acceptable levels (less than 50% relative understory cover) of crested wheatgrass	Land health assessments	Less than 60% of sampled acres	60-79% of sampled acres	80-94% of sampled acres	95% or more of sampled acres	Fair	AIM

Priority Species or Vegetation	Attribute	Indicator	Existing Data Source	Indicator Standards				Current Condition	Monitoring Methods
				Poor	Fair	Good	Very Good		
(Sagebrush Shrublands continued)	Understory invasive species	Percentage of sampled acres exhibiting an acceptable composition of understory invasive plant species (<10% relative cover)	Land health assessments	Less than 60% of sampled acres	60-79% of sampled acres	80-94% of sampled acres	95% or more of sampled acres	Fair	AIM
	Gunnison sage-grouse winter habitat condition	Percentage of sampled acres with moderate cover of sagebrush (10-30% cover)	Land health assessments	Less than 60% of sampled acres	60-79% of sampled acres	80-94% of sampled acres	95% or more of sampled acres	Poor	AIM, HAF
	Sagebrush fragmentation and extent	Average size of unfragmented (defined as route-free) sagebrush parks	BLM vegetation cover data and route inventory information	Average of 40 (or less) acres per unfragmented sagebrush parks	Average of 4050 acres per unfragmented sagebrush parks	Average of 50-60 acres per unfragmented sagebrush parks	Average of 60 acres (or more) per unfragmented sagebrush parks	Good	Remote sensing
Ponderosa Pine									
Ponderosa Pine	Fire regime	Fire regime condition class (FRCC)	FRCC	FRCC 3	FRCC 2	FRCC 2 trending toward 1	FRCC 1	Fair	Site observations by fuels specialist

Priority Species or Vegetation	Attribute	Indicator	Existing Data Source	Indicator Standards				Current Condition	Monitoring methods
				Poor	Fair	Good	Very Good		
	Understory species composition	Presence of understory ladder fuels	Best estimation based on specialist opinion	Ladder fuels very likely to cause crown fires	Ladder fuels likely to cause crown fires	Ladder fuels unlikely to cause crown fires	Few to no Ladder fuels present	Good	Site observations by fuels specialist
	Number and size of stands	Number of stands and size of stands relative to current situation	Best estimation based on specialist opinion	Loss of stands	Decreasing stand size	Increasing stand size	Increasing stand size and new stands	Good	Site observations by fuels specialist
Mountain Shrub									
Mountain Shrub	Age class structure	Percentage of acres in early, mid and late age classes	Best estimation based on specialist opinion	Less than 5% of the D-E NCA's mountain shrub communities are within each of the following age classes: early, mid and late seral	At least 5% of the D-E NCA's mountain shrub communities are within each of the following age classes: early, mid and late seral	15-25% of the DE NCA's mountain shrub communities are within each of the following age classes: early, mid and late seral	25% (or more) of the D-E NCA's mountain shrub communities are within each of the following age classes: early, mid and late seral	Good	AIM + Remote sensing
	Vegetation structural composition	Percentage of sampled acres containing adequate mixtures of warm and cold season grasses, shrubs and forbs (taken from existing LHA data)	Land health assessments	Less than 60% of sampled acres	60-79% of sampled acres	80-94% of sampled acres	95% or more of sampled acres	Very Good	AIM

Priority Species or Vegetation	Attribute	Indicator	Existing Data Source	Indicator Standards				Current Condition	Monitoring Methods
				Poor	Fair	Good	Very Good		
	Understory invasive species	Percentage of sampled acres exhibiting an acceptable composition of understory invasive plant species (<10% relative cover)	Land health assessments	Less than 60% of sampled acres	60-79% of sampled acres	80-94% of sampled acres	95% or more of sampled acres	Good	AIM
	Vigor	Percent hedging by big game and livestock	Land health assessments (UFO only)	> 50 percent of sites with most of the palatable shrubs severely hedged	25-50 percent of sites with most of the palatable shrubs severely hedged	10-24 percent of sites with most of the palatable shrubs severely hedged	less than 10 percent of sites with most of the palatable shrubs severely hedged	Very good	Browse Study
Riparian									
Riparian	Fire fuel load on Gunnison River	Percentage relative cover of tamarisk (dead or alive)	BLM greenline data (UFO only)	greater than 50% relative cover of tamarisk (dead or alive)	26-50 % relative cover of tamarisk (dead or alive)	11-25% relative cover of tamarisk (dead or alive)	Under 10% relative cover of tamarisk (dead or alive)	Good	DRRP Rapid Monitoring Protocol
	Stream function	Percentage of sampled miles in proper functioning condition	BLM proper functioning condition data	Less than 60% of sampled miles	60-79% of sampled miles	80-94% of sampled miles	More than 95% of sampled miles	Good	PFC

Priority Species or Vegetation (Riparian Continued)	Attribute	Indicator	Existing Data Source	Indicator Standards				Current Condition	
				Poor	Fair	Good	Very Good		
	Invasive species composition on Gunnison River	Percentage of sample sites along the Gunnison River with acceptable levels of invasive plants (less than 20% relative cover)	BLM greenline data (UFO only)	Less than 60% of sample sites	60-79% of sample sites	80-94% of sample sites	95% or more of sample sites	Poor	DRRP Rapid Monitoring Protocol
	Invasive species composition on tributary creeks	Percentage of sample sites along tributary creeks with acceptable levels of invasive plants (less than 20% relative cover)	BLM greenline data (UFO only)	Less than 60% of sample sites	60-79% of sample sites	80-94% of sample sites	95% or more of sample sites	Very Good	DRRP Rapid Monitoring Protocol
	Presence of saline grasslands	Percent variation from present conditions in extent of saline grasslands in riparian zones	Best estimate based on specialist opinion	>25% decrease from present condition	6-25% decrease from present condition	Present condition +/-5%	Greater than 5% increase from present condition	Good	DRRP Rapid Monitoring Protocol
	Presence of wetland obligate plant species	Trend (compared to present conditions) in wetland obligate plant cover along riparian reaches	BLM greenline data (UFO only)	Loss of obligates from >25 percent of riparian reaches	Loss of obligates from 5-25 percent of riparian reaches	Loss or gain of obligates from +5% percent of riparian reaches	Gain of obligates in more than 5% of riparian reaches	Fair	DRRP Rapid Monitoring Protocol or Aquatic AIM

