APPENDIX A

GLOSSARY OF TERMS AND ACRONYMS

DEFINITIONS

This glossary is a subset of the NWCG Glossary of Wildland Fire Terminology, PMS-205 located at the following website: http://www.nwcg.gov/pms/pubs/glossary/index.htm. Terms in this section are more unique and significant to understanding of the Rocky Mountain Arsenal NWR Complex Fire Management Plan.

Aerial Detection: A system for, or the act of discovering, locating and reporting fires from aircraft.
After Action Review (AAR): A professional discussion of an event, focused on performance standards, that enables Agency Administrators and firefighters to discover for themselves what happened, why it happened, and how to sustain strengths and improve on weaknesses. An After Action Review is a tool incident command personnel and units can use to get maximum benefit from every incident. It provides a daily review of the day's actions: - Identify and discuss effective and non-effective performance. Candid insights into specific firefighter, leader, and unit strengths and weaknesses from various perspectives. - Feedback and insight critical to actions that were not standard operating procedures, or those that presented safety problems. - Lessons learned and how to apply them in the future.
Agency: An agency is a division of government with a specific function, or a non-governmental organization (e.g., private contractor, business, etc.) that offers a particular kind of assistance. In ICS, agencies are defined as jurisdictional (having statutory responsibility for incident mitigation), or assisting and/or cooperating (providing resources and/or assistance).
Agency Administrator: Managing officer of an agency, division thereof, or jurisdiction having statutory responsibility for incident mitigation and management. Examples: NPS Park Superintendent, BIA Agency Superintendent, USFS Forest Supervisor, BLM District Manager, FWS Refuge Manager, State Forest Officer, Fire Chief, Police Chief.
Agency Dispatch: The agency or jurisdictional facility from which resources are allocated to incidents.
Agency Dispatcher: A person working within an agency organization who processes resources to and from incidents.
Agency Representative (AREP): This ICS position serves as the point of contact for an assisting or cooperating agency which has been delegated authority to make decisions on matters affecting that agency's participation at the incident and reports to the Liaison Officer.
Annual Certification: Annual review by an employing agency of an individual's position qualifications and documentation certifying that the individual is fully qualified to perform duties and responsibilities for a specified position. Annual certification is based on established performance standards and agency specific requirements
Appropriate Management Response (AMR): Any specific action suitable to meet Fire Management Unit (FMU) objectives. Typically, the AMR ranges across a spectrum of tactical options (from monitoring to intensive management actions). The AMR is developed by using Fire Management Unit strategies and objectives identified in the Fire Management Plan.
Arson Fire: A fire that is intentional and wrongfully set to burn one's own or someone else's property.
Cache: A pre-determined complement of tools, equipment and/or supplies stored in a designated location, available for incident use.
Confine: Restrict a fire within predetermined boundaries established either prior to the fire or during the fire.
Contain: Surround a fire, and any spot fires, with a control line, as needed, that can reasonably be expected to check the fire's spread under prevailing and predicted conditions.
Community Wildfire Protection Plan (CWPP): A plan developed in the collaborative framework established by the Wildland Fire Leadership Council and agreed to by state, tribal, and local government, local fire department, other stakeholders and federal land management agencies managing land in the vicinity of the planning area. A Community Wildfire Protection Plan (CWPP) identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure and recommends measures to reduce structural ignitability throughout the at-risk community. A CWPP may address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection – or all of the above.

Cooperator: Local agency or person who has agreed in advance to perform specified fire control services and has been properly instructed to give such service.
Delegation of Authority: A statement provided to the incident commander by the agency executive delegating authority and assigning responsibility. The delegation of authority can include objectives, priorities, expectations, constraints and other considerations or guidelines as needed. Many agencies require written delegation of authority to be given to incident commanders prior to their assuming command on larger incidents.
DEPARTMENT/DOI: Department of the Interior
Dispatch: The implementation of a command decision to move a resource or resources from one place to another.
Dispatch Center: A facility from which resources are assigned to an incident. **Dispatcher:** A person who receives reports of discovery and status of fires, confirms their locations, takes action promptly to provide people and equipment likely to be needed for control efforts.
Drought Index: A number representing the net effect of evapotranspiration and precipitation in producing cumulative moisture depletion in deep duff and upper soil layers (see KBDI).
Ecosystem: An interacting natural system including all the component organisms together with the abiotic environment and processes affecting them.
Fire Cache: A supply of fire tools and equipment assembled in planned quantities or standard units at a strategic point for exclusive use in fire suppression.
Fire Management Unit (FMU): A land management area definable by objectives, management constraints, topographic features, access, values to be protected, political boundaries, fuel types, major fire regime groups, etc. that set it apart from the characteristics of an adjacent FMU. The FMU may have dominant management objectives and pre-selected strategies assigned to accomplish these objectives.
FIRE ECOLOGY: The study of the effects of fire on living organisms and their environment.
Initial Attack (IA): A planned response to a wildfire given the wildfire's potential fire behavior. The objective of initial attack is to stop the fire and put it out in a manner consistent with firefighter and public safety and values to be protected.
Hazard Fuel: A fuel complex defined by kind, arrangement, volume, condition, and location that presents a threat of ignition and resistance to control.
Hazard Map: Map of the area of operations that shows all of the known aerial hazards, including but not limited to power lines, military training areas, hang gliding areas, etc.
Mitigation: Those activities implemented prior to, during, or after an incident which are designed to reduce or eliminate risks to persons or property that lessen the actual or potential effects or consequences of an incident. Mitigation measures can include efforts to educate governments, businesses, and the general public on measures they can take to reduce loss and injury and are often informed by lessons learned from prior incidents.
Mutual Aid: Assistance in firefighting or investigation by fire agencies, without regard for jurisdictional boundaries.
Mutual Aid Agreement: Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.
REFUGE: Any one of the three Refuges, Two Ponds, Rocky Mtn. Arsenal, or Rocky Flats National Wildlife Refuges.
SERVICE: U. S. Fish and Wildlife Service
Values to Be Protected: Include property, structures, physical improvements, natural and culture resources, community infrastructure, and economic, environmental, and social values.
Values-At-Risk: *see:* Values to Be Protected

ACRONYMS

AFPD: Arvada Fire Protection District
AMD: Aviation Management Directorate
AMR: Any specific action suitable to meet Fire Management Unit (FMU) objectives. Typically, the AMR ranges across a spectrum of tactical options (from monitoring to intensive management actions). The AMR is developed by using Fire Management Unit strategies and objectives identified in the Fire Management Plan.
APCD: Air Pollution Control Division
AOP: Annual Operating Plan
BCOS: Boulder County Open space
BI: Burning Index: An output from the NFDRS

BLM: Bureau of Land Management
CAA: Clean Air Act
CAR: Communities at Risk
CCP: Comprehensive Conservation Plan
CMP: Comprehensive Management Plan
COI: Communities of Interest
CX: Categorical Exclusion
DPHE: State of Colorado Department of Public Health and Environment
DOE: Department of Energy
DOI: Department of the Interior
DOW: Colorado Department of Wildlife
EA: Environmental Assessment
EIS: Environmental Impact Statement
EMDS: Ecosystem Management Decision Support Weighting Spreadsheet
ERC: Energy Release Component: The computed total heat release per unit area (British thermal units per square foot) within the flaming front at the head of a moving fire
ESA: Endangered Species Act (Colorado)
FBPS: Fire Behavior Prediction System. A system of computer models that estimate fire behavior for various fuel types.
FEIS: Fire Effects Information System
FMO: Fire Management Officer
FMP: Fire Management Plan
FMU: Fire Management Unit
FONSI: Finding of No Significant Impact
FPA: Fire Program Analysis
FWS: Fish and Wildlife Service
HFR: Hazardous Fuels Reduction
IA: A planned response to a wildfire given the wildfire's potential fire behavior. The objective of initial attack is to stop the fire and put it out in a manner consistent with firefighter and public safety and values to be protected.
IADC: Interagency Dispatch Center
IC: Incident Commander
ICS: Incident Command System
IHF: Incident History File
JCOS: Jefferson County Open space
LCES: Lookout(s), Communication(s), Escape Route(s), and Safety Zone(s): Elements of a safety system used by fire fighters to routinely assess their current situation with respect to wildland firefighting hazards.
MIST: Minimum Impact Suppression Technique: The application of strategy and tactics that effectively meet suppression and resource objectives with the least environmental, cultural and social impacts.
NEPA: National Environmental Protection Act
NFP: National Fire Plan
NFPORS: National Fire Plan Operating Reporting System
NICC: National Interagency Coordination center
NIFC: National Interagency Fire Center
NPS: National Park Service
NWCG: National Wildfire Coordinating Group
NWR: National Wildlife Refuge.
PDI: Palmer Drought Index
PPE: Personal Protective Equipment
RF: Rocky Flats National Wildlife Refuge
RFA: Rural Fire Assistance
RMA: Rocky Mountain Arsenal National Wildlife Refuge
RMARC: Rocky Mountain Arsenal National Wildlife Refuge Complex
RMCC: Rocky Mountain Coordination Center
RMFPD: Rocky Mountain Fire Protection District.

ROD: Record of Decision
SACFPD: South Adams County Fire Protection District
TES / T & E SPECIES: Threatened and Endangered species of plants and animals.
TP: Two Ponds National Wildlife Refuge
USFWS: U.S. Fish and Wildlife Service
WFDSS – Wildland Fire Decision Support System: A decision-making process that evaluates alternative wildfire suppression strategies against selected environmental, social, political, and economic criteria, and provides a record of those decisions. This system will replace the WFSA and WFIP Analyses.
WFIP – Wildland Fire Implementation Plan: A progressively developed assessment and operational management plan that documents the analysis and describes the appropriate management response for a wildland fire.
WFSA – Wildland Fire Situation Analysis: A decision-making process that evaluates alternative wildfire suppression strategies against selected environmental, social, political, and economic criteria, and provides a record of those decisions.
WIMS: Weather Information Management System
WUI: Wildland Urban Interface.
VFD: Volunteer Fire Department

APPENDIX A-2

AUTHORITIES

The following statutes authorize and provide the means for managing wildland fires on FWS lands or threatening FWS lands and on adjacent lands:

A. **Protection Act of September 20, 1922** (42 Stat. 857; 16 U.S.C. 594) Authorizes the Secretary of the Interior to protect, from fire, lands under his/her jurisdiction and to cooperate with other Federal agencies, States, or owners of timber.

B. **Economy Act of June 30, 1932** (47 Stat. 417; 31 U.S.C. 1535). Authorizes Federal agencies to enter into contracts and agreements for services with each other.

C. **Reciprocal Fire Protection Act of May 27, 1955** as amended by the Wildfire Suppression Assistance Act of 1989 (69 Stat. 66, 67; 42 U.S.C. 1856a)(102 Stat. 1615). Authorizes reciprocal fire protection agreements with any fire organization for mutual aid with or without reimbursement and allows for emergency assistance in the vicinity of agency facilities in extinguishing fires when no agreement exists.

D. **National Wildlife Refuge System Administration Act of 1966**, as amended by the National Wildlife Refuge System Improvement Act of 1997 and the Refuge Recreation Act of 1962.(80 Stat. 927)(16 U.S.C. 668dd-668ee)(16 U.S.C. 460k-460k4). Governs the administration and use of the National Wildlife Refuge System.

E. **Disaster Relief Act of May 22, 1974**. (88 Stat. 143; 42 U.S.C. 5121). Authorizes Federal agencies to assist State and local governments during emergency or major disaster by direction of the President.

F. **Federal Fire Prevention and Control Act of October 29, 1974 et seq**. (88 Stat. 1535; 15 U.S.C. 2201) as amended. Authorizes reimbursement to State and local fire services for costs incurred in firefighting on Federal property.

G. **Federal Grants and Cooperative Act of 1977**. (Pub. L. 95-244, as amended by Pub. L. 97-258, September 13, 1982. 96 Stat. 1003; 31 U.S.C. 6301-6308). Eliminates unnecessary administrative requirements on recipients of Government awards by characterizing the relationship between executive agencies and contractors, States and local governments and other recipients in acquiring property and services in providing U.S. Government assistance.

H. **Supplemental Appropriation Act of September 10, 1982**. (96 Stat. 837). Authorizes Secretary of the Interior and Secretary of Agriculture to enter into contracts with State and local government entities, including local fire districts, for procurement of services in pre-suppression, detection, and suppression of fires on any unit within their jurisdiction.

I. **Emergency Wetland Resource Act of 1986.** The purpose of the Act is “To promote the conservation of migratory waterfowl and to offset or prevent the serious loss of wetlands by the acquisition of wetlands and other essential habitat, and for other purposes.” Two Ponds National Wildlife Refuge was acquired under the authority of this Act.

I. **Wildfire Suppression Assistance Act of 1989**. (Pub. L. 100-428, as amended by Pub. L. 101-11, April 7, 1989). Authorizes reciprocal fire protection agreements with any fire organization for mutual aid with or without reimbursement and allows for emergency assistance in the vicinity of agency facilities in extinguishing fires when no agreement exists.

J. **Rocky Mountain Arsenal National Wildlife Refuge Act of 1992.** (Public Law 102-402) established the Arsenal as a National Wildlife Refuge (Refuge) following environmental cleanup. The Act authorizes the Service to manage the area "as if it were" a National Wildlife Refuge during the cleanup process. The Act defines the roles of the Service in managing the area before cleanup is completed, and the property transfer that

will occur between the Army and the Service once cleanup is completed. After environmental cleanup, the site will become one of the largest urban wildlife refuges in the country.

K. **Rocky Flats National Wildlife Refuge Act of 2001.** Establishes Rocky Flats National Wildlife Refuge following cleanup and closure of the site, directs the development of a Comprehensive Conservation Plan for the Refuge, and other details.

Other Policy References

1. **Wildland Fire Leadership Conference Call Notes**, March 24, 2008 "Modifying Guidance for Implementation of Federal Wildland Fire Policy (AMR), published on the Internet at http://www.forestsandrangelands.gov/leadership/meetings/index.shtml

2. **Departmental Manual, 620 DM 1-3**, Wildland Fire Management, General Policy and Procedures; Wildland Fire Management, General Policy and Procedures – Alaska; and Burned Area Emergency Stabilization and Rehabilitation.

3. **United States Fish and Wildlife Service Manual** sections 095 FW 3 Emergency Preparedness and Response -- Wildland Fire Management, 241 FW 7 Wildland Fire Safety, 232 FW 6 Training Standards for Wildland and Prescribed Fire Operations, 621 FW 1 Wildland Fire Policies and Responsibilities, 621 FW 2 Fire Management Planning, and 621 FW 3 Prescribed Fire.

4. **United States Fish and Wildlife Service Fire Management Handbook**

5. **Interagency Standards for Fire and Fire Aviation Operations**, also known as the "*Red Book*."

6. **Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide**, September 2006

7. **National Wildlife Refuge System Wildland Fire Management Strategic Plan** (May 2006)

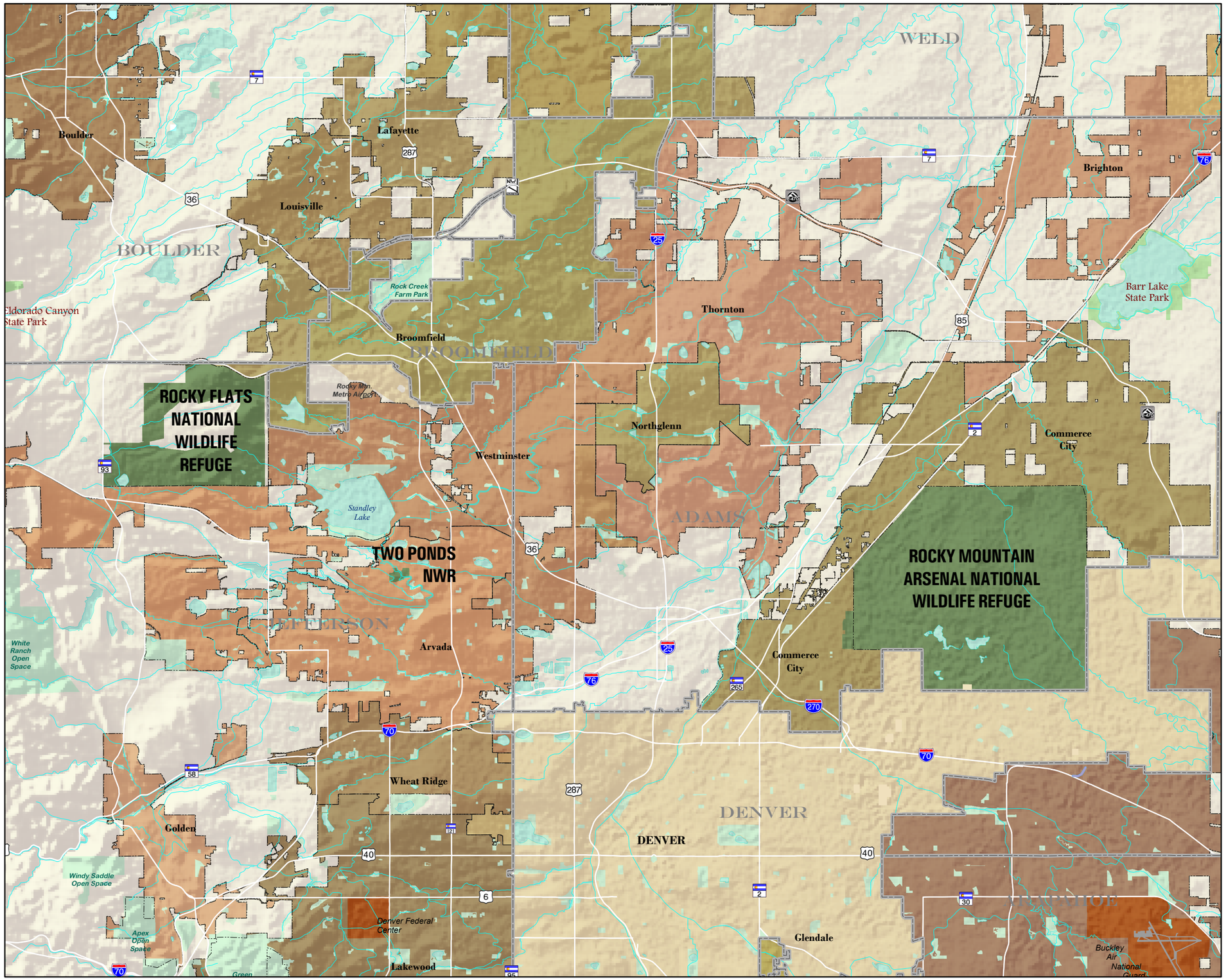
8. **Wildland Fire Use Implementation Procedure Reference Guide**, May 2005

9. **A Collaborative Approach for Reducing Wildfire Risks to Communities and the Environment: 10-Year Strategy Implementation Plan** (December 2006)

10. **National Fire Plan** (September 2001) and Healthy Forest Initiative (August 2002)

11. **Fire Qualification Guide (PMS 310-1)**. National Wildland Fire Coordination Group (NWCG)

Appendix B Maps



U.S. Fish & Wildlife Service

Rocky Mountain Arsenal
Rocky Flats
Two Ponds

National Wildlife Refuge Complex

Fire Management Plan

Regional Location Reference

- National Wildlife Refuge
- Other Federal Facility
- National Forest
- State Park or Forest
- Local Park or Recreational Area
- County Boundary
- Lake
- Stream

