

WILDLAND FIRE MANAGEMENT PLAN

TURNBULL NATIONAL WILDLIFE REFUGE



OCTOBER 2008

Amended 2015



United States Department of the Interior
FISH AND WILDLIFE SERVICE
911 NE 11th Avenue
Portland, Oregon 97232-4181



IN REPLY REFER TO:
NWRS/NCR/Fire

MAR 23 2009

Memorandum

To: Regional Director, Region 1
Portland, Oregon

From: Regional Chief, National Wildlife Refuge System
Portland, Oregon

Carolyn A. Baker

Subject: Approval of Updated Fire Management Plans for
Little Pend Oreille and Turnbull National Wildlife Refuges

The Department of Interior policy (910 DM 1-3) and Fish and Wildlife Service (Service) policy (621 FW 1.1) require that Service lands with burnable vegetation have an approved Fire Management Plan. The Inland Northwest National Wildlife Refuge Complex has updated the fire management plans for Little Pend Oreille and Turnbull National Wildlife Refuges. The updated fire management plans continue the range and extent of activities described in previous plans, but have been updated to be consistent with new interagency formatting directives.

Consistent with the February 2009 Fire Management Handbook, the subject fire management plans have been forwarded for your review and approval.

Please contact Pam Ensley (503) 231-6174 or Brett Fay (503) 872-2756 if you require additional information on these fire management plans.

Attachments



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Inland Northwest National Wildlife Refuge Complex
Kootenai, Little Pend Oreille, and Turnbull Refuges
26010 South Smith Road
Cheney, Washington 99004
(509) 235-4723


February 27, 2009

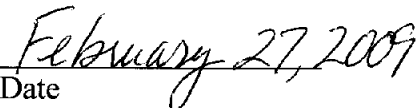
Memorandum

Subject: Environmental Action Statement for Update of Little Pend Oreille and Turnbull National Wildlife Refuge Management Plans

The Inland Northwest National Wildlife Refuge Complex has updated the Fire Management Plans for Little Pend Oreille and Turnbull refuges with the Complex. The updated fire management plans have been reformatted to be consistent with new interagency formatting directives. These updated plans continue the range and extent of activities described in the previous fire management plans.

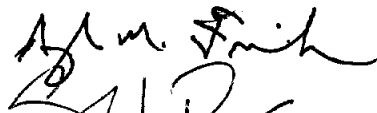
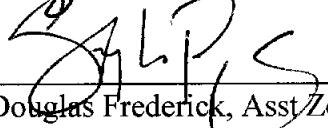
As such, updating the Little Pend Oreille National Wildlife Refuge Fire Management Plan and Turnbull National Wildlife Refuge Fire Management Plan qualifies as a categorical exclusion per 516 DM 8.5 C(10): "The issuance of new or revised site, unit, or activity-specific management plans for public use, land use, or other management activities when only minor changes are planned. Examples could include an amended public use plan or fire management plan."



Project Leader



Date

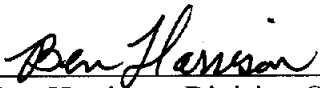
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Signatures below reference the
2009 Inland Northwest NWR Complex
Fire Management Plan for Turnbull NWR

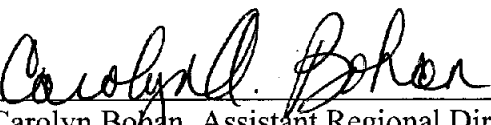
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Approved:  3/24/09
Date
For: Robyn Thorson, Regional Director
Pacific Region, U.S. Fish and Wildlife Service

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Turnbull Fire Management Plan

1. Introduction

1.1. Purpose of the Fire Management Plan (FMP)

As wildland fire suppression capabilities improved, a decline occurred in the natural role of fire in sustaining the dynamic ecosystem conditions within the vegetation communities of Turnbull National Wildlife Refuge (NWR) and the region surrounding it. Emergent vegetation in the many marshes within the refuge and downed trees that accumulated on forest floors created hazardous wildland fire conditions. Without the natural thinning caused by wildfires and after the extensive logging by early settlers, unnatural densities of ponderosa pine reproduction spread in the area. In the 1980's the U.S. Fish & Wildlife Service (FWS) began a program of using controlled burning in the marshes and forested areas within the refuge to re-introduce the influence of fire in maintaining natural habitat conditions.

Fire, a natural phenomenon, has played a critical role in the ecosystem dynamics of natural communities represented within and in the region of Turnbull NWR. Before the advent of current wildland fire suppression capabilities, naturally caused lightning fires burned thousands of acres of upland and wetland vegetation in eastern Washington on an annual basis. These naturally caused fires occurred at return intervals estimated at 5 to 20 years. These frequent natural fires maintained vigorous, diverse upland and wetland plant communities in various stages of post-fire succession, providing a wide variety of habitat conditions for wildlife.

Policies within the Department of Interior require that all refuges with vegetation capable of sustaining fire develop a fire management plan that details wildland fire suppression policies, the use of prescribed fire for attaining resource management objectives and fire program operational procedures. The FMP is an extension of the refuge *Turnbull NWR Comprehensive Conservation Plan 2007*. It describes in detail fire management programs, activities and methods that will be undertaken by the FWS in meeting the wildland fire suppression objectives and fire management strategies which utilize prescribed fire to attain the habitat management goals established for Turnbull NWR. The plan also assesses the potential environmental effects of the proposed fire management program in relation to refuge resources, the local environment as well as impacts to the public, adjacent landowners and surrounding communities. Consideration of these issues is required by the mandates of the *National Environmental Policy Act of 1972 (NEPA)* and other applicable federal laws and regulations.

It is the intention of the FWS to continue to suppress all unplanned wildland fires occurring within Turnbull NWR. Prescribed fire will be utilized under controlled conditions and defined weather variables to mimic the natural role of fire in sustaining ecosystem functions, improve habitat conditions for wildlife and reduce hazardous accumulations of dead fuels for fire prevention.

unduplicated anywhere in the world. The flood carved ravines (called Coulees), potholes and rugged rock outcrops, which distinguish the local topography called channeled scablands, providing diverse niches for a unique combination of habitat types. Meadows, marshes and lakes are surrounded by pine forest, grasslands, riparian woodlands, and groves of aspen.

1.3. Significant Values to Protect

The Refuge was established in 1937 by Executive Order for the purpose of providing "...refuge and breeding ground for migratory birds and other wildlife." Prior to establishment of the Refuge, wetlands were drained by homesteaders in an attempt to farm the land, but the rocky basalt and thin soils proved to be more persistent than the efforts of the settlers. After the Refuge was established the wetlands were restored with the installation of a number of water control structures. Farms and ranches still surround the Refuge on more suitable sites, while residential development, the largest growth industry of the Inland Northwest, is rapidly becoming the dominate land use adjacent to refuge boundaries.

Critical values to protect as described by the 2007 CCP include:

- Protection of local watersheds to maintain adequate water quality and quantity for native Refuge wetland species.
- A natural distribution of stand structural and successional stages in Refuge aspen and ponderosa pine forests to benefit forest dependent wildlife.
- Habitat conditions essential to the conservation of migratory birds and other wildlife within a variety of wetland complexes
- A natural distribution and diversity of grassland and shrub steppe habitats to benefit wildlife.
- Threatened and endangered species in their natural ecosystems including Water Howellia and Spalding's Catchfly.

Capital Improvements on the Refuge requiring protection from wildland fire includes:

- Headquarters, maintenance shop, EE Classroom, EE structures, Fire Cache, Refuge Bunkhouse, the TLES laboratory, numerous cultural sites, and visitor use facilities.
- Primary residences inside of the Refuge boundary include
 - Grogan – one primary residence
 - Inland NW Land Trust Tract – one primary residence

2.0 Policy, Land Management Planning and Partnerships

2.1.1. Federal Interagency Wildland Fire Policy

This FMP implements these guiding principles of Federal wildland fire policy:

- Firefighter and public safety is the first priority in every fire management activity.
- The role of wildland fire as an essential ecological process and natural change agent has been incorporated into the planning process. Federal agency land and resource

management plans set the objectives for the use and desired future condition of the various public lands.

- Fire management plans, programs, and activities support land and resource management plans and their implementation.
- Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity.
- Fire management programs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives,
- Fire management plans and activities are based upon the best available science.
- Fire management plans and activities incorporate public health and environmental quality considerations.
- Federal, State, tribal, local, interagency, and international coordination and cooperation are essential.
- Standardization of policies and procedures among federal agencies is an ongoing objective.

2.1.2. National Fire Plan

This FMP emphasizes the following primary goals of the *10 Year Comprehensive Strategy and Cohesive Strategy for Protecting People and Sustaining Natural Resources*: Improving fire prevention and suppression, reducing hazardous fuels, restoring fire-adapted ecosystems, and promoting community assistance.

2.1.3. Department of Interior (DOI) Fire Policy

This FMP meets DOI policy in 620 DM 1 by making full use of wildland fire as a natural process and as a tool in the planning process.

2.1.4. U.S. Fish and Wildlife Service Fire Policy

This FMP addresses a full range of potential wildland fires and considers a full spectrum of tactical options (from monitoring to intensive management actions) to meet Fire Management Unit (FMU) objectives. It fully applies procedures and guidelines in the Service Fire Management Handbook and the Interagency Standards for Fire and Fire Aviation Operations and affirms these key elements of FWS fire policy:

- Firefighter and public safety is the first priority of the wildland fire management program and all associated activities.
- Only trained and qualified leaders and agency administrators will be responsible for, and conduct, wildland fire management duties and operations.
- Trained and certified employees will participate in the wildland fire management program as the situation requires, and non-certified employees will provide needed support as necessary.

- Fire management planning, preparedness, and wildfire and prescribed fire operations, other hazardous fuel operations, monitoring, and research will be conducted on an interagency basis with involvement by all partners to the extent practicable.
- The responsible agency administrator has coordinated, reviewed, and approved this FMP to ensure consistency with approved land management plans, values to be protected, and natural and cultural resource management plans, and that it addresses public health issues related to smoke and air quality.
- Fire, as an ecological process, has been integrated into resource management plans and activities on a landscape scale, across agency boundaries, based upon the best available science.
- Wildland fire is used to meet identified resource management objectives and benefits when appropriate.
- Prescribed fire and other treatment types will be employed whenever they are the appropriate tool to reduce hazardous fuels and the associated risk of wildfire to human life, property, and cultural and natural resources and to manage our lands for habitats as mandated by statute, treaty, and other authorities.
- Appropriate management response will consider firefighter and public safety, cost effectiveness, values to protect, and natural and cultural resource objectives.
- Staff members will work with local cooperators and the public to prevent unauthorized ignition of wildfires on our lands.

2.1.5. Refuge-specific Fire Management Policy

There is no unit specific Code of Federal Regulations (CFR) related to fire management. The refuge fire management policy is out lined in the *1999 Turnbull NWR Habitat Management plan* and supported by the *Turnbull NWR Comprehensive Conservation Plan 2007*. The service policy has adopted the Interagency Standards for Fire and Fire Aviation Operations Handbook for the current year.