Priority Species or Vegetation	Attribute	Indicator	Existing Data Source	Indicator Standards				Current Condition	Monitoring Methods
				Poor	Fair	Good	Very Good		
	Vegetation structure	Percentage of suitable stream reaches that support the historical proportions of age classes and vegetation composition of woody native riparian species (e.g., willows, cottonwoods, and others)	BLM greenline data (UFO only)	less than 60% of suitable stream reaches	60-79% of suitable stream reaches	80-94% of suitable stream reaches	95% (or more) of suitable stream reaches	Fair	DRRP Rapid Monitoring Protocol or Aquatic AIM
Seeps and Springs									
Seeps and Springs	Groundwater hydrology	Number of well and water catchments in the recharge area	BLM Range Improvement Projects inventory	More than current number of water developments at full capacity	Current number of water developments at full capacity	Current number of water developments at current capacity	Fewer water developments than current condition	Good	Inventories & if > 0, calculate impact to recharge
	Groundwater hydrology	10-year trend in size of wetland/riparian area around naturally occurring seeps and springs	Best estimate based on specialist opinion	Trends toward smaller riparian/ wetland area	Stable to trend toward smaller riparian/wetl and area	Stable trend	Trend toward enlargement	Good	Spring Monitoring Protocol
	Invasive species composition/ dominance	Percentage of naturally occurring seeps and springs with non-native perennial plant species (e.g., tamarisk, Canada thistle, bull thistle)	Best estimate based on specialist opinion	Greater than 50% of naturally occurring seeps and springs	16-49% of naturally occurring seeps and springs	5-15% of naturally occurring seeps and springs	Less than 5% of naturally occurring seeps and springs	Fair	Presence/absence inventories

Priority Species or Vegetation	Attribute	Indicator	Existing Data Source	Indicator Standards				Current Condition	Monitoring Method
				Poor	Fair	Good	Very Good		
(Seeps and Springs continued)	Presence of wetland obligate plant species	Trend (compared to present conditions) in wetland obligate plant cover around naturally occurring seeps and springs	Best estimate based on specialist opinion	Loss of obligates from >15% of springs/seeps	Loss of obligates from 5-15% of springs/seeps	Loss or gain of obligates from +5% percent of springs/seeps	Gain of obligates in more than 5% of springs/seeps	Fair	PFC
	Rare plant presence	Number of seeps with continued presence of rare plants (e.g., canyon bog orchid, Eastwood's monkeyflower,giant helleborine)	Best estimate based on specialist opinion	More than 20% reduction in sites with continued presence	5-19% reduction in sites with continued presence	plus or minus 5% of continued presence of rare plants	More than 5% increase in presence of rare plants	Good	Inventories
	Surface water hydrology	Percentage of seeps impacted by surface water diversions	Best estimate based on specialist opinion	Increased number of diversions and an increased overall rate	Current number of water diversions at an increased rate	Current number of water diversions at current rate	Decrease in the number of diversions and/or the rate	Good	Inventories
	Trampling and human disturbance	Percentage of naturally occurring seeps and springs with evidence of trampling and human disturbance	BLM inventory data (UFO only)	50% or more of sites	21-49% of sites	6-20% of sites	Less than 5% of sites	Fair	Inventories
Aquatic Systems									

Priority Species or Vegetation	Attribute	Indicator	Existing Data Source	Indicator Standards				Current Condition	Monitoring Methods
				Poor	Fair	Good	Very Good		
Aquatic Systems	Gunnison River channel movement	Percentage of the Gunnison River with evidence of channelization and riprap	BLM GIS data	More than 50% of the Gunnison River has evidence of channelization and riprap	26-50% of the Gunnison River has evidence of channelization and riprap	6-25% of the Gunnison River has evidence of channelization and riprap	5% (or less) of the Gunnison River has evidence of channelization and riprap	Fair	PFC

Priority Species or Vegetation	Attribute	Indicator	Source	Indicator Standards				Current Condition	Monitoring Methods
				Poor	Fair	Good	Very Good		
(Aquatic Systems continued)	Gunnisen River hydrologic regime/surface water	Gunnison River hydrograph comparison to predam conditions	USGS water flow data	Monthly median of the average daily flows during critical spring runoff months (4/16/30) falls below the 35th percentile; OR the shape of the natural hydrograph is altered; OR minimum base-flows established by USFWS and BOR for special status fish	Monthly median of the average daily flows is equal to or exceeds the 35th percentile value during critical spring runoff periods (4/1-6/30); and the shape of the natural hydrograph is maintained; and minimum base-flows established by USFWS and BOR for special status fish	Monthly median of the average daily flows is at or above the median value (50th percentile) during critical spring runoff periods (4/1-6/30); and the shape of the natural hydrograph is maintained; and timing of peak runoff is consistent with pre-dam conditions; and minimum base-flows established by USFWS and BOR for special status fish	Monthly median of the average daily flows ranks at or above 75th percentile during critical spring runoff periods (4/16/30); and the shape of the natural hydrograph is maintained; and timing of peak runoff is consistent with pre-dam events; and minimum base-flows established by USFWS and BOR for special status fish	Fair	Stream gauge
	Gunnisen River presence/ abundance of native fish	Percentage of fish (by number of fish collected) in Gunnison River that are native	BLM and Division of Wildlife fish sampling	Less than 60% native fish in the Gunnison River	60-79% native fish in the Gunnison River	80-95% native fish in the Gunnison River	More than 95% native fish in the Gunnison River	Good	BLM and Division of Wildlife fish sampling