N

0 Miles 5

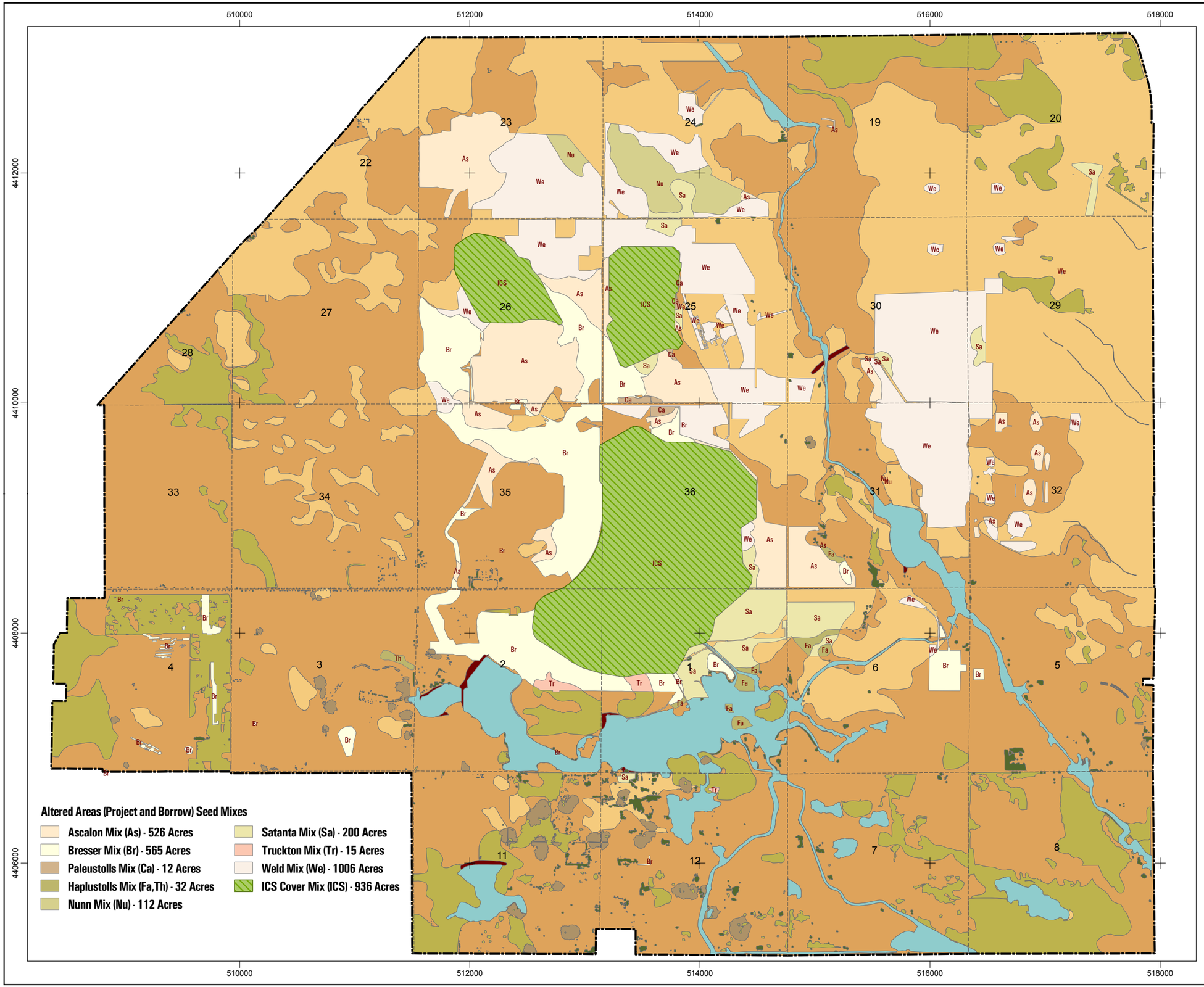
0 Kilometers 5

Transverse Mercator Projection
UTM Zone 13 North, Units Meters
North American Datum 1927
Data Sources: USFWS, Esri, CDOT

U.S. FISH & WILDLIFE SERVICE

U.S. DEPARTMENT OF THE INTERIOR
U.S. Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

Appendix B-1
Regional Location Reference



U.S. Fish & Wildlife Service

Rocky Mountain Arsenal

National Wildlife Refuge

Fire Management Plan

Habitat Types*

- Shortgrass Prairie (4576 Acres)
- Mixed-grass Prairie (8104 Acres)
- Shrubland (1373 Acres)
- New Mexico Locust Thicket (89 Acres)
- Woodland (79 Acres)
- Wetland, Riparian, and Lacustrine (674 Acres)
- Dam/Dike (16 Acres)
- Army-Retained Land (1084 Acres)

*Source: "Soil Investigation and Inventory of the Rocky Mountain Arsenal, Adams County, Colorado" by James P. Walsh & Associates, April, 1991.

0 Miles 1

0 Kilometers 2

Transverse Mercator Projection
UTM Zone 13 North, Units Meters
North American Datum 1927
Data Sources: USFWS, U.S. Army, RVO GIS Dept.

Appendix B-2b
Vegetation at the RMANWR

U.S. Fish & Wildlife Service

Two Ponds

National Wildlife Refuge

Fire Management Plan

Legend

- *Trails*
- *Fences*
- *Power Line*

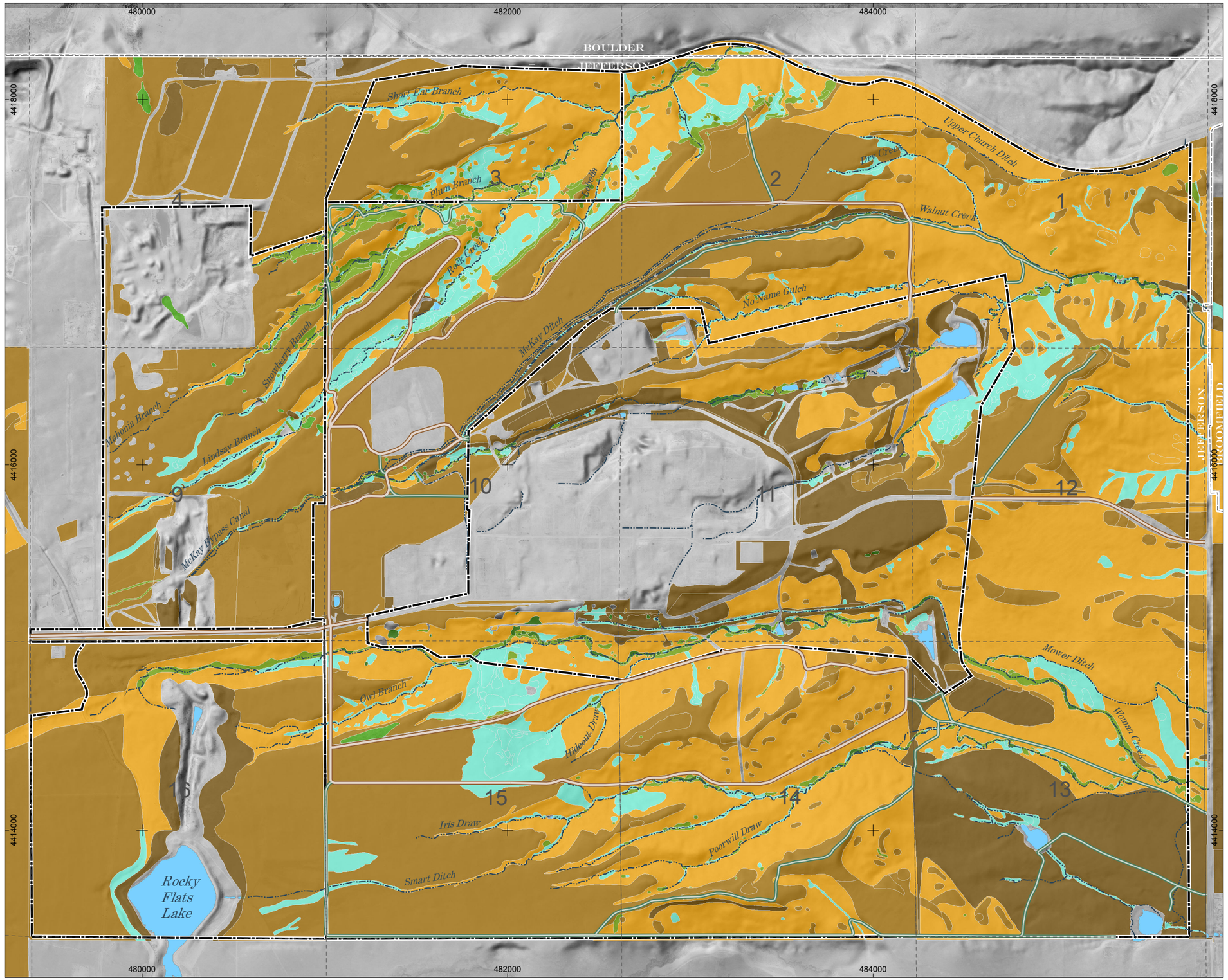
0 Feet 300

0 Meters 100

Transverse Mercator Projection
UTM Zone 13 North, Units Meters
North American Datum 1983
Data Sources: USFWS, NJAG, DOE

Appendix B-3
Two Ponds
National Wildlife Refuge

Landiscor Aerial Photography; taken August 2009



Landiscor Aerial Photography; taken August 2009

U.S. Fish & Wildlife Service

Rocky Flats

National Wildlife Refuge

Fire Management Plan

Vegetation Classes

- *Mixed Grassland*
- *Tallgrass Grassland*
- *Reclaimed Grassland*
- *Mixed Shrubland*
- *Ponderosa Pine Savana*
- *Ponderosa Pine Woodland/Forest*
- *Riarian Woodland*
- *Mixed Wetland*
- *Disturbed*

Other Features

- *Gravel Road*
- *Two-Track*
- *Stream*
- *Lakes*

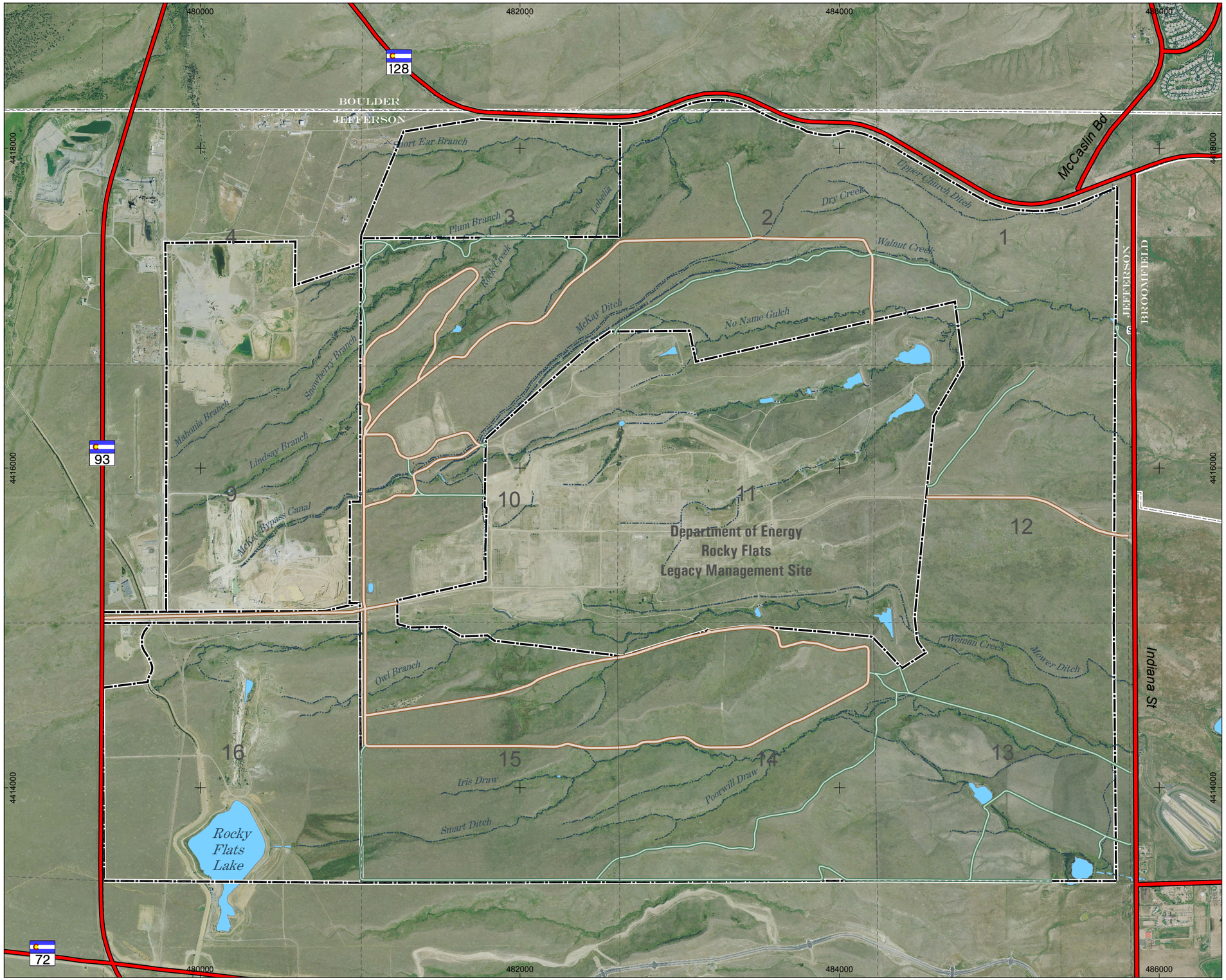
N

0 Miles 0.5

0 Kilometers 1

Transverse Mercator Projection
UTM Zone 13 North, Units Meters
North American Datum 1983
Data Sources: USFWS, NJAG, DOE

Appendix B-4b
Vegetation Classifications (2004) from North Jefferson Area Group (NJAG)



Landiscor Aerial Photography; taken August 2009

U.S. Fish & Wildlife Service

Rocky Flats

National Wildlife Refuge

Fire Management Plan

Legend

- *Rocky Flats Parcel Boundaries (Perimeter and Interior)*
- *Gravel Road*
- *Two-Track*
- *Section Line*
- *Stream*
- *Lakes*

N

0 Miles 0.5

0 Kilometers 1

Transverse Mercator Projection
UTM Zone 13 North, Units Meters
North American Datum 1983
Data Sources: USFWS, NJAG, DOE

U.S. FISH & WILDLIFE SERVICE

U.S. DEPARTMENT OF THE INTERIOR U.S. Fish and Wildlife Service NATIONAL WILDLIFE REFUGE SYSTEM

Appendix B-4b
Rocky Flats
National Wildlife Refuge

APPENDIX C-1

Finding of No Significant Impact

Fire Management Program at
Rocky Mountain Arsenal National Wildlife Refuge

1) NAME OF ACTION

Implementation of a Fire Management Program.

II. DESCRIPTION OF ACTION AND ALTERNATIVES

The proposed action would implement and maintain a comprehensive Fire Management Program at Rocky Mountain Arsenal National Wildlife Refuge. The proposed program was developed to ensure that approved fire management activities are followed by all U.S. Fish and Wildlife Service personnel, and to ensure that these activities comply with applicable Service, U.S. Army, state, and federal regulations. The Fire Management Plan outlines Service program guidelines, Service and U.S. Army roles and responsibilities, and coordination efforts. The proposed plan directs the Service to use prescribed fire to manage native wildlife habitats in a safe and cost-effective manner, while the U.S. Army continues to be responsible for fire suppression on the Refuge until such time that Refuge property is transferred to the Service.

The alternatives to the proposed action are the “no-action” or “no management” alternatives. Under these alternatives, fire management activities would be severely limited or not conducted by the Service at the Refuge. Essentially, prescribed fire would not be an available alternative to manage native wildlife habitat.

III. SUMMARY OF ENVIRONMENTAL EFFECTS

The attached Environmental Assessment (EA) for the Fire Management Program at Rocky Mountain Arsenal National Wildlife Refuge and Final Environmental Impact Statement (FEIS) (U.S. Fish and Wildlife Service 1995) provide the basis for this Finding of No Significant Impact (FONSI). The EA examined the impacts of the proposed Fire Management Program and alternatives on Refuge wildlife and habitat resources, local economics, and public use activities. No significant adverse impacts were anticipated from implementation of the Fire Management Program. Under the “no action” or “no management” alternative, the overall quality of Refuge habitats important to wildlife and people would deteriorate due primarily from invasion by noxious weeds. These alternatives are not conducive to meeting the goals and objectives for which the Refuge will be established.

IV. CONCLUSION

Based on the evaluation of the potential effects of the proposed action as set forth in the EA and other supporting documentation, it is determined that the “no action” or “no management” alternatives would have significant negative environmental impacts. The alternative of implementing the Fire Management Program would be the most beneficial to wildlife and habitat resources while facilitating habitat restoration and public use activities at the Refuge. Therefore, the implementation of this Fire Management Program is not a major federal action which would significantly affect the quality of the human environment within the meaning of Section 102(2)(C) of the National Environmental Policy Act of 1969. Accordingly, preparation of an Environmental Impact Statement on the proposed action is not required and a Finding of No Significant Impact is warranted.

V. SUPPORTING REFERENCES

U.S. Fish and Wildlife Service. 1997. An Assessment of Fire as an Alternative for the Management of Wildlife Habitats at Rocky Mountain Arsenal National Wildlife Refuge.

U.S. Fish and Wildlife Service. 1995. Rocky Mountain Arsenal National Wildlife Refuge Final Environmental Impact Statement. Adams County, Colorado.

Regional Director
Mountain-Prairie Region 6

Date

APPENDIX C-1

An Assessment of Fire as an Alternative for the Management of Wildlife Habitats at Rocky Mountain Arsenal National Wildlife Refuge

U.S. Fish and Wildlife Service
Rocky Mountain Arsenal National Wildlife Refuge
June 1997

An Assessment of Fire as an Alternative for the Management of Wildlife Habitats at Rocky Mountain Arsenal National Wildlife Refuge

TABLE OF CONTENTS

PAGE

I. PURPOSE AND NEED FOR ACTION..... 1

- **A. Introduction**
- **B. Purpose of Action**
- **C. Need for Action**

II. THE AFFECTED ENVIRONMENT.... 4

- **A. Location and Habitat Types**
- **B. Climate**
- **C. Topography, Geology, and Soils**
- **D. Vegetation**
- **E. Water Resources**
- **F. Wildlife**
- **G. Cultural Resources**
- **H. Public Use**
- **I. Social and Economic Environment**

III. FIRE AS AN ALTERNATIVE FOR HABITAT MANAGEMENT.. 11

- **A. Environmental Consequences of Fire**
  1. General
  2. Fire Effects on Plant Communities
  3. Fire Effects on Wildlife
  4. Fire Effects on Refuge Neighbors
- **B. Alternatives for Habitat Management**
  1. General
  2. Alternatives
     - a. No Action Alternative
     - b. No Management Alternative
     - c. Proposed Action Alternative

IV. CONSULTATION AND COORDINATION.. 21

LITERATURE CITED..... 21

I. PURPOSE AND NEED FOR ACTION

A. Introduction

The U.S. Fish and Wildlife Service proposes to actively manage wildlife habitats found on Rocky Mountain Arsenal National Wildlife Refuge to achieve Refuge purposes and objectives. The Rocky Mountain Arsenal National Wildlife Refuge Act (H.R. 1435) was enacted by Congress on October 9, 1992 and specified that real property would be transferred from the U.S. Army to the Service upon the completion of environmental cleanup and certification by the Environmental Protection Agency. The Act also specified that the Service would manage the site "as if it were a Refuge" during cleanup.