2.2. Land/Resource Management Planning

2.2.1. Agency Land/Resource Planning Documents

1. *Turnbull NWR Comprehensive Conservation Plan 2007 & Final EA (March 2007)*.
2. *Turnbull Habitat Management Plan & Final EA (August 1999)*

2.2.2. Compliance with Regulatory Acts

The Service has procedures for assessing environmental effects of specific Service actions. NEPA compliance was accomplished by completion of an Environmental Assessment (EA) for the fire management program in May 2002. After a public comment period, on October 14, 2002 the Refuge Project Leader signed a Finding of No Significant Impact (FONSI), which is in official files at Refuge Headquarters. The project leader has determined that the

activities envisioned in this FMP update are similar in scope and effect as those covered by the EA and therefore a new EA is not needed.

In conjunction with the 2002 EA, the Refuge requested a Biological Assessment from Ecological Services (ES) in March 2002. In May of that year, ES concurred with the refuge that actions authorized by the FMP would not have adverse affects.

All FMP actions/decisions comply with Section 106 of NHPA.

Print documentation of any NEPA action is available at the Turnbull NWR office.

2.3. Fire Management Partnerships

Our external mutual aid suppression agreement is in place with Spokane County Fire District 3 (Appendix A). Our external agreement is with the North East Washington Interagency Communication Center (NEWICC); see Appendix B for more information. We are a partner in the master agreement (see Region 1 Sharepoint) with the State of Washington Department of Natural Resources for fire protection.

3. Fire Management Unit Characteristics

Turnbull NWR has been divided into five Fire Management Units (FMU's) based upon logical wildland fire control boundaries that utilize natural and manmade fuel breaks (wetlands and roads) as well as refuge boundaries. These fire management planning units (designated hereafter as FMU1, FMU2, FMU3, FMU4 and FMU5) essentially divide the refuge into quadrants of similar size (Appendix A).

Historic Fire Occurrence

Turnbull NWR has kept fire records starting in 1940 in form of Refuge Annual Narrative Reports. Since 1940 the Refuge has seen 94 fires. The average fire burns 97 acres and since the implementation of the National Fire Plan, Turnbull has averaged 2 fires per year and they on average only burned less than 2 acres each. Fire causes varied over time with lightning as the number one cause of fires on the Refuge. On average 37% of refuge fires were lightning caused. Trains crossing through the refuge was the second leading cause of fires (20% of all fires, However, after the 1980's fires started by trains dropped to less than 1% of fires as the Burlington Northern railroad bed going through the refuge was closed and converted to a State trail. Human causes are the next leading cause of fires at 18%. This is separate from the other statistical causes which include: equipment use (<1%), incendiary (<1%), other (<1%), misuse of fire (<1%), and escaped prescribed fires (<1%).

Hazard Fuels treatment

The Turnbull Habitat Management Plan prescribes an annual target of treating 800 acres of refuge habitat with prescribed fire. With fuels treatment funding allocations after the National Fire Plan was implemented the Refuge has been able to treat an average of 1200 acres a year.

The strategy outlined in the Turnbull NWR CCP is “The existence of the wildland/urban interface surrounding the Refuge presents significant constraints on the use of prescribed fire in relation to potential liabilities resulting from escaped fires. An escaped fire resulting from a Refuge habitat management prescribed fire that burns into private property will cause severe constraints to be placed upon the use of prescribed fire by the FWS. Due to the importance of using prescribed fire in the management of the Refuge, extreme caution should be used when implementing prescribed fires. The USFWS must maintain a significant initial attack capability of engines, crews, dozers and water tenders to deal with this risk. Cooperative agreements and/or funding are required to provide for remuneration to local fire agencies to assist Refuge staff in the implementation of the prescribed fire program. The values at risk from an escaped prescribed fire are too great to allow escapes to occur into areas surrounding the Refuge. This constraint will continue to increase as the urban interface continues to develop adjacent to the Refuge. Communication is necessary with local agencies about the magnitude of the wildland fire problem on and around the Refuge”.

Each FMU has a pre-attack map which contains the following specific information (see Appendix A):

1. A detailed map of the unit that may include the following elements: roads, improvements, structures, fuel/vegetation types, hydrology (water control structures), threatened or endangered species locations, cultural or historical sites and the best locations for containing a running wildland fire within the unit.
2. Fire suppression objectives of the unit.
3. Primary control strategies and tactics to be utilized within the unit.
4. Identification/description of the best suppression containment/control points within the unit.

3.1. Area Wide Management Considerations

- Manage fire suppression to minimize risks to firefighters and public safety.
- Reduce and maintain hazardous fuels in WUI areas at non-hazardous levels to provide for public and firefighter health and safety.
- Reduce and maintain hazardous fuels in non-WUI areas at non-hazardous levels to provide for firefighter health and safety and to protect habitats critical to endangered species, migratory birds, and ecosystem integrity.
- Aerial retardants and foams will not be used within 300 feet of any waterway.
- Prevent the further spread of invasive plants.

3.1.1. Management Goals, Objectives, and Constraints in Comprehensive Conservation Plan (CCP).

The following are the CCP (2007) goals:

- Contribute to protection of local watersheds to maintain adequate water quality and quantity for native Refuge wetland species.

- Restore Refuge aspen and ponderosa pine forests to a natural distribution of stand structural and successional stages to benefit forest dependent wildlife.
- Provide habitat conditions essential to the conservation of migratory birds and other wildlife within a variety of wetland complexes
- Protect and restore the natural distribution and diversity of grassland and shrub steppe habitats to benefit wildlife.
- Support the conservation of threatened and endangered species in their natural ecosystems

The mission of Turnbull NWR (as described by the 1999 Turnbull Habitat Management Plan) is to restore and maintain ecosystem processes that provide for a natural diversity of flora and fauna native to the wetland, steppe and ponderosa pine communities of Eastern Washington. Refuge management goals identified in the 2007 CCP are:

1. Contribute to protection of local watersheds to maintain adequate water quality and quantity for native Refuge wetland species.
2. Provide habitat conditions essential to the conservation of migratory birds and other wildlife within a variety of wetland complexes.
3. Restore refuge aspen and ponderosa forest to a natural distribution of stand structural and successional stages to benefit forest-dependent wildlife.
4. Protect and restore the natural distribution and diversity of grassland and shrub steppe habitats to benefit wildlife.
5. Support the conservation of threatened and endangered species in their natural ecosystems.
6. Support the maintenance of biologically effective landscape linkages and corridors between the Refuge and other intact areas of vegetation zones representative of this eco-region.
7. Foster appreciation of and support for the Refuge and the Channeled Scablands ecosystem through quality environmental education, interpretation, wildlife-dependent recreation, and outreach compatible with the Refuge purposes and mission.
8. Encourage and support research that substantially contributes to our understanding of the Channeled Scablands ecosystem.

It is the intent of the fire management program to support the mission, management objectives and operational goals of the Refuge by protecting refuge resources and habitats from the undesirable effects of wildland fire. The FMP needs to be viewed in conjunction with the 1999 Habitat Management Plan, which describes specific actions and techniques that will be undertaken by the FWS to manage the various habitat types found within the Refuge. Since wildland fire played an essential role in the evolution of the Ponderosa pine/bunchgrass ecosystem, prescribed fire is most desirable techniques for manipulating vegetation within the Refuge to meet habitat management objectives.

The specific objectives of the wildland fire management program are to:

- Suppress all wildland fires occurring within Turnbull NWR, including natural lightning ignitions.

- Utilize prescribed fire under controlled conditions and defined weather variables to mimic the natural role of fire in sustaining ecosystem functions, improve habitat conditions for wildlife and reduce hazardous accumulations of dead fuels for fire prevention.
- Protect human life and property both within and adjacent to Refuge areas.
- Perpetuate, restore, replace or replicate natural processes where appropriate.
- Protect natural and cultural resources from unacceptable impacts due to fire and fire management activities.
- Promote an interagency approach to managing fires on an ecosystem basis.
- Develop and implement a process to ensure the collection, analysis and application of high quality fire management information needed for sound management decisions.
- Employ strategies to suppress all wildland fires, which minimize costs and resource damage, consistent with values at risk.
- Prevent unplanned human-caused ignitions.
- Restore and rehabilitate facilities lost in or damaged by fire or suppression activities.
- Minimize and mitigate human-induced impacts to resources or natural processes.
- Promote public understanding of fire management programs and objectives.
- Conduct fire activities in a manner consistent with applicable laws, policies and regulations.
- Organize and maintain a fire management capability which consistently applies the highest standards of professional and technical expertise.
- Encourage research to advance understanding of fire behavior, effects, and ecology.

Protection of Sensitive Cultural Resources

The Regional Archaeologist and/or his/her staff will work with fire staff, project leaders, and incident commanders to ensure that cultural resources are protected from fire and fire management activities. The “Request For Cultural Resource Compliance” will be used to inform the Regional Archaeologist of impending activities, thereby meeting the regulations and directions governing the protection of cultural resources as outlined in Departmental Manual Part 519, National Historic Preservation Act (NHPA) of 1966, Code of Federal Regulations (36CFR800), the Archaeological Resources Protection Act of 1979, as amended, and the Archaeological and Historic Preservation Act of 1974. The NHPA Section 106 clearance will be followed for any fire management activity that may affect historic properties (cultural resources eligible to the National Register of Historic Places).

Cultural resource fire management considerations

Impacts to archaeological 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). All Suppression activities will be aimed at no net negative affect on cultural resource. Any questions or concerns that may arise will be discussed with Refuge staff resource advisors prior to implementation of any tactics during suppression or prescribed fire operations.

3.1.2. Common Characteristics of the Fire Management Units

The fuel types, fire history and fire behavior characteristics of refuge fire management units are consistent in the regard that each unit has a variety of fuel types and conditions. Common fuel types in all the FMU's are:

- NFFL FM2 Ponderosa Pine with a grass understory,
- NFFL FM3 Tall grass represented by Bullrush, Cattail and reed canary grass,
- NFFL FM4 Shrub step represented by Wood Rose and Mt. Snowberry
- NFFL FM9 Long needle litter, represented by closed canopy stands of Ponderosa Pine

The geologic formation of the channeled scablands created many shallow ravines, potholes, lakes that affect vegetation/fuel types. This variety of topography creates great differences in soil and moisture characteristics within short distances and small areas. The result is a "patchwork quilt" of habitats and consequently fuel types. There are upland meadows, grasslands dotted with pine, dense stands of pine forests, marshes, and riparian woodlands populated with deciduous trees and shrubs.

