I. INTRODUCTION

This Fire Management Plan has been developed to meet U.S. Fish and Wildlife Service requirements.

REFUGE DESCRIPTION

The Ouray National Wildlife Refuge (hereinafter referred to as the Refuge) is located in Northeast Utah, 20 miles southwest of Vernal, Utah, near the town of Ouray, Utah (Map 1). The Refuge boundary encompasses approximately 11,987 acres along the Green River. Of the 11,987 acres within the refuge boundary, an estimated 7,487 acres contain flammable fuels. The remaining acreage is open water or bare soil/rock outcrops. Of the 11,987 acres, 2,347 acres are leased from the Uinta and Ouray Nation. The majority of the surrounding land is managed by the Bureau of Land Management (BLM) and the Bureau of Indian Affairs (BIA).

Topography & Soils: The Refuge area is generally flat to rolling, however the area includes steep barren slopes. Elevations range from 4550-5072 feet above mean sea level.

Soils in the dry upland benches consist of Fruita fine sand or fine sandy loam. Intermixed with these soils are areas of rough, broken and stony soils. The uplands are separated from the bottomland by broken and stony bluffs of sandstone and shale. The bottomland is Green River fine sand, sandy loam, clay loam or silty clay. Some of the soils in the area exhibit a high degree of alkalinity. Appendix A contains a map which shows the distribution of soils on the Refuge as well as an explanation of soil types..

Climate: The area is characterized as a cold desert biome with low precipitation and extreme temperature variations. Average annual precipitation is less than seven inches with most occurring in the spring and fall seasons of the year. Mean annual temperature is 45EF. Temperatures range from -43E F. in the winter to +104E F. during the summer. There is an average of 113 frost-free days annually. Evapo-transpriration averages 48 inches per year.

Vegetation: Vegetation types on the Refuge are classified as: wetlands, uplands, riparian and agricultural. Table 1 displays vegetation types and their respective acreage. Maps 2 & 3 display the distribution of vegetative types on the Refuge.

Table 1: Ouray NWR Vegetation Types

VEGETATION TYPE	ACRES
Wetlands	4,940
Uplands	4,765
Riparian	1,099
Agricultural	152
Water (Non-vegetative)	1,031
TOTAL	11,987

Wetlands: Approximately 4,940 acres of wetland marsh habitat exists on the Refuge. This includes both deepwater and shallow marshes. Hardstem bulrush (*Scirpus acutus)* and cattail (*Typha latifolia)* are the dominant plant species. This vegetative type exists in marsh units along the length of the Refuge adjacent to the Green River.

Uplands: Approximately 4,765 acres of uplands exist on the Refuge. This type is composed of desert (3,454 acres) and native grassland (1,311 acres). Dominant plant species in this type are sagebrush (*Artemisia ssp.),* greasewood (*Sarcobatus vermiculatus),* rabbitbrush (*Chrysothamnus spp.*), prickly pear cactus (*Opuntia polyancantha*), alkali sacaton (*Sporobolus airoides*), saltgrass and Indian rice grass (*Oryzopsis hymenoides).*

Riparian: This vegetation type includes the narrow ribbon of trees along the Green River on the Refuge. Approximately 1099 acres of riparian forest habitat exists on the Refuge. The dominant plant species are Fremont cottonwood (*Populus fremontii*) and several species of willow (*Salix spp).*

Agricultural: This vegetation type consists of 152 acres near the Refuge headquarters. This area is used to produce agricultural crops and is irrigated.

Noxious Weeds and Other Problem Species: Several non-native species are acting as invasives on the Refuge. Cheat grass (*Bromus tectorum),* perennial pepperweed or tall whitetop (*Lepidium latifolium*), Russian olive (*Elaeagnus angustifolia*), salt cedar (*Tamarix ramosissima*), Russian knapweed (*Centaurea repens)* are the non-natives of most concern. Perennial pepperweed is the most widespread and difficult to control. These plants have the potential to displace native species.

Threatened, Endangered and Special Concern Species: The Refuge provides important habitat for eight animals of special concern: bald eagle *(Haliaeetus leucocephalus)*; peregrine falcon *(Falco peregrinus)*; whooping crane (*Grus americana*); osprey (*Pandion haliaetus)*; Colorado pikeminnow (*Ptychocheilus lucius*); humpback chub (*Gila cypha*); bonytail chub (*Gila elegans*) and razorback sucker (*Xyrauchen texanus*).

The federally endangered Colorado squawfish, humpback chub, bonytail chub and razorback sucker inhabit the Green River. The peregrine falcon, whooping crane, osprey and bald eagle are frequently observed using the Refuge. Bald eagles frequent the Refuge's riparian areas during the winter.

Only one federally listed plant, the Uintah Basin hookless cactus (*Sclerocactus whipplei* var. glaucus) occurs on the Refuge.

Birds, Mammals, Fish, Reptiles, Amphibians and Invertebrates: Over 200 species of birds have been identified on the Refuge, seventy-five of which are confirmed nesters. The refuge is most important as a migratory stop-over for migrating birds. Twenty-nine mammal species have also been reported on the Refuge. In addition, three bats are believed to inhabit Refuge habitats.

Twelve species of reptiles and amphibians have been observed to frequent the Refuge. Many different fish species inhabit the Green River including the endangered fish mentioned in the previous paragraph. Appendix B contains a listing of animal sightings and/or occurrence on the Refuge.

Cultural/paleontological Resources: Five archaeological sites and four isolated finds of paleontological materials have been identified on the Refuge. The paleontological finds are predominatly small sheep-like skulls. The prehistoric materials identified on the Refuge are generally surface lithic sites. These include flint knapping stations scattered across the landscape and raw material quarry sites along the Green River.

Improvements: There are two areas of improvements on the Refuge. The headquarters complex consists of Refuge headquarters, employee residences, the old fish hatchery, fish screen building and refuge maintenance buildings. The estimated value of this complex is $1,575,400. The second area of improvements on refuge is the Ouray National Fish Hatchery. The value of this complex is unknown to Refuge personnel.

Adjacent landownership is either Bureau of Land Management, Uinta and Ouray Nation or privately owned agricultural lands. These lands are maintained for land management purposes and have no improved value. The town of Ouray, Utah is located near the south boundary of the Refuge. The town consists of several homes with outbuildings adjacent.

Wilderness: There is no congressionally mandated wilderness within the Refuge.

Fire Ecology: Historical fire information for the Refuge area is generally lacking. Fire acts as a disturbance factor in the vegetal development of most plant communities and invokes secondary successional processes (Bunting 1984). Because of the historical prominence of humans in the area it is probable that fire was a disturbance factor in the development of vegetative communities on the Refuge. Farming and timbering in the late 19th century and into the 20th century has disturbed the pre-European fire regime. The best approach to return fire into the Ouray ecosystem is to determine a desired condition, develop fire strategies to achieve the condition and then to monitor the results of the action. Following is a brief summary of the fire ecology of the vegetative communities identified on the Refuge:

Wetlands: There is little documentation on the historical fire ecology of this type. Fire would not have been necessary to maintain the species composition in these wetland systems. Hydrologic factors are more likely the force behind the development of this vegetative community. Prescribed fire can be used as an effective means of reducing vegetative biomass when it is beneficial to do so.

Uplands: Domination of sites by shrub species such as big sagebrush in this type would require a non-disturbance interval of more than 30 years (Petersburg 1992). With disturbance intervals less than 30 years a community of grass and desert shrub would result.

Riparian: Fremont cottonwood is an indicator of this vegetative type and has a low tolerance to high or prolonged fire intensities (FEIS 1998). Low fire intensities will generally not top-kill Fremont cottonwoods. In related populus species, top-killing of trees is generally followed by sprouting from the stump and root collars (FEIS 1998). The understory species in this vegetative type will generally respond favorably to fire.

Agricultural: There is no fire history on this parcel with the only possibility of fire being used for stubble removal. Currently stubble is tilled into the ground reducing the need for the use of fire to maintain fields.