This document was prepared to investigate and evaluate the use of prescribed fire as a management alternative on Refuge habitats. Prescribed fire is a habitat management tool available to assist in achieving Refuge goals and objectives. The affected environment is identified, beneficial and detrimental effects are discussed, and environmental consequences are evaluated in this assessment.

B. Purpose of Action

This Environmental Assessment (EA) evaluates the prescribed fire alternative for managing wildlife habitats to achieve Refuge goals and objectives. The purposes of the Refuge as stated in the Act are:

> (1) "To conserve and enhance populations of fish, wildlife, and plants within the refuge, including populations of waterfowl, raptors, passerines, and marsh and water birds."
> (2) "To conserve species listed as threatened or endangered under the Endangered Species Act and species that are candidates for such listing."
> (3) "To provide maximum fish and wildlife oriented public uses at levels compatible with the conservation and enhancement of wildlife and wildlife habitat."
> (4) "To provide opportunities for compatible scientific research."
> (5) "To provide opportunities for compatible environmental and land use education."
> (6) "To conserve and enhance the land and water of the refuge in a manner that will conserve and enhance the natural diversity of fish, wildlife, plants, and their habitats."
> (7) "To protect and enhance the quality of aquatic habitat within the

refuge."
(8) "To fulfill international treaty obligations of the United States with respect to fish and wildlife and their habitats."

In keeping with the above purposes and the mission of the Service, the following goals were identified in the Final Environmental Impact Statement (FEIS) (U.S. Fish and Wildlife Service 1995) and Comprehensive Management Plan (CMP) (U.S. Fish and Wildlife Service 1996):

- *Wildlife and Habitat Management Goal.* Manage wildlife and habitat to contribute to ecosystem management using strategies that recognize the Refuge's different resource types and the varying purposes specified in the legislation.
- *Community Cooperation Goal.* Interact with communities and organizations through outreach, partnerships, and other cooperative efforts to create mutually beneficial relationships.
- *Environmental Education and Interpretation Goal.* Create environmental education and outreach programs for urban populations that will nurture an appreciation of nature and will help instill an attitude of environmental responsibility.
- *Recreational Goal.* Provide opportunities for enjoyable experiences through compatible wildlife-oriented recreation.
- *Research Goal.* Use the site's unique qualities to provide opportunities for research activities compatible with management of the Refuge.
- *Program Support Goal.* Develop a program support system to provide facilities, funding and resources necessary to accomplish Refuge purposes.

The Service has also identified specific goals and objectives of the Refuge habitat restoration program:

- Compensate for the loss of habitat which has been or will be destroyed or significantly disturbed by the U.S. Army, Shell Oil Company, and/or their contractors as a result of production and/or cleanup of chemical contaminants.
- Restore important components of the native plant communities thought to have existed prior to European settlement.
- Develop stable vegetation communities for native wildlife species, particularly for those emphasized in the "Goals and Objectives" section of the CMP (i.e., black-tailed prairie dog (*Cynomys ludovicianus*), deer (*Odocoileus* spp.), bison (*Bison bison*),

pronghorn (*Antilocarpa americana*), and prairie grouse (*Tympanuchu*s spp.). Many additional important species (e.g., eagles) or groups of species (e.g., raptors, songbirds) will benefit from developing or enhancing habitat for the species above, particularly prairie dogs and deer.

- Restore important features of First Creek believed to have existed prior to European settlement.
- Maintain certain specific plant communities, especially those defined by native, woody species or succulent vegetation, that serve particularly significant wildlife communities.
- Improve methods for reestablishing native wildlife habitat.

Specific objectives are attached to the above goals and may be referenced in the Habitat Restoration Plan for Rocky Mountain Arsenal National Wildlife Refuge (U.S. Fish and Wildlife Service 1997).

C. Need for Action

Quality management of Refuge habitats is critical to providing for the wildlife and people that use the area. The Service is additionally responsible for mitigation and environmental restoration before, during, and after cleanup activities. There are several tools and strategies available to the Service to assist in accomplishing habitat management goals. Prescribed fire is one such tool that is addressed in this assessment.

Fire was an essential part of the natural shortgrass and sand prairie ecosystems found in the eastern Colorado, Central Great Plains region. Prairie ecosystems were also shaped by large herds of bison grazing and trampling vegetation and drought conditions occurring at varying times of year and intensity levels. Although varying drought conditions continue to shape Refuge lands today, the past suppression of fire and grazing and the conversion of most native vegetation into cropland has had the most influence on existing Refuge habitats. The Service recognizes that prairies evolved under dynamic conditions that resulted in diverse plant and animal communities in various successional stages. With this realization comes the need to employ a variety of habitat management tools that help to recreate and restore historical conditions.

To employ prescribed fire as a tool along with the mechanical, chemical, and biological methods already being used at the Refuge, a good understanding of the effects of fire on Refuge ecosystems is needed. This assessment will address this need by evaluating how prescribed fire can

be used to assist in habitat restoration and maintenance strategies aimed to achieve overall management goals. Grazing is not currently being used on Refuge lands and therefore will not be addressed in this document. Future wildlife reintroductions may allow for grazing as a management tool and an assessment will be performed at that time.

II. THE AFFECTED ENVIRONMENT

A. Location and Habitat Types

Rocky Mountain Arsenal National Wildlife Refuge consists of approximately 17,000 acres of largely undeveloped, open grassland in southern Adams County, Colorado . The Refuge is bordered by the urban communities of Commerce City to the west/northwest and Denver (Montbello) to the south. Denver International Airport is located east of the Refuge and primarily agricultural land exists along the Refuge's northern border.

Refuge lands were first used by settlers in the late 1800's for farming and livestock grazing. In 1942, the U.S. Army purchased the property and produced incendiary weapons and gases for World War II and the Korean Conflict. Pesticides were also produced during this time by private companies, including Shell Chemical Company, now Shell Oil Company. The result of approximately 40 years of production was the environmental contamination of groundwater and soils in primarily the core production areas. The property is currently listed as a Superfund site and is undergoing environmental cleanup managed and funded by the U.S. Army and Shell Oil Company. The Service currently manages land and wildlife resources under a Cooperative Agreement with the Army and the property will be transferred to the Service when cleanup is complete.

The Refuge is thought to be originally made of shortgrass and sand prairie of which small remnants exist today. Most native vegetation was lost through settlement and conversion of land to agricultural uses in the late 1800's (Ebasco et al. 1989). Today, approximately 10,000 Refuge acres consist of weedy forbs and grasses such as cheatgrass (*Bromus tectorum*), crested wheatgrass (*Agropyron cristatum*), field bindweed (*Convolvulus arvense*), annual mustards (*Sisymbrium* spp.), and exotic thistles (*Cirsium* spp.). The Service has concentrated habitat restoration efforts in these areas. Other Refuge acreage is made up of approximately 4,000 acres of remnant and seeded native perennial grasslands, 1,000 acres of shrubland/succulents, 450 acres of disturbed land, 425 acres of wetlands, 260 acres of riparian habitat, 240 acres of woodlands made up

of native and non-native tree species, and 180 acres of lacustrine habitat.

B. Climate

The Refuge experiences a moderate, sunny, semi-arid climate with uncommon prolonged periods of very cold/hot weather (Morrison-Knudsen 1989). The region averages 30 days with high temperatures above 90°F (32°C) and 150 days with low temperatures below 32°F (0°C). Low humidity, moderate temperatures, and moderate winds dominate the 180 day average growing season. Mean maximum and minimum winter temperatures are 41°F (5°C) and 12°F (-11°C) for January, and 85°F (29°C) and 55°F (13°C) for July.

Average yearly precipitation ranges from 12 to 16 inches with 80 percent occurring between the growing season months of April and September. Precipitation is generally in the form of wet snow or rain that occurs primarily during the spring. Summer thunderstorms are usually brief, producing some rain and lightning. Winters are relatively dry with occasional high intensity “chinook” winds typically from the south-southwest. Relative humidity is generally low throughout the year, with monthly averages of 50-60 percent and numerous days below 10 percent.

C. Topography, Geology, and Soils

The Refuge is located on the western edge of the Central Great Plains that extend from the foothills of the Rockies in eastern Colorado and southeastern Wyoming eastward through Kansas and Nebraska to grassland-forest communities in northwest Missouri, southern Iowa, and Illinois. The Refuge is in the Denver basin, a north-south fold in regional geology that extends along the Front Range from Cheyenne, Wyoming to Colorado Springs, Colorado. Surface geologic deposits and topography are due primarily to river and stream erosion that deposited alluvial sediments from the Platte River system, and wind blown eolian sediments (U.S. Fish and Wildlife Service 1995).

The Refuge landscape is gently undulating to undulating to rolling with slopes typically less than 3 percent and up to 10 percent. The elevation is approximately 5,300 feet (1,622 meters above sea level (MSL)) at the southeastern corner and 5,100 feet (1,566 MSL) at the northwestern corner. The average elevation is 5,250 feet.

The predominant types of surficial soils are sandy and Weld loams. These topsoils are extremely well-drained and wind erosion is quite

common in areas with little or no vegetation. Sandy soils include Ascalon, Bresser, and Bresser-Satanta sandy loams. Loam soils include Nunn Clay, Satanta, Truckton, and Weld loam types. Aquic and Typic Haplustoll soils are found in riparian, wetland, and drainage areas.

D. Vegetation

Refuge vegetation is currently classified into the following types: weedy forbs/grasses, native perennial grasslands, shrubland/succulents, disturbed, wetlands, riparian, woodlands, and lacustrine. Habitat management strategies vary according to the presence of native vegetation and the objectives at the site. Restoration efforts are currently concentrated in weedy grassland areas and the use of fire will be addressed in each of the following Refuge habitats.

1. Weedy forbs/grasses - Approximately 10,000 Refuge acres are invaded by weedy species due to the conversion of native plant communities to cropland in the late 1800's and subsequent abandonment of agricultural uses in 1942. Plant communities are now dominated by cheatgrass and crested wheatgrass with many weedy forb species present throughout the site. Canada (*Cirsium arvense*) and musk thistle (*Carduus nutans*) have invaded many wetland areas. Three knapweed species (*Centaurea* spp.) on the State noxious weed list are also present on the Refuge in drier upland areas.

2. Native perennial grasslands - Native grasslands exist as approximately 3,340 acres of remnant sites that escaped the plow and persisted despite invading weeds, and 660 acres of seeded restoration sites. Species present and planted in these native areas include western wheatgrass (*Agropyron smithii*), blue grama (*Bouteloua gracilis*), sand bluestem (*Andropogon hallii*), needle-and-thread grass (*Stipa comata*), and sand dropseed (*Sporobolus cryptandrus*).

3. Shrubland/succulents - Approximately 1,000 acres of shrublands on the Refuge are made up of species such as sand sagebrush (*Artemisia filifolia*), rubber rabbitbrush (*Chrysothamnus nauseous*), and yucca (*Yucca glauca*). Most of these areas were used for grazing instead of planted for crops, and although many shrub species are present, the grass understory is often composed of weedy grass species due to past poor grazing practices.

4. Disturbed - Disturbed areas consist of those lands presently used for buildings, cleanup monitoring infrastructure, and cleanup sites. These 440 acres are not managed by the Service at this time, but a portion of this

acreage will eventually become available to be managed as wildlife habitat as cleanup progresses.

5. Wetlands - Approximately 425 acres of Refuge wetlands provide stopover habitat for migrating waterfowl. Native cattails (*Typha* spp.) provide ample habitat for nesting marshland birds such as red-winged blackbirds (*Agelaius phoeniceus*), but have grown so dense in some wetlands that control will be employed.

6. Riparian - Riparian habitat consists of approximately 260 Refuge acres primarily along First Creek, the Highline Canal, Uvalda Drainage, Havana Ponds, and near the lakes. Mature cottonwood trees (*Populus* spp.) and coyote and peachleaf willow (*Salix* spp.) line these waterways and provide valuable habitat to various raptors, songbirds, and upland gamebirds such as ring-necked pheasants (*Phasianus colchicus*).

7. Woodlands - The approximately 240 acres of Refuge woodlands consist of a variety of native and non-native species. Former homestead sites now serve as scattered woodlots throughout the Refuge. Many of these sites are made up of non-native species of pine (*Pinus* spp.), juniper (*Juniperus* spp.), and a variety of deciduous trees.

8. Lacustrine - Primarily four lakes make up the 180 acres of lacustrine habitat found on the Refuge. Lake Ladora and Upper and Lower Derby Lakes were built for irrigation in the late 1800's and Lake Mary was constructed in the 1950's as a children's fishing lake.

E. Water Resources

Locally, the Refuge lies within the South Platte River drainage. The principle streams are intermittent and include First Creek, Irondale Gulch, and the Sand Creek lateral. First Creek, the only natural waterway on the Refuge, drains the southeastern corner, runs north, and eventually discharges into the O'Brien Canal. The Highline Canal lateral was built in the late 1800's to supply water to 3 artificial lakes: Lake Ladora, Lower Derby Lake, and Upper Derby Lake located on the south side of the Refuge. A fourth lake, Lake Mary, was constructed by Army personnel in the 1950's. The Service has also created five wetlands located in the southeastern part of the Refuge with additional wetland and marsh habitats found surrounding the lakes, along First Creek, and in small ponds and drainages throughout the Refuge.

F. Wildlife

1. Threatened, Endangered, and Candidate Species - The Refuge provides habitat for several federally listed threatened, endangered, and candidate plant and animal species. Candidate species are those that are not yet listed as threatened or endangered due to insufficient information. Some species inhabit the Refuge on a regular basis, others are migrants and only occasionally sighted, and some have not been seen on the Refuge despite suitable habitat.

Bald eagle (*Haliaeetus leucocephalpus*) - The bald eagle was recently down listed from endangered to threatened due to nationwide recovery efforts. The bald eagle communal roost site along First Creek and other loafing, perching, and roosting sites throughout the Refuge are locations that would be particularly sensitive to wildfires. Care will continue to be taken during wildfire suppression and prescribed burning to adequately protect large trees that bald eagles and other raptors use. Equally important would be the protection of Black-tailed prairie dog (*Cynomys ludovicianus*) and small mammal habitat that bald eagles rely on as primary prey species on the Refuge. Although a large wildfire at the wrong time of year could have a negative impact on prey populations, prescribed fire could be used as a tool to restore, enhance, and maintain healthy native grasslands that support abundant prey.

American peregrine falcon (*Falco peregrinus*) - The American peregrine falcon is listed as an endangered species and has been observed on the Refuge several times. The closest suitable nesting habitat is 25 miles west in the Front Range foothills and in downtown Denver where they have been introduced in an attempt to establish an urban population. Since this species is usually just passing through the Refuge, fire on Refuge lands would have little or no effect on peregrine populations.

Eskimo curlew (*Numenius borealis*) - The endangered Eskimo curlew has never been sighted on the Refuge and has not been sighted in Colorado since 1965. The Refuge has open grassy meadow habitat this species prefers, though more suitable habitat might be found north of the Refuge along the South Platte River.

Ute ladies'-tresses orchid (*Spiranthes diluvialis*) - This threatened plant is found along streams, in wetlands, and in other moist habitats along Colorado's Front Range and plains. Although not yet located on the Refuge, suitable habitat exists and if an orchid population is found, fire effects on the species and its habitat would be considered in fire

management.

Candidate Species:

- Preble's meadow jumping mouse (*Zapus hudsonius preblei*) - Suitable willow and grass riparian habitat occurs, but the jumping mouse is not currently found on the Refuge.
- Swift fox (*Vulpes velox*) - Suitable shortgrass prairie and potential prey base occur on the Refuge, but it is uncertain if swift fox are present.
- Ferruginous hawk (*Buteo regalis*) - Ferruginous hawks are attracted to open Refuge grasslands each winter to prey on prairie dogs and rabbits.
- Baird's sparrow (*Ammodramus caudacutus*) - The Baird's sparrow is a migrant species to native Refuge grasslands.
- Black tern (*Chlidonias niger*) - The black tern in an uncommon migrant to Refuge wetlands.
- Mountain plover (*Charadrius montanus*) - The mountain plover has been observed using Refuge shortgrass prairie, especially in prairie dog towns, but nesting activity has not been documented.
- White-faced ibis (*Plegadis chihi*) - The white-faced ibis has been observed as a casual visitor to the Refuge, but optimal wetland habitat for foraging or nesting does not occur on the Refuge.
- Regal fritillary butterfly (*Speyeria idalia*) - Some suitable wet or moist meadow habitat occurs on the Refuge, but the larval host plant species is uncommon and the butterfly has not been observed.
- Colorado butterfly weed (*Asclepias tuberosa*) - Suitable moist prairie meadow habitat occurs on the Refuge, but the butterfly weed has not been found.

2. Birds - Refuge biologists and visitors have observed 228 bird species on the Refuge. Of these, 58 species have been known to nest here. The Refuge is an important stopover site during spring and fall migrations for many waterfowl, shorebirds, and songbirds. Habitat management techniques can affect all species of birds and their food sources, and therefore planning efforts should take as many species into account as possible.

3. Mammals - Refuge habitats support 34 mammal species. The Refuge is home to healthy populations of approximately 200 whitetail deer (*Odocoileus virginianus*) and 550 mule deer (*O. hemionus*). Other mammal species include American badger (*Taxidea taxus*), coyote (*Canis*

latrans), red fox (*Vulpes fulva*), 19 small mammal/rodent species, and 4 lagomorph (rabbit and hare) species. Along with other mammal species, habitat planning should consider Refuge prairie dog and cottontail rabbit (*Sylvilagus* spp.) populations that are especially important prey species for Refuge raptor populations.

4. Reptiles and Amphibians - Twenty species of reptiles and amphibians have been documented in Refuge habitats. These include tiger salamanders (*Ambystoma tigrinum*), 3 toad and 3 frog species, 3 turtle species, 2 lizard and 1 skink species, and 7 species of snakes.

5. Fish - Fifteen fish species have been observed on the Refuge. Since First Creek experiences only intermittent flows, it is most likely that all of these species were introduced into Refuge lakes and waterways.

6. Invertebrates - Several species of invertebrates have been documented in parts of various research conducted on vertebrate species on the Refuge. No formal invertebrate surveys have been conducted, but general observations indicate that the Refuge supports populations typical to similar habitats found in the region.

G. Cultural Resources

A Class III cultural resource investigation has identified 175 prehistoric and historic properties. Evidence of prehistoric activities near the northern boundary of the Refuge exists as stone flakes from projectile points and knives, fire-cracked rocks and pottery used for cooking, and hammer and grinding stones dating between 3500 B.C. and 1700 A.D. (U.S. Fish and Wildlife Service 1995). These activities were conducted by modern native tribes that occupied the area by the early 1500's.

The Refuge may contain Native American sites up to 13,000 years old and historic sites related to prairie settlement in the 1800's, World War II, and Cold War chemical weapons production from the mid-1900's. Habitat management techniques should continue to consider cultural resources since most prehistoric and sites are protected by soil coverage vulnerable to soil disturbances.