Fire Behavior

The primary, dominant fuel type of Turnbull NWR is a ponderosa pine/bunchgrass vegetation association (Fuel Model GR2/TL8 FBFM40) that can be one of the most burnable vegetation types in the west. Approximately 60% or 11,000 acres of the Refuge is covered with this fuel type. Fuel loading in these area ranges from 1 to 6 tons/acre because of the aggressive hazard fuels reduction program. Fires in the tall grass fuel type can be fast moving and have high fireline intensity which can require indirect attack suppression techniques. The average (50th percentile) mid summer fire behavior in GR2 can be described at 150 chains/hr and 10 ft flame lengths, fire behavior under extreme conditions, with winds from 15 mph to 40+ mph, in our area, exhibit rates of spread that approximates the forward ground speed of 10 to 20 mph (1000 to 2000 chains/hour). Fire line intensities can range from 2,500 to 15,000 BTU/FT/SEC and flame lengths range from 17 to 35 feet. A typical fire under these conditions would burn approximately 10,000 acres (over 2/3 of the refuge) in one hour.

Fire Fighter Safety considerations common to all the FMU's

The diversity and distribution of these varied fuel types within the Refuge create significant complexity in fire suppression strategies and solutions. Wildland fires occurring in these varied fuel types will exhibit very different fire behaviors depending on which fuel type the fire front is burning in at a particular time. A firefighter may find himself facing a running grassfire at one location, while only a short distance away, extreme fuel loading in a stand of ponderosa pine may be spotting up to one half mile downwind. All suppression strategies employed must recognize the disparate nature of Refuge fuels types and utilize tactics which will address the potential for very inconsistent and erratic fire fronts.

<i>FMU Name</i>	<i>AMR Strategy</i>	<i>Acres (Burnable)</i>	<i>NFFL Fuel Models</i>
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<i>FMU 1</i>	<i>Containment only</i>	<i>3900</i>	<i>GR2,GR3,SH7,TL9</i>
<i>FMU 2</i>	<i>Containment only</i>	<i>4005.4</i>	<i>GR2,GR3,SH7,TL9</i>
<i>FMU 3</i>	<i>Containment only</i>	<i>5240.3</i>	<i>GR2,GR3,SH7,TL9</i>
<i>FMU 4</i>	<i>Containment only</i>	<i>3509.3</i>	<i>GR2,GR3,SH7,TL9</i>
<i>FMU 5</i>	<i>Containment only</i>	<i>697.2</i>	<i>GR2,GR3,SH7,TL9</i>
<i>Lease</i>	<i>Containment only</i>	<i>1,527.25</i>	<i>GR2,GR3,SH7,TL9</i>
<i>Total</i>		<i>18,765.25</i>	

Table 1. FMU Summary

3.2. Unit Descriptions

FMU 1 Description:

Fire Management Unit 1 is located in the northwest section of the Refuge, bounded on the east by Cheney-Plaza Rd, on the south by Upper Turnbull Slough and on the west and north by the Refuge boundary (see map in appendix A). This FMU has a relatively high concentration of structures and permanent residences adjacent to the refuge. The Union Pacific main line railroad tracks on the north border represent a potential safety concern for both firefighters and railroad operations. Wetlands in this FMU present a hazard for vehicle entrapment for most of the year.

FMU2 Description:

This subunit is in the northeast quadrant of the Refuge and is bounded by Cheney-Plaza Road on the west, Smith Road (Refuge Entrance road) on the south and the Refuge boundary on the east and north. This area contains the Public Use Area and the auto tour route as well as the Headquarters. The east and north borders also contain a higher density of primary residences and development adjacent to the refuge. County rural conservation zoning in this area is one house per 20 acres except where one house per 10 acres was grandfathered in.

FMU3 Description:

This subunit is in the southwest quadrant of the Refuge. The Upper Columbia Plateau trail is the west boundary, the Refuge boundary is on the south side, and Cheney-Plaza road forms the eastern edge. The north edge is along Upper Turnbull slough from gate 6 to gate 3. This quadrant has a few farms and ranches adjacent to the southern boundary fence and there are several roads which can further divide this unit into smaller units that can be used to control unwanted fires. Additionally the Johnson and Corder tracts have been acquired recently and are between Harmony road and Phillips road SW of the refuge along Mullenix Rd. In 2015 we also added the Anderson Tract to this FMU, which is adjacent to the SW corner of the refuge.

FMU4 Description:

This unit is in the southeast quadrant of the Refuge, with Cheney-Plaza road being the west boundary and the Refuge boundary forming the south and east edges. The north boundary is Smith Road. This unit contains one in holding, the Grogan Tract. There are only a few ranches and farms bordering the Refuge. Large tracts of agricultural lands on areas of deeper Palouse soils are located near this portion of the Refuge. They are most commonly planted to winter

wheat which is harvested during August and September. There is a potential threat to the Refuge from fires originating from harvest activities.

FMU5 Description:

This unit consists of Refuge owned parcels outside and east of the fee title boundary of the Refuge. The Inland Northwest Land Trust parcel is the most northerly and abuts the City of Cheney north of Curtis Road. The Horner tract is east of the Refuge Headquarters and is bordered by Jennings Road on the north and Cheney-Spangle Road on the west. The third parcel is the Martin tract which lies south of Rupp Road just off of Cheney-Spangle Road on the north side of Philleo Lake.

3.2.1. FMU Objectives and Constraints

Fire Management Unit One

Wildland Fire Control Objectives:

1. Provide for firefighter and public safety first.
2. Keep damage from suppression effort to refuge resources to a minimum.
3. Contain and control the fire within sub-unit boundaries.

Extended Attack Tactical considerations:

1. Keep the fire north of Upper Turnbull road (dirt).
2. Keep the fire west of Cheney Plaza road (blacktop).
3. Keep the fire south of the north Refuge boundary.
4. Use Mullinix road (blacktop) as control line depending on fire origin and direction of spread.

Hazard Fuels Objectives:

1. Use mechanical treatments to improve the defensibility of the road system and Refuge boundary. Ponderosa Pine stands within the unit will be thinned and or burned as part of the implementation of the Refuge Habitat Management Plan.

Fire Management Unit Two

Wildland Fire Control Objectives:

1. Provide for firefighter and public safety first.
2. Keep damage from suppression effort to refuge resources to a minimum.
3. Contain and control the fire within sub-unit boundaries.

Extended Attack Tactical considerations:

1. Keep the fire north of Smith road (gravel).
2. Keep the fire east of Cheney Plaza road (blacktop).
3. Keep the fire west of the south Refuge boundary.

Hazard Fuels Objectives:

1. Use mechanical treatments to improve the defensibility of the road system and Refuge boundary. Ponderosa Pine stands within the unit will be thinned and or burned as part of the implementation of the Refuge Habitat Management Plan.

Fire Management Unit Three

Wildland fire Control Objectives:

1. Provide for firefighter and public safety first.
2. Keep damage from suppression effort to refuge resources to a minimum.
3. Contain and control the fire within sub-unit boundaries.

Extended Attack Tactical considerations:

1. Keep the fire south of upper Turnbull Slough road (dirt).
2. Keep the fire west of Cheney Plaza road (blacktop).
3. Keep the fire east of the west Refuge boundary.

Hazard Fuels Objectives:

1. Use mechanical treatments to improve the defensibility of the road system and Refuge boundary. Ponderosa Pine stands within the unit will be thinned and or burned as part of the implementation of the Refuge Habitat Management Plan.

Fire Management Unit Four

Wildland Fire Control Objectives:

1. Provide for firefighter and public safety first.
2. Keep damage from suppression effort to refuge resources to a minimum.
3. Contain and control the fire within sub-unit boundaries.

Extended Attack Tactical considerations:

1. Keep the fire south of Smith road (gravel).
2. Keep the fire east of Cheney Plaza road (blacktop).
3. Keep the fire south of the north Refuge boundary.
4. Use Cheney-Plaza road (blacktop) as control line depending on fire origin and direction of spread.

Hazard Fuels Objectives:

1. Use mechanical treatments to improve the defensibility of the road system and Refuge boundary. Ponderosa Pine stands within the unit will be thinned and or burned as part of the implementation of the Refuge Habitat Management Plan.

Fire Management Unit Five

Wildland Fire Control Objectives:

1. Provide for firefighter and public safety first.
2. Keep damage from suppression effort to refuge resources to a minimum.

3. Contain and control the fire within unit boundaries.

Extended Attack Tactical considerations:

1. Keep new starts off these parcels when possible.
2. Protect any private exposures adjacent to or inside these areas from being damaged.

Hazard Fuels Objectives:

1. Use mechanical treatments to improve the defensibility of the road system and Refuge boundary. Ponderosa Pine stands within the unit will be thinned and or burned as part of the implementation of the Refuge Habitat Management Plan.

3.2.2. FMU Guidance: Objectives, Fire Regime, and Fire Environment

The Refuge is comprised of five FMU's. All FMU's allow prescribed fire, suppression and mechanical fuel reduction as management actions, and in all the FMU's suppression of all wildfires is the only alternative. The following is a description of information that applies to all FMU's. Information specific to each FMU is discussed under the heading of each specific FMU. These alternatives were determined by the CCP EA approved in 2008. Fire management characteristics, operational guidance, and safety are discussed.

The five natural (historical) fire regimes are based on the average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant over-story vegetation. These five regimes include:

- I – 0-35 year frequency, low to mixed severity (<75% over-story replaced)
- II – 0-35 year frequency, high severity (>75% over-story replaced)
- III – 35-100 year frequency, low to mixed severity (<75% over-story replaced)
- IV – 35-100 year frequency, high severity (>75% over-story replaced)
- V – 200+ year frequency, high severity (>75% over-story replaced)

A fire regime condition class (FRCC) is a classification of the amount of departure from the natural regime. This departure results in changes to one (or more) of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances (e.g., insect and diseased mortality, grazing, and drought). There are no wildland vegetation and fuel conditions or wildland fire situations that do not fit within one of the three classes (www.frcc.gov). The three classes are based on low (FRCC 1), moderate

(FRCC 2), and high (FRCC 3) departure from the central tendency of the natural (historical) regime.

3.2.3. Refuge FMU Values to Protect

In general habitat structure and function is a value across the FMU. Thermal cover near open areas provides ideal vegetation conditions for the desired wildlife species.

Threatened and endangered species for these areas included:

- Catchfly Water Howellia (*Howellia aquatilis*)
- Spalding's (*Silene spaldingii*)
- Ute lady-tresses (*Spiranthes diluvialis*)

All can occur in riparian areas and wetlands. Ground disturbing activities related to Wildland Fires would be minimal due to wet ground. Heavy equipment would not be able to work in these areas. Any suppression activities would be limited to hand line or hose lays which would result in minimal disturbance.

Developments to protect:

- Rail Road Right of Ways (burning of ties)
- Columbia Plateau Trail State Park (structures, toilets and interpretive signs)
- Private residences and out buildings (adjacent to Refuge)

3.2.4. FMU Safety Considerations

There are several safety items common to all FMU's; public access off the entrance road, public access off the auto tour route, and public access on the Columbia Plateau trail would be a problem during initial attack in those areas. Other concerns are historic ditches, current fences, the rise in the Moose population with around 20 resident cows and calves. Turnbull also lies on the vectored approach to Spokane International Airport some 15 miles north and from time to time approaching planes fly over the area at 3000-4000 above ground levels.