Refuge Fire History: In the time period 1963-1998 the Refuge experienced on average 0.55 wildfires/year. In the ten-year period of 1989-1998 this frequency increased to 0.80 wildfires/year. Historical wildfire causes are: Human, 40%, Lightning, 40% and 20% undetermined.

Prescribed fire has been utilized as a management tool historically on the Refuge. In the period 1976-1996 a yearly average of 357 acres were burned under a prescription. Due to high mortality of cottonwoods, mainly from escaped prescribed burns, prescribed burning was not utilized on the Refuge in 1997-1998. Prescribed burning is planned in 1999 and into the future.

II. POLICY COMPLIANCE-GOALS AND OBJECTIVES

Service Policy Compliance: U.S. Fish and Wildlife Service policy requires that an approved Fire Management Plan must be in place for all of Service lands with burnable vegetation. Service Fire Management Plans must be consistent with firefighter and public safety, protection values, and land, natural, and cultural resource management plans, and must address public health issues. Fire Management Plans must also address all potential wildland fire occurrences and may include the full range of appropriate management responses. The responsible agency administrator must coordinate, review, and approve Fire Management Plans to ensure consistency with approved land management plans.

Service policy allows for a wildland fire management program that offers a full range of activities and functions necessary for planning, preparedness, emergency suppression operations, emergency rehabilitation, and prescribed fire operations, including non-activity fuels management to reduce risks to public safety and to restore and sustain ecosystem health. This plan meets this requirement and provides fire management guidelines for the Refuge.

National Environmental Policy Act Compliance: This plan meets the requirements of the National Environmental Protection Act (NEPA). An environmental assessment (EA) for Fire Management was completed in 1983 and has been included as a reference (Appendix C). More recently, an Environmental Assessment that addressed fire management was completed as part of the Comprehensive Conservation Planning process. A Finding of No Significant Impact was signed by the Regional Director July 17, 2000 (Appendix C). This Fire Management Plan tiers off a land management plan that address the use of fire as a management tool and has been through the NEPA process, therefore an EA will not be completed for this plan. In addition, regulations published in the Federal Register (62 FR 2375) January 16, 1997 categorically excludes prescribed fire when used for habitat improvement purposes and conducted in accordance with local and State ordinances and laws. Wildfire suppression actions and prescribed fire are both categorically excluded, as outlined in 516 DM 2 Appendix 1.

Authorities Citations: The statutes cited herein authorize and provide the means for fire management activities on lands under the jurisdiction of the Department of the Interior, or lands adjacent thereto.

1. Protection Act of 1922 (42 Stat. 857; 16 USC 594)

2. Economy Act of 1932 (47 Stat. 417; 31 USC 1535)

3. Taylor Grazing Act of 1934 (48 Stat. 1269; 43 USC 315)

4. Reciprocal Fire Protection Act of 1955 (69 Stat. 66; 42 USC 1856a)

5. National Wildlife Refuge System Administration Act of 1966 as amended (80 Stat. 927; 16 USC 668dd-668ee)

6. Federal Fire Prevention and Control Act of 1974 (88 Stat. 1535; 15 USC 2201)

7. Wildfire Suppression Assistance Act of 1989 (PL 100-428 as amended by PL 101-11)

8. Disaster Relief Act of May 22, 1974. (88 Stat. 143l 42 U.S.C. 5121)

9. 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 USC 6301-6308)

10. Department of Interior Manual, Part 620 DM-1, Wildland Fire Management (April 10, 1998).

11. United States Fish and Wildlife Service Wildland Fire Management Handbook (December 28,2000)

12. United States Fish and Wildlife Service Manual, 621 FS 1-3,
Fire Management (February 7, 2000)

Enabling Legislation: The enabling legislation for the Refuge included the Migratory Bird Conservation Act (16 USC 715d). The legal purposes of the refuge include:

"... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds," and

"... suitable for-(1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species..."

Refuge Mission, Goals, Objectives and Strategies As They Relate To Fire Management (CCP 2000)

1. Mission: To Manage and Restore all habitats utilized by migratory birds and other indigenous species.

2. Refuge Goals and Objectives Related to Fire Management

A. Goal: Maintain and enhance habitats for migratory birds that depend upon the Green River corridor

1. Objective: Restore and maintain riparian plant communities

2: Objective: Restore and maintain bottom lands and provide a mosaic of wetland types.

B. Goal: Provide habitats that support the recovery of threatened and endangered species on or adjacent to the Refuge

1: Objective: Maintain populations of the Uintah Basin Hookless Cactus**.**

C. Goal: Provide high quality upland habitats for migratory birds and resident ungulates.

1. Objective: Maintain or manage healthy grassland (Indian rice grass, shadscale, etc.) and desert habitats.

D. Goal: Educate refuge visitors and the local community about the Refuge, the refuge system and the Upper Colorado River Ecosystem

1. Objective: Provide educational opportunities in a natural setting to help Refuge visitors understand and appreciate management activities at Ouray National Wildlife Refuge.

3. Fire Management Opportunities to Implement Goals and Objectives

A. Wildland fire hazard reduction is the primary fire management technique to be used in the riparian corridor. Mechanical removal of hazardous fuels will be utilized. Prescribed burning will only be used to reduce hazard fuel accumulations.

B. Prescribed fire alone, or in combination with other vegetation management techniques may be used to reduce and/or contain the invasion of non-native plants (saltcedar, perennial pepperweed and Russian olive). Prescribed fire may also be used to reduce the abundance or desirable

vegetation to attain specific habitat objectives.

C. Create fuel mosaics with prescribed fire or other means on the Refuge that reduce the potential for wildland fire to damage populations of the Uintah Basin Hookless Cactus. The use of prescribed fire in areas known to contain the cactus will be avoided unless new research determines that the use of fire would be beneficial to the Uintah Basin Hookless Cactus.

D. Utilize prescribed fire to promote healthy grassland and desert habitats by removing decadent vegetation and recycling nutrients into living plant material.

E. Provide opportunities for Refuge visitors to understand and view the effects that both prescribed and wildland fire may have on vegetative and animal communities. This may be accomplished by interpretive signing along nature trails or the auto tour route in areas that have been treated or where a wildland fire has occurred.

III. REFUGE FIRE MANAGEMENT OBJECTIVES

The goal of wildland fire management is to plan and make decisions that help accomplish the mission of the National Wildlife Refuge System. That mission is to administer a national network of lands and waters for the conservation, management, and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. Fire management objectives (standards) are used in the planning process to guide management to determine what fire management responses and activities are necessary to achieve land management goals and objectives.

Service policy and the Wildland Fire Policy and Program Review direct an agency administrator to use the appropriate management response concept when selecting specific actions to implement protection and fire use objectives. The resulting Appropriate Management Response are specific actions taken in response to a wildland fire to implement protection and fire use objectives. With an approved Fire Management Plan, the Refuge staff may use wildland fire in accordance with local and State ordinances and laws to achieve resource management objectives (habitat improvement).

Using the Appropriate Management Response concept, suppress all wildfires commensurate with values at risk. Strategies employing a range of suppression options will be considered by the Incident Commander, and minimum impact suppression techniques (MIST) will be utilized, where appropriate.

1. Goal: Protect life, property, and other resources from unwanted fire.

Objectives:

a. Safely suppress all wildfires using strategies and tactics appropriate to safety considerations, values at risk, and in accordance with Service policy.
b. Minimize the cost and impact of wildland fire suppression activities.
c. Prevent human-caused wildfires.
d. Take actions to reduce vulnerability of refuge resources to fire.
e. Utilize mechanical treatment to reduce the concentration of fuels in areas dominated by Fremont cottonwood.

2. Goal: When practical, use prescribed fire as a tool to accomplish habitat management objectives.

Objectives: Use prescribed fire:

a. To increase vigor in native grasslands.
b. To reset selected habitats to more productive early successional stages.
c. To create a mosaic of successional stages within Refuge habitats, to provide habitat for the greatest diversity of wildlife.
d. To prepare non-native plant infestations for more efficient herbicide treatments.
e. As part of an integrated pest management plan to control non-native plants.