Priority Species or Vegetation (Aquatic Systems continued)	Attribute	Indicator	Existing Data Source	Indicator Standards				Current Condition	Monitoring Methods
				Poor	Fair	Good	Very Good		
	Tributary creek hydrologic regime/surface water	Tributary hydrograph comparison	Best estimate based on BLM specialist opinion and intermittent data	Monthly median of the average daily flows during critical spring runoff months (4/16/30) falls below the 35th percentile; OR the shape of the natural hydrograph is altered; OR minimum base-flows established by USFWS and BOR for special status fish	Monthly median of the average daily flows is equal to or exceeds the 35th percentile value during critical spring runoff periods (4/1-6/30). The shape of the natural hydrograph is maintained; minimum base-flows established by USFWS and BOR for special status fish	Monthly median of the average daily flows is at or above the median value (50th percentile) during critical spring runoff periods (4/1-6/30), and the shape of the natural hydrograph is maintained; and timing of peak runoff is consistent with pre-dam conditions	Monthly median of the average daily flows ranks at or above 75th percentile during critical spring runoff periods (4/16/30); and the shape of the natural hydrograph is maintained; and timing of peak runoff is consistent with pre-dam events	Good	Stream gauge
	Tributary creek presence/ abundance of native fish	Percentage of fish in warm-water reaches of tributary creeks that are native	BLM and Division of Wildlife fish sampling	Less than 60% native fish in perennial warm-water reaches	60-79% native fish in perennial warm-water reaches	80-95% native fish in perennial warm-water reaches	More than 95% native fish in perennial warm-water reaches	Good	BLM and Division of Wildlife fish sampling

Priority Species or Vegetation	Attribute	Indicator	Existing Data Source	Indicator Standards				Current Condition	Monitoring Methods
				Poor	Fair	Good	Very Good		
	Cold-water fish composition	Percentage of fish in cold-water reaches that are native	BLM and Division of Wildlife fish sampling	Less than 60% native fish in perennial cold-water reaches	60-79% native fish in perennial cold-water reaches	80-95% native fish in perennial cold-water reaches	More than 95% native fish in perennial cold-water reaches	Poor	BLM and Division of Wildlife fish sampling
	Cold-water aquatic habitat quality	Percentage of cold-water fish bearing stream miles that rank is good in the Pfankuch stability rating	Best estimate based on BLM specialist opinion	Less than 60% of sites in tributary streams have a good rating on the Pfankuch stability rating	60-79% of sites in tributary streams have a good rating on the Pfankuch stability rating	less than 80-95% of sites in tributary streams have a good rating on the Pfankuch stability rating	Greater than 95% of sites in tributary streams have a good rating on the Pfankuch stability rating	Good	Pfankuch method
Desert Bighorn Sheep									
Desert Bighorn Sheep	Population structure and recruitment	Lamb to ewe ratio	CPW surveys	Ratio that will lead to downward population trend	Ratio that will lead to stable to decreasing population trend	Ratio that will lead to stable to increasing population trend	Ratio that will lead to upward population trend	Good	CPW surveys

Priority Species or Vegetation	Attribute	Indicator	Existing Data Source	Indicator Standards					
				Poor	Fair	Good	Very Good	Current Condition	Monitoring Methods
Desert Bighorn Sheep	Potential for disease transmission	Potential for disease transmission between domestic sheep and goats with desert bighorn sheep	BLM and CPW GIS data	Significant overlap (overlap within high risk areas) occurs between domestic sheep/goats and desert bighorn sheep on BLM lands.	High risk overlap (permitted sheep/goat grazing within high risk allotments) occurs between domestic sheep/goats and desert bighorn sheep on BLM lands. Risk is reduced in low, medium and high risk allotments using WAFWA recommendations	There is no high risk overlap (permitted sheep/goat grazing within high risk allotments) between domestic sheep/goats and desert bighorn sheep on BLM lands. Risk is reduced in low and medium risk allotments using WAFWA recommendations	There is no risk of disease transmission between domestic sheep/goats and desert bighorn sheep on BLM lands.	Poor	• % of CPW mapped Core Herd Home Range that is permitted sheep/goat grazing allotments; • for permitted sheep/goat allotments outside of CHHR, utilize current accepted peer reviewed modeling technique (currently Risk of Contact) and best available data to assess potential risk of wild sheep contact or interaction with domestic sheep or goats. • CPW bighorn sheep movement and disease data
	Population size* *This attribute will only go into effect after CPW develops a herd population goal.	Size (5-year floating average) of the desert bighorn sheep herd	CPW surveys	Population at or below lowest goal	Mid to lower population goal	Mid to upper population goal	Greater than or equal to upper population goal	Good	CPW surveys

Colorado Hookless Cactus									
Priority Species or Vegetation	**Attribute**	**Indicator**	**Existing Data Source**	**Indicator Standards**					
				Poor	**Fair**	**Good**	**Very Good**	**Current Condition**	**Monitoring Methods**
Colorado Hookless Cactus	Habitat quality	Percentage of sites occupied by Colorado hookless cactus that have low levels of invasive weeds (10% or less relative cover)	CNHP specialist opinion	0-49% of sites	50-79% of sites	80-9% of sites	95% of sites or more	Good	Demographic Monitoring of Colorado Hookless cactus
	Population structure and recruitment	Percent of populations with evidence of recruitment	CNHP specialist opinion	0-49% of sites	50-79% of sites	80-94% of sites	Greater than 95% of sites	Good	Demographic Monitoring of Colorado Hookless Cactus
	Population size	Population trend (20year trend) in number of individual hookless cactus in known populations	CNHP	Loss of populations	Decreasing population	Static to increasing population	Increasing population	Fair	Demographic Monitoring of Colorado Hookless Cactus

Appendix F: Demographic Monitoring

Demographic Monitoring of Colorado hookless cactus (Sclerocactus glaucus)

Developed by BLM Colorado State Office

Introduction:

The Colorado hookless cactus (Sclerocactus glaucus) is a small ball to barrel-shaped cactus endemic to the Colorado and Gunnison River basins and their tributary canyons in western Colorado. Across this confined range, the species has a patchy distribution found in population clusters occupying a variety of habitats ranging from alluvial river benches to shale barrens and sparse pinyon-juniper woodlands. The species was first listed as threatened under the Endangered Species Act of 1973, as amended (ESA) in 1979 as part of the Uintah Basin hookless cactus complex (44 FR 58868).

In 2012, BLM Colorado established a long-term demographic trend monitoring study of Colorado hookless cactus within the greater Grand Valley, Colorado. This monitoring study is central to our evaluation of the status of Colorado hookless cactus within the greater Grand Valley by providing detailed biological information as well as trends at both the population and the landscape level. In addition, monitoring has contributed to our knowledge and understanding of the species' life history and reproductive biology, threats to the species, and has aided in the development of actions aimed at assisting in the long-term persistence of the species in-situ (Schemske et al., 1994).