H. Public Use

Approximately 49,000 people from the Denver metropolitan area visit the Refuge annually to participate in public use programs. Programs include wildlife tours, environmental education, presentations, special events, the

Eagle Watch, interpretive activities, nature walks, and fishing and scout programs. Visitors include approximately 15,000 students and teachers participating in environmental education programs. Recreational uses also include bird watching and fishing with 700 permits issued each year for catch-and-release sport. No hunting is allowed on the Refuge.

I. Social and Economic Environment

The Refuge is located in Adams County, accounting for 2 percent of the county's acreage in the northeastern portion of the six-county Denver metropolitan area. Land use surrounding the Refuge varies considerably and includes the former Stapleton Airport site, residential, commercial, industrial, and agricultural uses. Future land use surrounding the Refuge will vary depending on the landowner and includes plans for residential, business and retail, and open space designations.

Because of its location in proximity to Denver, the Adams County economy is integrated into the larger and more complex Denver metro area economy. Population in the metro area was 1,715,300 in 1992 and is expected to grow to 2,612,200 by 2015. Adams County was ranked fifth in the state with a population of 281,700 and expected to grow to 408,400 by 2015.

Adams County includes 9 cities and has a land area of 1,194 square miles. Commerce City adjoins or will adjoin the Refuge on the north, west, and northeast. Commerce City is home to a high concentration of industry and is a central transportation and distribution hub. Nearly half of the business in the city involves services and retail trade, and the majority of land is used for public roads, infrastructure, and industry. Residential land uses account for 23 percent with a median household income of $22,916 and commercial uses account for 5 percent.

III. FIRE AS AN ALTERNATIVE FOR HABITAT MANAGEMENT

A. Environmental Consequences of Fire

1. General

The Service currently uses mechanical, chemical, and biological tools, and prescribed fire to manage habitat at the Refuge. This assessment will address the continued use of prescribed fire to manage Refuge habitats. Prescribed burns would be conducted by the Service under the guidance of the Refuge Fire Management

Plan and individual prescribed burn plans. Specific instructions, objectives, and guidance are contained in those documents and will not be duplicated here.

Fire is a natural and essential part of the Refuge's grass and shrubland ecosystems. Fire created and sustained native prairie by helping to prevent the invasion of trees and other woody species. Historic records describe huge prairie fires started by lightning or humans. As with southern mixed grass prairie, slow litter accumulation of Refuge short and mixed grass systems probably prevented fires from occurring more frequently than every 5 - 50 years (Bragg 1994). Other studies indicate that a longer frequency of 10 - 30 years may be more accurate (Wright and Bailey 1982).

2. Fire Effects on Plant Communities

Fire can probably have the most severe effect on habitat and wildlife of any management tool except plowing, and yet it can have some of the most beneficial and positive effects as well. Prescribed burns and wildfires may kill or reduce the vigor of some plants while invigorating grasses and woody shrubs. Fire exposes the soil which may increase run-off of precipitation and erosion, increase soil moisture evaporation, and increase soil surface temperature and moisture extremes. Depending on the severity, fire can also quickly cycle nutrients from organic to inorganic states by converting surface mulch, litter, and standing growth to ash. Frequent burning tends to decrease grass and forb seedling establishment, increase moss and algal communities, and reduce soil fertility and organic content.

Despite its possible negative effects, fire can be managed as prescribed burns and produce many desired effects on plant communities. Burning may be used to reduce heavy litter that is reducing new vegetative growth and productivity. Removing litter accumulations by burning and increasing soil temperatures at the right time can stimulate the growth of native grasses and help to hasten establishment of desired species. In this way prescribed burns may be used to rejuvenate decadent native grass stands that have become recently susceptible to invasion by weedy species.

Warm season native grasses that increase with frequent spring burns include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), blue grama, Indiangrass (*Sorghastrum*

avenaceum), and switchgrass (*Panicum virgatum*) (Higgins et al. 1989). Cool season native grasses such as western wheatgrass and needle-and thread grass (*Stipa comata*) also increase after spring burns, with western wheatgrass increasing considerably more after late summer or early fall fires (Higgins et al. 1989).

Prescribed burning may be used to prepare areas for interseeding instead of plowing and can reduce wildfire danger by reducing heavy fuel loads. It may also be used with other management tools to control weedy species such as smooth brome (*Bromus inermis*), Kentucky bluegrass (*Poa pratensis*), and cheatgrass (*Bromus tectorum*). Fire is a major cause of disturbance that has enhanced the establishment and spread of cheatgrass, but fire can also be used to control the species (Higgins et al.1989). Prescribed fire may also be used in wetland areas to control dense monotypic cattail (*Typha* spp.) growth, choking off open water areas. Cattail stem densities were reduced by 70 percent and no fruiting heads were formed on areas burned over the ice and flooded the following spring (Higgins et al. 1989).

Although fire is commonly used in rangelands to remove shrubs of low forage value for cattle, fire can have very positive effects on desirable shrub species for wildlife. Desirable shrubs such as serviceberry (*Amelanchier* spp.), snowbrush (*Ceanothus velutinus*), and true mountain mahogany (*Cercocarpus montanus*) are only temporarily set back by fire and Wood's wild rose (*Rosa woodsii*) is enhanced by fire (Wright and Bailey 1982). Other shrub species such as smooth sumac (*Rhus glabra*), western snowberry (*Symphoricarpos occidentalis*), four-wing saltbush (*Atriplex canescens*), and winterfat (*Ceratoides lanata*) are also desirable shrubs benefitted by fire depending on the frequency of burning (Higgins et al. 1989).

Additionally, fire has various effects on native shrub species that comprise most of the shrublands on the Refuge. Big sagebrush (*Artemisia tridentata*) is fire sensitive and usually controlled by burning, as is broom snakeweed (*Gutierrezia sarothrae*) (Wright and Bailey 1982). Fire has been found to virtually eliminate gray (rubber) rabbitbrush, but personal observations on the Refuge found that rabbitbrush sprouted vigorously after a cool spring burn. Yucca species are tolerant of fire and hold their own in various plant communities, and sand sagebrush (*A. filifolia*) is a non-sprouter whose seedlings come back vigorously following fire

(Higgins et al. 1989).

3. Fire Effects on Wildlife

Many native wildlife species evolved with fire and have developed means of tolerating and/or taking advantage of fires. In general, fires result in little direct wildlife mortality and usually benefit native wildlife (Higgins et al. 1989). However, an escaped prescribed fire turned wildfire on the Refuge during drought conditions or late in the growing season could significantly reduce forage availability for the season for the mule deer population. Escaped fires in sensitive wildlife areas such as the bald eagle roost and raptor nesting sites could damage individual roost/nest trees and therefore negatively affect Refuge raptor populations. Timing of prescribed burns to minimize the impact on ground nesting birds would be of major importance in prescribed burn planning. Timing is also a major factor in insect fire ecology with early spring burning having the least impact on insect populations.

Bird species evolving with fire may show fire-adapted behavior, whereas other species exposed infrequently to fire in their evolutionary histories may be severely inhibited by it. There is general agreement that fire reduces waterfowl breeding pair densities, alters nest site selection, and changes foraging behavior of nongame bird species, at least during the first breeding season after the burn (Higgins et al. 1989). Breeding pair densities of lark sparrows (*Chondestes grammacus*) in central Texas were highest in the most recently burned areas. Grasshopper sparrows (*Ammodramus savannarum*) and western meadowlarks (*Sturnella neglecta*) decreased in numbers in South Dakota grasslands after spring burning, while vesper sparrows (*Pooecetes gramineus*) increased (Higgins et al. 1989). Other researchers found that the major impact of burning on foraging behavior was to make plant seeds and insects more accessible.

Prescribed burns conducted to manage habitat for waterfowl and shorebird production are generally beneficial. Obvious immediate impacts of fire on upland nesting waterfowl are the destruction of nests and their contents. However, most researchers agree that prescribed burning is a valuable management tool for upland nesting birds in grassland areas (Higgins et al. 1989). One study found that 52 percent of the duck nests on burned grasslands were successful, compared to 32 percent on unburned areas. The

greatest measured change in vegetation after burning was an increase in plant variety that also changed the growth form and pattern of nesting cover, which may have made it more attractive to waterfowl. Burning shorelines and upland grasses also generally attracted shorebird species (Higgins et al. 1989).

The effects of prescribed burns on small mammals varies with the species' ecology. Most research indicates limited direct mortality due to fire but notes that an indirect cause of mortality was due to the reduced immediate cover and increased accessibility to predation by avian and mammalian predators (Higgins et al. 1989). Fires affect rodent population densities primarily by altering habitat. The decrease in vegetative cover results in fewer microhabitats available for use by rodents. However, the reduction in ground litter enhances primary production causing a shift in rodent species composition and density depending on habitat use and forage preferences (Higgins et al. 1989). The increased availability of seeds and insects after a burn favors species such as deer mice (*Peromyscus maniculatus*), kangaroo rats (*Dipodomys* spp.), and pocket mice (*Perognathus hispidus*). Populations of herbivore species such as voles (*Microtus* spp.) and jumping mice (*Zapus* spp.) that are restricted to habitats with dense cover often decline after a burn but then increase in 2-4 years following a fire when undergrowth accumulations reach that of unburned areas (Higgins et al. 1989).

Grass and forb eating large mammals such as pronghorn antelope (*Antilocapra americana*), bison (*Bison bison*), and elk (*Cervus elaphus*) that do not require abundant escape cover benefit from the increase in the grass component of habitats after fire (Higgins et al. 1989). Fires have varying effects on browsers such as mule deer depending on the intensity and patchiness of the burn. Prescribed burns on big sagebrush shrublands have short-term negative effects on mule deer winter forage. Prescribed burns on other browse can stimulate production and result in an increase in deer populations with regenerating brush sprouts and seedlings after a cool grassland fire offering deer a palatable and nutritious diet (Higgins et al. 1989). Unburned habitat generally can support larger populations of mule deer than burned habitat on a relatively low plane of nutrition. Prescribed burning becomes a productive treatment when management objectives specify supporting fewer animals at higher nutritional levels (Higgins et al. 1989).

In general, fire enhances wildlife habitat by creating vegetative diversity. Burns leaving a mosaic pattern with about 20 percent of unburned vegetation are most desirable for most wildlife species. Mosaic prescribed burns provide for new growth of nutritional forages, seasonal habitats, and maintenance of vegetation in early successional stages. This improvement in habitat and forage increases the carrying capacity of managed habitats for a variety of wildlife (Higgins et al. 1989).

The Service will strive for optimal results in its prescribed burn program. Negative impacts of fire on Refuge wildlife will be minimized through proper burn planning and operations. Pre- and post-burn habitat and wildlife population monitoring will become an integral part of the Refuge's prescribed burn program.

4. Fire Effects on Refuge Neighbors

Fire can produce large amounts of smoke and particulates that may have an effect on Refuge neighbors. The Service will work closely with Refuge neighboring communities and fire protection districts to ensure public health and safety during prescribed burn operations. The close proximity of the Refuge to urban development in the Denver metro area and the Denver International Airport requires that the Service operate under strict air pollution guidelines governing open burning. Burning permits are required from the Colorado Department of Health Air Pollution Control Division and open burning is generally banned during the months of November through February.

B. Alternatives for Habitat Management

1. General

Management of National Wildlife Refuges must adhere to sound resource management principles that govern the Service's mission and purposes for which each Refuge is established. The Service has developed detailed on-site management plans to provide guidance and direction that ensures that outlined goals and objectives are accomplished. Habitat management alternatives, like other management policies must also comply with existing environmental laws and regulations. These laws, regulations, and management actions are discussed here. A summary of effects of alternatives on major issues at the Refuge is available in Table 1.

Cultural Resources - Both historical and prehistorical cultural resources on the Refuge will be protected from damage in accordance with the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470). The Service will preserve all sites of cultural resources recommended for the National Register in their original location unless excavation is necessary for environmental remediation purposes. Additionally, areas planned for habitat management have been surveyed for cultural resources and will be reviewed by the State Historic Preservation Office prior to treatment.

Threatened and Endangered Species - The proposed action is not likely to affect any federally listed species. If future determinations find that the implementation of the Fire Management Plan under the guidance of this assessment may affect any threatened or endangered species, a Section 7 intra-Service consultation will be requested prior to any action as required by the Endangered Species Act of 1973 (16 U.S.C. 1531-1543). The Service will also inventory and protect state listed threatened and endangered species.

Native Grassland Protection - The Service has a longstanding policy prohibiting the conversion of Refuge native grassland habitats to other upland types or conditions such as cropland or "improved" duck nesting cover (6 RM 5.1). Native grasslands disturbed as a result of construction of other management actions must be rehabilitated with native species.

Refuge Compatibility - The National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd) states that uses of National Wildlife Refuges are permissible when "compatible with the major purposes for which such areas are established." These uses must not materially interfere with or detract from Refuge purposes (5 RM 20.6).

Refuge Management Plans - Management plans provide detailed guidance and direction for accomplishing Refuge goals and objectives. As with the Refuge Comprehensive Management Plan (March 1996), the Fire Management Plan and Habitat Management Plan will offer the public and other federal, state and local agencies an opportunity to participate and comment in the planning and decision making process.

Aesthetic Resources - The National Environmental Policy Act of 1969, as amended (NEPA), (42 U.S.C. 4321-4347) requires agencies to consider aesthetic impacts of proposed federal actions, including possible impacts on scenery, noise, and odor. The Service will preserve and enhance aesthetic values to the extent that Refuge objectives may still be accomplished. The Service strives to achieve a natural undisturbed appearance with habitat management practices used to mitigate any negative impacts of especially environmental cleanup.

2. Alternatives

a. No Action Alternative

The Service implemented 47 mitigation projects totaling 1225 acres to partially offset impacts to 2312 acres from 40 habitat disturbing projects in fiscal year 1996 (U.S. Fish and Wildlife Service 1996). Ten additional habitat-related projects (operational assistance or avoidance mitigation tasks) totaled 796 acres. The Service used various habitat management methods to accomplish these tasks. A description of habitat management methods used on the Refuge in 1996 follows:

- **Seeding** - Native vegetation was seeded using a drill seeder or broadcaster on 204.4 Refuge acres after some kind of mechanical soil treatment such as plowing, discing, and/or harrowing. Seeding to non-native vegetation was conducted on 373.4 acres, primarily to control weeds prior to seeding natives.

- **Weed control** - Mowing or hand pulling to control weeds was conducted on 79 Refuge acres. An additional 10.6 acres of Russian knapweed (*Centaurea repens*) were mowed. A chemical was applied to approximately 85 salt cedar (*Tamarix* spp.) plants. Biological control agents were also released to control Russian knapweed and Canada thistle.

- **Prescribed fire** - One prescribed burn was conducted on 59.5 acres of the Refuge. This burn was conducted in the spring to remove standing litter,

temporarily control spring cheatgrass growth, stimulate western wheatgrass growth, and open up habitat for arriving burrowing owls (*Athene cunicularia*).

Under this alternative, current programs would not be expanded and Refuge purposes, goals, and objectives would be marginally met. More specifically, mitigation for environmental cleanup would not keep pace with habitat disturbances. Although not the preferred alternative, this alternative is compatible with the purpose for which the Refuge will be established.

Seeding would continue at current levels to restore weedy habitat with native species, but restoration would not keep pace with habitat disturbances caused by cleanup and related activities. Integrated pest management would continue but a lack of expansion in this area would ultimately result in even more Refuge acreage infested with weeds. The minimal current use of prescribed fire would be insufficient to maintain native habitat, resulting in decadent stands more susceptible to invasion by weedy species. Vegetation monitoring of habitats would be minimal and result in reduced response time if the health of habitats began to deteriorate. Overall, the quality of Refuge habitats would decrease if current levels of habitat management were maintained.

b. <u>No Management Alternative</u>

Under this alternative, no management other than rest would be practiced except those actions which are required by law, regulation, policy or under the Cooperative Agreement with the U.S. Army. Seeding with native species would not be used to mitigate for habitat disturbances caused by cleanup and related disturbances and native and non-native habitats would be heavily infested with weedy species. Prescribed burning to maintain native habitats would not be conducted and decadent stands would become susceptible to weed invasion and dominance. Integrated pest management activities to control noxious weeds (those listed by the state and others) would not continue and result in increased infestations throughout the Refuge.

The impacts of selecting this alternative would be mostly negative. As Refuge habitats declined, so to would wildlife diversity and populations, resulting in fewer public use opportunities. Conflicts with Refuge neighbors and local and state weed control boards would occur with increases in populations of state and county listed weeds. Local economies would suffer with decreased public use of the Refuge. Goals and objectives would not be met and this alternative is not compatible with the purposes for which the Refuge will be established.

c. Proposed Action Alternative

The use of prescribed fire is proposed to assist in managing Refuge habitats. Prescribed fire can be used to help maintain restored and remnant native grasslands, clear vegetation for seeding, and control undesirable invasive vegetation. The Service favors this method over an expanded chemical use program for grassland maintenance, clearing, and weed control. Grazing is another method that could accomplish the same objectives, but is not yet considered here because it probably will not be available to use as a management tool on the Refuge until after cleanup.

Prescribed fire will be used according to the guidelines described in the Refuge Fire Management Plan. Its use, like other Refuge programs, will be constrained by budget and staffing requirements. The Service will continue to monitor restored and remnant sites to determine habitat management treatments, and monitoring will be expanded to include post-burn fire effects as well. Detailed prescribed burn plans will continue to be written for each burn and prescribed fire will be incorporated into methods in habitat restoration plans.

Adopting the use of prescribed fire along with the continued expansion of current seeding and weed control programs would assist in fully meeting Refuge goals and objectives. Overall habitat quality would continue to improve, providing benefits to a variety of wildlife such as songbirds, waterfowl, threatened and endangered species, and many others. The increased habitat quality will also lead to increased public

use opportunities. This alternative is compatible with the purposes for which the Refuge will be established and is also cost effective compared to other methods. This alternative presents itself as the best means to accomplish Refuge goals and objectives by providing another habitat management tool.

MAJOR ISSUE	NO ACTION	NO MANAGEMENT	PROPOSED ACTION
WILDLIFE RESOURCES			
Threatened, Endangered, Species of Concern	o	-	+
Waterfowl	-	-	+
Shorebirds	o	-	+
Other Migratory and Resident Birds	-	-	+
Mammals	o	-	+
Wildlife Diversity	o	-	+
HABITAT RESOURCES			
Soils	o	o	+
Water	o	o	+
Native Plant Diversity	-	-	++
Restored and Remnant Native Plant Communities	-	-	++
ECONOMICS			
Benefits to Local Economy	o	o	+
PUBLIC USE			
Environmental Education	o	-	+
Wildlife Tour Route	o	o	o
Recreation	-	-	+
Visual Aesthetics	o	-	-

Key: “o” = No change; “+” = Positive effects; “-” = Negative effects

Table 1. A summary of the expected effects of the three alternatives on major issues at Rocky Mountain Arsenal National Wildlife Refuge, 1997.

IV. CONSULTATION AND COORDINATION

In addition to informal consultations and reviews by U.S. Fish and Wildlife Service Refuge and Regional staff and cooperators, this Environmental Assessment was made available to the public and other appropriate parties for review in May 1997. A list of these parties and comments received are part of the Fire Management Plan as Appendix K. All fire management program activities will be implemented in cooperation and coordination with the Colorado Department of Public Health and Environment Air Pollution Control Division, the U.S. Army at Rocky Mountain Arsenal, and local fire protection cooperators. Future revisions of this assessment will follow guidelines documented in the Fire Management Plan.