3.2.5 FMU Wildfire response objectives

The primary objectives for wildfire response at Turnbull NWR are to control any unwanted ignitions as quickly as possible while protecting the public and firefighters safety. We hope that our initial attack efforts will control these wildfires in a small area with the least cost. Each Fire Management Unit of the refuge is then described in areas of primary control perimeters as marked on each map. Within those areas are smaller blocks that fires could be contained in using indirect burn out tactics, see appendix A.

3.2.6 FMU Fuel treatment and methods

Annually the staff will meet and plan our work schedule, and discuss what treatments need to be applied specific areas on the refuge. Our 2007 NEPA documentation gives us guidance on which treatment to select from, either prescribed fire, non-commercial thinning or commercial thinning.

These selected treatment areas then are entered into the National Fire Plan Operating and Reporting system (NFPORS) for funding and approval. Once approved and funded the method that was approved will be implemented.

4. Wildland Fire Operational Guidance

The procedures used to implement the FMP for Turnbull NWR are covered in this section. Information pertaining to these management procedures is either directly provided or references are provided as to where it may be located.

FWS wildland fire management policy states that every wildland fire will be assessed following a decision support process that examines the full range of management responses.

This policy also provides that wildland fires may be managed for one or more objective(s) based on land and resource management plan direction. When two or more wildland fires burn together they will be managed as a single wildland fire and may also be managed for one or more objectives based on land and resource management plan direction as an event moves across the landscape and fuels and weather conditions change.

As stated before, the purpose of fire suppression is to put the fire out in a safe, effective, and efficient manner. Fires are easier and less expensive to suppress when they are contained to small areas on the Refuge. Thus, the following procedures will be followed for all wildland fires to ensure optimum resource protection and firefighter safety.

4.1 Management of Unplanned Ignitions

Fire suppression at Turnbull NWR has been outlined in the 2007 CCP and the only appropriate response is full suppression of any unplanned fire on the Refuge regardless of cause. All other possible responses have not been approved according to the 2007 CCP.

Fire suppression strategies for Turnbull NWR will place primary emphasis on the development of a fire suppression program that is capable of suppressing wildland fires quickly, before significant resource damage can occur. Meeting this objective will require a refuge fire management program with a significant initial attack capability of equipment and personnel. Fire suppression capabilities will be augmented by cooperative agreements, fire prevention programs and hazard fuel reduction projects. Hazard fuel reduction will involve both mechanical removal of fuels in critical areas by contractors and Refuge fire crew and the systematic application of low intensity prescribed fire under carefully controlled conditions to gradually reduce accumulations of dead fuels in timber stands. Due to the hazardous levels of dead fuel within the forest environments of Turnbull NWR, a significant wildland fire occurring on the Refuge not only threatens refuge resources, but threatens numerous private residences built immediately adjacent to the Refuge and on lands under lease to the Refuge. The communities surrounding Turnbull NWR are rapidly developing which will create a complex fire environment and limit management alternatives in the future.

The purpose of the wildland fire suppression program at Turnbull NWR is to provide the equipment and personnel necessary to suppress wildland fires that occur within or near the Refuge boundary that threaten life, property and refuge resources. It is also the intention of the U.S. Fish & Wildlife Service to provide cooperative wildland fire suppression assistance to local, state and other federal firefighting agencies in the suppression of wildland fires when requested through the provisions of various mutual-aid agreements, cooperative agreements, and as mandated by federal law.

As part of Turnbull NWR's wildland fire pre-suppression program fire staff at the Refuge will identify areas of hazardous accumulations of woodland and range fuels and attempt to reduce wildland fire potential and effect by using various means of fuel reduction including; manual fuel reduction by crews, mechanical fuel reduction and hazard fuel reduction prescribed burns.

Fire suppression strategies employed at Turnbull NWR will include a range of suppression techniques in order to provide for protection of values at risk, natural resources, and cost efficiency with firefighter safety always being the first operational priority. Suppression strategies and tactics will be unique to each wildland fire, predicated by weather parameters, fuel conditions, safety considerations, resources and threats to improvements. Determination of strategies and tactics will be made by the Incident Commander on scene utilizing guidance from pre-attack plans (see Fire Management Units section) for individual areas of the Refuge, knowledge of refuge fire management objectives, and input from refuge resource advisors if available.

The primary suppression strategy employed at Turnbull NWR will be aggressive but safe perimeter control utilizing direct attack tactics. Numerous justifications for this strategy have been enumerated elsewhere in this document. Turnbull NWR contains numerous lakes, wetlands, rock outcrops and roads that provide excellent barriers to fire spread and safe areas for control efforts. In situations in which direct attack on a high intensity, rapidly spreading wildland fire would jeopardize firefighter safety, the Incident Commander should consider use of indirect attack tactics taking advantage of natural barriers as part of the fire perimeter control plan. Burnout's, black-lines and backfires can and will be utilized to augment the control capabilities of natural and manmade barriers to contain wildland fires. Indirect attack tactics may be employed when resource values are compromised more by suppression actions than by the wildland fire. Examples include areas of archeological resources or endangered plant populations within the fire perimeter. The use of heavy equipment such as bulldozers will be cleared by the Refuge Manager or resource advisor prior to use, the consideration here being threat to life or private structures.

All fires occurring on the Refuge will be staffed with all refuge resources until mopped-up and declared controlled. No fire occurring on the Refuge will be left staffed during daylight hours; however patrol status will be sufficient during the night time hours. Refuge fires will be declared out after 100% mop-up has been achieved.

4.1 Fire Season Preparedness

The Zone staff should meet with area wildland fire partners annually, preferably prior to fire season, to review the respective agreements. This may include contact information and fire suppression policies and procedures. In addition, an annual meeting with the zone FMO should be scheduled to review and update fire management activities, plans, and updated fire program information.

The normal fire season begins in early June, which triggers the following general preparedness actions under our guidelines:

- Fire qualified personnel work with zone FMO or regional medical standards program manager to schedule annual medical examinations prior to start of fire season.
- One engine (Type 5 or 6) will be staffed and available annually June 1st – September 30th.
- Fire qualified personnel complete fitness testing and the annual refresher and are issued full personal protective equipment (PPE).
- Implement the step-up plan according to daily fire weather forecasts.
- Preparedness is the work accomplished prior to fire occurrence to ensure that the appropriate response, as directed by the Fire Management Plan, can be carried out. Preparedness activities include: budget planning, equipment acquisition, equipment maintenance, dispatch (Initial attack, extended, and expanded), equipment inventory, personnel qualifications, and training. The preparedness objective is to have a well trained and equipped fire management organization to manage all fire situations within the Refuge. Preparedness efforts are to be accomplished in the time frames outside the normal fire season dates.
- Wildland Fire Preparedness activities refer to those actions taken by the fire staff to prepare for and prevent wildland fires. These activities include conducting fire suppression training courses, preparation and maintenance of fire suppression equipment, physical fitness training, fire weather monitoring, fire danger rating, extra staffing during high fire danger, hazard fuel reduction activities (manual fuel reduction and prescribed fire), practice drills with refuge fire suppression equipment and public education in fire prevention in coordination with other local fire agencies.
- The minimum qualification will be firefighter type 2 (FFT2), which also requires the annual firefighter refresher. The Refuge will conform strictly to FWS-specific guidelines as well as the National Wildfire Coordinating Group (NWCG) Publication 310-1, “*Wildland Fire Qualification System Guide*” (May 2011). U.S. Fish and Wildlife Service employees participating in any wildland fire activities on FWS lands must meet these requirements as well as those for fitness and personal protective equipment (PPE). More information about training and fitness is provided

in Chapter 13 of the FWS *Fire Management Handbook*, the *Interagency Standards for Fire and Aviation Operations*, and through the assistant zone fire management officer at Turnbull NWR. Consult with the ZFMO on arranging fire training for refuge staff.

- Wildland fire training, experience, and position qualifications information will be maintained through the FWS Incident Qualifications and Certification System (IQCS) database. The information is updated annually at the zone or regional levels.
- The primary progenitors of large wildland fires in the local fire environment are the "Palouse Winds" which occur during late summer and fall with regular frequency. These westerly winds are typically associated with changing weather conditions when cooler low pressure systems sweep in from the Pacific, accelerated by the "gravity wind" effect of cool air coming down the east slope of the Cascades and meeting little resistance as they sweep across the flat, rolling terrain of the Columbia River Basin. Wind speeds under these conditions can reach 40 to 60+ miles per hour. These winds occur in conjunction with the lowest levels of fuel moisture in all size classes and can cause relative humidity levels to drop below 15%. Wildland fires occurring under these conditions are virtually uncontrollable unless contained with rapid and capable initial attack forces. In 1991, a series of wildland fires ignited by 60 mph winds in the vicinity of Turnbull NWR burned over 100,000 acres and destroyed 110 homes in a single day of devastation that became known as "Firestorm 91". This was the largest wildland/urban interface fire in the history of the Inland Northwest. It can be expected that due to local forest health, fuel loading and weather conditions the situation will occur again in the near future. Turnbull NWR lies within the "rain shadow" of the Cascade Mountain Range in the flat rolling country immediately west of the Rocky Mountain Range in Idaho. Most of the precipitation coming in from the Pacific Ocean is deposited on the west side of the Cascades in Washington. The result is that the intermountain region has a climate that is described as "semi-arid." Annual precipitation at Turnbull NWR is approximately 16 inches with most of the precipitation occurring during the winter as snow. Summers are normally very dry with average high temperatures in the low 80's and maximum temperatures that can get over 100 degrees.

4.2 Refuge Delegation of Authority to Fire Staff

The complex project leader will issue a delegation of authority to the Zone Fire Management Officer, Fire Management Specialist and the Fire Operations Tech through the Refuge Managers and review them annually.

4.3 Readiness

The pre-attack map (appendix A) is a pre-determined set of tactics that can be implemented by the staff and pre-fire management intelligence data for the Refuge. Pre-attack plans should be placed in the engine with a copy at the Turnbull NWR headquarters as a minimum. Upon discovery of a fire, all subsequent actions will be based on the following:

1. The Incident Commander (IC) will locate, size-up, and coordinate suppression actions. The IC will complete the appropriate ICS forms and prepare the Incident complexity analysis if the incident escapes initial attack.
2. Provide for public safety.
3. Considering the current and predicted fire conditions, the Incident Commander will assess the need for additional suppression resources and estimate the final size of the fire. The potential for spread outside of the refuge should be predicted, as well as the total suppression force required to initiate effective containment action at the beginning of each burning period.
4. The Incident Commander will assess the need for law enforcement personnel for traffic control, investigations, evacuations, etc., and make the request to the ZFMO or Duty Officer.
5. Contact the Refuge Manager or Acting Refuge Manager
6. Document decisions on the appropriate ICS form (ICS 201, 202.) and complete the fire report (DI-1202).
7. Should a wildland fire move into an extended attack a Delegation of Authority will be invoked. Once a Delegation of Authority has been authorized the Incident Commander will make the final decisions pertaining to the fire. A copy of Delegation of Authority is in *Interagency Standards for Fire and Aviation Operations*.