Objectives:

The following summary outlines the objectives and methodology applied to the demographic monitoring study of Colorado hookless cactus in Colorado. The key aims of demographic monitoring are:

1. To understand the status and trend of populations of Colorado hookless cactus range-wide.

2. To identify important life-history and demographic characteristics including: recruitment rates, phenological traits, and population fecundity.

3. Identify the response of Colorado hookless cactus to various and differing management actions, disturbances, and environmental conditions across its range.

Methods:

The demographic monitoring methods summarized here were adapted from the BLM technical references Measuring and Monitoring Plant Populations (Elzinga et al., 1998) and the Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems (Herrick et al., 2005). Methods were selected to efficiently provide robust data. Monitoring is designed to determine if populations are increasing, decreasing, or stable by comparing differences in mean plant density across years. Understanding the demography and trend of these populations can then be used to

inform land management decisions aimed at reducing or eliminating threats to the species (BLM, 2008).

Monitoring Objectives:

Management Objective: Maintain stable or increasing mean density of Colorado hookless cactus at the landscape level for fifteen years (2014 – 2029).

Sampling Objective: We aim to be 90% certain of detecting at least a 20% change in mean Colorado hookless cactus density at the landscape level.

Sample Design:

Permanent sample units are preferred in monitoring long-lived perennial species (Elzinga et al., 1998). Permanent sampling units are advantageous in that they require fewer samples than temporary sampling units and they are more statistically robust when conducting analysis. This thereby increases the power of the data and increases monitoring efficiency.

Sample Design:

Permanent sample units are preferred in monitoring long-lived perennial species (Elzinga et al., 1998). Permanent sampling units are advantageous in that they require fewer samples than temporary sampling units and they are more statistically robust when conducting analysis. This thereby increases the power of the data and increases monitoring efficiency.

Target Populations:

Populations were surveyed and selected for sampling based on BLM surface management responsibility and size and structure of population at location of occurrence. Selected populations are stratified across the greater Grand Valley in order to provide a representative sample of occupied sites across the species range.

Field Establishment and Data Collection Procedure:

Permanent rectangular macroplots were established in areas of species occurrence. Plots were oriented to capture the majority of the target population in areas containing the highest plant density. Plot dimensions vary based on population size and structure at location of occurrence. Plot corners are monumented with rebar and marked with GPS to aid in relocation. Permanent sampling units were established within macroplots. In order to limit observer bias, transect locations were selected within the plot using a restricted random method (Elzinga et al., 1998). Ten-inch steel stakes were placed in the middle and at both ends of each transect. When transect length exceeds 25 meters, quarter stakes were placed to aid in the accuracy of data collection. In order to detect and document important recruitment, mortality, and disturbance events monitoring has been conducted on a yearly basis.

All plants within each 1 meter transect belt have been tagged with an 8" nail and numbered aluminum tag. In order to relocate individuals from year to year X / Y coordinates were recorded for each tag. All plants within each 1 meter transect belt were counted to determine mean

density. Population trend is determined by calculating changes in mean density between and across years.

In order to address questions related to the life history of the species demographic metrics were recorded on an annual basis for each marked plant. Demographic metrics include but are not limited to: reproduction, recruitment, and mortality of individuals. In addition, notes were taken indicating evidence of browsing or herbivory and general condition of the plant.

Power Analysis:

Two years of data were used in conducting sample size calculations. The number of sampling units within each macroplot was adjusted during the third year of monitoring to accommodate the necessary number of samples required to obtain statistically meaningful results. The calculation used to determine the necessary number of samples to detect a specified amount of change in plant density between two time periods using permanent sample units is:

$$n=(s)^2(Z\alpha+Z\beta)^2/(MDC)^2$$

Where n is the necessary number of transects needed to detect a specified amount of change between two samples according to a specified power (Elzinga et al., 1998). Calculations were performed to meet a sampling objective that maximizes statistical power (≥ 0.8) of detecting at least a 20% change in mean plant density, while maintaining the possibility of committing either a type 1 or 2 error at ≤ 20%.

A finite population correction factor (FPC) was applied to adjust the sample size for the large (> 5%) of the population that was sampled.

Landscape Level Power Analysis:

In order to extrapolate our results to the landscape level and understand range-wide trends; a power analysis was completed to determine the number of monitoring plots required to detect meaningful changes at the landscape level (n = 4.01). Due to the permanent nature of our plot design the calculation is the same for determining the necessary number of samples from within a macroplot (Herrick et al., 2005). No correction factor is applied do to the fact that we are sampling < 5% of the total species population.

Statistical Analysis:

Sampling results, once compiled, were compared from year to year using a two-tailed paired t-test analysis to determine the significance ($p \leq 0.05$) of changes in mean density over time. As with determining sample size, if more that 5% of a population has been sampled a FPC was applied to the results of the significance test (Elzinga et al., 1998).

Landscape level trends were determined by assessing the change in mean population density across all monitoring plots between years.

All statistical transformations were completed using Microsoft Excel.

Study Sites:

*Cactus Park-The Cactus Park study site was established in 2011 due west of Delta on the south side of the Gunnison River.

Devil's Thumb-The Devil's Thumb study population occupies a south facing slope north of Delta at approximately 5,400ft. The site is typical of S. glaucus habitat flanking the toe of the Grand Mesa in the adobe hills. Soils are exposed Mancos Shale with embedded basalt fragments ranging in size from small fragments to large blocks. The site also has a biological soil crust component. Associated vegetation is sparse salt-desert scrub consisting of Shadscale (Atriplex confertifolia), mat saltbush (Atriplex corrugata).

The study population is proximal to areas popular with off-highway vehicle (OHV) recreation. A transmission line runs adjacent to the population.

*Escalante Canyon-The Escalante Canyon site is the furthest south in our study. Located north of Escalante Creek within the Dominguez-Escalante National Conservation Area. The site was established in 2011 and is located in the canyon bottom among sparse pinyon-juniper woodlands (P. edulis and J. osteosperma), species of sagebrush (Artemisia spp.), and rabbit brush (Chrysothamnus spp.). The plot is proximal to the road; ca. 10m. Heavy livestock grazing and trailing has been documented in the area.