LITERATURE CITED

Bragg, T.B. 1994. The changing prairie: the physical environment of Great Plains grasslands. University of Nebraska. Omaha, Nebraska.

Ebasco Services, Inc., Applied Environmental, Inc. CH2M Hill, Data Chem, and R.L. Stollar and Associates, Inc. 1989. Remedial Investigation Report volumes VI, XI, XII -- Southern, Western, and North Central Study Areas. Prepared for the U.S. Army Manager's Office for Rocky Mountain Arsenal Contamination Cleanup.

Higgins, K.F., A.D. Kruse, and J.L. Piehl. 1989. Effects of fire in the northern Great Plains. U.S. Fish and Wildl. Serv., Brookings, South Dakota.

Morrison - Knudsen Environmental Services, Inc. 1989. Vegetation Resources of Rocky Mountain Arsenal. Denver, Colorado.

U.S. Fish and Wildlife Service. 1995. Rocky Mountain Arsenal National Wildlife Refuge Final Environmental Impact Statement. Adams County, Colorado.

_____. 1996. Rocky Mountain Arsenal National Wildlife Refuge Final Comprehensive Management Plan. Adams County, Colorado.

_____. 1996. U.S. Fish and Wildlife Service Rocky Mountain Arsenal Field Office Fiscal Year 1996 Annual Progress Report. Partial fulfillment of the Cooperative greement between the U.S. Fish and Wildlife Service and the U.S. Army.

Wright, H.A. and A.W. Bailey. 1982. Fire Ecology: United States and Southern Canada. John Wiley & Sons, Inc. New York.

APPENDIX C-2a

Categorical Exclusions

The Code of Federal Regulations (CFR) (43 CFR 46.210) and DOI Manual (Part 516 DM 8.5) identifies Categorical Exclusions (CX) pursuant to 43 CFR 46.205 for fire and fuels management actions. Categorical exclusions are classes of actions which do not individually or cumulatively have a significant effect on the human environment. Categorical exclusions are not the equivalent of statutory exemptions. If exceptions to categorical exclusions apply, 46 CFR 43.215, categorical exclusions cannot be used.

Two (2) departmental wide CXs identified in the CFR pertain specifically to fire management actions. The first CX (43 CFR 46.215(k)) deals with fuel reduction; and the second (43 CFR 46.215(l)) relates to post-fire rehabilitation.

(43 CFR 46.215(k)): "Hazardous fuels reduction activities using prescribed fire not to exceed 4,500 acres, and mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing, not to exceed 1,000 acres. Such activities:

(1) Shall be limited to areas:
    i. in wildland-urban interface; and
    ii. Condition Classes 2 or 3 in Fire Regime Groups I, II, or III, outside the wildland-urban interface;
(2) Shall be identified through a collaborative framework as described in "A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan;"
(3) Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans;
(4) Shall not be conducted in wilderness areas or impair the suitability of wilderness study areas for preservation as wilderness;
(5) Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and may include the sale of vegetative material if the primary purpose of the activity is hazardous fuels reduction." (Refer to the Environmental Statement Memoranda Series for additional, required guidance.)

(43 CFR 46.215(l)): "Post-fire rehabilitation activities not to exceed 4,200 acres (such as tree planting, fence replacement, habitat restoration, heritage site restoration, repair of roads and trails, and repair of damage to minor facilities such as campgrounds) to repair or improve lands unlikely to recover to a management approved condition from wildland fire damage, or to repair or replace minor facilities damaged by fire. Such activities must comply with the following (Refer to Environmental Statement Series for additional, required guidance.):

(1) Shall be conducted consistent with agency and Departmental procedures and applicable land and resource management plans;
(2) Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and
(3) Shall be completed within three years following a wildland fire.

In addition to the CXs identified above, the DOI Manual Part 516 DM 8.5 identifies CXs that are specific to the FWS. Identified below are categorical exclusions that may apply to fire management activities.

516 DM 8.5 A(2): "Personnel training, environmental interpretation, public safety efforts, and other educational activities, which do not involve new construction or major additions to existing facilities."

516 DM 8.5 B(4): "The use of prescribed burning for habitat improvement purposes, when conducted in accordance with local and State ordinances and laws".

516 DM 8.5 B(5): "Fire management activities, including prevention and restoration measures, when conducted in accordance with Departmental and Service procedures".

516 DM 8.5 B(9): "Minor changes in existing master plans, comprehensive conservation plans, or operations, when no or minor effects are anticipated. Examples could include minor changes in the type and location of compatible public use activities and land management practices."

516 DM 8.5 B(10): "The issuance of new or revised site, unit, or activity-specific management plans for public use, land use, or other management activities when only minor changes are planned. Examples could include an amended public use plan or fire management plan."

APPENDIX C-2b

U.S. FISH AND WILDLIFE SERVICE ENVIRONMENTAL ACTION STATEMENT FOR CATEGORICAL EXCLUSION

Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA), and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and determined that the following proposed action is categorically excluded from NEPA documentation requirements consistent with 40 CFR 1508.4 and 43 CFR 46.205 – 215.

Proposed Action and Alternatives. *Describe the proposed action and any alternatives explored. Discuss briefly why proposed action was selected over other alternatives.*

Categorical Exclusion(s). *Quote and provide the Departmental Manual and/or Code of Federal Regulation citation(s) for the specific Categorical Exclusions you are using; if it appears necessary, discuss why you believe the action fits as this Categorical Exclusion; mention that the action does not trigger an Exception to the Categorical Exclusions at 43 CFR 46.205 – 215; and/or if it does trigger an Exception, discuss why it does not apply for this action.*

Permits/Approvals. *Discuss any additional permits/approvals needed before the proposed action can be implemented, such as a Clean Water Act section 404 permit, Endangered Species Act section 7 consultation, and/or National Historic Preservation Act section 106 clearance.*

Public Involvement/Interagency Coordination. *Discuss the opportunities provided to the public, other agencies, and/or Tribes to get involved with the proposed action, any significant comments they may have made, and our responses.*

<u>Supporting Documents.</u> Supporting documents for this determination include relevant office file material and the following key references: *(List document citations here.)*

(Project Leader)	**(Date)**

APPENDIX C-2c

NEPA COMPLIANCE CHECKLIST

State: _____ **Federal Financial Assistance Grant/Agreement/Amendment Number:** _____

Grant/Project Name: _____

This proposal ☐ is; ☐ is not completely covered by categorical exclusion in 43 CFR 46.205-215 and/or 516 DM 8.5.

(*check (T) one*) *(Review proposed activities. An appropriate categorical exclusion must be identified before completing the remainder of the Checklist. If a categorical exclusion cannot be identified, or the proposal cannot meet the qualifying criteria in the categorical exclusion, or an extraordinary circumstance applies (see below), an EA must be prepared.)*

Extraordinary Circumstances:

Will This Proposal (*check (T) yes or no for each item below*):

Yes	No		
☐	☐	1.	Have significant adverse effects on public health or safety.
☐	☐	2.	Have significant adverse effects on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds (Executive Order 13186); and other ecologically significant or critical areas under Federal ownership or jurisdiction.
☐	☐	3.	Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources [NEPA Section 102(2)(E)].
☐	☐	4.	Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks.
☐	☐	5.	Have a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects.
☐	☐	6.	Have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects.
☐	☐	7.	Have significant adverse effects on properties listed or eligible for listing on the National Register of Historic Places as determined by either the bureau or office, the State Historic Preservation Officer, the Tribal Historic Preservation Officer, the Advisory Council on Historic Preservation, or a consulting party under 36 CFR 800.
☐	☐	8.	Have significant adverse effects on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have significant adverse effects on designated Critical Habitat for these species.
☐	☐	9.	Have the possibility of violating a Federal law, or a State, local, or tribal law or requirement imposed for the protection of the environment.
☐	☐	10.	Have the possibility for a disproportionately high and adverse effect on low income or minority populations (Executive Order 12898).
☐	☐	11.	Have the possibility to limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (Executive Order 13007).
☐	☐	12.	Have the possibility to significantly contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112).

(If any of the above extraordinary circumstances receive a ☐ Yes/☐ check (T) , an EA must be prepared.)

☐ Yes ☐ No This grant/project includes additional information supporting the Checklist.

Concurrences/Approvals:

Project Leader: _____ Date: _____

State Authority Concurrence: _____ Date: _____

(with financial assistance signature authority, if applicable)

Within the spirit and intent of the Council of Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record and have determined that the grant/agreement/amendment:

- ☐ **is a categorical exclusion as provided by 516 DM 8 and/or 43 CFR 46.205-215. No further NEPA documentation will therefore be made.**
- ☐ **is not completely covered by the categorical exclusion as provided by 516 DM 8 and/or 43 CFR 46.205-215. An EA must be prepared.**

Service signature approval:

RO or WO Environmental Coordinator: _____ Date: _____

Staff Specialist, Division of Federal Assistance: _____ Date: _____

(or authorized Service representative with financial assistance signature authority)

OMB Control Number 1018-0110

Expiration Date 06/30/2007

NOTICE

In accordance with the Paperwork Reduction Act (44 U.S.C. 3501et seq.), please be advised that:

The gathering of information from potential grant recipients is authorized by The National Environmental Policy Act (NEPA, 42 U.S.C. 4321-4347). NEPA requires that a number of items be considered prior to any activity under a grant.

The submission of requested information is required for entities competing for federal assistance grants. This completed checklist is a record that these NEPA issues were considered prior to commencing grant activity.

You are not required to respond to a collection of information unless it displays a currently valid OMB control number.

This information collection has been approved by OMB and assigned clearance number 1018-0110.

The requested information may be subject to disclosure under provisions of the Freedom of Information Act (5 U.S.C. 552).

The public reporting burden for the information collected on this form is 30 minutes. This burden estimate includes time for reviewing instructions, gathering data, and completing and reviewing form. Comments on this form should be mailed to the Information Collection Officer, Mail Stop 222, Arlington Square, U.S. Fish and Wildlife Service, Washington, DC 20240. Thank you.

APPENDIX C-2d

Note to NEPA documentation forms Appendix C-2c.

The latest FMH (2011) is recommending the Environmental Action Statement form. This form has been updated to reflect the removal of DM 516 Appendix 2. This information is now in Code of Federal Regulations (43 CFR 46.205-215).

The Categorical Exclusion NEPA Compliance Checklist that begins with the Project Description is a version of NEPA Compliance Checklist that has been modified by Region 2 NEPA coordinator Carol Torrez in April 2010. The nice thing about this form and form below is that it identifies the Extraordinary Circumstances without having to go to the CFR.

Form 3-2185 is the original NEPA Compliance Checklist. It has been modified to reflect the removal of 516 DM 2 Appendix. Information from this removal is now in 43 CFR 46.205-215. This form was originally developed for Grants and has expiration date; however, it can still be used (FMH 2011 page 9-61)

The form you choose to document the Categorical Exclusions is currently up to you (March 2011); but if you utilize the EAS, I would suggest also looking at the Extraordinary Circumstances listed on the other 2 forms (or in CFR) as you evaluate.

Rich Sterry

R6 Fire Planner

March 7, 2011

APPENDIX C-3b

U.S. Fish and Wildlife Service: Region 6

Request for Cultural Resource Review for Prescribed Burns
And Mechanical Fuel Reduction Please see instructions on back.
Include topo indicating project area.

Station		**Cultural Resource Staff**	
Contact		**Phone Number**	
Date Submitted		**Date Reviewed**	
Anticipated Implementation Dates		**Comments**	
Comments			

Burn/Project Name	Location	Size	Undertaking	Potential Effect	Environmental Setting	Cultural Resource Information

U.S. Fish and Wildlife Service: Region 6

Request for Cultural Resource Review for Prescribed Burns and Mechanical Fuel Reduction

Instructions

Please complete this form and e-mail it to the cultural resource staff person for the state. Include a topo indicating the project area. The sooner you can submit the information the better and you should expect a response within 30 days concerning the need for additional cultural resource review. The shaded columns will be completed by the cultural resource staff.

Montana, Wyoming, Utah: Brant Loflin Spearfish, SD 605-642-7730,x209 Brant_Loflin@fws.gov
North and South Dakota: Barry Williams Bismarck, ND 701-355-8577 Barry_Williams@fws.gov
Colorado, Kansas, Nebraska: Meg Van Ness Denver, CO 303-236-8103 Meg_VanNess@fws.gov

Station: The name of the Refuge or Wetland Management District

Contact: The name and phone number for the person who can best answer questions about the planned projects

Date Submitted: Date you e-mailed it to the cultural resource person

Anticipated Implementation dates: The date range for when you are planning on doing the projects

Comments: Anything extra that you think the cultural resource person might need to know or would help make decisions. Please include any information concerning known sites or buildings.

Burn/Project Name: Indicate whatever name you are using to refer to the project

Location: Township, Range and Section

Size: In acres

Undertaking: Describe what you are planning on doing (mechanical treatment, prescribed burn, etc.)

Potential Effect: Describe any anticipated ground, rock, or structure disturbance (fire breaks, road building, post burn rehab, etc.)

Environmental Setting: Describe the general vegetation and topography (wetland, rolling hills, flood plain, etc.) and condition (agricultural land, heavily disturbed, etc.)

APPENDIX D-1

ANNUAL REVIEW CHECK LIST

Annual RMAMWR Fire Management Activities

ACTIVITY	J	F	M	A	M	J	J	A	S	O	N	D
Update Interagency Fire Agreements/AOP's	x											
Winterize Fire Management Equipment										x		
Inventory Fire Engine and Cache		x										
Complete Training Analysis	x											
Annual Refresher Training			x									
Annual Fitness Testing			x									
Pre-Season Engine Preparation			x									
Weigh Engines to verify GVW Compliance			x									
Prescribed Fire Plan Preparation			x									
Review and Update Fire Management Plan	x											
Prepare Pre-season Risk Analysis			x									
Live Fuel Moisture Sampling						x	x	x	x			

APPENDIX D-2

PREPAREDNESS STEP-UP PLAN

STAFFING CLASS	DESCRIPTION	STEP-UP ACTION/COPMNSIDERATION
1	No large fire activity on wildland fire agency's jurisdictional lands. Most Districts or units have low to moderate adjective class ratings. Little of no commitment of resources locally or nationally. Preseason preparedness duties being accomplished. Other characteristics of this preparedness level may include the following: ERC – less than 24th percentile 1000 hr fuels – greater than 20% Resources committed – 10% or less Burning Index – BI trend is less than 30th percentile US Drought Monitor – normal, some pockets of abnormally dry area exist. Conditions are normal with some short term dryness, slowing plant growth, some lingering water deficits.	A. Review and update all operating plans and cooperative agreements. B. Fire Management Plans are updated. C. Prepare Preseason BPA's, Equipment Rental Agreements D. Weather Stations activated before fire season starts so they can adjust properly. E. Red cards completed and Work Capacity Tests administered f. Preparedness review meetings with other agencies as needed G. Analyze Fire Severity, resources committed and validate preparedness levels. H. Prescribe fire operations monitored

2	Class A and B fires occurring on jurisdictional lands and/or adjacent lands and a potential for escapes to larger (project) fires. One or more district or units experiencing moderate to high adjective rating class. Resources with District or Zone are handling the situation with help from cooperators. Other characteristics f this preparedness level may include the following: ERC – 25th to 50th percentile 1000 hr fuels – 16% to 20% Resources Committed – 11% to 25% KBDI – 301 to 399 Burning Index – BI trend is at or near the 35-55th percentile US Drought Monitor – Abnormally dry and moderate drought building into some areas. Some damage to crops and rangelands, streams reservoirs or well low, some water shortages developing	A. Analyze Fire Severity, fire resources ready and in place during fire season C. Check for action needed for prevention, detection, pre-suppression and suppression on Districts D. Prescribed bringing operations reviewed at the start of each day before there are any new ignitions

3	Two or more incidents (Class B, C or larger) on jurisdictional lands or adjacent lands requiring a major commitment of resources or major special event with significant increase in human caused risk and resultant drain on resources. Likelihood of additional resources being requested and mobilized through GACC. The weighted adjective level may include the following; ERC – 51st to 80th percentile 1000 hr fuels – 13% to 16% Resources Committed – 50% to 75% KBDI – 400 to 449 Burning Index – BI trend is at or near the 60-80th percentile US Drought Monitor – Severe and moderate drought dominates much of the area. Crop and rangeland losses likely water shortages common water restrictions imposed.	A. all prescribed burning operations suspended B. Evaluate need for fire restrictions on jurisdictional lands C. consider requisition other resources fro pre-positioning F. consider utilizing detection flights as needed G. Review Fire Severity Plan for implementation H. If a high visitation period has been determined to pose exceptional human caused risk of wildland fire, move to SC-4 (e.g. historic records of a specific three-day holiday weekend, opening days of hunting seasons on adjacent lands producing additional human caused fires). I. If live and/or dead fuel moistures are sufficiently low (e.g. live fuel moisture in sagebrush of 90%, 100hHR TL FM 7%, 1000 HR TL FM 9%) to allow rapid fire spread or high fire intensity in the presence of wind, step-up may be moved to SC-4. This section is included because wind velocities often increase in late afternoon and NFDRS indices have been obtained for the day.

4	Potential for numerous incidents exist and/or numerous other incidents being reported or are in progress, depleting local resources. Adjective rating class is high to extreme on jurisdictional lands. Most of the local reinforcement resources are committed to local, regional, and national responses. No relief in fire weather conditions predicted near term. Other characteristics of this preparedness level may include the following: ERC – 81st to 95th percentile 1000 hr fuels – 8% to 12% Resources Committed – greater than 75% KBDI – 450 to 499 Burning Index – BI trend is at or near the 85-90th percentile US Drought Monitor – Extreme drought exists across a large area. Widespread crop and rangeland losses continue to occur. Widespread water shortages or restrictions are in place	A. ALL PRESCRIBED BURINING OPERATIONS must be actively moved to :OUT" status declarations B. Consider more wide-s-read fire restrictions C. All fire equipment will be kept in a fire ready condition and positioned appropriately. No fire equipment will be used for project work. D. If the LAL is between 3 and 6, a fixed wing detection over-flight may be requested fro an adjacent cooperator. If cooperating aircraft are not available, a fixed wing aircraft may be hired for detection flight. Cooperators and RFMC will be advised of these situations daily. E. The normal tour of duty for fire lookouts will ordinarily be staggered, with one lookout staffed from 0800 to 1630 and the other staffed from 0930 to 1800. Tours of duty will be extended through the burning period and/or during distinct evening and nighttime periods when the observed LAL is 3 or greater or when observations suggest the likelihood of LAL between 3 and 6. If these LAL levels occur during the night, the lookouts should begin detection efforts by 0800 the next morning.