IV. FIRE MANAGEMENT STRATEGIES

Wildland fire activities will be conducted in accordance with Service and Departmental policy. Ouray NWR will utilize the appropriate management response concept when suppressing wildland fire, regardless of origin. Wildland fire use for resource benefit (WFURB) will not be a factor when determining the appropriate management response. Figure 1 displays the flow of activities for fire management at Ouray NWR.

Figure 1: Fire Management Flow Chart (2001 edition)

A. All unplanned ignitions on Ouray NWR will be suppressed.

Strategies are as follow and will be employed to meet refuge fire management objectives. Minimum impact strategies and tactics will be used whenever possible.

1. Aggressive initial attack will generally be the suppression strategy for the entire Refuge. The use of natural or manmade barriers to contain the fire is also appropriate when increased safety or reduced cost over aggressive attack can be attained. Tactics will be unique to each incident dependent on safety considerations, weather conditions, cost of suppression, fuel conditions, availability of resources and location of the fire in relation to structures and cultural resource sites. Specific tactics will be determined by the Incident Commander on scene.

2. Prescribed fire will be utilized to modify vegetative communities for improved wildlife habitat, ecosystem function and fuel reduction.

3. Mechanical treatment of natural fuels will be utilized to reduce potential for damage from wildfire. These treatments must be in compliance with resource management goals and objectives.

B. Constraints on Refuge fire management strategies include the following:

1. Utilization of heavy equipment during high intensity fires will be allowed only with the approval of the Refuge manager or his designee.

2. Aerial Retardants and foams will not be used within 300 feet of any waterway as described in the Guidelines for Aerial Delivery of Retardant or Foam near Waterways.

3. Any fire management activity within the Refuge boundary that are leased from the Uintah and Ouray Nation will be coordinated with Tribal Leaders before implementation can occur.

4. Any fire management activity occurring within the Refuge will be implemented in such a way as to provide the appropriate level of protection for species of special concern. Section 7 clearance will be secured, as appropriate..

5. A prescribed burn will not be implemented unless the Clearing Index will exceed 500.

6. All fires occurring on the Refuge will be staffed or monitored until declared out.

7. The use of prescribed fire to achieve management objectives must be conducted in a cost effective manner.

C. Rationale for determining fire management strategies.

1. Due to the small size of the refuge and the low number of lightning ignited fires occurring on the Refuge, Wildland Fire Use for Resource Benefit (WFURB) was determined to not be an efficient option at this time. Planning and implementing WFURB was deemed higher cost than the selected method.

2. Hazard fuel reduction on some areas of the refuge are not conducive to the use of prescribed fire due to potential damage to resource values. Prescribed fire would be an option for the maintenance of these areas after mechanical treatment of high fuel loading has been completed.

D. Appropriate Management Response

A wide range of options are available for consideration by the Incident Commander. Some are summarized in the following table.

Table 2: Appropriate Management Response

SITUATION	STRATEGY	TACTIC
1. Wildland fire on Refuge lands which does not threaten life, natural or cultural resources or property values.	Restrict the fire within defined boundaries established either prior to the fire or during the fire.	1. Holding at natural and man-made barriers. 2. Burning out. 3. Observe and patrol.
1. Wildland fire on Service property with low values to be protected. 2. Wildfire burning on to Service lands. 3. Escaped prescribed fire entering another unit to be burned.	Take suppression action, as needed, which can reasonably be expected to check the spread of the fire under prevailing conditions.	1. Direct and indirect line construction. 2. Use of natural and man-made barriers. 3. Burning out 4. Patrol and mop-up of fire perimeter.
1. Wildland fire that threaten life, property or sensitive resources. 2. Wildland fire on Service property with high values to be protected. 3. Observed and/or forecasted extreme fire behavior.	Aggressively suppress the fire using direct or indirect attack methods, holding the fire to the fewest acres burned as possible.	1. Direct and indirect line construction 2. Engine and water use. 3. Aerial retardant 4. Burn out and back fire. 5. Mop-up all or part of the fire area.

E. Effects of Fire Management Activities

The fire management program at the Ouray NWR has limited potential to impact lands adjacent to the refuge and nearby communities. The majority of land adjacent to the refuge is Uintah and Ouray Indian Reservation or Bureau of Land Management properties. These lands are managed for multiple use purposes (primarily rangeland) and the values at risk are low. The town of Ouray, south of the refuge, consists of seven homes with outbuildings. There are also smaller parcels of private and state lands along the west and northeast refuge boundaries. There are no homes on private or state lands, adjacent to the refuge (Map 5).

Vegetation types on adjacent Tribal (excluding leased), BLM and State lands fall mostly under the upland category and fuels are generally light. Most of the private

land is agricultural. The upland vegetation type will most likely burn only under extreme drought conditions.

The Ouray NWR lies in a remote part of the Uintah Basin and the area surrounding it is sparsely populated. There are few improved facilities adjacent to the refuge and any values at risk are minimal.

A potential impact to local residents is the smoke produced from a prescribed or wildfire on the refuge. This is particularly true of burns in riparian or wetland habitat, which have the heaviest fuel loads. Ouray NWR, along with other federal and state agencies, follows procedures outlined in the Utah Smoke Management Plan to comply with regulations and mitigate the effects of smoke (Appendix P). Potential areas to be affected by smoke are the cities of Vernal (22 miles N) and Roosevelt (24 miles NW) and State Highway 88 (1-2 miles W).

V. FIRE MANAGEMENT RESPONSIBILITIES

The Refuge Manager is responsible for planning and implementing an effective fire management program at Ouray NWR. This individual is the official ultimately responsible for all fire management decisions concerning both wildfire and prescribed fire on the refuge. Prescribed natural fires will not occur on the refuge. The Refuge Manager will be responsible for the daily determination if prescribed burn units are within prescription. During the absence of the Refuge Manager, the Assistant Refuge Manager will be delegated the authority to make decisions concerning both wildfire and prescribed fire on the refuge. All wildfires will receive an appropriate initial attack response. The initial attack forces are located at Refuge headquarters. The most fire qualified individual available will be in charge of suppression efforts until relieved.

Refuge Manager

1. Responsible for the overall management of the Refuge, including the fire program.
2. Insure that Department, Service, and Refuge policies are followed and maintained.
3. Insure sufficient collateral duty firefighters meeting Service standards are available for initial attack.
4. Supervise the writing of prescribed burn plans for the Refuge.
5. Serves as prescribed fire burn boss, as qualified.
6. Approves prescribed fire plans.
7. Prepares annual FIREBASE budget request, approves and tracks use of FIREBASE accounts.

Assistant Refuge Manager

1. Provide input to the resource management activities on the Refuge

including the selection of objectives and tools to be used in achieving objectives (including prescribed fire).

2. Serves during suppression action, as qualified..
3. Responsible for planning, coordinating, and directing preparedness activities including:
   a. Fire training.
   b. Physical fitness testing and Interagency Fire Qualification System (IFQS) data entry.
   c. Fire cache and equipment inventory accountability, maintenance, and operation.
   d. Cooperation with cooperative agencies. Revises cooperative agreements as necessary.
   e. Insures step-up plan is followed.
4. Insures fire management policies are observed.
5. Has lead responsibility for managing the prescribed fire program including:
   a. Serves as prescribed fire burn boss, as qualified.
   b. Propose prescribed fire projects.
   c. Write prescribed fire plans.
6. Maintains liaison with Regional Fire Management Coordinator and Fire Management Officer.
7. Updates the Fire Management Plan, maintains fire records, reviews fire reports (DI-1202) for accuracy.
8. Submits DI-1202 to Zone FMO within 10 days of fire declared out.