4.1.4 Step-Up Plan

The step-up plan is based on general NFDRS indices and 90th/97th percentile break points. The intent is to inform the Refuge of a basic level of management readiness, as fire danger or potential rises. Daily fire danger indices will be compiled and averaged using the local NFDRS station (Fuel model C – open pine/ grass) and the Weather Information Management System. The fire danger indices and preparedness step-up plan can be found in Table 2.

The NE Washington Fire Danger Operating Plan identifies the process and procedures for determining the level of preparedness activities by fire staff and fire suppression equipment on an incremental basis in response to increasing fire danger. As the fire season progresses, the temperatures get higher, vegetation gets drier and the potential for wildland fires increases proportionally. The NE Washington FDOP Plan uses the Burning Index calculated by the National Fire Danger Rating System (NFDRS) for determining the level of fire danger. As the level of fire danger increases within and around the Refuge, fire staff will respond by working their normal days off, increasing the level of readiness of all refuge fire equipment. The Staffing Plan will also determine the number of engines and crews with which the FWS will respond with to inter-agency requests for assistance.

Table 2: NE Washington FDOP staffing plan.

Staffing Level Worksheet - South FDRA	
Staffing Level	BI (7H) South FDRA SIG (Nespelem, Kramer, Douglas)
I	0-13
II	14-19

STAFFING LEVELS	STAFFING LEVEL 1-2	STAFFING LEVEL 3	STAFFING LEVEL 4-5
	III	20-24	
	IV	25-30	
	V	31+	

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The decisions will be made daily by the Duty Officer on whether or not short term severity funding will be applied for that day based on the staffing level. Further guidance and references for the NE Washington FDOP will be found in Appendix

4.1.1.3.2 Cache Supplies

The station maintains a cache of firefighting tools and personal protective equipment (PPE) adequate to support all Refuge initial attack staff. Cache equipment, other than capitalized property, will be maintained at normal unit strength (NUS). NUS will include PPE and other safety items required by personnel for initial attack as well as prescribed fire projects. The cache at Turnbull NWR can be contacted if additional items are needed.

4.1.1.3.3 Communication

Most of the local agencies have the capability to communicate using a local frequency. For those local cooperators that do not have that capability, a FWS radio will be provided and cell phone information exchanged to ensure communication during the incident. A frequency list is found in FMP packet. Current Radio Frequency agreements will be kept on file in the Complex office.

4.1.1.4 Aviation Management

All aviation operations will follow the guidelines of the DOI national business centers, Aviation Management Directorate. That can be found on the website: Chapter16, Aviation Operations and Resources

4.1.1.5 Fire Detection

Due to the urban nature and small footprint Turnbull has no active Detection program. All fire will be reported in the 911 system. Once reported, we will investigate all unplanned ignitions. Agency policy requires any wildfire to be investigated to determine cause, origin, and responsibility. After a wildland fire has been detected, responding personnel should be alert for any suspicious individuals or vehicles in the area. Personnel should not disturb the fire origin and protect the scene with flagging. Personnel responding to the incident should also attempt to record pertinent information required for the IC to determine fire cause. All suspicious fires will be promptly and efficiently investigated.

Individuals should not question suspects or pursue the fire investigation unless they are commissioned law enforcement officers. Personnel from other agencies may investigate wildland fire arson or fire incidents involving structures. All fire investigations should follow guidelines in Chapter 18 of the *2022 Interagency Standards for Fire and Fire Aviation Operations*. The ZFMO or the manager or their designee should be contacted if necessary.

4.1.1.6 Detection and Initial Attack

Wildland fires on the Refuge are often discovered and reported by local residents and the visiting public. These fires may or may not be reported directly to the refuge manager; it is expected that the reporting individual will contact the local fire department or 911 directly and refuge staff may not learn about the fire until after it has already been staffed. Regardless of how any fires are discovered they need to be reported to the refuge manager or ZFMO or Duty Officer immediately so suppression actions can be started without delay. In situations where fire danger and staffing levels increase, refuge patrols will be an additional source of detection and reporting.

Once notified of a fire, the ZFMO or Duty officer will contact NEWICC with a request to respond or confirmation of response. The ZFMO or Duty Officer will notify the manager or designee of the situation and resources assigned or in route. Qualified and available refuge staff should respond to complete or assist with tasks such as securing the fire origin, fire suppression, protecting visitors at risk, and implementing closure(s) at the scene. If the fire threatens to burn outside the Refuge boundary, the manager and/or the incident commander (IC) will notify the Department of Natural Resources and local law enforcement.

When the responding fire department arrives, the senior officer of that department will serve as the IC responsible for the fire until a qualified refuge employee arrives and either assumes command or institutes unified command. The Complex will use the Incident Command System (ICS) as a guide for suppression organization and actions. The IC will brief the refuge manager on the location and status of the fire. The refuge manager will provide pertinent details on location and protection of resources of concern via the delegation of authority that is found in the Red Book.

4.4 Incident Management

The Refuge will enter the extended attack phase of suppression operations when initial attack has failed to achieve containment of the incident. This situation also applies to an escaped prescribed fire. For all incidents escaping initial attack, refuge staff, ZFMO, or Duty Officer will prepare a wildland fire decision support system (WFDSS) see Appendix K.

The WFDSS is an analysis of possible resource, economic, and social impacts of various suppression alternatives. The Refuge Manager will review the alternatives and then publish the selected strategy. Daily update of the Wildland Fire Decision Support System (WFDSS) <http://wfdss.usgs.gov> will be reviewed and approved by the refuge manager in consultation with the IC and zone FMO.

Transition to an incident management team (Type 2 or Type 1) from an extended attack organization will follow guidelines and protocols found in the 2022 Interagency Standards for Fire and Fire Aviation Operations, Chapter 11.

All aircraft operations, other than initial attack, will follow the interagency aircraft use regulations and policies. During initial attack the closest resource, including state owned aircraft, may be used. After the first burn period, and the fire remains uncontrolled, Service policy states that all individuals must meet or exceed NWCG qualifications for the line operation function they perform. This applies to FWS, local, state, other federal, and contractors. All incoming resources will be given a copy of the Fire behavior briefing cards as part of their initial briefing.

4.4.1 Dispatch beyond Initial Attack

For extended attack support the ZFMO or Duty Officer will request expanded dispatch established for the incident at NEWICC in Colville, WA. Expanded Dispatch will be responsible for tracking and ordering Overhead, Crews, Equipment and Supplies for the ongoing incident. The team that is delegated the extended attack role will also be responsible to repair any suppression damage from that incident before demobilization.

4.4.2 Delegation of Authority

The Refuge Manager will issue a delegation of authority once the suppression efforts have gone beyond initial attack and the WFDSS has been approved. An example is available in the 2022 Interagency Standards for Fire and Fire Aviation Operations.

4.4.3 Resource Allocation and Prioritization

Once suppression operations have commenced on any fire the Incident commander will consult with the Fire staff from the Refuge and complex and review the preparedness level and anticipated resource need for the incident and communicate this to Expanded at NEWICC. With the proximity of structures and life safety in the Turnbull area higher priority should be recommended for the status of the incident in the Incident Status Summary (ICS-209 Form).

4.4.3 Regulatory Compliance for Managing Unplanned Ignitions

The Turnbull FMP is in compliance with current fire management policy as described below. “Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, and across agency boundaries. Response to wildland fire is based on ecological, social, and legal consequences of fire. The circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected dictate the appropriate management response to fire.”

1995/2001 Federal Wildland Fire Management Policy

The Refuge has completed relevant NEPA documentation for the Fire Management Plan dated January 2000 and completed the FONSI for the same date.

All fuels treatments and prescribed fire have been cleared from Cultural Resources and recorded in the file. A resource advisor will be present if we suspect any additional Cultural resource finds.

The Eastern Washington Field office in Spokane will be consulted in case any Endangered Species issues arise while suppressing any wildfires on the refuge.

4.4.4 Use of WFDSS

The FWS has provided guidance and adopted the Wildland Fire Decision and Support System as the analysis tool to guide our agency administrators through the decision process when dealing with a large complex incident on FWS lands. The most important part of the tool is it provides excellent documentation for the Agency administrator as part of the public record and thus meets all legal requirements.

4.4.5 Reporting and Funding

The Zone Fire Management Officer or designee will file a report in the Fire Management Information System (FMIS) for the following types of fires within 10 days of a fire being declared out:

- All wildfires on FWS and FWS-protected lands.
- Wildfires threatening refuge lands on which the Turnbull NWR takes action.
- All prescribed fires that remain within prescription on refuge lands.
- All escaped prescribed fires. When a fire is declared a wildfire a separate new report must be filed to report acres burned by the wildfire from the time of declaration to the time of being declared out.

Fire reports are required regardless of who takes action, e.g., FWS engine, cooperator, or contractor. When an initial attack is off refuge lands, the agency with jurisdiction where the fire occurs will file a report and Turnbull NWR will file a limited report to document response and to support potential billing to non-federal entities for trespass fires. The ZFMO or Duty Officer is responsible for sending a situation report daily (ICS-209) or when significant activity occurs to the Northeast Washington Interagency Communication Center indicating the local planning level, wildfire occurrence by cause and number of acres. The ZFMO or Duty Officer will also notify the communication center of pre-planned prescribed fire and post burn accomplishments (#units, # acres). The Burn boss is expected to provide this information to the ZFMO or Duty Officer.

The Fire Management Specialist will issue a project cost code number from the WBS system and add the fire to the Fire Management Information System (FMIS).

Fire reviews will be documented and filed with the final fire report going to the ZFMO (reference 2022 Interagency Standards for Fire and Fire Aviation Operations, chapter 18, and consult with ZFMO).

Communications

Turnbull NWR has a base station radio and various vehicle and handheld mobile radios. Current Memorandum of Understanding's can be found in the office files. Dispatching is done North East Washington Interagency Coordination Center (NEWICC). NEWICC records the conversations and can provide written transcripts upon request. Interagency dispatching is done over the radio, phone and email; records are kept in ZFMO office.

Aircraft Operations

Aircraft may be used in all phases of fire management operations. All aircraft must be Office of Aircraft Services (OAS) or Forest Service approved. An OAS Aviation Policy Department Manual will be provided by OAS.

Helicopters may be used for reconnaissance, bucket drops and transportation of personnel and equipment. Natural helispots and parking lots are readily available in most cases. Clearing for new helispots should be avoided where possible. Improved helispots will be rehabilitated following the fire.