5	Interagency and cooperator resources are committed to multiple incidents and /or major incidents and initial attack on jurisdictional lands or committed to regional/national suppression efforts. Adjective rating class is very high to extreme. Other characteristics of this preparedness level may include the following; ERC – 95th percentile 1000 hr fuels – less than 8% Resources Committed – most assigned to incidents, initial attack capability severely limited KBDI – greater than 500 Burning Index – BI trend is at or near the 95th percentile US Drought Monitor – Extreme to exceptional drought exits across large areas. Exceptional widespread crop continue to occur. Shortages of water creating a water emergency.	A. All available resources assigned to incidents or ready and in contact for immediate initial attack response. B. active enforcement of fire orders in effect C. Tours of duty for fire lookouts will be extended through the burning period and/or during distinct evening and nighttime periods when the observed or predicted LAL is 3 or greater. D. Workweeks and/or daily tours of duty for regular initial attack/monitoring personnel and key permanent personnel may be expanded , particularly when predicted or observed LAL is between 3 and 6 and/or human caused risk is exceptionally high (MR-80). E. In these situations, the initial attack/monitoring team will, if possible, consist of a minimum of three qualified people, and will be held on duty through the burning period. F. The main standby initial attack/monitoring team in any SC-5 incident should be in the area where risk is considered highest. Initial attack/monitoring teams may be held on standby in other areas if conditions warrant. G. Temporary closures may be imposed on areas in the refuge or for certain activities (e.g. open fires) in conjunction with similar impositions by adjacent land managing agencies.

APPENDIX D-3a

Cultural Resource Review Procedures for Projects in Region 6
20 August 2007 (December 1, 2008 revision)

Purpose and Legal Framework
The following is an outline of procedures for the cultural resource review of projects in Region 6. The primary purpose of this process is to ensure that historic properties are identified and, if possible, protected. The process is also intended to promote compliance with Federal laws and regulations, in addition to FWS regulations and policies, concerning historic preservation. This is largely accomplished through Section 106 of the National Historic Preservation Act (NHPA), although a suite of laws govern Federal agency responsibilities concerning cultural resources. Please see attached summary of some of the applicable cultural resource laws, regulations, and policies.

If there are any questions concerning these procedures, whether a project needs review or has already undergone review, or any other aspect of the cultural resource program, please contact any of the staff listed below:

Brant Loflin	Montana, Wyoming, Utah	605.642.7730, X209 (D.C. Booth)
Meg Van Ness	Colorado, Kansas, Nebraska	303.236.8103 (Regional Office)
Barry Williams	South Dakota, North Dakota	701-355-8577 (Bismarck)

Definitions
Below are three key definitions for terms used in the process:

Cultural resources
Cultural Resources are sites, buildings, structures and objects that are the result of human activities and are over 50 years old. They include prehistoric, historic, and architectural sites, artifacts, historic records, and traditional cultural properties - including traditional use areas for Native Americans - that may or may not have material evidence.

Historic Properties
Historic properties are cultural resources (historic or prehistoric) that are listed on, or are eligible to be listed on, the National Register of Historic Places.

Undertaking (16 U.S.C. 470w, Section 301(7)
"Undertaking" means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including —

(A) those carried out by or on behalf of the agency;
(B) those carried out with Federal financial assistance;
(C) those requiring a Federal permit, license, or approval; and
(D) those subject to State or local regulation administered pursuant to a delegation or approval by a Federal agency.

Projects Needing Cultural Resource Review

All projects with the potential to affect structures older than 50 years or cause ground disturbance should be evaluated for their potential to impact cultural resources. Section 106 of NHPA applies to projects on fee-title and easement lands and on projects that FWS is involved with on private land if that project is considered an undertaking (see definition noted above).

Easement Lands

Legally, if a project is determined to be an undertaking on easement lands all of the provisions of NHPA are potentially applicable. In the case of easement lands, emphasis should be placed on undertakings that:

1. Have the potential to harm historic properties.

   To find out about known cultural resources in the project area contact one of the three cultural resource staff and they will review their records and possibly request a file search through the SHPO. They will know if there is a previously recorded historic property or if there has already been a survey of the area. Information on the age and eligibility of many cultural resources can also be found in RPI. They will also have some insights about the need for a survey if there is a potential for cultural resources.

2. Are large in size.

   Although this is difficult to define, if a project is going to disturb more than about five acres or if the project components are going to cover more than about ¼ mile (wind towers, pipelines, roads, ditches, etc.) it is probably in the large category. If in doubt whether the project needs review please call the cultural resource person for that state.

3. Have a high public profile or are potentially controversial.

   If there are members of the public or other agencies who are concerned about the project we may do a survey even if the chances of affecting a cultural resource are very slim.

Cultural Resource Review Procedures

The following six steps summarize the general procedure for cultural resource review. A flow chart diagramming these steps is located on page 5. The exact application of these procedures will vary from project to project depending on the nature, size, location of the project, and the cultural resources involved. Additional information and details can be found in the Section 106 regulations (36 CFR 800).

Cultural Resource staff should be notified as early in the planning process as possible – even if the project is still in the conceptual phase. This process can take just a few days or can extend over many months. Completion of the report is important, but it is possible for Steps 5 and 6 to take several months after the initial report is done. If a project is an undertaking it should not proceed until the cultural resource review has been completed.

1. Information sent to cultural resource staff

   Information including project location, description, current land condition, and time schedule should be provided along with a map of the location and any other information that might help with the review (photographs, drawings, air photos, other agencies or organizations involved, Special Use Permits, etc.). A lead contact person

for FWS should be identified – especially for large projects. There is a short two page form that can be used to summarize this information for most projects (see attached – also available as a WORD document). The information can be mailed, faxed, or emailed.

2. Initial review of the project

The cultural resource staff will decide if further review of the project is necessary. If the project does not qualify as an undertaking, or if it is determined that the undertaking has no potential to affect historic properties, the review process will be over, the project lead will be contacted, and the project may proceed.

If it is determined that the project is an undertaking with the potential to affect historic properties additional review will be necessary. The project lead will be contacted and the status of the review and plans for additional work will be discussed. Consultation with the State Historic Preservation Officer (SHPO), Tribal Historic Preservation Officers (THPOs), and other interested parties may be initiated at this point.

If you do not hear back from the cultural resource staff when you need to please contact us and remind us that the project is waiting for review – do not assume there are no cultural resource concerns. At certain times of the year we get extremely busy and reminding us of your schedule is a great help in prioritizing reviews.

3. Gather information and conduct field work

Depending on the nature, size, and timing of the project, FWS staff will continue the review process or it will be done by consultants. Most refuge, fire, and PFW projects are done by the cultural resource staff. The staff will collect the necessary information, from existing records or in the field, to determine if historic properties will be affected.

If the project involves a commercial company (pipelines, wind towers, railroads, oil and gas development, etc.), or if the project involves another agency (Department of Transportation, County, etc.) that company or agency will be asked to hire a consultant to do the work. The consultant needs to contact the cultural resource staff and obtain an ARPA permit before they do any field work.

4. Report Preparation and findings recommendation

A report will be prepared summarizing the project, the results of the information gathering and the field work, and findings recommendations. There are two primary recommendations that are possible (although others are also possible):

<u>No Historic Properties Affected</u>: there are no historic properties present (no effect) or there are historic properties present but the undertaking will have no effect upon them (no adverse effect). It will be recommended that the project proceed with no further review. Concurrence on this recommendation is still needed – see Step 5.

Historic Properties Affected: there are historic properties which may be affected by the undertaking (adverse effect). It will be recommended that additional consultation and planning take place.

5. Consultation on findings

The report will be sent to the SHPO by the cultural resource staff along with a letter requesting their concurrence with the findings. It may also be sent to the appropriate THPOs or other interested parties for their concurrence or comments. Consulting parties have 30 days to comment.

If the finding is that no historic properties will be affected (no adverse effect) and the consulting parties concur with those findings then the project may proceed with no further review after the letter(s) of concurrence is received.

If the finding is that no historic properties will be affected (no adverse effect) and a consulting party disagrees additional consultation may be necessary.

If the finding is that historic properties will be affected (adverse effect) then the cultural resource staff will continue consultation in coordination with the project manager to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate adverse effects on historic properties. In this case, the Advisory Council on Historic Preservation (ACHP) will also become a consulting party.

6. Resolution of Adverse Effects

In consultation with the SHPO, possibly the ACHP or THPOs, and other interested parties, a Memorandum of Agreement (MOA) will be executed and implemented outlining the plans to resolve the adverse effects. The activities outlined in the MOA need to be completed, a report prepared, and consultation concerning the findings completed prior to the start of the project unless other arrangements have been made.

Special Considerations

Human Remains

If human remains are possibly present (looks like a grave site, local residents believe there is a burial, etc.) or if human remains are found during project construction stop work in that area immediately and call the cultural resource staff for that state. Do not remove anything and close-off public access. This holds true for all projects regardless of land status and for all states. Because of looting problems, do not discuss the matter with anyone until the cultural resource staff has a chance to respond.

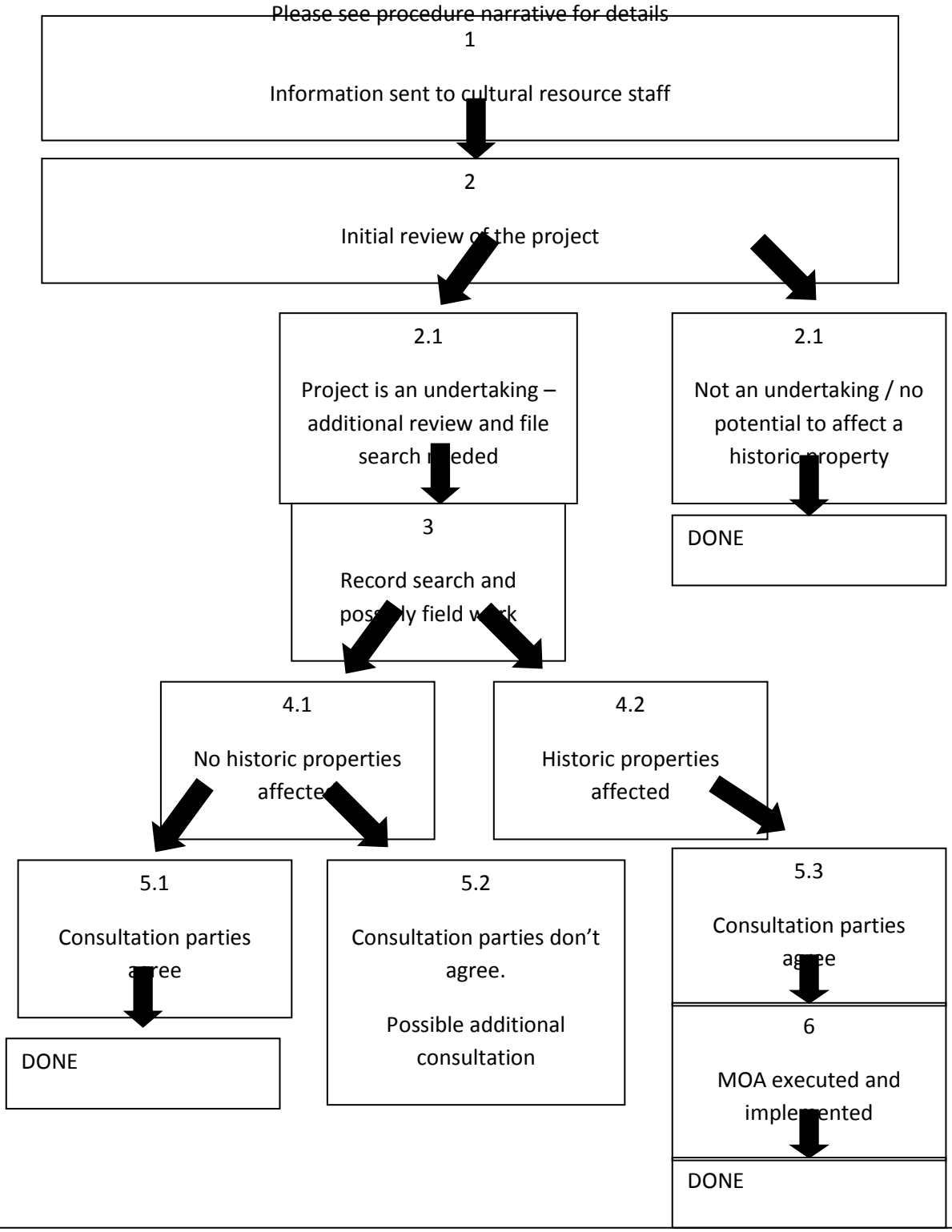
Unanticipated Discoveries

If you find any cultural resource or paleontological remains please let us know as soon as possible. If it is in danger (in a road, eroding out, in a place where public might pick it up, etc.) take photos, GPS it in, and collect it. Otherwise leave it in place but take photos and GPS the location. In any case, contact the FWS cultural resource staff for your state as soon as possible. If there is any chance there are human remains or anything associated with a burial, don't remove anything, stop work in that area, and contact us immediately.

Educational and Training Opportunities

Let us know if there is anything we can do (training, workshops, presentations, etc.), for the staff or the public that would be of help. Also let us know if you need information on the cultural resource work that has been done in your area.

Cultural Resource Review for Projects in Region 6



Key Cultural Resource Legislation, Regulations and Policies: Summary Information

NOTE: This is a summary of some of the laws and regulations concerning USFWS responsibilities for cultural resources. It is not intended to be comprehensive and additional information is available on the USFWS web page (www.fws.gov/historicPreservation/crp/authorities.html)

National Laws

1. Antiquities Act of 1906 as amended
(PL 59-209; 34 Stat. 225; 16 USC 431-433)
This is the earliest and most basic legislation for protecting cultural resources on Federal lands. It provides misdemeanor-level criminal penalties to control unauthorized uses. Appropriate scientific uses may be authorized through permits, and materials removed under a permit must be permanently preserved in a public museum. The 1906 Act is broader in scope than the 1979 Archaeological Resources Protection Act, which partially supersedes it. Uniform regulations at 43 CFR Part 3 implement the Act.

2. American Indian Religious Freedom Act of 1978 as amended
(PL 95-431; 92 Stat. 469; 42 USC 1996)
This Act (AIRFA) resolves that it shall be the policy of the United States to protect and preserve for the American Indian, Eskimo, Aleut, and Native Hawaiian the inherent right of freedom to believe, express, and exercise their traditional religions, including access to religious sites, use and possession of sacred objects, and freedom to worship through ceremonial and traditional rites. Federal agencies are directed to evaluate their policies and procedures to determine if changes are needed to protect such rights and freedoms from agency practices. The act is a specific expression of First Amendment guarantees of religious freedom. It is not implemented by regulations.

3. Archeological and Historic Preservation Act of 1974 amended Reservoir Salvage Act 1960 (PL 86-523; 74 Stat. 220, 221; 16 USC 469; PL 93-291; 88 Stat. 174; 16 USC 469)
This Act provides for the preservation of historical and archaeological data that might otherwise be lost as the result of Federal construction projects or Federally-licensed or assisted programs. The act provides that up to one percent of congressionally authorized funds for a project may be spent from appropriated project funds to recover, preserve, and protect archaeological and historical data.

4. Archaeological Resources Protection Act of 1979 as amended
(PL 96-95; 93 Stat. 721; 16 USC 47Oaa et seq.)
Often referred to as ARPA, this act is primarily a permitting and law-enforcement law that has felony-level penalties for excavating, removing, damaging, altering, or defacing any archaeological resource more than 100 years of age, on public or Indian lands, unless authorized by a permit. It prohibits the sale, purchase, exchange, transportation, receipt, or offering of any archaeological resource obtained in violation of any regulation or permit under the act or under any Federal, State, or local law. The Act's definitions, permit requirements, and criminal and civil penalties augment the Antiquities Act, which it partially supersedes. It is implemented by uniform regulations and Interior-specific regulations, both noted in 43 CFR Part 7.

5. Historic Sites Act of 1935 as amended
(PL 74-292; 49 Stat. 666; 16 USC 461)

The Historic Sites Act declares national policy to identify and preserve nationally significant “historic sites, buildings, objects and antiquities.” It authorizes the National Historic Landmarks program and provides the foundation for the National Register of Historic Places authorized in the National Historic Preservation Act of 1966. Regulations implementing the National Historic Landmarks Program are at 36 CFR Part 65.

6. National Environmental Policy Act of 1969, as amended
(42 USC 4321, and 4331 - 4335)

NEPA states it is the Federal government's continuing responsibility to use all practicable means to preserve important historic, cultural, and natural aspects of our national heritage. It also instructs Federal agencies to prepare environmental impact statements for each major Federal action having an effect on the environment.

NEPA and NHPA Coordination (Sec. 101 [42 USC § 4331]
(b) In order to carry out the policy set forth in this Act, it is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy, to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may --

(4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice;

7. National Historic Preservation Act of 1966 as amended
(PL 89-665; 80 Stat. 915; 16 USC 470),

NHPA is perhaps the premier legislation that governs cultural resource work on USFWS lands. The Act creates the National Register of Historic Places and extends protection to historic places of State and local as well as national significance. It establishes the Advisory Council on Historic Preservation, State Historic Preservation Officers, Tribal Preservation Officers, and a preservation grants-in-aid program. Section 106 directs Federal agencies to take into account effects of their actions ("undertakings") on properties in or eligible for the National Register, and Section 110(a) sets inventory, nomination, protection, and preservation responsibilities for Federally-owned cultural properties. Section 110(c) requires each Federal agency to designate a Preservation Officer to coordinate activities under the act. Section 106 of the act is implemented by regulations of the Advisory Council on Historic Preservation, 36 CFR Part 800. The Department of the Interior criteria and procedures for evaluating a property's eligibility for inclusion in the National Register are at 36 CFR Part 60.

A. Section 106 Purpose (36 CFR 800.1)

The section 106 process seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning.

B. Historic Property Defined (36 CFR 800.16(l))

Historic Property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

C. Federal Agency Responsibility - Section 106 (16 U.S.C. 470f)
The head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking.

D. Federal Agency Responsibility – Section 106 Regulations (36 CFR 800.2(a)).
It is the statutory obligation of the Federal agency to fulfill requirements of section 106 and to ensure that an agency official with jurisdiction over an undertaking takes legal and financial responsibility for section 106 compliance in accordance with subpart B of this part.

E. Timing of the Section 106 Process (36 CFR 800 A (c))
The agency official must complete the section 106 process “prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license.” This does not prohibit agency official from conducting or authorizing non destructive project planning activities before completing compliance with section 106, provided that such actions do not restrict the subsequent consideration of alternatives to avoid, minimize or mitigate the undertaking's adverse effects on historic properties. The agency official shall ensure that the section 106 process is initiated early in the undertaking's planning, so that abroad range of alternatives may be considered during the planning process or the undertaking.

F. NHPA and NEPA Coordination (36 CFR 800.8)
(a.1) Early coordination.
Federal agencies are encouraged to coordinate compliance with section 106 and the procedures in this part with any steps taken to meet the requirements of the National Environmental Policy Act (NEPA). Agencies should consider their section 106 responsibilities as early as possible in the NEPA process, and plan their public participation, analysis, and review in such a way that they can meet the purposes and requirements of both statutes in a timely and efficient manner. The determination of whether an undertaking is a “major Federal action significantly affecting the quality of the human environment,” and therefore requires

preparation of an environmental impact statement (EIS) under NEPA, should include consideration of the undertaking's likely effects on historic properties. A finding of adverse effect on a historic property does not necessarily require an EIS under NEPA.

(a.2) Consulting party roles.
SHPO/THPOs, Indian tribes and Native Hawaiian organizations, other consulting parties, and organizations and individuals who may be concerned with the possible effects of an agency action on historic properties should be prepared to consult with agencies early in the NEPA process, when the purpose of and need for the proposed action as well as the widest possible range of alternatives are under consideration.