Seasonal and Collateral Duty Firefighters

1. Maintain assigned fire equipment in ready state and use required safety gear.
2. Responsible for their personal protective equipment and physical conditioning.
3. Qualify annually with the work capacity test before February 28 or within two weeks after reporting for duty.

Wildfire Incident Commander (as assigned)

The Incident Commander is responsible for aspects of the management of the fire, including:

4. Providing a size-up of the fire to dispatch as soon as possible.
5. Using guidance found in the fire Management Plan or in the Delegation of Authority, determine the strategy and tactics to be used.
6. Determine the resources needed for the fire.
7. Brief assigned resources on the strategy and tactics to be used, expected fire behavior, historic weather and fire behavior patterns, impacts of drought, live

fuel moisture, escape routes and safety zones, and radio frequencies to be used.

8. Advising dispatch of resource needs on the fire
9. Managing all aspects of the incident until relieved or the fire is suppressed
10. Submit completed DI-1202 (wildland fire report), crew time sheets, and a listing of any other fire related expenditures or losses to Assistant Refuge Manager within 3 days of fire being declared out.

Prescribed Fire Burn Boss (as assigned)

1. Implement approved prescribed burn plans within prescriptions.
2. Assist with the administration, monitoring, and evaluation of prescribed burns.
3. Document weather and fire behavior (including rates of spread and flame length) and submit to Assistant Refuge Manager.
4. Document necessary information to complete DI-1202 (fire report) and submit to Assistant Refuge Manager within 3 days of fire being declared out.

Cooperators and Fire Related Agreements: Ouray NWR is almost entirely surrounded by federal lands owned and/or managed by the Vernal Field Office of the Bureau of Land Management and the Uintah and Ouray Nation. There are no private inholdings but 2,347 acres are leased from the Uintah and Ouray Nation. The Uintah Basin Interagency Fire Center Annual Operating Plan (Appendix H) displays suppression responsibilities for the area as well as a list of Refuge cooperators.

Along with other land management agencies, the Service has adopted the National Interagency Incident Management System (NIIMS) Wildland and Prescribed Fire Qualification Subsystem Guide, PMS 310-1 to identify minimum qualification standards for interagency wildland and prescribed fire operations. PMS 310-1 recognizes the ability of cooperating agencies at the local level to jointly define certification and qualification standards for wildland fire suppression. Under that authority, local wildland fire suppression forces will meet the standards established for their agency or department. All personnel participating in prescribed fire management activities must meet Service fitness and training standards.

VI. FIRE SEASON

In the time period 1963-1998 the Refuge experienced on average 0.55 wildfires/year. In the ten-year period of 1989-1998 this frequency increased to 0.80 wildfires/year. Historical wildfire causes are: Human, 40%, Lightning, 40% and 20% undetermined.

Prescribed fire has been utilized as a management tool historically on the Refuge. In the period 1976-1996 a yearly average of 357 acres were burned under a prescription. Due to high mortality of cottonwoods, mainly from escaped prescribed burns, prescribed burning was not utilized on the Refuge in 1997-1998. Prescribed burning is planned in 1999 and into the future. Appendix K contains historical fire occurrence information.

The wildfire season determined by the Uinta Basin Interagency Dispatch Center for the Interagency Fire community is June 1 through September 30. However, historic fire accounts speak of large, fast moving fires occurring in the late winter and early spring months. The Fire Occurrence Subsystem of FMIS indicates that the majority of fires on the Refuge occur March 1 through May 30.

The prescribed fire season can occur at any time of the year on the Refuge. Historically, prescribed fire has occurred mainly in the spring (Feb.-June) and in the fall (Nov.-Dec.).

VII. EQUIPMENT AND STAFFING NEEDS

Equipment: Engines are the primary initial attack resource on the Refuge because of the predominance of fine fuels and access roads. Earth moving equipment is available, however it will only be used after approval of the Refuge Manager and when no other alternatives exist. Heavy equipment is not maintained specifically for fire use and will only be used on refuge fires only. Equipment available for fire management purposes is listed in Appendix G.

Normal Unit Strength: Ouray NWR is authorized a ten-person fire cache. Recommended cache items and Type 6 engine inventory are located in Appendix G.

Personnel and Level of Qualification: The following table outlines the position needs of the Fire Management program at Ouray NWR. Appendix E contains a listing of current employee qualifications.

Table 3. Fire Management Organization

Position	Minimum # Required
Incident Commander Type 5 (ICT5)	1
Prescribed Fire Burn Boss Type 3 (RXB3)	1
Engine Boss (ENGB)	1
Engine Operator (ENOP)	1
Fire Fighter Type 2 (FFT2)	3

VIII. PREPAREDNESS

Table 4: Annual Refuge Fire Management Activities. Annual preparedness actions that will be accomplished prior to the end of the month which is identified.

ACTIVITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Update Annual Fire Management Operating Plan	X											
Winterize Fire Management Equipment										X		
Inventory fire engine and cache equipment			X									
Identify Refuge Fire Management Training Needs	X											
Annual Refresher Training			X									
Annual Work Capacity Test		X										
Pre-season Engine Preparation			X									
Update Fire Management Plan		X										
Review Fire Agreements for Currency	X											

Prescribed Fire Plan Preparation		X									
Weigh engines to determine GVW compliance			X								
Prepare pre-season risk analysis			X								
Live Fuel Moisture Sampling						X	X	X	X		

Training, Qualification and Fitness: The safety of firefighters and the public is the first priority. Persons engaged in fire suppression activities are exposed to a high element of risk. The Refuge Manager and fireline supervisors must make every effort to reduce the exposure to risk and enhance performance. One way is through formal and on-the-job training and improved physical fitness. The Service has adopted the training and fitness standards established in 310-1, and all firefighters must meet these and other standards established by the Service to participate in fire management activities.

Training: Refuge shall complete and submit a **copy** of completed National Wildfire Coordinating Group Interagency Training Nomination form either as a hard copy or electronically for each course to the Zone FMO (Appendix F). The Zone FMO will review the nomination and approve or deny the request. The Zone FMO will notify the Refuge via E:mail of their decision and provide an account number to be used for travel and other costs associated with training.

Annual Refresher Training: All personnel involved in Fire Management activities are required to participate in wildland fire management refresher training annually in order to be qualified for fire management activities in that calendar year. Refresher training will concentrate on local conditions and factors, the Standard Fire Orders, LCES, 18 Situations, and Common Denominators. NWCG courses Standards for Survival, Lessons Learned, Look Up, Look Down, Look Around, and others meet the firefighter safety requirement; but efforts will be made to vary the training and use all or portions of other NWCG courses to cover the required topics. Fire **shelter use and deployment** under adverse conditions, if possible, **must** be included as part of the annual refresher

Physical Fitness: All personnel involved in fire management activities will meet the fitness standards established by the Service and the Region. At this point in

time, firefighters participating in wildfire suppression must achieve and maintain an **Arduous** rating. Firefighters participating in Prescribed Burning must achieve and maintain a **Moderate** rating. Information found in **Appendix F** provides specific instructions to administer the tests, a health screening questionnaire to aid in assessing personal health and fitness of employees prior to training for or taking the test, an informed consent form, and safety considerations. A trained and qualified American Red Cross First Responder (or equivalent) who can recognize symptoms of physical distress and appropriate first aid procedures must be on site during the test.

Wildland fire fitness tests shall not be administered to anyone who has obvious physical conditions or known of heart problems that would place them at risk. All individuals are required to complete a pre-test physical activity readiness questionnaire prior to preparing for and taking a physical fitness test. They must read and sign the Par-Q health screening questionnaire, an informed consent form (Appendix F). If an employee cannot answer NO to all the questions in the PAR-Q health screening questionnaire, or is over 40 years of age, unaccustomed to vigorous exercise, and testing to achieve a Moderate or Light rating, the test administrator will recommend a physical examination. As noted below, all individuals over 40 years of age **must** receive an annual physical **prior** to physical testing.