As in all fire management activities, safety is a primary consideration. Only qualified aviation personnel will be assigned to all flight operations.

4.4.6 Suppression Damage Repairs

The Refuge staff will evaluate operations on all fires and recommend any repairs to the Incident Commander through the Refuge manager. Repairs will be included any delegation issued by the Refuge Manager.

4.4.7 Emergency Stabilization

All emergency Stabilization plans and activities shall follow the *Emergency Stabilization and Burned Area Rehabilitation policy and Guidance (October 2006)* found at [dhttps://www.nifc.gov/PUBLICATIONS/redbook/2020/RedBookAll.pdf](https://www.nifc.gov/PUBLICATIONS/redbook/2020/RedBookAll.pdf)

And follow the departmental manual 620 DM 7.

4.4.8 Emergency Stabilization and Post Fire Assessment

When suppression action is taken, rehabilitation is appropriate. The most effective rehabilitation measure is prevention of impacts through careful planning and the use of minimum impact suppression techniques.

Rehabilitation will be initiated by the Incident Commander, ZFMO, or Refuge Manager. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential hazards caused by the fire. These actions may include:

- Backfill control lines, scarify, and seed.
- Install water bars and construct drain dips on control lines to prevent erosion.
- Install check dams to reduce erosion potential in drainages.
- Restore natural ground contours.
- Remove all flagging, equipment and litter.
- Completely restore camping areas and improved heli-spots.
- Plan more extensive rehabilitation or re-vegetation to restore sensitive impacted areas.

If re-vegetation or seeding is necessary, only native plant species will be used.

If emergency rehabilitation measures are needed or if rehabilitation is needed to reduce the effects of a wildland fire then the Refuge Manager can request appropriate funding through the Burned Area Emergency Rehabilitation (BAER) fund. The BAER fund is administered through the NPS representative at the National Interagency Fire Center and national BAER team leader.

Rehabilitation plans for each fire will be reviewed by the Refuge staff. A final plan will be submitted to Region for establishing an account. Rehabilitation should be initiated prior to complete demobilization or early the following season.

4.4.9 Emergency Stabilization and Post wildfire Issues and values to Protect

Current CCP concerns are to repair suppression damage and mitigate non-native and invasive species from becoming epidemic to the refuge. Our Biologist will review and survey all post fire operations and recommend any ES work that needs to be considered in the plans.

4.4.10 Emergency Stabilization Maintenance and Monitoring

The maintenance and monitoring will be covered in any plans generated by any post fire activities here at Turnbull NWR. The Biologist will review these portions and make recommendations back to the planning group.

4.4.11 Emergency Stabilization report requirements

Any reporting requirements can be found at in the ES and Baer policy and Guidance documents or in 620 DM 7.

4.5 Burned Area Rehabilitation

All Burned Area Rehabilitation planning and activities shall follow the ES & Baer policy and Guidance documents at www.fws.gov/fire/fcc/Esr/P&G.htm.

4.5.1 BAR Issues and values to protect

Issue and values were identified in 2008 Turnbull CCP. The biggest concern is invasive species and non-native species expanding within the refuge boundary. All effort should be made to get any exposed soil rehabilitated as soon as possible. The Refuge Biologist will be the lead on any BAR planning and rehabilitation effort.

4.5.2 BAR Regulatory compliance

All planning effort will follow current laws, regulations and guidance found in the 2022 Interagency Standards for Fire and Fire Aviation Operations, FWS Fire Management Handbook. All BAR plans will also comply with 620 DM 3.8M.

4.5.3 BAR Monitoring Protocols

All plans will consult with the biologist and contain monitoring protocols. For any assistance please refer to “*A Framework for Monitoring Hazardous Fuels on U.S. Fish and Wildlife lands in the Pacific Region. V-9 (2009)*” and it can be found on the R-1 SharePoint.

4.5.4 BAR Contact information

All BAR inquiries can be directed to the INNWRC Headquarters at 26010 S. Smith Rd Cheney, WA 99004 (509) 235-4723.

4.5.5 BAR Public information and the Public Concerns

All public information and concerns will be addressed by the refuge staff at the same setting mentioned in the previous section.

4.5.6 BAR Reporting requirements

The Refuge will follow all reporting requirements outlined in the 2022 Interagency Standards for Fire and Fire Aviation Operations, FWS Fire Management Handbook 2022 FINAL.pdf

4.6 Management of Planned Fuels Treatments

The refuge will conduct an annual work planning session and produce annual and 3 year work plans to define and outline fuels treatments. The Fire staff will consult with the refuge biologist and assure that all treatments fall within the scope of the Habitat Management plan as well as the CCP.

The goals of prescribed fire within the U.S. Fish & Wildlife Service are to:

1. Conduct a vigorous prescribed fire program with the highest professional and technological standards using all means available to prevent escaped fires.
2. Identify the type of prescribed fire that is most appropriate to most situations and areas.

3. Efficiently accomplish resource management objectives through the application of prescribed fire.
4. Continually evaluate the prescribed fire program to better meet program goals by refining prescription treatments and monitoring methods, and by integrating applicable technical and scientific treatments.
5. Use prescribed fire in a manner, which meets the requirements of the *Clean Air Act (PL 88- 206, 42 USC 7401 revised 1990)*.
6. Effectively manage prescribed fire emissions using the most current technologies and techniques available.

Prescribed fire is a management technique, which will be used within Turnbull NWR to attain the following resource management objectives:

1. Enhance wildlife and plant species along with their associated habitats.
2. Eliminate hazardous accumulations of dead biomass within the Refuge to reduce the intensity and associated damage of uncontrolled wildland fires to natural habitat and values at risk.
3. Eliminate or reduce the abundance of exotic/alien species, which compete with species indigenous to the refuge.
4. Promote natural biodiversity among species inhabiting the Refuge.
5. Utilize management ignited prescribed fires to mimic the role once played by natural lightning ignitions within the fire dependent ecosystems of Turnbull NWR.

4.6.1 Process to Identify and Prioritize Fuels Treatments

All treatments will be identified and approved from the Annual work Plan and be combined with the other complex treatment and prioritized then entered into the FMIS planning process through the National Fire Plan and Reporting System (NFPORS). The complex will use the Project Priority System (PPS) evaluation sheet to rank the projects from the complex for inclusion into NFPORS requests.

4.6.2 Prescribed Fire Planning

Prescribed Fire Burn Plan

The Prescribed Fire Burn Boss will conduct a field reconnaissance of the proposed burn location with members of the Refuge Management staff to discuss objectives, special concerns, and gather all necessary information to write the burn plan. After completing the reconnaissance, the Prescribed Fire Burn Boss will write the prescribed burn plan in accordance with the *Interagency Standards for Fire and Aviation Operations, Chapter 17* and the *Fire Management Handbook 2022 FINAL.pdf; Chapter 17*.

All prescribed fires will have prescribed burn plans. The prescribed burn plan is a site specific action plan describing the purpose, objectives, prescription, and operational procedures needed to prepare and safely conduct the burn. The treatment area, objectives, constraints, and alternatives will be clearly outlined. No burn will be ignited unless all prescriptions of the plan are met. Fires not within those parameters will be suppressed. Prescribed Burn Plans will follow the format contained in the *Fire*

Management Handbook. The term “burn unit” refers to a specific tract of land to which a prescribed burn plan applies.

Ponderosa Pine forest objectives:

- a. Use management ignited prescribed fire to approximate the role of natural fire in Ponderosa pine forests.
- b. Allow fire to function in the critical task of forest nutrient cycling.
- c. Use prescribed fire to reduce hazardous accumulations of dead woody biomass, particularly in the 100 hr., 1000 hr. and 10,000 hr. size classes of forest fuels.
- d. Use prescribed fire in combination with mechanical timber stand thinning to reduce the density of trees per acre throughout the Refuge.
- e. Utilize prescribed fire effects to create forest habitat of varying age classes and densities to approximate the heterogeneous composition of natural ponderosa pine stands and promote greater biodiversity within forest habitats.
- f. Improve forest health by utilizing fire to reduce stand density reducing competition for light, moisture and nutrients.
- g. Remove pine encroachment from riparian, grassland, aspen and shrub habitats.
- h. Increase water yield in wetland habitats by reducing pine density.

Prescription recommendations were developed based upon observations of prescribed fire behavior and fire effects over three years of prescribed fire implementation at Turnbull NWR and the research recommendations of prominent researchers in the use of prescribed fire in managing ponderosa pine forests.

Wetland Habitat objectives:

Semi-permanent Marsh

- a. Reduce the accumulation of litter and standing residual cover that impedes plant growth and restricts access to emergent vegetation by nesting hens and broods. Maintain litter depths below 40 cm within stands of emergent vegetation.
- b. Utilize prescribed fire to rejuvenate decadent stands of emergent vegetation and promote nutrient cycling in semi-permanent marshes.

4.6.3 Seasonal Wetlands

- a. Remove accumulated dead plant litter from seasonal wetland basins to promote early season food production of plants and invertebrates through increased solar insulation of water surface area.
- b. Prescribed fire in seasonal wetlands should consume at least 80% of the wetland surface area.
- c. Prescribed fire should result in a 75% reduction of total dead biomass within the wetland basin, resulting in less than 10% of the basin being covered by litter, with a mean litter depth of less than 2 cm. and standing stubble height of less than 10 centimeters.
- d. Increase water yield and available wetland habitat by reducing density of Ponderosa pine within wetland watersheds.
- e. Initiate research into the effects of prescribed fire on the abundance, distribution and habitat of the endangered water Howellia (*Howellia aquatillus*).

Grassland and Shrub Steppe objectives:

- a. Restore fire as an ecological influence within grassland and meadow habitats.
- b. Prevent pine forest encroachment into grassland and meadow habitats.
- c. Promote vigorous populations of native forbs and grasses.
- d. Promote biodiversity in grassland/meadow habitats in both flora and faunal populations.

Aspen and Shrub objectives:

- a. Restore fire as an ecological influence in Aspen and shrub habitats.
- b. Increase the abundance and distribution of aspen and shrub stands by reducing pine encroachment into aspen and shrub stands.
- c. Increase tree density, reduce dead biomass and improve the health and vigor of decadent aspen and shrub stands.

4.3.3 Prescribed Fire Project Implementation

All project that are implemented will be approved through the annual work plan process and will be the responsibility of the ZFMO as delegated to the Prescribed Fire /Fuels Manager to implement.

4.6.4 Prescribed Fire Operations

Human Health and Safety: Roads potentially affected by surface smoke will be signed with visibility hazard notifications and patrolled during and after the burn until visibility is safe for traffic. If poor smoke dispersal characteristics cause safety hazards on State or County Roads near the burn site, all ignition operations will cease, appropriate law enforcement authorities will be notified and checkpoints to channel traffic safely through smoke affected areas will be established. Roads affected by smoke will be periodically patrolled and monitored through the duration of the burn.