Star Nelson-The Star Nelson study site is located northwest of Delta and north of Highway 50. The population is relatively remote in the adobe badlands where substrate consists of Mancos Shale; vegetation is sparse. The population is dispersed along the crest of a rocky badland formation. The plot was established in 2012.

*Well's Gulch -The Well's Gulch study site was established in 2014. Located off Dominguez Canyon Road south of US 50, the population extends laterally along the south facing bench just above a gravel road. The proximity of the lower edge of the macro plot to the road is < 10m. The area is leased for grazing. Dominant vegetation consists of galleta grass (Pleuraphis jamesii) and shadscale (Atriplex confertifolia).

Whitewater –The Whitewater population is the furthest north in our study. Located between Grand Junction and Whitewater; the population occupies a south facing slope of Mancos shale covered in alluvium. The study site is located in area popular with OHV recreation under a Tri-State transmission line.

* Denotes Dominguez Escalante NCA plots.

Appendix G: Example Campsite Monitoring and Form

Gunnison Gorge NCA Recreation Impact Monitoring
Uncompagre Field Office
Bureau of Land Management
and
Northern Arizona University (NAU)
Recreation Impact Monitoring Program
Submitted: May 21, 2008

Introduction

The Gunnison Gorge National Conservation Area consists of 62,844 acres of BLM managed land. Gunnison Gorge NCA provides the opportunity for a number of outdoor recreation experiences, including hiking and backpacking, horseback riding, hunting, and "Gold Medal" trout fishing. Gunnison Gorge Wilderness, part of the NCA, includes 17,784 acres of public land and a 14 mile stretch of the Gunnison River. The Wilderness is managed to protect the outstanding scenic and non-recreational values; but also, to provide access to class III-IV boating. Current river management allows for 2 commercial launches per day and unlimited private boater access. Approximately 10,000 boaters experience the wonders of the wilderness portion of the Gunnison River each year. The current use distribution is estimated at 60% private and 40% commercial use. Group size on the river is limited to 12 people and each group is allowed 2 nights in the wilderness section during their boating experience. River parties choose all of their campsites prior to launching and then either carry or horseback their boating gear to the launch site (approximately 1 mile along a steep, rocky trail). Repeat visitation is extremely high on the river (60%+), as is visitor satisfaction. This project is designed to address the current and future status of physical recreation impacts in the Gunnison Gorge NCA river portion and, thereby, assist in management actions to protect use access and benefits and to prevent deterioration of the resource base.

This project is based on the planning approach entitled the Limits of Acceptable Change (LAC). While LAC includes nine detailed steps, there are four basic implementation concepts relevant to the planning process, as follows:

1. Specification of acceptable and achievable resource and social conditions. (Basically, what do you want in the area or on the site?) While this project will not directly address this step of LAC, it will provide assistance in determining standards for recreation site variables through the on-going monitoring system.

2. Analysis of the relationship between existing conditions and those judged acceptable. (What do you currently have in the area or on the site? This includes baseline inventory data and how does baseline compare with desired conditions?) This project will directly address this step of the LAC process. It will provide recreation impact data in the wilderness areas with the goal of creating sustainable recreation environments through impact control.

3. Identification of management actions judged to best achieve desired conditions. (What do you need to do to get to your desired conditions? This includes recreation management prescriptions.) This project will provide the BLM with the onsite data necessary to determine what actions, or changes in current prescriptions, are necessary to protect the integrity of the resource base.

4. A program of monitoring and evaluating management effectiveness. (How do you know when resource change occurs?) This project will propose a recommended monitoring program to ensure longitudinal data collection related to recreation impacts in the wilderness areas.

LAC postulates that all users are consumptive users and that resource impacts are the inevitable result of site use. While human impacts may change the nature of a site, the **amount of change tolerated** on any site is a managerial decision. Informed managerial decisions allow for the creation of sustainable recreation environments through the protection and preservation of the integrity of the resource base. However, effective managerial decisions, regarding recreational uses and impacts, can only be made within an informed framework of social and physical site data collection. This project focuses on recreational physical impact data collection.

This project focuses on wilderness recreation impact data collection in the form of a monitoring program for the BLM's Gunnison Gorge NCA river section. The monitoring program will focus on presence/absence of impacts and quantitative assessment related to each impact area. The project will include a universe sample for the research area; in particular, in the Gunnison Gorge NCA wilderness portion, this will include all designated sites (boater and hiker), all over-flow camps, and any illegal camps. For the BLM river section beyond the wilderness boundary, all campsites will be assessed using a similar, but separate form.

In a recreation impact inventory and/or monitoring program, it is assumed that the number, type, and extent of physical human impacts on a recreation site is a useful indicator of both visitor behaviors and visitor numbers. Based upon physical impact information (in combination with social information and managerial expertise), site managers have the ability to formulate recreation management prescriptions for a site (such as education, outreach, allocations, fees, limits, group size numbers, site closure, site rehabilitation, rest-rotation of sites, etc.). The focus of the current project is to capture monitoring data for the Gunnison Gorge NCA river portion. It is anticipated that this project will form the basis for an on-going recreation impact monitoring system to determine longitudinal trends of impacts in the river portion of the NCA.

This project includes, as follows:
(1) Development and implementation (on-site data collection) of a recreation impact inventory monitoring system.
(2) Data entry of all monitoring data into an Access database accessible via the web.
(3) Data analysis and reporting of the results of the monitoring for recreational impacts.
(4) Recommendations related to site variables and time frames for an on-going recreation monitoring program for the Gunnison Gorge NCA river portion.

Goals of the Project

1). Coordination of a Recreation Impact Monitoring System
Development and coordination of Recreation Impact Monitoring System to include: site variables and data collection timeframes, as well as: GIS coordinates and digital imagery for each site.

2). Implementation
Implementation of a Recreation Impact Monitoring System to include: onsite data collection, protection of the integrity of the data in the field, data entry, data analysis, and data reporting.

3). Reporting
A presentation and written report of the results of the Recreation Impact Monitoring to the Uncompahgre Field Office. Part of the reporting will include recommendations related to recreation management techniques to protect the integrity of the resource base.

4). Recommendations related to Continuation of an On-Going Recreation Impact Monitoring System
Recommendations related to the development and implementation of an on-going recreation impact monitoring system for the Gunnison Gorge NCA river portion. Monitoring recommendations will include: monitoring timeframes, costs, and critical monitoring indicators/ variables with standards.