(a.3) Inclusion of historic preservation issues.
Agency officials should ensure that preparation of an environmental assessment (EA) and finding of no significant impact (FONSI) or an EIS and record of decision (ROD) includes appropriate scoping, identification of historic properties, assessment of effects upon them, and consultation leading to resolution of any adverse effects.

(b) Actions categorically excluded under NEPA.
If a project, activity, or program is categorically excluded from NEPA review under an agency's NEPA procedures, the agency official shall determine if it still qualifies as an undertaking requiring review under section 106 pursuant to § 800.3(a). If so, the agency official shall proceed with section 106 review in accordance with
the procedures in this subpart.

(c) Use of the NEPA process for section 106 purposes.
An agency official may use the process and documentation required for the preparation of an EA/FONSI or an EIS/ROD to comply with section 106 in lieu of the procedures set forth in §§ 800.3 through800.6 if the agency official has notified in advance the SHPO/THPO and the Council that it intends to do so and the following standards are met.

8. Native American Graves Protection and Repatriation Act of 1990, as amended
(PL 101-601; 104 Stat. 3048; 25 USC 3001 et esq.)
NAGPRA establishes rights of Indian tribes and Native Hawaiian organizations to claim ownership of certain cultural items, including human remains, funerary objects, sacred objects, and objects of cultural patrimony, held or controlled by Federal agencies and museums that receive Federal funds. It requires agencies and museums to identify holdings of such remains and objects, and to work with appropriate Native Americans toward their repatriation. Permits for the excavation and/or removal of cultural items protected by the act require Native American consultation, as do discoveries of cultural items made during Federal land use activities. The Secretary of the Interior's implementing regulations are at 43 CFR Part 10.

Laws, Policies and Guidelines Specific to USFWS and/or Region 6

1. National Wildlife Refuge System Improvement Act of 1997
   This Act outlines general management goals for the Refuge system including protection and interpretation of cultural resources.

2. Reservoir Salvage Act of 1960, as amended (16 USC 469-469c)
   This extended the Historic Sites Act of 1935. It gave the Department of the Interior, through the National Park Service, major responsibility for preservation of archaeological data that might be lost specifically through dam construction.

3. Fulfilling the Promise
   [Refuges] are places where the people of today can renew the ties to their cultural heritage by viewing ancient and historic sites. These ties, delivered through the System's public use programs, strengthen the connection between wildlife and people.

4. USFWS Cultural Resources Management Policy 1992, 614 FW 1, Policy, Responsibilities and Definitions
   This establishes, in section I.4, that "It is the policy of the Service to identify, protect, and manage cultural resources located on Service lands and affected by Service undertakings, in a spirit of stewardship, for future generations". Undertaking is defined in Section I.7(M) as "Any Federal, federally assisted, or federally licensed project, activity, or program that can result in changes in the character or use of known or unknown historic properties, if any such properties are located in the area of potential effects. These may include new and continuing projects, activities, or programs and any of their elements not previously considered under the provisions of 36 CFR 800.

5. Administrative and Enforcement Procedures for FWS Easements within the Prairie Pothole States (Regions 3 and 6) 2005: Pages 12-13
   Activities normally associated with easement properties are not usually considered "undertakings" under Federal cultural resource laws. Private landowners may do what is necessary to manage their property without the need to comply with Federal cultural resource laws. These laws, however, do come into play for easement properties when either the project is completed with Federal funding, or for which there has been a permit issued authorizing the work, or both.

   Therefore, projects federally funded on private lands (ie Partners for Fish and Wildlife Program) are subject to NHPA requirements and need to be evaluated. Also, any activity for which managers issue a Permit will also be subject to Section 106 of NHPA. These activities are generally restricted to ground surface disturbance-type activities (permits for dugouts, shelterbelt establishment, wind generators, highway improvement projects, utility line crossings, etc.). When a request is received, managers must evaluate whether the Service has jurisdiction. If we have no jurisdiction, then no permit is needed, and no CR compliance is necessary. An example would be a landowner who wants to build a house on an upland site where the land is encumbered with only a wetland easement.

Many of the projects requested by other entities (DOT, utility companies) will have CR evaluations already considered, but managers must insure that these issues are addressed before issuing a permit, and should be reviewed for sufficiency by your regional CR staff.

Consult with your regional Cultural Resources staff about CR responsibilities. They are ultimately responsible for compliance with these laws and policies. Their addresses and phone numbers are found in Exhibit II-4. The FWS website provides useful information about Cultural Resource responsibilities: www.refuges.fws.gov/cultural/links

APPENDIX D-3

M.I.S.T. GUIDELINES
MINIMUM IMPACT SUPPRESSION TACTICS

Safety

Safety is of utmost importance. Constantly review and apply the "Watch Out Situations" and "Fire Orders." Be particularly cautious with:

- Unburned fuel between you and the fire.
- Burning snags allowed to burn.
- Burning or partially burned live and dead trees.

Be constantly aware of surroundings; anticipate fire behavior and possible fire perimeter 1 or 2 days hence.

Fire Line Phase

Select procedures, tools, equipment that least impact the environment.
Seriously consider use water as a fireline tactic. Fireline constructed with nozzle pressure, wetlining.

In light fuels, consider:

- Coldtrail line.
- Allowing fire to burn to natural barrier.
- Burning out and use of "gunny" sack or swatter.
- Constantly rechecking coldtrailed fireline.
- If constructed fireline is necessary, using minimum width and depth to check fire spread.

In medium/heavy fuels, consider:

- Using natural barriers and coldtrailing.
- Cooling with dirt and water, and coldtrailing.
- If constructed fireline is necessary, using minimum width and depth to check fire spread.
- Minimizing bucking to establish fireline. Preferably move or roll downed material out of the intended constructed fireline area. If moving or rolling out is not possible, or the downed bole is already on fire, build line around and let material be consumed.

In aerial fuels—brush, trees, snags:

- Adjacent to fireline: limb only enough to prevent additional fire spread.
- Inside fireline: remove or limb only those that if ignited would have potential to spread fire outside the fireline.
- Brush or small trees that are necessary to cut during fireline construction will be cut flush with the ground.

In trees, burned trees, and snags:

- Minimize cutting of trees, burned trees and snags.
- Live trees will not be cut, unless determined they will cause fire spread across the fireline or endanger workers. If tree cutting occurs, cut the stumps flush with the ground.
- Scrape around tree bases near fireline if hot and likely to cause fire spread.
- Identify hazardous trees with an observer, flagging, and/or glow sticks.

When using indirect attack:

- Do not fall snags on the intended unburned side of the constructed fireline, unless they are safety hazard to crews.
- On the unintended burn-out side of the line, fall only those snags that would reach the fireline should they burn and fall over.
- Consider alternative means to falling, i.e., fireline explosives, bucket drops.
- Review items listed above (aerial fuels, brush, trees, and snags).

Mop-up Phase

Consider using “hot-spot” detection devices along perimeter (aerial or hand-held).

Light fuels:

- Coldtrail areas adjacent to unburned fuels.
- Do minimal spading; restrict spading to hot areas near fireline.
- Use extensive coldtrailing to detect hot areas.

Medium and heavy fuels:

- Coldtrail charred logs near fireline; do minimal scraping or tool scarring.
- Minimize bucking of logs to check for hot spots or extinguish the fire.
- Return logs to original position after checking or ground is cool.
- Refrain from making boneyards; burned/partially burned fuels that were moved should be arranged in natural position as much as possible.
- Consider allowing larger logs near the fireline to burnout instead of bucking into manageable lengths. Use lever, etc., to move large logs.

Aerial fuels- brush, small trees, and limbs.

- Remove or limb only those fuels that if ignited, have potential to spread outside the fireline.

Burning trees and snags.

- See Section B.

APPENDIX D-4

Guidelines for Aerial Delivery of Retardant or Foam near Waterways

Definitions:

WATERWAY - Any body of water including lakes, rivers, streams and ponds whether or not they contain aquatic life.

Guidelines:

These guidelines do not require the helicopter or airtanker pilot-in-command to fly in such a way as to endanger his or her aircraft, other aircraft, or structures or compromise ground personnel safety.

Avoid aerial application of retardant or foam within 300 feet of waterways.

Guidance for pilots:
To meet the 300-foot buffer zone guideline, implement the following:

X Medium/Heavy Airtankers: When approaching a waterway visible to the pilot, the pilot shall terminate the application of retardant approximately 300 feet before reaching the waterway. When flying over a waterway, pilots shall wait one second after crossing the far bank or shore of a waterway before applying retardant. Pilots shall make adjustments for airspeed and ambient conditions such as wind to avoid the application of retardant within the 300-foot buffer zone.

X Single Engine Airtankers: When approaching a waterway visible to the pilot, the pilot shall terminate application of retardant or foam approximately 300 feet before reaching the waterway. When flying over a waterway, pilots shall not begin application of foam or retardants until 300 feet after crossing the far bank or shore. Pilots shall make adjustments for airspeed and ambient conditions such as wind to avoid the application of retardant within the 300-foot buffer zone.

X Helicopters: When approaching a waterway visible to the pilot, the pilot shall terminate the application of retardant or foams 300 feet before reaching the waterway. When flying over a waterway, pilots shall wait five seconds after crossing the far bank or shore before applying the retardant or foam. Pilots shall make adjustments for airspeed and ambient conditions such as wind to avoid the application of retardant or foam within the 300-foot buffer zone.

Exceptions:

When alternative line construction tactics are not available due to terrain constraints, congested area, life and property concerns or lack of ground personnel, it is acceptable to anchor the foam or retardant drop to the waterway. When anchoring a retardant or foam line to a waterway, use

the most accurate method of delivery in order to minimize placement of retardant or foam in the waterway (e.g. a helicopter rather than a heavy airtanker).

Deviations from these guidelines are acceptable when life or property is threatened.

When potential damage to natural resources outweighs possible loss of aquatic life, the unit administrator may approve a deviation from these guidelines.

Threatened and Endangered (T&E) Species:
The following provisions are guidance for complying with the Emergency Section 7 consultation provision of the ESA with respect to aquatic species. These provisions do not alter or diminish an action agency's responsibilities under the ESA.

Where aquatic T&E species or their habitats are potentially affected by aerial application of retardant or foam, the following additional procedures apply:

1. As soon as practicable after the aerial application of retardant or foam near waterways, determine whether the aerial application has caused any adverse effects to a T&E species or their habitat. This can be accomplished by the following:

    a. Application of retardant or foam outside 300 ft of a waterway is presumed to avoid adverse effects on aquatic species and no further consultation for aquatic species is necessary.

    b. Application of retardant or foam within 300 ft of a waterway requires that the unit administrator determine whether there have been any adverse effects to T&E species within the waterway.

These procedures shall be documented in the initial or subsequent fire reports.

2. If there were no adverse effects on aquatic T&E species or their habitat, there is no additional requirement to consult with Fish and Wildlife Service (FWS) or National Marine Fisheries Service (NMFS).

3. If the action agency determines that there were adverse effects on T&E species or their habitat, then the action agency must consult with FWS and NMFS as required by 50 CFR 402.05 (Emergencies). Procedures for emergency consultation are described in the Interagency Consultation Handbook, Chapter 8 (March, 1998). In the case of a long duration incident, emergency consultation should be initiated as soon as practical during the event. Otherwise, post-event consultation is appropriate. The initiation of the consultation is the responsibility of the unit administrator.

Each agency will be responsible for insuring that the appropriate guides and training manuals reflect these guidelines.

APPENDIX D-5

SAMPLE INCIDENT DELEGATION OF AUTHORITY

Delegation of Authority
Rocky Mountain Arsenal Complex

As of (Time, Date), I have delegated authority to manage the (Incident name) Fire, Number (??), Rocky Mountain Arsenal Refuge Complex, to Incident Commander (IC's name here) and his/her Incident Management Team.

The fire, which originated as (brief fire start description here) occurring on (Date), is burning on the (Refuge name here) NWR. My considerations for management of this fire are:

1. Provide for firefighter and public safety.
2. Manage the fire with as little environmental damage as possible. (use MIST where possible)
3. Key cultural features requiring priority protection are: (locations)
4. Key resources considerations are: (List here)
5. Restrictions for suppression actions include: (Specify here)
6. Minimum tools for use are: (Specify here)
7. My agency Resource Advisor will be: (Provide name here)
8. The fire borders are: (Provide MMA)
9. Manage the fire cost-effectively for the values at risk.
10. Provide training opportunities for the resources area personnel to strengthen our organizational capabilities. (Contact ?? for list of individuals)
11. Minimum disruption of residential access to private property, and visitor use consistent with public safety.

_____ _____
(Signature and Title of Agency Administrator) (Date)

Amendment to Delegation of Authority

The Delegation of Authority dated (??), issued to Incident Commander Bill Jones for the management of the (Incident name), number (??), is hereby amended as follows. This will be effective at (Time, Date).

12. Key cultural features requiring priority protection are: (list locate)
13. Use of tracked vehicles authorized to protect No-Man's-Land.

_____ _____
(Signature and Title of Agency Administrator) (Date)

APPENDIX D-6

(Will be updated with new District FMO when complete)

Delegation for Colorado District

Fire Management Officer

The Fire Management Officer for the Colorado Fire Management District including:

- Alamosa - Monte Vista – Baca NWR Complex
- Arapaho NWR Complex
- Browns Park NWR
- Rocky Mt. Arsenal NWR Complex
- Rocky Flats NWR
- Hotchkiss NFH
- Leadville NFH
- Jones Hole NFH - UT
- Saratoga NFH - WY
- Air Force Academy, Colorado MAO*
- Pinon Canyon Maneuver Site, Colorado MAO*

* Funding transferred to NWRS

is delegated authority to act on my behalf for the following duties and actions:

1. Provide direction, supervision (direct and indirect) and leadership to District Fire Management. Staff outlined in the attached organization chart.

2. Coordinate with and provide timely and accurate reports to Project Leaders, Deputy Project Leaders and appropriate Refuge and Hatchery Managers, on all fire related activities of the district and personnel.

3. Responsible for Fire Budget coordination and oversight to assure the fiscal guidelines are adhered to within the District.

4. Coordinate all prescribed fire activities for the district including requests and oversight of funding for Hazardous Fuel and WUI projects.

5. Assure personnel participating in prescribed fire and wildfire operations are fully qualified.

6. Request and oversee distribution of Severity and Emergency Preparedness Funding for District Fire and Aviation.

7. Ensure all district incidents are managed in a safe and cost-effective manner.

8. Oversee the recruitment and hiring of district fire personnel.
9. Responsible for representing the Fire Management District in all matters related to the Wildland/Prescribed Fire Management Program with local cooperators

10. Coordinate district fire and prevention activities and provide appropriate program direction and guidance.

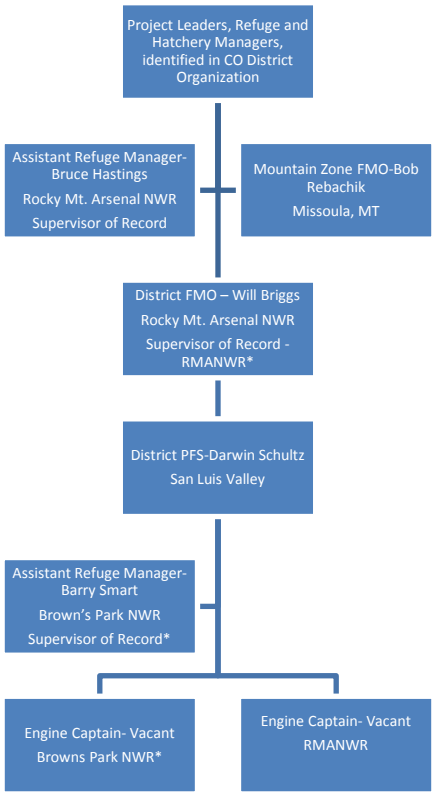
11. Provide for management of property records for equipment and supplies purchased with fire program allocations.

12. Coordinate, preposition, send and order fire and aviation resources in response to current and anticipated district, regional and national fire conditions.

13. Hire emergency firefighters in accordance with Department of Interior "Pay Plan for Emergency Workers."

14. Manage Incident Qualification Certification System and certify Incident Qualification Cards within the District.

2010 Colorado District Supervisory Organizational Chart



Solid boxes are funded with fire funds.

Project Leader: _____ Date: 7/22/2008
Alamosa - Monte Vista - Baca NWR Complex

Refuge Manager: _____ Date: 7/24/2008
Arapaho NWR Complex

Refuge Manager: _____ Date: 7/24/2008
Browns Park NWR

Project Manager: _____ Date: 7/25/08
Rocky Mt. Arsenal NWR Complex

Hatchery Manager: _____ Date: 7-23-08
Hotchkiss NFH

Hatchery Manager: _____ Date: 8/28/2008
Leadville NFH

Hatchery Manager: _____ Date: 07/23/08
Jones Hole NFH

Hatchery Manager: _____ Date: 7/25/08
Saratoga NFH

Project Leader: _____ Date: 8/19/08
Colorado MAO, (Air Force Academy and Pinon Canyon Maneuver Site)

APPENDIX D-7

Fire Management Radio Frequency

INCIDENT RADIO COMMUNICATIONS PLAN	1.Incident Name Rma operations	2.Date/Time Prepared 3/21/13	3. Operational period date/time
4. Basic Radio Channel Utilization			

Channel								Function	Frequency
1	Refuge	RX:		148.900	mode	Assignment	remarks		
1 2	Refuge Tac 1	TX: RX:	149.600 143.375		W	Refuge work	Rma Ch. 3		
2 3	Tac 1 Tac 2	TX: RX:	143.375 150.575		W	Tac 1	Rma Ch. 11		
3 4	Tac 2 Tac 3	TX: RX:	150.575 168.350		W	Tac 2	Rma Ch. 12		
4 5	Tac 3 Tac 4	TX: RX:	168.350 163.100		N	Tac 3 (alt)	FWS RX Alt tactical		
5 6	Tac 4 Pawnee	TX: RX:	163.100 169.175		N	Tac 4 (alt)	Alt tactical		
6 7	Pawnee Thorodin	TX: RX:	169.975 169.175	 167.9	N	FT. Collins Dispatch	Dispatch For Rma		
7 8	Thorodin Gunbarrel	TX: RX:	169.975 169.175	 136.5	N	FT. Collins Dispatch	Dispatch For Rma		
8 9	Gunbarrel Devils head	TX: RX:	169.975 168.725	 103.5	N	FT. Collins Dispatch	Dispatch For Rma		
9 10	Devils head Pike Direct	TX: RX:	168.125 168.725	 156.7	N	Pueblo Dispatch	Dispatch for Rocky Flats, 2-ponds		
10 11	Pike Direct Air/ground	TX: RX:	168.725 166.9125	 103.5	N	Pueblo Dispatch	Dispatch for Rocky Flats, 2-ponds		
11 12	Air/ground Air/ground	TX: RX:	166.9125 166.850		N	Air to Ground	CO05 A/G 09		
12 13	Air/ground Red NW	TX: RX:	166.850 155.250		N	Air to ground	CO05 A/G 07		
13 14	Red NW Red 1	TX: RX:	155.250 154.325	110.9 110.9	N	RM Fire Tac	RM Fire IA Tac for Rocky Flats		
14 15	Red 1 V Fire 21	TX: RX:	154.325 154.280	179.9 179.9	N	RM Fire dispatch			
15 16	V Fire 21	TX: RX:	154.280 	 156.7	N	Interagency Med vac (old fern 1)	Medical Emergency Rocky Flats		
16		TX: RX:							