Minimum State of Washington Visibility Standards for vehicle safety on roads potentially affected by the Turnbull NWR prescribed fire program:

Cheney Plaza: 1000 ft.
Cheney Spangle: 1000 ft.
Mullinex Rd.: 1000 ft.
SR-904: 1000 ft.
I-90: 1000 ft.
Smith Rd.: 1000 ft.

*Note: If smoke is on the roadway during the night the distances for minimum visibility standards must be doubled.

Prescribed fire operations or ignitions may occur during Regional or National preparedness level 4 or 5 if the specified requirement from the regional interagency mobilization guide and/or national mobilization guide are met. The Regional Fire Management coordinator should be advised if operations are planned prior to implementation.

4.6.5 Prescribed Fire Public Notifications

1. **Interagency Coordination:** Smoke management approval will be obtained from the Washington Department of Natural Resources. Once DNR smoke management approval is obtained, Spokane Regional Clean Air Agency, and any concerned cooperators will be given a notification call of the intention to proceed with the burn
2. **Critical Impact Areas:** Burns will be conducted under weather and fuel moisture conditions which generally provide good smoke dispersal characteristics and low impacts to surrounding communities and identified "Critical Impact Areas". Critical Impact Areas are locations within a 30 mile radius of the burn unit that smoke from the burn must not affect human health or safety. Identified Critical Impact Areas for Turnbull NWR are listed in Table 4.

AREA	TYPE	DISTANCE and DIRECTION
Cheney (city)	Residential/Commercial	6 miles/ north
Spokane (city)	Residential/Commercial	20 miles/northeast
Spokane Int. Airport	Commercial Aviation	15 miles/northeast
Interstate 90	Transportation corridor	10-15 miles/NW/NE

Table 4. Critical Impact Areas

3. **Notification Procedures:** Local communities and residents may be notified of the proposed burn program through local media sources (newspapers, television and radio) with official news releases at least two weeks prior to the burn implementation. In addition, potentially affected agencies and individuals will be notified prior to implementation by telephone on the day of the proposed burn. Specific notification via phone under this guideline include; Spokane Fire District #3, North East Washington Interagency Communications Center (NEWICC), Spokane Regional Clean Air Agency, Spokane County 911 Fire dispatch center and concerned landowners adjacent to the Refuge potentially affected by drift smoke.

A call down list will be part of all burn plans for public notification and that will be done in advance of the fire to let concerned or sensitive groups or individuals aware of our plans.

4.6.6 Multiple Prescribed Fires

Turnbull NWR will avoid multiple ignitions or concurrent ignitions due to small staff and high risks in the wildland urban interface.

4.6.7 Prescribed Fires on Private Lands

Service personnel planning or implementing habitat restoration projects on off-Service lands, using prescribed burning, must be certified, and in compliance with all applicable departmental, Service, and regional fire management policies. The project must have an agreement signed by

the landowner authorizing the use of prescribed fire on private land, and clearly stating the benefit to Federal Trust resources.

The project officer or the person in charge of fire operations specifically must meet the Burn Boss certification requirements appropriate for the complexity level of the burn as derived from the National Wildfire Coordinating Group (NWCG) *Prescribed Fire Complexity Rating System Guide*. Based upon the outcome of the Complexity Analysis, the project officer qualifications (RXB1, RXB2, or RXB3) will be assigned to oversee the implementation of the project. The project must meet National Environmental Policy Act requirements prior to ignition (621FW 2, 4A (2)), and have all the necessary permits and approvals. All Service personnel participating in prescribed fires must meet the appropriate Service training and experience qualification requirements as detailed in the Fire Management Handbook. For all fire activities where the Service is involved a written prescribed fire plan must be prepared, reviewed, and approved according to Service and regional policies.

Non-certified Service personnel may provide technical assistance regarding the ecological benefits of conducting a prescribed fire on a project. They must clearly state that their recommendation for the use of fire is only to describe or project ecological improvements and they are not certified to provide any recommendations regarding the actual design and implementation of the prescribed fire, nor will they participate in the operational aspects of the prescribed fire.

Use of certified agencies

Local, State, Tribal and other Federal agencies could be the partner actually planning and/or implementing the prescribed fire on private lands. The NWCG recognizes the ability of cooperating agencies at the local level to jointly define and accept each other's qualifications for prescribed fire. PMS 310-1 identifies the minimum qualification standards for interagency prescribed fire operations. Departmental policy requires all Service personnel engaged in interagency operations to meet these standards.

In some limited cases, the Service could provide funds to non-certified agencies for the restoration and enhancement of Federal trust species habitats on private lands where prescribed burning may or may not be used as a management tool. In these cases, the Service will not have "substantial involvement" as defined in 31 U.S.C. 6301-6308. The only mechanism to transfer funds to non-certified agencies where prescribed fire may be used is a Grant Agreement. Grant Agreements with a non-certified state agency are for the purpose of general habitat restoration activities. The Service cannot identify or stipulate the techniques to be used for these habitat restoration projects. The task of identifying these techniques is a responsibility of the state agency.

Cooperative Agreements and Procurement Contracts require "substantial involvement" of Service personnel and should not be used with non-certified agencies.

Use of private cooperators

Private cooperators conducting a burn that is funded by Service must be in compliance with NWCG, Service and regional policies regarding prescribed burning. PMS 310-1 allows the

establishment of standards to meet Service-specific needs for operations that involve only Service personnel or, in some cases, local cooperators. A written prescribed fire plan must be prepared, reviewed, and approved according to Service and regional policies.

Hire private contractors certified by the Service. Private contractors who specialize in providing fire management services must meet the NWCG standards contained within the Wildland and Prescribed Fire Qualification Subsystem Guide, PMS 310-1, and meet any other Service standards for qualifications and personal protective equipment (PPE). The contract should specify these requirements as well as other regional and local standards or work accomplishments they are to meet. There are vendors that are certified as meeting the NWCG standards; however, the Service must still approve the burn plan. A written prescribed fire plan must be prepared, reviewed, and approved according to local, Service and regional policies.

Support only non-fire components

In the event one of the options above is not available, the Service maintains the ability to only provide funding and/or technical assistance on the non-fire components of the project. For example, the landowner is willing to implement a project using prescribed burning without financial or technical assistance from the Service, and the Service provides financial/technical assistance only to plant trees or conduct seeding after the burn is complete. Service personnel may acknowledge the potential ecological benefits of conducting a prescribed fire on a project, and that prescribed fire may be used to complement activities funded by the Service, but the planning documents and agreements must clearly state the limits of the Service's involvement, that the Service is not responsible for the implementation of prescribed fire, that the decision to use prescribed fire is the responsibility of the landowner, and that the Service is not certified to provide any technical recommendations regarding the actual design or execution of a prescribed fire.

4.6.8 Prescribed Fire Conversions and Reviews

If a prescribed fire is declared a wildfire, the procedures described in the prescribed fire plan and Agency Administrator or Go/No-Go Checklist will be followed.

The FMO will notify the RFMC and Agency Administrator will initiate an Escaped Prescribed Fire Review (*Interagency Standards for Fire and Fire Aviation Operations Chapter 18*). Refer to the Interagency Prescribed Fire Planning and Implementation Procedures Guide for further guidance regarding Declared Wildfire Reviews in the *Fire Management Handbook*.

If a significant event occurs other than a Declared Wildfire (deployment, entrapment, fatality, near miss, etc.) refer to 240 FW 7 for reporting and investigative requirements.

4.6.9 Planning, Preparing, Implementing Non-Fire Fuels Treatments

For policy, guidance, and standards for implementation of non-prescribed fire hazard fuel reduction treatments (e.g. mechanical, biological, chemical), refer to agency specific policy and direction.

4.6.10 Fuels Treatment Regulatory Compliance

The Fuels Management Specialist will be responsible for completing an annual fire summary report. The report will contain the number of fires by types, acres burned by fuel type, cost summary; personnel utilized, and fire effects.

Prescribed Fire activities will be reviewed annually by the Refuge Management. Necessary updates or changes to the Fire Management Plan will be accomplished prior to the next fire season. Any additions, deletions, or changes will be reviewed by the Refuge Manager to determine if such alterations warrant a re-approval of the plan.

The Refuge has completed relevant NEPA documentation for the Fire Management Plan dated January 2000 and completed the FONSI for the same date.

All fuels treatments and prescribed fire have been cleared from Cultural Resources and recorded in the file. A resource advisor will be present if we suspect any additional Cultural resource finds.

The Eastern Washington Field office in Spokane will be consulted in case any Endangered Species issues arise while suppressing any wildfires on the refuge.

For additional guidance see, *Smoke Management Guide for Prescribed and Wildland fire 2001*. (www.nwccg.gov/pms/pubs/SMG/SMG-72.pdf)

4.6.11 Fuels Management Monitoring

See section 5.

4.6.12 Fuels Treatment Reporting Requirements

All prescribed burn forms will be completed as outlined by the Prescribed Fire Burn Boss. A monitor will be assigned to collect all predetermined information and complete all necessary forms prior to, during, and after the burn. All records will be archived in the refuge's fire records for future use and reference.

The Prescribed Fire Burn Boss will prepare a final report on the prescribed burn for the file. Information will include a narrative of the burn operation, a determination of whether objectives were met, weather and fire behavior data, map of the burn area, photographs of the burn, number of work hours, and final cost of the burn. The Burn Boss will also be responsible for all post burn reporting requirements such as FMIS and NFPORS.

4.6.13 Fuels Committees or Local Coordinating Groups

Smoke Management

According to Fish & Wildlife Service Fire Management Policies " ... fire management activities which result in the discharge of air pollutants are subject to, and must comply with, all applicable

Federal, state, interstate, and local air pollution control requirements as specified by Section 118 of the *Clean Air Act*."

Prescribed fire program implementation at Turnbull NWR, must be sensitive to potential smoke impacts to the local communities and residential areas that could be affected by smoke from refuge fires. In addition to the local communities of Cheney and Spokane, the Refuge is located within 10 miles of Spokane International Airport and Interstate 90. Smoke generated by refuge prescribed fires could cause serious visibility impairment to these areas with resulting threats to operational safety.

Portions of Spokane County have been designated as management areas for particulate matter (PM-10: particulates 10 microns or less in size) under the provisions of the *Clean Air Act (Public Law 95-95)*. The *Clean Air Act* established "National Ambient Air Quality Standards and provides the States with the primary jurisdiction in air quality management. Under the act, States are required to identify areas, which have air pollutant levels, which do not meet national standards." Once identified, States must develop plans, called State Implementation Plans (SIP) which identifies specific actions to bring non-attainment areas into compliance. The state of Washington has developed the *Washington Clean Air Act RCW 70.94*. Under the provisions of this act the Department of Natural Resources has been given the authority to issue burn permits for "abating or prevention of forest fire hazards, management of ecosystemsand silvicultural operations." Negotiated agreements between the U.S. Department of Agriculture and the Department of Interior have placed all prescribed fire conducted for the purpose of silvicultural or ecological restoration in the state of Washington under the direct regulatory authority of the Department of Natural Resources in relation to smoke management coordination and permitting.