Final Product

The project will result in the following deliverables:
(1) A recreation impact monitoring for the Gunnison Gorge NCA river portion. The final product will include:
(a) a presentation of the findings to BLM Uncompahgre Field Office, Montrose, CO,
(b) a written report identifying impacts,
(c) an Access database (available and downloadable) with all field data posted to the NAU Monitoring Website,
(d) GIS points for all monitoring sites, and

(e) digital images for all monitoring sites (identified, saved, and transmitted to the BLM Uncompahgre Field Office, Montrose, CO in a CD format).

(2) A recommended continued monitoring plan for Gunnison Gorge NCA river portion including site variables and monitoring timeframes, variables, and costs.

Proposed Implementation Schedule (May, 2008 - December, 2008)

Coordination Meeting	May, 2008
Date Form Development and Approval (Separate Attachment)	Summer, 2008
Data Collection/Entry Period	August-October, 2008
Data Analysis & Report Preparation Period	October-December, 2008
Data Reporting	TBA

Proposed Budget

Gunnison Gorge NCA River Portion Recreation Impact Inventory (RSI)

	BLM
Principal Investigator Pam Foti, Ph.D. Includes data collection preparation and logistics, data analysis, and data reporting.	$ 0
Research Assistants Andrew Mount: $600 Includes 3.5 days of field time and data entry. Data Entry: $300	$ 900
Employee Related Expenses 8.22% x $900	$ 74
Travel	
Transportation 5 days x $50/day = $250 $0.40 x 700 miles x 1 trip = $280	$ 530
Per Diem 5 days x $10/day x 2 people= $100	$ 100
Supplies Digital Imagery Supplies Field Supplies GIS Equipment	$ 60
Reporting Trip Reporting Trip to Montrose, CO Pam Foti Transportation, Per Diem, Lodging	$ 550
PROJECT TOTALS	$2,214

Gunnison Gorge NCA Project Responsibilities

1. Providing input and feedback on the recreation impact monitoring data collection instrument, data collection areas, and data collection travel routes.
2. Assisting in logistics and shuttles, as needed, in on-site monitoring.
3. Providing maps for monitoring.
4. Assisting with field information (especially weather and water) during data collection.
5. Providing internal coordination so that the project runs smoothly.
6. Providing necessary permits and administrative approvals for on-site travel.

Northern Arizona University Project Responsibilities

1. Overall coordination of the recreational physical impact monitoring system and data.
2. Development of on-site monitoring techniques and forms.
3. On-site data collection.
4. Protection of data integrity on-site and in the lab.
5. Data compilation, analysis, and entry to the Access database and website.
6. Data reporting.

GUNNISON GORGE NCA: RIVER RECREATION IMPACT INVENTORY

Rapid Site Assessment
Summer, 2008

Site Descriptor Information

__ __ _____Date of Monitoring

__ _____Data Collector Initials

D __ __ Designated Site ID Number (From the BLM Map)

Designated Site Name: _____

Type of Site: Boater Hiker

O __ _____Over-Flow Campsite Number (sequentially from Chukar Put-In)

I __ _____Illegal Campsite Number (sequentially from Chukar Put-In)

NW __ _____NON-WILDERNESS CAMPSITE NUMBER (sequentially from BLM Gunnison Forks)

__ __ . _____River Mile

RIVER SIDE: Right Left

Digital Image Numbers: _____

GIS Coordinates: _____ (NAD 83)
NOTE: TWO Variables _____

__ _____Landing Capacity (# of boats)

CAMPSITE SURFACE TYPE:	Sand	Bedrock	Cobble	Other
Presence of Non-native Vegetation	Yes	No		
Cryptobiotic Soil Presence	Yes	No		
Common Toilet Site	Yes	No		
Common Food Preparation Site	Yes	No		
Stream/Drainage/Wash Present	Yes	No		
Presence of Poison Ivy	Yes	No		

Site Impact Information

[Note: For human caused impacts surrounding campsite, search an area that is a reasonable distance for a camper to travel away from site for given impact category. The "site" boundary is considered to be where 90-95% of the human impact footprint exists.]

Maximum Estimated Camping Capacity of Site: (tent sites = 10x10 ft area)

1-3 tent sites
4-5 tent sites
6-8 tent sites
8-10 tent sites
11-13 tent sites

Human-Caused Barren Core Sizes (measurement):

_____ X _____ X
_____ X _____ X
_____ X _____ X
_____ X _____ X

SHORELINE LOSS OF RIPARIAN VEGETATION:

Approximate Linear Feet Campsite Shoreline:

Linear Feet of 100% Loss of Vegetation:

% of Vegetative Loss: 0-15% 16-30% 31-45% 46-60% 61-75% >75%

Access Trails to Camp Yes No
# of Access Trails to Camp: 1-5 6-10 11-15 16-20 20+ Social/Spurious Trails around Camp? Yes No
# of Social Trails: 1-5 6-10 11-15 16-20 20+

Presence of Vegetation Islands On Site Yes No
Ant Nests On-Site Yes No
# of Ant Nests _____

Presence of Micro-surface Litter (not carried in by flood) Yes No # of
Micro-Litter: 1-5 6-10 11-20 21-30 30+
Presence of Macro-surface Litter (not carried in by flood) Yes No
# of Macro-Litter: 1-5 6-10 11-20 21-30 30+
Presence of FISHING LITTER
# of Fishing Litter: 1-5 6-10 11-20 21-30 30+
Non-recreational Trash (carried in by flood) Yes No
Presence of Surface Food Scraps Yes No
Presence of Food in Water Yes No
Evidence of Human Waste Yes No
Human Waste Indicators
Fecal Material Paper Products Cathole Construction Other
Evidence of Urine Yes No
# of Urine Spots: 1-5 6-10 11-15 16-20 20+

Artistic/Visual Impacts on-site Yes No
# of Visual Impacts: 1-5 6-10 11-15 16-20 20+

Human Caused Tree Damage Yes No
# of Tree Impacts: 1-5 6-10 11-15 16-20 20+
Beaver Caused Tree Damage Yes No
# of Beaver Impacts: 1-5 6-10 11-15 16-20 20+
Human Caused Shrub Damage Yes No
# of Shrub Impacts: 1-5 6-10 11-15 16-20 20+
Human Caused Cactus Damage Yes No
# of Cactus Impacts: 1-5 6-10 11-15 16-20 20+