Physical Examinations: In keeping with Service Policy, a physical examination is required for all new permanent employees and all seasonal employees assigned to arduous duty as fire fighters prior to reporting for duty. A physical examination may be requested for a permanent employee by the supervisor if there is a question about the ability of an employee to safely complete one of the work capacity tests. All permanent employees over 40 years of age who take the Pack or Field Work Capacity Test to qualify for a wildland or prescribed fire position are required to have an annual physical examination before taking the test.

Impact of Drought and Preparedness Levels

As indicated previously, periods of drought can greatly impact fire behavior and resistance to suppression. For that reason the Palmer Drought Index and the Keetch-Byram Drought Index will be monitored at a minimum on a weekly bases throughout the year. All are available on the Internet at http//:www. crh.noaa.gov/gjt/fire.htm. The Refuge fire staff can also contact the Uintah Basin Interagency Dispatch Center (435-789-7021) during periods of high fire danger to track indices and anticipate possible fire activity. Preparedness actions have been identified in the Step-Up Plan to respond to unusual conditions associated with drought and other factors.

During the fire season, the Uintah Basin Interagency Fire Center implements systems necessary to gather weather observations on a daily basis. Observations

are entered into the WIMS and fire danger indices extracted. Fire weather forecasts are broadcast via radio and include the Haines Index, preparedness level for the day, and the actual Energy Release Components for the Cart Creek and Yellowstone RAWS.

Other general methods to monitor factors related to local drought conditions include tracking snowpacks, reservior storage, and streamflow forecasts provided by the Natural Resource Conservation Service. This information is sent to the assistant manager via email on a monthly basis. River flows can also be monitored through USGS (http://svr1dutslc.wr.usgs.gov/rt-cgi/gen_stn_pg?statin=09261000) and BOR (www.uc.usbr.gov/wrg/crsp/srsp_cs_fgd,html) websites.

Large scale fire suppression activities occurring in various parts of the country can have an impact on local fire management activities. For example, resources may be limited to implement prescribed fire activities because the closest available resources may be assigned to fire suppression duties or Refuge personnel may be involved as well. Regional drought conditions may also tie-up local resources that would normally be able to assist with Refuge fire management activities. It may be necessary to go out of Region to get the resources needed to staff Refuge engines during periods of extreme drought or high fire danger.

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The Refuge is in the Eastern Great Basin Area. During National and Regional Preparedness Levels IV and V, it is necessary to receive approval from the Regional Fire Management Officer and the concurrence of the Eastern Great Basin Area Coordination Group to conduct prescribed burns during PL IV and the National Coordination Group during PL V.

Step-up Plan: The step-up plan for the Ouray National Wildlife Refuge is located in Appendix O.

IX. FIRE MANAGEMENT UNITS (FMU)

The Refuge will be divided into four FMU's designated as 1, 2, 3 and 4. These FMU's are designated to facilitate the implementation of Refuge vegetation management objectives and are delineated by the vegetation types referenced previously in this plan. All FMU's

will utilize the appropriate management response concept when managing wildland fire. Map 4 illustrates the location of these FMU's. Table 5 illustrates the relationship between the vegetative types and the FMU. Following is a description of each FMU.

FMU 1 is represented by the area in and around the wetland marsh vegetation type. Wildfires will be suppressed in this unit. Water levels in this area are quite variable and there may be times during drought periods and during the dormant season i.e. February - May/October - December that the chance of unplanned ignitions may be moderately high. It is anticipated that approximately 2,200 acres in a 10-year period or an average of 220 acres/year will be prescribed burned.

FMU 2 is that portion of the refuge generally surrounding the stream corridors within the Refuge boundary. The riparian vegetation type delineates this FMU. The boundary of this FMU is a combination of roads and the Refuge boundary. Wildfires will be suppressed and limited prescribed burning is planned within this FMU. Mechanical fuel reduction will be used to reduce the fire hazard to cottonwood trees in the riparian corridor. Prescribed fire will be in the form of burning piled material that is associated with the mechanical fuel reduction areas. Further prescribed fire may be utilized to reduce fuel loading when large fuel moisture is high and only small and fine fuels would be consumed. In this manner,

Map 4: Fire Management Units

cottonwoods would be protected from intense prescribed fire. Fuel reduction with pile burning will be approximately 80 acres over the 10-year period.

FMU 3 is the area associated with the uplands vegetative community. Wildfires will be suppressed and prescribed fire will be used in this FMU. Fuels are generally light and fire behavior based on fire prediction models is expected to be overestimated. The expected burn acreage over a 10-year period is 1,500 acres or an average of 150 acres/year.

FMU 4 is the agricultural cropland area. The likelihood of wildfire in this irrigated area is low, however, wildfires will be suppressed if they occur. Prescribed fire is not expected to be used within this FMU. Stubble will be used as tillage which will reduce fire hazard to low levels

Table 5: Vegetation Types by Fire Management Unit (FMU)

FMU	CORRESPONDING VEGETATION TYPE	ACRES
1	Wetlands	4,940
2	Uplands	4,765
3	Riparian	1,099
4	Agricultural	152

Fire Behavior: Severe fire behavior may occur throughout the period from March through September. From March through the end of April, fine fuels are dead and dry and heavy winds from frequent frontal passages create the potential for extreme rates of spread and high spotting potential. The majority of ignitions in this time period are human-caused.

In the period from March through September, thunderstorms, low relative humidity and gusty wind are most severe. Generally prevailing winds are westerly to southwesterly but can occur from any direction when thunderstorms or a frontal passage moves through the area. Wind speed can be expected to increase with these weather events. During this time period, vegetation in the upland and desert area is dry but sparse while vegetation in the riparian areas has a higher fuel moisture content due to water relations. With the above mentioned fuel characteristics, severe fire behavior would only occur in the few areas where low fuel moisture and ample fuel occur. Ignitions are from both human causes and lightning during this time.

Live fuel moisture (LFM) is a good indicator of larger fuel conditions and how well they will burn. They are also a good indicator of long-term drying. Live fuel moisture for key species which will indicate that intense burning will occur if weather conditions are

favorable are as follows:

Table 6: Live Fuel Moisture

Species	LFM INDICATING SPECIES WILL BURN	LFM INDICATING INTENSE BURNING IS PROBABLE
Sagebrush (*Artemisia tridentata*)	<120%	<100%
Grass	<80%	<60%

Following are descriptions of fire behavior and their respective fuel models for the five vegetation types described in the vegetation section of this document.

Wetlands: This type occupies approximately 4,940 acres of Refuge and is located specifically in river and stream corridors. The main vegetation is bulrush and cattail. Fire Behavior Fuel Model 3 and National Fire Danger Rating System (NFDRS) Fuel Model N represent this type. Fire in this fuel model is the most intense of grass fuel models and displays high rates of spread under the influence of wind. Wind may drive fire into the upper heights of the grass and across standing water. Fuel loads consist of fine and course dead fuels averaging 3.0 tons/acre and a fuel bed depth of 2.5 feet.

Uplands: This type is by far the predominant vegetative type on the Refuge occurring on approximately 4,765 acres or 40% of the land area. NFDRS Fuel Model T or Fire Behavior Fuel Model 2 is appropriate for this type. Rates of spread are highly dependent on fuel continuity and wind or slope gradient. On the Refuge, intensities in this type will vary depending on species composition. Most of the area in this type is composed of low-growing shadscale, saltbush and grass. Fire spread in this type is generally not a concern even under extreme fire weather conditions. The remainder of this type is composed of greasewood. When greasewood is involved and live fuel moisture is low, intense burning can occur. Generally the extent of burning in this type is limited on the Refuge by natural barriers and areas of discontinuous fuels. A rate of spread of 35 chains/hour could be expected with a flame length of 6 feet. Total live and dead fuel loading averages 3.0 tons/acre with a fuel bed depth of 2.5 feet. Due to the continuity and sparsity of fuels within this type on the Refuge, fire intensity and rate of spread will be highly exaggerated by this fuel model.