INCIDENT RADIO COMMUNICATIONS PLAN	1.Incident Name Rocky Mountain Fire extended attack for Rocky Flats	2.Date/Time Prepared 3/31/13	3. Operational period date/time

4. Basic Radio Channel Utilization

Channel	Function	Frequency		Tone	mode	Assignment	remarks
1	Red 1	RX:	154.3250	179.9	N	Dispatch/Emergency	
		TX:	154.3250	179.9			
2	Red 6	RX:	154.3700	131.8	N	Command/Operations	County wide repeated-do not use for local tactical communications
		TX:	153.7700	131.8			
3	VTac17RPT	RX:	161.8500	156.7	N	Alt. Command/Operations	
		TX:	157.2500	156.7			
4	A VTac 11	RX:	151.1375		N	Div A	
		TX:	151.1375	156.7			
5	Z Vtac 12	RX:	154.4525		N	Div Z	
		TX:	154.4525	156.7			
6	B Vtac 13	RX:	158.7375		N	Div B	
		TX:	158.7375	156.7			
7	Y VTac 14	RX:	159.4725		N	Div Y	
		TX:	159.4725	156.7			
8	C VTac 24	RX:	154.2725		N	Div C	
		TX:	154.2725	156.7			
9	X VTac 26	RX:	154.3025		N	Div X	
		TX:	154.3025	156.7			
10	SG1 VFire23	RX:	154.2950		N	Structure Group 1	
		TX:	154.2950	156.7			
11	SG2 VFire22	RX:	154.2650		N	Structure Group 2	
		TX:	154.2650	156.7			
12	VFire21	RX:	154.2800		N	Medical Emergency	
		TX:	154.2800	156.7			
13	Air gnd 7	RX:	166.8500		N	Air to Ground	
		TX:	166.8500				
14	Yellow 2	RX:	155.9250	123.0	N	Law Branch	Monitored by EOC
		TX:	154.3100	123.0			
15	RNF Gunb	RX:	169.175		N	FT. Collins dispatch	
		TX:	169.9750	103.5			
16	RedNW	RX:	155.2500	110.9	N	Interop to DTRS	Cross band connected to state DTRS
		TX:	155.2500	110.9			

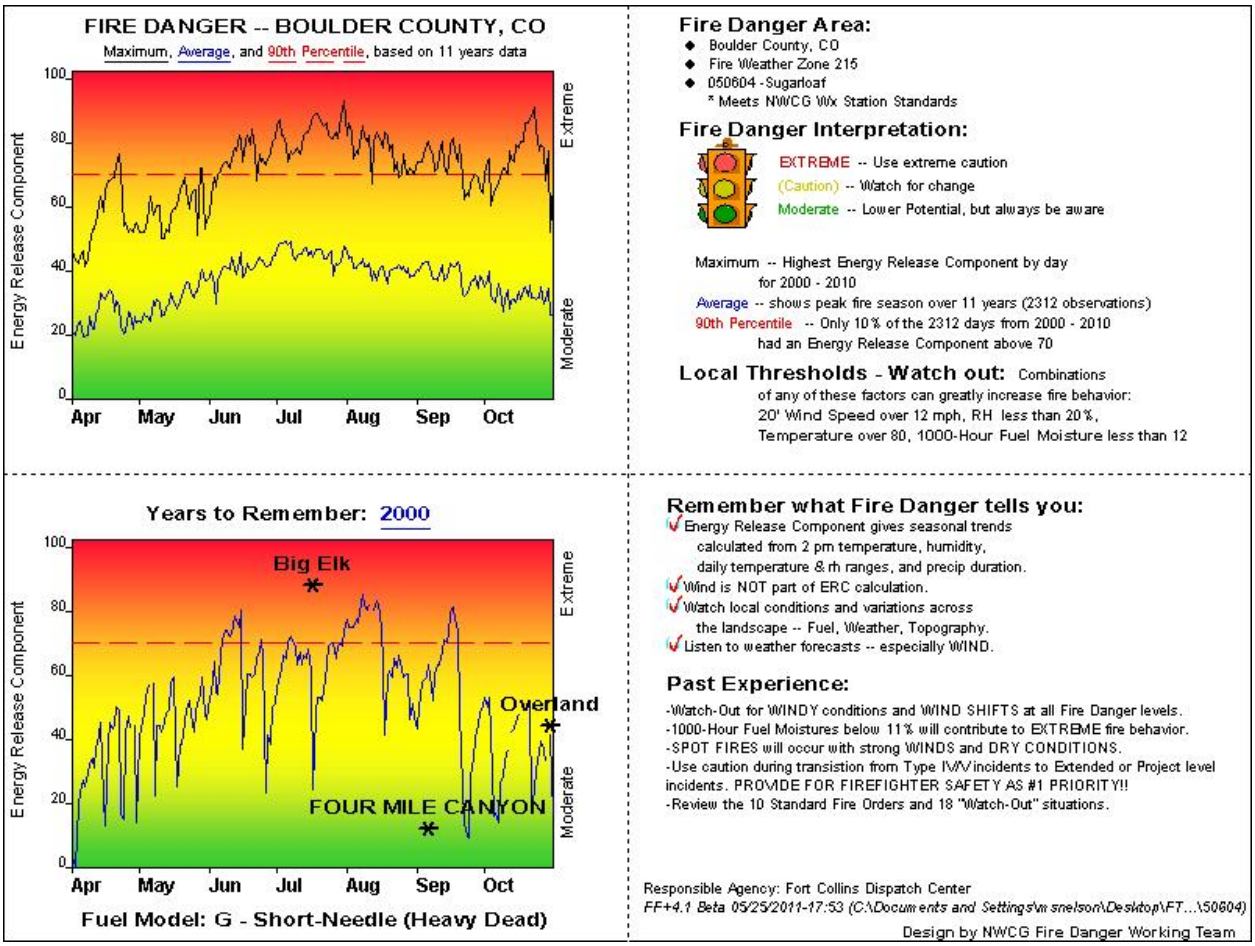
APPENDIX D-8

No pre attack plans are in place for Rocky Mountain Arsenal Complex.

APPENDIX D-9

Pocket Cards

No pocket cards currently exist for the Rocky Mountain Arsenal Complex. The closest RAWS station is in Boulder County. Since it is approximately 2000 feet higher in elevation than the refuge's it can only show trends in the area and should not be heavily relied upon.



Appendix D-10

Rocky Mountain Arsenal NWR

Table 1 **Willdland and Prescribed Fire History**

Date	Year	UNIT	Fire type	Fire name	Acres	Class
	1986	RMR	RX			Bx4 C
	1986	RMR	WF			Ax4 bx7Cd
	1987	RMR	RX			Cx2
	1987	RMR	WF			ABx5
	1988	RMR	RX			Bx11Cx3
	1988	RMR	WF			Ax3Bx9C
	1989	RMR	WF			CABx2C
	1989	RMR	RX			Bx4
	1990	RMR	RX			Bx15
	1991	RMR	WF			B
	1991	RMR	RX			Bx2C
	1992	RMR	RX			Bx7C
	1992	RMR	WF			Ax2C
	1993	RMR	WF			Bx8
	1993	RMR	RX			Bx3C
	1994	RMR	WF			Ax2Bx9C
	1994	RMR	RX			Bx4
7/?	1995	RMR	WF			C
7/7	1995	RMR	WF	Sec23-95	442.9	E
4/?	1995	RMR	RX			Bx8
4/?	1996	RMR	WF			BCx3
5/?	1996	RMR	WF			BC
7/?	1996	RMR	WF			A
	1996	RMR	RX			BCx3
8/4	1996	RMR	WF	EW-SEC 25-96	34.2	C
7/4	1996	RMR	WF	NWSEC 27-96	1.1	B
6/20	1996	RMR	WF	NPSECT 25-96	9.4	B
6/17	1996	RMR	WF	SEC 9-96	0.7	B
	1996	RMR	RX	BURROW OWL	37	C
2/7	1996	RMR	WF	MARKER 24	0.1	A
	1997	RMR	RX	BEMA 1A/B97	18.9	C
	1998	RMR	RX	SEC1 SPLANT	5	B
	1998	RMR	RX	SANDCREEK	5	B
	1998	RMR	RX	HIGHLINECA	5	B
	1998	RMR	RX	WEST 345-98	46	C
	1998	RMR	RX	BEMA 4A-4C	44.5	C
	1999	RMR	RX	SANDCREEK	10	C
	1999	RMR	RX	HIGHLINE C	10	C
	1999	RMR	RX	NESEC25	40	C
7/2	1999	RMR	WF	WFSEC27	0.2	A

Date	Year	Unit	Fire type	Fire name	Acres	Class
7/2	1999	RMR	WF	WFSEC3	0.1	A
	1999	RMR	RX	VIS CNTR	15	C
4/24	2000	RMR	WF	RMACTRKOO	0.1	A
7/4	2000	RMR	WF	64QBCPER00	1	B
7/4	2000	RMR	WF	WF07SEC08	5	B
8/3	2000	RMR	WF	RMANES2000	11	C
	2000	RMR	RX	HIGHLINE CANAL	6	B
	2000	RMR	RX	BUFFER ZON	26.2	C
	2000	RMR	RX	HFR BUFFER AONE 7A&7B	132.4	D
	2001	RMR	RX	HIGHLINE	2.2	B
4/27	2001	RMR	WF	WF0401SE30	0.1	A
	2001	RMR	RX	HIGHLINE CANAL	6	B
	2001	RMR	RX	BUFFER ZONE DEBRIS PILE SEC 20	2	B
7/4	2001	RMR	WF	WFSEC23	0.1	A
8/12	2001	RMR	WF	WFSEC36	6.4	B
7/5	2001	RMR	WF	WFSEC8	0.1	A
8/20	2001	RMR	WF	WFSEC11	1.6	B
8/3	2002	RMR	WF	BUCKELY	0.1	A
	2002	RMR	RX	BUFFER ZONE	40	C
8/19	2002	RMR	WF	RAINBOW34	43.6	C
8/19	2002	RMR	WF	RUNWAY	2	B
8/19	2002	RMR	WF	1ST CREEK	7	B
9/13	2002	RMR	WF	LONER	1.1	B
	2002	RMR	RX	HIGHLINE	2.3	B
	2002	RMR	RX	BUFFER ZONE SEC 7	217	D
	2003	RMR	RX	HFR BUFFER ZONE SEC 11 PILES	0.5	B
	2003	RMR	RX	HFR BUFFER ZONE SEC 11 PILES	0.5	B
	2003	RMR	RX	GRASSLAND SEC 3	1.9	B
	2003	RMR	RX	HFR BUFFER ZONE SEC 11	13.2	C
	2003	RMR	RX	GRASSLAND SEC 3	96.3	C
	2003	RMR	RX	HFR BUFFER ZONE 5ABC	169.5	D
10/19	2003	RMR	WF	KLIEN	0.1	A
	2003	RMR	RX	GRASSLAND	227	D
	2004	RMR	RX	BORROW 31	24	C
7/8	2004	RMR	WF	KESTREL	0.1	A
7/9	2004	RMR	WF	EAGLE WATCH	0.7	B
	2004	RMR	RX	BORROW NORTH 5	88	C
	2004	RMR	RX	BORROW NORTH 4	24	C
	2004	RMR	RX	ARSENAL HFRSEC 34 NORTH	299	E
	2004	RMR	RX	ARSENAL HFR SEC 34 RAT HILL	7.7	B
	2004	RMR	RX	ARSENAL HFR ISLANDS SEC 35	11.5	C
	2004	RMR	RX	WATERWAYS UVALDA	3.1	B
	2004	RMR	RX	WATERWAYS 72	72	C
	2004	RMR	RX	GRASSLAND SEC 3	16.4	C
	2005	RMR	RX	WATERWAYS UVALDA	3.8	B

Date	Year	Unit	Fire type	Fire Name	Acres	Class
	2005	RMR	RX	WATERWAYS HIGHLINE	0.5	B
	2005	RMR	RX	SE COMPLEX SE8	139	D
	2005	RMR	RX	HFR SEC 30	29	C
7/21	2005	RMR	WF	1ST CREEK	2.7	B
5/19	2005	RMR	WF	PENSTEMON BEACH	0.1	A
8/3	2005	RMR	WF	FOUR O'CLOCK FIRE	1.4	B
	2005	RMR	RX	WATERWAYS 72 SOUTH	88.9	C
	2005	RMR	RX	WATERAWAYS HIGHLINE	4.7	B
	2005	RMR	RX	SEC 7 BLOCK 3 UNITA	40.1	C
	2006	RMR	RX	SE COMPLEX SEC 8 SW	117.9	D
	2006	RMR	RX	SECTION 34 SOUTH	294.9	D
	2006	RMR	RX	ISLANDS SEC 30	27.7	C
	2006	RMR	RX	ISLANDS SEC 12	8.2	B
	2006	RMR	RX	EASTEERN SEC 5	154.5	D
	2006	RMR	RX	SW SEC 6	27.3	C
	2006	RMR	RX	SW SEC34	17.1	C
	2006	RMR	RX	ISLAND ROD AND GUN CLUB	26.7	C
	2006	RMR	RX	SEC 7 UNITB PARKFIELD	139.4	D
	2006	RMR	RX	WATERWAYS HIGLIN 3/27	2.5	B
5/25	2006	RMR	WF	SEC 32 FIRE	98.5	C
6/18	2006	RMR	WF	JAMES FIRE	8.3	B
7/17	2006	RMR	WF	HENDERSPON HILL	0.2	A
7/20	2006	RMR	WF	HAVANA FIRE	0.6	B
	2006	RMR	RX	ISLANDS SEC 6 PILES HFR	3.8	B
	2006	RMR	RX	ISLANDS PILES SEC 12	10.8	C
7/4	2007	RMR	WF	BISON FIRE	1.3	B
	2007	RMR	RX	HFR RX ARSENAL PILES	4	B
	2007	RMR	RX	SEC 33 FALL	436	E
	2007	RMR	RX	ISLAND SEC 3A	9.8	C
	2007	RMR	RX	ISLAND SEC 3B	20.1	C
	2007	RMR	RX	SEC 27 NORTH	184.2	D
	2007	RMR	RX	SEC 11 UNIT A	38	C
	2008	RMR	RX	GRASSLAND SE COMPLEX 3C	191	D
	2008	RMR	RX	GRASSLAND SE COMPLEX 1B	91	C
7/4	2008	RMR	WF	GATEWAY	0.2	A
	2009	RMR	WF	RMANWR SLASH PILE RX SEC 3	1	B
7/14	2010	RMR	WF	CORRAL	0.5	B
11/9	2010	RMR	WF	QUEBEC	0.1	A
	2010	RMR	RX	SOUTH CENTRAL	100	D
	2010	RMR	RX	RMA PILES	12	C
	2011	RMR	RX	ARSENAL SEC 24	189	D
	2011	RMR	RX	ARSENAL SEC 4 RX	426.4	E
	2011	RMR	RX	ARSENAL SEC 6	85	C
	2011	RMR	RX	ARSENAL SEC 2	20	C
9/4	2011	RMR	WF	ARSENAL FIRE	6.5	B

Date	Year	Unit	Fire type	Fire Name	Acres	Class
	2011	RMR	RX	ARSENAL SEC 5	100	D
	2011	RMR	RX	ARSENAL SEC 6-2	110	D
4/26	2012	RMR	WF	BISON CHIP FIRE	0.2	A
7/9	2012	RMR	WF	DERBY	0.4	B
1/24	2013	RMR	WF	SUBSTATION FIRE	0.1	A
	2013	RMR	RX	BASIN F CAPS N COVERS	110	D

Fire Class:

Class A= 0-.25 acres

Class B= .25-9 acres

Class C= 10-99 acres

Class D= 100-299 acres

Class E= 299-999 acres

Class E= 1000-4999 acres

Table 2: Wildfires by Size Class (RMANWR)

Wildfire Statistics		
1995-2012: 17 Years		
Total Wildfires : 56		
Wildfires: 3.29 Wildfires per year		
Fire By Size Class:	Total	%
Class A-0 to .25 Acre:	17	30%
Class B-.25 to 10 Acres:	29	52%
Class C-11 to 99 Acres:	9	16%
Class D-100 to 299 Acres:	0	0%
Class E-300 to 999 Acres:	1	2%
Class F-1000 to 4999 Acres:	0	0%
Class G-5000+ Acres:	0	0%

Table 3: Wildfires by Month (RMANWR)

Month	Number of Fires	%
January	1	2%
February	1	2%
March	0	0%
April	15	27%
May	4	8%
June	3	5%
July	19	34%
August	8	14%
September	2	4%
October	1	2%
November	1	2%
December	0	0%

Table 4: Prescribed Fire (Treatments) Statistics (RMANWR)

1996-2012: 16 Years
Total Treatments in Dataset: 83
Treatments: 5.19 Treatments per year
Total Acres Treated: 4989.10 Acres
Average Acres per Treatment: 60.11 Acres

Rocky Flats NWR

Wildland and Prescribed Fire History

Table 5:

Date	Year	Unit	Fire type	Fir Name	Acres	Class
	1993	RFR	WF	1993 FIRE	0.14	A
3/20	1994	RFR	WF	RFR 1994 #1	70.17	C
9/2	1996	RFR	WF	LABOR DAY FIRE	104.1	D
7/10	2000	RFR	WF	RFR 2000 #1	8.2	B
9/10	2000	RFR	WF	RFR 2000 #2	0.5	B
4/6	2000	RFR	RX	APRIL 6 PRESCRIBED BURN	48	C
6/26	2001	RFR	WF	RFR 2001 #1	.01	A
7/4	2001	RFR	WF	RFR 2001 #2	1	B
2/24	2002	RFR	WF	RFR 2002 #1	26.6	C
8/26	2005	RFR	WF	ORIGINAL LANDFILL WILDFIRE	4	B
4/2	2006	RFR	WF	ROCKY FLATS	852 ($140_{private}$)	E
9/28	2011	RFR	WF	INDIANA WF	20	C
2/9	2013	RFR	WF	ROCKY FLATS LAKE	0.1	A

Fire Class:

Class A= 0-.25 acres

Class B= .25-9 acres

Class C= 10-99 acres

Class D= 100-299 acres

Class E= 299-999 acres

Class E= 1000-4999 acres

Table 6: Wildfires by Size Class (RFNWR)

1995-2012: 17 Years		
Total Wildfires : 12		
Wildfires: .7 Wildfires per year		
Fire By Size Class:	Total	%
Class A-0 to.25 Acre:	3	25%
Class B-.25 to 10 Acres:	4	33%
Class C-11 to 99 Acres:	3	25%
Class D-100 to 299 Acres:	1	8.5%
Class E-300 to 999 Acres:	1	8.5%
Class F-1000 to 4999 Acres:	0	0%
Class G-5000+ Acres:	0	0%

Table 7: Wildfires by Month (RFNWR)

Month	Number of Fires	%
January	0	0%
February	2	17%
March	1	8%
April	2	17%
May	0	0%
June	1	8%
July	2	17%
August	1	8%
September	3	25%
October	0	0%
November	0	0%
December	0	0%

Table 8: **Prescribed Fire (Treatments) Statistics (RFNWR)**

1996-2012: 16 Years
Total Treatments: 1
Total Acres Treated: 48 Acres