Cryptobiotic Soil Presence Yes No
Cryptobiotic Soil Impacts Yes No
# of Crypto Impacts: 1-5 6-10 11-15 16-20 20+

Root Exposure in camp Yes No
# of Trees with Root Exposure:
Root exposure at landing Yes No
# of Trees with Root Exposure:

Rock Formation Impacts Yes No
# of Rock Impacts: 1-5 6-10 11-15 16-20 20+
Description of Impact:

Sleep arrangements Lines/Scratching Furniture
Cairns Breaking/Chipping Fire Scars
Piles Stains

Charcoal Presence on Beach Yes No
Fire Rings/Ground Fire Evidence Number of Yes No
Fire Rings _____
Fire Wood Pile Presence Yes No

Presence of Habituated Animals Observed On-Site Yes No
Type of Animals: Ravens Mice Ringtail Deer Bighorn Cattle Other

OHV Impacts On-Site Yes No
Tracks Machine Debris Rock Damage
Rutting Erosion Other

Cultural Presence/Impacts

Cultural Site Yes No
Distance From Camp Site to Cultural Site
# of feet from camp: 0-49 50-100 >100
Trail Access to Cultural Site Yes No
Camping Evidence in Cultural Site Yes No

Collection Piles of Artifacts	Yes	No
Surface Litter at Cultural Site	Yes	No
Human Waste at Cultural Site	Yes	No
Graffiti Presence at Cultural Site	Yes	No

Cultural Site Comments:

Inherent Site Problems

This site is:
1). Too close to water source other than the Gunnison River
2). Too close to Cultural Features
(Note: "Too Close" = <200 feet)

Overall Field Comments (Site Concerns & Impact Considerations

Appendix H: Recreation Monitoring and Forms

BLM DE-NCA Recreation Monitoring Guideline for Crews

- Trailhead information: Number of people, vehicles, dogs and contacts
- Trail information: Number of people, vehicles, dogs and contacts
- Contacts: On trail? OHV sticker, Activity, and group size
- Trash: type, weight, disposal cost, and disposal method
- Maintenance: stock toilet paper, sweep toilet, wash toilet
- Trail work: drainage maintenance and construction. Linear feet of tread maintained.

  Cattle- guards installed and maintained.
- Vehicle counter information.
- Project work: what, where, number of volunteers and number of volunteer hours.
- Law Enforcement follow up.
- SRP monitoring information: who, what, where, when.

Maintaining Vehicle Counters

Maintain each unit every 3-4 months at a minimum

Avoid parking near the counter so you can get an accurate observation not influenced by your vehicle.

1. Observe the case:

Is it muddy on the seal? Is there moisture inside? Is it full of water? Is it exposed to the sun? Is it easily seen from the road/trail?

2. Observe the counter:

- What does the digital display say – are the numbers behaving normally? Wait for a vehicle to drive by, if you can, to observe what happens.
- If it is an IR unit, wave your hand in front or walk by to check if it's working. Is the IR lens pointing in the correct direction – it should be pointing across the trail, either at the ground or against a solid surface (avoid pointing at vegetation that can heat up in the sun and blow in the wind)

3. Plug in the G3 Dock and follow the instructions. Be careful not to disturb the batteries.

If changing the batteries, plug the dock back in after installing the new batteries to ensure a launch – **make sure the little red light on the counter is blinking rapidly before and after disconnecting the dock.**

Put in new moisture absorbing packets.

Make sure the seal is clean from all mud, dirt and debris – these will prevent a complete seal and cause water/moisture to enter the case.

Make sure the unit is well hidden. People will tamper with the units and steal them.

Date + Location:					
Unit Start AND Unit End #:					
Time In/Out (or date)	Tally multiple counts (entrance/exits)	Description (to keep track of exit time)	# of Ppl	# pets	Activity(s)

Appendix I: Travel Management Monitoring

This framework will be included in the overall DENCA Travel Management Implementation Action Plan located at:

S:\Programs\Comprehensive Trails and Travel Management\1. Travel Management Implementation\DENCA

DENCA Monitoring Framework

Monitoring plans associated with travel management implementation will provide an indication of change in use and the effects of that use on the environment. On the basis of an evaluation of the monitoring data, the BLM will determine whether changes to the route network need to be made. This process of monitoring, analyzing, and evaluating will allow the BLM to adaptively manage the route network to achieve the resource management objectives identified in the RMP. Three types of monitoring are associated with travel management implementation:

- Implementation Monitoring

Implementation monitoring is the most basic type of monitoring and simply determines whether management actions have been implemented in the manner outlined by the plan. Implementation monitoring also ensures that the record-keeping process is organized, efficient, and up-to-date. There are no specific thresholds or indicators required for this type of monitoring. New tasks should be added, as necessary. Implementation monitoring will be the responsibility of the travel management coordinator, and include the following:

Biweekly:

- Update sign inventory geodatabase (Travel Management Coordinator)
- Update SDE GTLF layer (Travel Management Coordinator with GIS Specialist)
- Change/update published travel management maps, as needed (Travel Management Coordinator with GIS Specialist)

Monthly:

- Provide GTLF and sign inventory to Mesa County GIS Specialist (Travel Management Coordinator) for law enforcement/safety needs.
- Coordinate with resource and lands staff to ensure all GIS information up to date (ROW entries, rehabilitated routes, new route creation, etc.)
- Check TM plan maintenance spreadsheet (not actual route maintenance) to ensure all work entered has been completed, or is scheduled to be completed.

Annually:

- Report changes in use patterns of travel network to all staff, including overall compliance estimates (Travel Management Coordinator with recreation program)

- Update all staff on overall implementation plan progress and alignment with TMP, including signing, communication/education, monitoring, and other areas, as needed.
- Update all staff on overall implementation project progress, including all plans developed for resource protection and recreation outcomes.

- Effectiveness Monitoring

Effectiveness monitoring will determine if implementation actions achieve user compliance, as well as help evaluate route conditions and changes in visitor demand/preferences. The majority of effectiveness monitoring will be achieved through the monitoring component of the Recreation Program's Trail Management Objectives.