Riparian: This type is composed of cottonwood stands with a grass understory. These areas are restricted to river and stream bottoms. This type is represented on 1,099 acres of the Refuge. Several areas within this type have experienced higher fuel loading due to dead trees falling to the ground, thus creating a high fuel load. Generally fire is restricted to the grassy understory in this type, however when fuel jackpots are burned, intense heavy fuel burning on the forest floor can cause mortality in live cottonwoods. This type is characterized by Fire Behavior Fuel Model 2 and NFDRS Fuel Model C. Rates of

spread average 35 chains/hour with flame lengths of 6 feet. Total fuel loading for both live and dead fuels is 4.0 tons/acre and fuel depths are approximately 1 foot.

Fire Effects: Fire effects for species of special concern will be characterized below. For a species specific listing of the effects of fire on species that occur on or within the geographic area around the Refuge, see Appendix D.

Noxious weeds:

Cheat Grass: Frequent fires favor cheatgrass over perennial native vegetation. Cheatgrass seed is stored in the ground and because of its rapid growth and vigorous reproduction it has the potential to dominate sites.

Perennial pepperweed: Dense stands of perennial pepperweed retard the spread of fire. When fire does penetrate a stand of perennial pepperweed, top-killing of the plant is accomplished. Perennial pepperweed resprouts from rhizomes following fire. Areas of severe disturbance within seeding distance of perennial pepperweed may be invaded and soon dominated by this plant.

Saltcedar: Saltcedar is a fire adapted, introduced species. Upon burning, saltcedar sprouts from the root crown and flowers profusely. Saltcedar will invade favorable seedbeds. Burning alone does not usually control saltcedar.

Russian knapweed: Russian knapweed is top-killed by fire, however it sprouts from rhizomes. There is no evidence that Russian knapweed will invade burned areas immediately after the burn.

Russian olive: Fire may top-kill Russian olive, but trees will probably sprout from the root crown after the disturbance. Seeding from off-site sources will occur on burned areas. Fire in combination with stump spraying can prevent sprouting from the root crown.

Species of Special Concern:

Bald Eagle: The greatest effect to bald eagles on the refuge is through the loss of roosting habitat when cottonwood trees are killed by intense fire behavior. Eagles do not nest on the refuge so loss of nesting is not a consideration.

Peregrine falcon: The falcon nests in the cliffs outside of the refuge boundaries. There would be little effect of fires on refuge.

Fish: Fire on a small scale should not effect the endangered fish in the Green River. There is a possibility that large scale fire could reduce shading on the Green River and be detrimental to overall fish habitat.

Uintah Basin hookless cactus: There is no documentation on this cactus in the Fire Effects Information System, however if other cacti are an indicator, fire can be harmful to these plants. Generally, the cactus would be expected on rocky outcrops away from a continuous fuelbed, so would not be at risk. Care should be taken to ensure that these plants are protected.

Non-Biological Resources

Soils: Soils should be unaffected by fire in light fuels on the Refuge. Fuels are generally flashy and will not provide for a fire that has a long enough residence time to cause significant soil damage due to heating. In heavier fuels such as would occur in cottonwood areas, soils have in the past and could in the future be damaged by smoldering, high fire intensity and lengthy fire residence time. Fire management activities that would occur in these heavy fuels should be limited to mechanical removal or burning when fuel moisture is such that prolonged burning or high fire intensity would not occur. Soil erosion caused by removing vegetation from the land is not likely since most areas that will burn on the Refuge do not have a steep slope.

Air Quality: Any fire on the Refuge will cause a temporary degradation in the local air quality. The air quality in the area around the refuge is very good and can absorb and buffer the effects of smoke from fire burning on refuge.

Cultural Resources/Refuge Improvements: Since some of the identified cultural resources on the refuge are on the surface, fire may have a direct effect on them. Care will be taken during suppression activities or fireline construction to prevent damage to these sites.

X. FIRE OPERATIONS

Wildland Fire

Fire History: Prior to 1986, fires were not entered into the Fire Occurrence Subsystem. Since that time, four fires have been recorded. Two of these fires were human caused and two were attributed to lightning. See Appendix K for a compilation of recorded fires.

Fire Occurrence: The wildfire frequency for the period 1989-1998 is 0.8 wildland fires per year.

Fire Season: The fire season determined by the Uintah Basin Interagency Dispatch Center for the Interagency Fire community is June 1 through September 30. However, historic fire accounts speak of large, fast moving fires occurring in the late winter and early spring months. The Fire Occurrence Subsystem of FMIS indicates the fire season for the Refuge is March 1 through May 30.

Initial Attack Strategies and Tactics: All unplanned ignitions will be suppressed. Minimum impact strategies and tactics will be used whenever possible. Aggressive attack will generally be the suppression strategy for the entire Refuge. The use of natural or manmade barriers to contain the fire is also appropriate when increased safety or reduced cost over aggressive attack can be attained. Tactics will be unique to each incident dependent on safety considerations, weather conditions, cost of suppression, fuel conditions, availability of resources and location of the fire in relation to structures and cultural resource sites. Specific tactics will be determined by the Incident Commander on site.

Limitations on Suppression Activities: 1. Heavy equipment use during high intensity fire events will be allowed only with the approval of the Refuge manager or his designee; 2. Aerial retardant and foam will not be used within 300 feet of any waterway as described in Guidelines for Aerial Delivery of Retardant or Foam near Waterways; and 3. Any fire management activity within the Refuge boundary that are leased from the Uintah and Ouray Nation will be coordinated with Tribal Leaders before implementation can occur.

Prevention: Of the seven wildland fires that occurred within the Refuge boundary during the 10-year period of 1989-1998, three have been human caused. The three fires burned a total of 190 confirmed acres. Although the number of ignitions is low, the human caused fires resulted in the majority of acres burned. The number of human caused fires can be reduced through a well managed fire prevention program. Following are fire prevention steps being used or planned to reduce human caused ignitions on the Refuge.

1. Public contact will be made with Refuge visitors informing them of a fire ban when a fire ban is in effect.

2. Mop-up activities following prescribed burning will be improved and all prescribed fire plan elements will be implemented.

Detection: There are no permanent detection facilities located on the Refuge. Detection of wildland fire is dependent on individuals reporting fires to the Refuge staff, the Uintah Basin Interagency Fire Center or the local Sheriff's Department.

Initial Reporting and Dispatching: Initial reporting and dispatching will be completed in according with the Uintah Basin Interagency Fire Center Annual Operating Plan (Appendix H).

There may be occasions when unqualified personnel discover a wildland fire. When this occurs the employee should report the fire and request assistance before taking action to suppress or slow the spread of the fire. If the fire poses an imminent threat to human life, the employee may take appropriate action to protect

that life before requesting assistance. The unqualified personnel will be relieved from direct on-line suppression duty or reassigned to non-fireline duty when qualified initial attack forces arrive.

Emergency Presuppression and Severity Funding:

Severity funding: Severity funding is different from Emergency Presuppression funding. Emergency Presuppression funds are used to fund activities during short-term weather events and increased human activity that increase the fire danger beyond what is normal. Severity funding is requested to prepare for abnormally extreme fire potential caused by unusual climate or weather events such as extended drought. Severity funds and emergency presuppression funds may be used to rent or preposition additional initial attack equipment, augment existing fire suppression personnel, and meet other requirement of the Step-up Plan.

Emergency Presuppression and Severity funds: Emergency Presuppression and Severity funds will be requested in accordance with the guidance provided in the Service's Fire Management Planning Handbook. As a general guide, Severity funding will be requested if a severe drought is indicated by a Palmer Drought Index reading of -4.0 or less or a Keetch-Byram Drought Index of 600 or greater and a long-range forecasts calling for below average precipitation and/or above average temperatures. Drought Indices can be located at: http://www.boi.noaa.gov/fwxweb/fwoutlook.htm

Prescribed Fire

Prescribed fire will be used to meet resource management objectives by reducing vegetative biomass in wetland areas and to enhance grassland production in the uplands. Prescribed fire in conjunction with herbicides or other vegetation management techniques will be utilized to reduce the incidence of noxious and invasive weed species. Prescribed fire may be used to reduce hazardous concentrations of wildland fuel.

Prescribed fire activity on the Refuge has not been consistent in the past. Prescribed fire was used in the early 1970's and used sporadically through to the present time. In the period 1989-1998 the Refuge completed 18 prescribed burns for 1,730 acres or a yearly average of 173 acres. A complete listing of historical prescribed fire on the Refuge can be found in Appendix K.

Prescribed burning can occur at any time during the year depending on resource and management objectives. Most burning will occur in the period from February through October. A prescribed fire plan will be prepared and approved prior to the accomplishment of any prescribed burning activities. The prescribed fire plan will follow the format approved by the Regional Fire Management Coordinator.

Long-term Prescribed Fire Program: Individual prescribed burn units will be

identified by the Refuge manager and their staff as part of an annual review process. Specific objectives for the burns will be determined at that time and included in the prescribed burn plan.

The long-term prescribed fire program is determined on a 10-year anticipated burn program. Annual average acreage is determined from the 10-year projection. There will not necessarily be a consistent burn program from year to year, however, the 10-year goal will meet Refuge habitat management objectives.

Prescribed fire acreage is calculated by vegetation type. The acreage planned for prescribed fire may be reduced by the number of acres consumed by wildland fire in a vegetative type if it is deemed to be a significant impact to the desired habitat condition of that vegetative type. Table 7 outlines the anticipated prescribed fire program for the next 10 years.

Table 7: Long-Term Prescribed Fire Program

VEGETATIVE TYPE	CONSTRAINTS	10-YEAR ACREAGE (acres)	ANNUAL AVERAGE (acres)
Wetlands		2,200	220
Uplands		1,500	150
Agricultural		0	0
Riparian		80	8
TOTAL		**3,780**	**378**

Planning and Implementation: All prescribed burns will be accomplished with an approved Prescribed Fire Burn Plan. Plans prepared by other than the Zone Fire Management Officer (FMO) will be evaluated by the Zone FMO. If the burn plan is completed by the Zone FMO, evaluation and approval will be completed by the Regional Prescribed Fire Specialist. All Prescribed Burn Plans will include a section (Contingency Plan) which outlines the actions to be taken in the event of an escape.

In the event a prescribed burn escapes and is declared a wildfire, refuge staff will serve as the initial attack resource. The initial attack resource will do an initial size up which will include location, acreage, weather conditions, and potential for escape. If the initial attack resource is not capable of managing the fire, the Uintah Basin Interagency Fire Center will be contacted to send additional initial attack resources to assist. At this stage, additional procedures to be followed are outlined within the 2001 Uintah Basin Interagency Annual Operating Plan (Appendix H).

The potential impacts to visitors and neighboring communities have been addressed previously under Section IV. E..

Prescribed Fire Monitoring: Prescribed fire monitoring and evaluation will be used to:

1. Determine whether burn plan criteria are being met.
2. Determine whether resource objectives are being met.
3. Document costs and improve economic efficiency.
4. Document data so results can be replicated.
5. Validate fire behavior predictions and refine prescriptions
6. Provide baseline data for long-term fire effects studies.
7. Provide intelligence for operational decisions during an ongoing fire.
8. Meet legal and administrative responsibility to document the fire.
9. Provide justification for continuation of the project or program.

Monitoring is divided into 3 categories for prescribed fire; pre-burn, short-term and long-term. Prescribed fire monitoring is outlined in Appendix L.

Pre-burn monitoring will consist of monitoring live fuel moisture, atmospheric factors to develop weather trends, dead fuel moisture and changes to the fuel loading. Live fuel moisture plots will be permanently established across the Refuge in representative fuel types as well as temporary plots on the prescribed burn unit. Sampling scheme and calculation of data will follow the format recommended by the report included in Appendix L.

Short-term monitoring for any prescribed fire will include the first order fire effects (FOFE) live fuel moisture, smoke, fire behavior and weather. First order fire effects are the immediate results of the fire and relate directly to fire treatment objectives. Examples of FOFE include plant mortality, duff consumption, fuel consumption, % of area consumed, etc. These effects should be listed in the prescribed fire plan for a burn unit. Fire behavior and smoke should be monitored during the burn to ensure that the objectives of the prescribed fire plan is being met. Weather will be monitored before and during the actual prescribed burn. Live fuel moisture will be monitored prior to the burn to ensure that the objectives of the prescription will be achieved.

Monitoring of second order or longer term fire effects will be addressed in the Refuge Habitat Management Plan. Items to be considered in long-term monitoring might include: plant community change, increase or decrease in individual species as a result of burning or the overall juxtaposition of successional types on the Refuge.

Prescribed Fire Complexity: Prescribed fire complexity will be determined by the U.S. Fish and Wildlife Service Region 6 Complexity Analysis (Appendix M). Most prescribed fires on the Ouray NWR will be Type 3 burns, however Type 1

and 2 burns are possible. The complexity of a prescribed fire is dependent upon fuels/vegetation, objectives, smoke management, values at risk, burn boundaries, size, and number of personnel involved. All prescribed fires currently being considered are of low complexity. Moderate and high complexity burns will only be undertaken if a burn boss II (RXB2) or burn boss I (RXB1) and adequate resources are available.

Non-fire Hazard Fuel Reduction

A project work plan for this work must be submitted and approved by the Regional Fire Management Coordinator prior to expending fire management funds..

XI. ADDITIONAL OPERATIONAL ELEMENTS

Wildland Fire Situation Analysis (WFSA): A Wildland Fire Situation Analysis will be prepared in the event that a wildland fire exceeds the capabilities of the initial attack forces or a prescribed burn exceeds the maximum allowable area defined in the prescribed fire burn plan. The WFSA will be completed by the Refuge Manager assisted by the Fire Management Officer. Due to the size of the Refuge and the adjacent land holdings it may be necessary to consult with the adjacent landowners in the preparation of the WFSA. A blank WFSA and Delegation of Authority are included in Appendix N.

Mop up Standards and Emergency Stabilization and Rehabilitation: The IC will be responsible for mop-up and mitigation of suppression actions taken on Refuge fires. The mop-up standards established in the Fireline Handbook will be followed. Refuge fires will be patrolled or monitored until declared out.

Prior to releasing all firefighters from a wildland fire the following actions will be taken:

- All trash will be removed.
- Firelines will be refilled and waterbars added if needed.
- Hazardous trees and snags cut and the stumps cut flush.
- Disked firelines should be compacted as soon as possible to preserve the living root stock of natives grasses
- Overturned sod resulting from plowing must be rolled back with a grader or by hand and compacted to preserve native grass root stock.
- Other emergency stabilization and emergency rehabilitation measures may be taken in accordance with Chapter 5 of the Fire Management Handbook.

Emergency stabilization: Emergency stabilization is the use of appropriate emergency stabilization techniques in order to protect public safety and stabilize and prevent further degradation of cultural and natural resources in the perimeter of the burned area and downstream impact areas from erosion and invasion of undesirable species. The Incident Commander may initiate Emergency Stabilization actions before the fire is demobilized, as delegated by the Agency Administrator, but completing emergency stabilization

activities may be completed after the fire is declared out.

Rehabilitation: Rehabilitation is the use of appropriate rehabilitation techniques to improve natural resources as stipulated in approved refuge management plans and the repair or replacement of minor facilities damaged by the fire. Total "rehabilitation" of a burned area is not within the scope of the Emergency Rehabilitation funding. Emergency Rehabilitation funding can be use to begin the rehabilitation process if other funding is committed to continue the rehabilitation throughout the life of the project (beyond the initial 3 years of Emergency Rehabilitation funding). Major facilities are repaired or replaced through supplemental appropriations of other funding.