Additionally, the travel management coordinator will keep a geodatabase that includes updates resulting from new resource monitoring information or law enforcement activity that informs on effectiveness of travel management implementation.

- Resource Monitoring

Resource monitoring will document how implementation has influenced natural and cultural resources over time. Two types of resource monitoring plans will be developed as part of travel management implementation:

- Monitoring plans created as part of prioritized implementation projects developed to address priorities included in the Travel Management Plan (i.e. route closures, new route creation, route limitations, or area designations with travel management implications.
- Monitoring as part of regular resource program monitoring with attributed impacts from travel management implementation that (i.e. resource degradation from increased use)

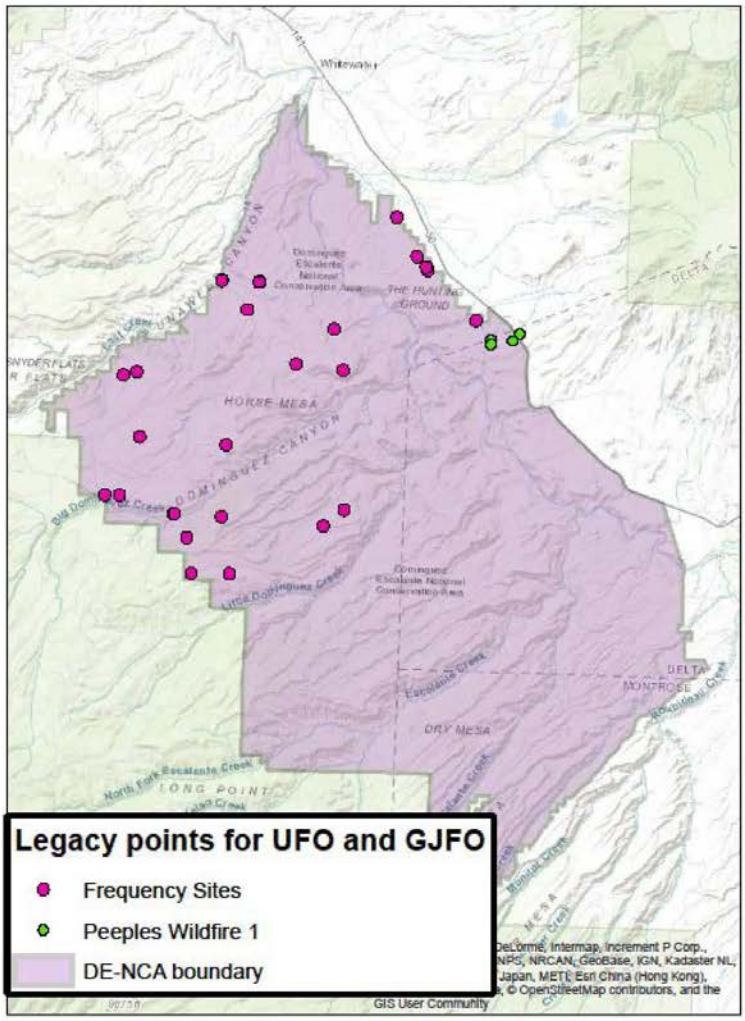
At minimum, qualitative monitoring will be conducted at specific intervals to quickly assess each travel management implementation actions (route restoration, closed signage installation, etc.) to determine if implementation is effective, or if other measures are required (related to effectiveness monitoring above). A qualitative monitoring form developed by resource program will be used to highlight important information and provide consistent analysis throughout the monitoring period. Programs that were directly involved in the travel management designation for a particular route or area will be responsible for developing and implementing a monitoring plan (as part of a larger implementation project plan) with the travel management coordinator.

Beyond qualitative monitoring, resource programs should design monitoring plans (indicators, standards, etc.) for projects that will capture resource data and that more accurately identify resource trends and changes. The travel management coordinator will assist resource programs in implementing these plans.

Appendix J: DE-NCA Allotments and Prioritization

Field Office Name	Allotment Number	Allotment Name	Priority group (first, second	ICM Category	Date of Last Land Health Evaluation	Scheduled to be visited	Date last visited	Next scheduled visit
UNCOMPAHGRE FO	CO03278	CACTUS PARK-CLUB GULCH	2.3	Improve	8/31/2010	1-Apr-18		12/31/1903
UNCOMPAHGRE FO	CO04293	DOMINGUEZ RIMS	2.3	Improve	8/31/2010	2-Apr-18		12/31/1903
UNCOMPAHGRE FO	CO04294	HUFF	2.3	Improve	8/31/2010	3-Apr-18		12/31/1903
UNCOMPAHGRE FO	CO14002	LOWER ESCALANTE	2.3	Improve	8/31/2010	1-Apr-19		12/31/1903
UNCOMPAHGRE FO	CO14020	ANTELOPE	2.3	Improve	8/31/2010	2-Apr-19		12/31/1903
GRAND JUNCTION FC	CO26301	GIBBLER COMMON	2	Improve	9/29/2010	3-Apr-19		12/31/1909
UNCOMPAHGRE FO	CO14001	DOMINGUEZ	3	Improve	8/31/2010	11-Apr-20		12/31/1903
UNCOMPAHGRE FO	CO14006	DRY MESA	3	Improve	8/31/2010	12-Apr-20		12/31/1903
UNCOMPAHGRE FO	CO14007	SAWMILL MESA	3	Improve	8/31/2010	13-Apr-20		12/31/1903
UNCOMPAHGRE FO	CO14008	25 MESA - NORTH	3	Improve	8/31/2010	13-Apr-21		12/31/1903
GRAND JUNCTION FC	CO26302	WAGON PARK AMP	3	Improve	9/29/2010	14-Apr-21		12/31/1909
GUNNISON GORGE N	CO14003	ESCALANTE FLATS	4	Improve	8/31/2010	15-Apr-21		12/31/1903
GRAND JUNCTION FC	CO04592	HUNTING GROUNDS	4	Improve	9/5/2010	16-Apr-21		12/31/1909
UNCOMPAHGRE FO	CO14014	JOKER	4	Maintain	8/31/2010	3-Apr-19		12/31/1905
GUNNISON GORGE N	CO14015	WHITE RANCH	4	Maintain	8/31/2010	16-Apr-20		12/31/1905
I= 4 years								
M=6 years								
C=10 years								

Appendix K: Legacy Points



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