Emergency Stabilization and Rehabilitation Plan: Because of the emergency nature of the fire event, the emergency stabilization section of the Emergency Stabilization and Rehabilitation Plan (ESR Plan) must be developed expeditiously and is frequently developed by a local unit or designated burned area ESR team. The rehabilitation section of the ESR Plan is not considered an emergency, and is developed as other refuge land use plans. The refuge manager is responsible for preparing all ESR Plans. In order to be funded, ESR Plans must meet resource management objectives and be approved by the Project Leader and the Regional Director.

Records and Reports: The incident commander (IC) on a wildland fire or the prescribed fire burn boss on a prescribed burn will be responsible for the completion of a DI-1202 Fire Report as well as Crew Time Reports for all personnel assigned to an incident and return these reports to the Assistant Manager. The IC or burn boss should include a list of all expenses and/or items lost on the fire and a list of personnel assignments on the DI-1202. The Assistant Refuge Manager will submit the DI-1202 to the Zone Fire Management Officer within 10 days of the fire declared out. The Zone FMO will then enter the information into the Fire Management Information System (FMIS). The Assistant Refuge Manager will also inform the timekeeper of all time and premium pay to be charged to the fire and ensure expended supplies are replaced.

Air Quality and Smoke Management: Smoke management is administered by the Utah State Division of Health. Requirements of the Division of Air Quality for prescribed burning will be followed. A prescribed burn will not be implemented unless the Clearing Index will exceed 500. The Clearing Index is determined daily by the National Weather Service and will be part of the prescribed burn spot weather forecast. Further information on smoke management is contained in Appendix H.

Cultural Resources: Fire Management activities at the Refuge will be implemented in accordance with the regulations and directions governing the protection of cultural resources as outline in Departmental Manual Part 519, Code of Federal Regulations (36 CFR 800), the Archeological Resources Protection Act of 1979, as amended, and the Archeological and Historic Preservation Act of 1974. All fire management activities will be in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

Although over 20 years of fire ecology research allows ecologists to predict impacts on biotic communities, the possible impacts of prescribed burning (and wildfires) on archeological resources are not well known. Research conducted in North Dakota indicated that fire-related impacts to buried artifacts are negligible, but effects on surface-exposed artifacts will be significant, depending on artifact type and size (Seabloom et al 1991).

Impacts to archeological resources by fire resources vary. The four basic sources of damage are (1) fire intensity, (2) duration of heat, (3) heat penetration into soil, and (4) suppression actions. Of the four, the most significant threat is from equipment during line construction for prescribed fires or wildfire holding actions (Anderson 1983).

The following actions will be taken to protect archeological and cultural resources:

- Files and records of cultural resources should be consulted by the staff when planning prescribed burns, developing pre-attack plans, and performing other preparedness actions. The potential for adverse impacts to cultural resources will be evaluated prior to prescribed burning and in the selection of fire suppression strategies during wildfires.

- The Regional Archeologist will be contacted during the development phase of the burn plan writing process when cultural resources are suspected or known to exist in the project area.

- The Utah State Historic Preservation Officer (SHPO) will be contacted by the Regional Archeologist when it is known a planned management action may impact archeological or cultural resources. The SHPO has 30-days to respond. The Refuge will follow any programmatic archeological/cultural resources management plan that may be implemented in the future.

- Low impact wildfire suppression tactics (cold-trailing, use of foam/wet-water/water, use of natural and manmade barriers, change in vegetation, mowing, etc.) will be used to the fullest extent possible. Line construction for prescribed fire activities will follow the same principle. Maps indicating the known location of significant cultural resources will be consulted prior to laying out burn units, and whenever possible, before constructing fireline to halt the spread of a wildfire.

- Prescriptions for management ignited prescribed fires will take into account the presence of known cultural sites. Cooler fires with short residence time will be used in areas containing known cultural sites, whenever possible.

- Known surface sites will be marked, protected, and excluded from the burn, if possible. Foam will not be used in areas known to harbor surface artifacts.

- The use of mechanize equipment within the refuge must be approved by the Refuge Manager on a fire by fire basis, and the use these resources will be considered in

the approval process for any planned management actions. When the use of heavy equipment is authorized, its use will be monitored.

! The location of sites discovered as the result of fire management activities will be reported by the Refuge Manager to the Regional Archeologist.

! Rehabilitation plans will address cultural resources and will be reviewed by the Regional Archeologist.

Public Safety: Firefighter and public safety will always take precedence over property and resource protection during any fire management activity. The greatest threat to public safety from Refuge wildfires are entrapment by fast moving fire fronts. The Refuge's first priority during fire management activities will be to keep the area near the fire clear of bystanders. This priority will be reviewed as part of the annual fire fighter refresher.

Reduced visibility from smoke is another public safety concern. In the event of a wildfire or prescribed burn emitting heavy smoke on to a primary roadway, top priority will be given to safeguarding the travelers using the roadway versus suppressing the fire. During wildfires, the local law enforcement agency having jurisdiction is responsible for managing traffic hazards from smoke. Specific smoke management strategies will be identified in all prescribed fire burn plans.

Public Information and Education: The public's perception of wildland fire is slowly changing. The beneficial effects of fire are being recognized by the general public, however views that all fire in the wildlands is bad persist. A successful prescribed fire program cannot occur without broad public support. Public information and education are an important part of the fire management program on the Refuge. Fire has in the past and will continue to shape landscape vegetation and animal behavior patterns on the landscape in the Ouray area. Efforts will be made to incorporate fire effects information into interpretation and environmental education projects on the Refuge.

Fire Research and Monitoring: The need for improved fire effects information on Refuge plant and animal species is evident. Past monitoring and evaluation has not been thorough enough to improve prescription writing capabilities and improving the probability of successful prescribed fire prescriptions. In particular, data is lacking on the effects of fire on greasewood, invasive species and the Uintah Basin hookless cactus.

Fire Critiques and Annual Review: The Refuge's Fire Management program will be reviewed periodically in an effort to improve performance. The Fire Management Plan will be reviewed annually for currency and applicability. A prescribed fire monitoring checklist is located in Appendix L and will be used as a guide in critiquing the success or failure of a prescribed burn. Other reviews and the circumstances when they would occur are as follows:

Prescribed Fire/Wildfire Review: All prescribed fires reclassified as wildfires will be reviewed by the Refuge Manager or their designated representative. A

formal report will be prepared, signed by the Refuge Manager and a copy forwarded to the Regional Fire Management Coordinator and the Fire Management Branch.

Refuge Level Review: This review is conducted by the refuge manager or their designee to provide information to recognize commendable actions and to take needed corrective actions after an incident. An oral review is the required minimum. report.

Regional Level Review: A regional level review will generally be conducted for any fire that:

1. Crosses the Refuge's boundary into another jurisdiction without the approval of an interagency agreement
2. Results in adverse media attention.
3. Involves a fatality, serious injury, or significant property damage.
4. Results in controversy involving another agency.

National Level Review: A national level review will generally be conducted for any fire that involves Servicewide or national issues, including:

1. Significant adverse media or political interest.
2. Multi-regional resource response.
3. A substantial loss of equipment of property
4. Multiple, serious fire-related injuries.
5. Any other fire that the director wants reviewed.

Additional information on reviews can be found in the Fire Management Handbook, section 3.4, Reviews.

XII. CONSULTATION AND COORDINATION

Copies of this plan will be made available to the Ashley National Forest, Vernal Field Office of the BLM, the Uintah and Ouray Indian Agency - BIA, Dinosaur National Monument - NPS, Utah Division of Forestry, Fire and State lands, and the Uintah and Ouray Nation.

The following individuals were consulted in the development of this plan:

Carl Douhan, Prescribed Fire Specialist, R6 USFWS
Rhoda Lewis, Regional Archeologist, R6 USFWS
Dan Schaad, Assistant Refuge Manager, Ouray NWR
Phil Street, Regional Fire Management Coordinator, R6 USFWS

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