As part of this plan, Turnbull NWR is required to obtain Smoke clearance from the Department of Natural Resources prior to implementation of any burning over 100 tons. The clearance procedure is used to ensure that weather conditions on the day of the planned burn are conducive to good smoke dispersal conditions (no inversions and wind directions which will carry the smoke away from populated areas). It also allows coordination of burns between agencies and private interests to prevent too many burns from being conducted simultaneously within the same air-shed. Clearance is obtained by placing a phone call to the local Department of Natural Resources Dispatch and requesting clearance for a specific date and time. The request must be made by 1500 hrs, on the day prior to the burn. Permission to burn is determined by DNR forecasters by 0900 hrs. The following day and communicated to the burn boss by the DNR Website. Once DNR smoke management approval is obtained, Turnbull NWR will advise / notify Spokane Regional Clean Air Agency (SRCAA) by phone of the intention to proceed with the permitted burn.

As part of an agreement between the Department of Natural Resources (DNR) and the Spokane Regional Clean Air Agency (SRCAA), DNR will communicate and coordinate all silvicultural burns within Spokane County with SRCAA. If SCRAA has specific concerns about silvicultural burning on a particular day due to weather conditions or poor ambient air quality, SCRAA may request the DNR curtail or prohibit all burning in the county.

In order to reduce these localized impacts the following restrictions and procedures will be part of the prescribed burn planning and implementation process for Turnbull NWR.

Guidelines, Procedures and Prescriptions for Effective Smoke Management in Prescribed Fire Implementation at Turnbull NWR:

Recommended Weather Conditions for Effective Smoke Management:

- Wind Direction - North, Northeast, East to Southeast
- Wind Speed Surface (20 ft. windspeed) - Minimum 2 mph.
- Transport Wind (windspeed @ 1500 ft.) - Minimum 9 mph.
- Mixing Height - Minimum 500 ft.
- Relative Humidity - Maximum of 60% during ignition.
- Fuel Moistures - 1 hr. maximum 10%, 10 hr. maximum 13%

All burning operations will cease if conditions of weather and fuel moisture do not meet those desired within the smoke management portion of the prescribed burn plan.

Prior the burn (24 hrs.): Obtain Spot Weather forecast from National Weather Service Fire Weather Office in Spokane. If available, a Hy-Split mixing height analysis from the NWS may be obtained with the spot weather forecast.

Morning of the burn (0800 hrs.): Obtain Smoke Management Forecast from DNR Northeast Region or DNR Smoke Management Office in Olympia.

4.6.14 Funding Processes

Turnbull NWR will follow national guidance as developed in fuels allocation and accountability system (FASS) and NFPHORS process to obtain funding for any Wildland Urban Interface project funding. All proposed projects will be submitted through NFPHORS up to the region and on to the National office for approval. All projects will be evaluated as a complex wide proposal which will include Kootenai and Little Pend Oreille.

4.7. Prevention, Mitigation and Education

4.7.1 Wildfire Investigation and Trespass Policies

Fire management personnel will attempt to locate and protect the probable point of origin and record pertinent information required to determine fire cause. They will be alert for possible evidence, protect the scene and report findings to the fireline supervisor.

Prompt and efficient investigation of all suspicious fires will be carried out. However, fire management personnel should not question suspects or pursue the fire investigation unless they are currently qualified law enforcement.

Personnel and services of other agencies may be utilized to investigate wildland fire arson or fire incidents involving structures. In the event an Investigator is needed and the Refuge Law Enforcement Officer is not available or is not qualified then a fire warden from the DNR can be requested through Dispatch

4.7.2 Fire Prevention Activities

An active fire prevention program may be conducted in conjunction with other agencies to protect human life and property, and prevent damage to cultural resources or physical facilities.

A program of internal and external education regarding potential fire danger may be implemented. Visitor contacts, bulletin board materials, handouts and interpretive programs may be utilized to increase visitor and neighbor awareness of fire hazards. Trained employees need to relate to the public the beneficial effects of prescribed fires as opposed to unwanted human-caused fires, with emphasis on information, essential to understanding the potential severity of human-caused wildland fires and how to prevent them.

During periods of extreme or prolonged fire danger emergency restrictions regarding refuge operations or area closures may become necessary. Such restrictions, when imposed, will usually be consistent with those implemented by cooperators. The Zone Fire Management officer or Duty Officer will recommend when such restrictions are necessary. Any recommended closures will be authorized by the Refuge Manager or their designee.

An important part of the refuge preparedness program, hazard fuel reduction refers to the removal of dead vegetation (grasses, pine needles, branches, logs) and the thinning of forested areas where tree densities prevent healthy forest conditions and present significant wildland fire hazards. Hazard fuel reduction is a fire prevention activity and can be accomplished through a variety of means and methods. The primary techniques to be used at Turnbull NWR in hazard fuel reduction will include manual reduction of fuel accumulation by fire crews in critical areas, mechanical reduction of fuels using refuge equipment, mechanical reduction of fuels during commercial timber sales and large scale hazard fuel reduction using prescribed fire.

As part of the primary work activities of fire crews at Turnbull NWR, annual hazard fuel reduction work will be accomplished in critical areas of the refuge using hand tools, chain-saws, and weed whips. Work elements include the cutting, raking, clean-up and removal of dead vegetation from areas adjacent to refuge facilities, residences and other improvements. This work is undertaken after grasses have cured to prevent re-growth and accomplished before the high fire danger season begins. Areas that will be given priority attention for manual hazard fuel reduction work will include:

1. Refuge Headquarters, Buildings, Shops and Equipment Storage Areas
2. Refuge bunkhouse
3. Visitor Use Facilities, Parking Areas, and Handicapped Boardwalk and Refuge Signs.
4. Fuel Facilities
5. Power Supply Poles
6. Turnbull Lab for Ecological Studies

These areas have been identified as priorities due to high potential for fire ignitions resulting from human activity or values at risk to damage and loss from a wildland fire.

In cooperation with local agencies Turnbull NWR will provide fire prevention programs on the Refuge in accordance with FWS guidelines. These activities will include daily maintenance of the refuge fire danger sign, which is located at the entrance to the refuge. Its purpose is to notify the public on a daily basis of the current fire danger level in the surrounding area (extreme, very high, high, moderate and low) and caution them to be careful with the use of fire. Additional fire prevention activities will include public contact by refuge staff during periods of extreme fire danger to make them aware of the hazard potential and media contacts through printed media, television and radio. When requested, refuge fire staff will provide interpretive programs on fire prevention for school groups and well as any other aspect of the fire management program on the refuge.

4.7.3 Education Activities

Educating the public on the value of fire as a natural process is important to increasing public understanding and support for the fire management program. The Refuge shall use the most appropriate and effective means to explain the overall fire and smoke management program. This may include supplemental handouts, signing, personal contacts, auto tour routes, or media releases. When necessary, interpretive presentations will address the fire management program and explain the role of fire in the environment.

The public information program will be developed as follows:

1. Concepts of the prescribed burn program will be incorporated, as appropriate, in publications, brochures, and handouts.
2. The fire management program may be incorporated into visitor contacts. Particular attention will be given when fires are conspicuous from roads or visitor use areas.
3. News releases will be distributed to the media as appropriate.
4. The public information outlets of neighboring and cooperating agencies and the regional office will be provided with all fire management information.
5. The fire management program will be discussed in informal talks with all employees, volunteers, residents, and neighbors.

As outlined in the prevention section, emergency closures or restrictions may become necessary during periods of extreme or extended fire danger.

5.0 Monitoring and Evaluation

5.1 FMP Monitoring

Information obtained from monitoring and evaluations is used to update the FMP as well as other Complex management plans. The FMP will be reviewed annually and updated as needed upon refuge manager approval. Revision of this FMP with regional review and concurrence is

required every five years or following completion of a new (or significantly revised) CCP or habitat management plan.

5.2 Treatment Effectiveness Monitoring

Monitoring and evaluation are part of the wildland fire suppression, the prescribed fire program and other mechanical/chemical treatments. Monitoring may be short term, as exemplified in those cases where wildland fires require immediate suppression, or it may extend for long periods (deemed long-term monitoring) of time as a result of the need to closely monitor habitat changes over an extended period. Monitoring is required to ensure that goals and objectives of treatment activities, such as prescribed burning, are within acceptable environmental parameters as stated in prescribed burn plans. (See the guidance found in “*A Framework for Monitoring Hazardous Fuels Treatments on U.S. Fish and Wildlife lands in the Pacific Region*” on the R-1 Share point)

Monitoring is conducted pre-burn, during the active phase of the prescribed burn, and post-burn. Pre-burn and post-burn evaluations are accomplished with transects or plots depending on the habitat type and fire unit. The ZFMO, in concert with Zone Fire Management Specialist and the regional fire ecologist, will provide specific guidance as to the type and amount of monitoring to be conducted.

All treatments, especially prescribed fire, will be well documented. Basic site conditions will be recorded during prescribed burns to ensure that prescribed fires are conducted within the appropriate range of environmental conditions (prescription). No special equipment is necessary for monitoring fire behavior. Since most burns on the Complex will be low to moderate intensity, they are easily measured by rate of spread and flame length observations. Should more comprehensive fire behavior and effects information be necessary, they will be outlined in the prescribed burn plan.

Basic monitoring to determine habitat response will generally use photo-points, which will be revisited and photographed during subsequent seasons. It is important that refuge staff devote time to post-burn monitoring of burn plots. Comparisons over time will aid in determining if burn objectives and resource objectives are being met. More complex monitoring efforts may be undertaken for research-related prescribed burns, or to answer questions about the effects of prescribed fire on specific wildlife or other habitat parameters. An excellent reference resource for monitoring procedures can be found within the *Fire Monitoring Handbook, USDI, and National Park Service, 2007*. The regional fire ecologist can be consulted as well.

Turnbull NWR will continue to use photo-points to monitor prescribed fire effects. Additional monitoring efforts will be incorporated as needed for research purposes.

An after action review (AAR) must be completed and documented after all prescribed fires, and the burn boss will be responsible to do this. This will focus on performance standards to enable agency administrators and firefighters to discover what happened, why it happened, and how to sustain strengths and improve on weaknesses. Also documented are the conditions under which the burn was conducted in order to evaluate how closely the fire conformed to planned fire

behavior, what unanticipated difficulties were encountered during the action, and how well the fire accomplished the desired results.

In order to determine the effectiveness of the smoke management techniques used in implementing the prescribed fire program at Turnbull NWR a monitoring program which documents all aspects of the prescribed fire in relation to reducing smoke impacts must be implemented. The purposes of the monitoring program are two fold; first to provide real time input to the prescribed fire manager about the smoke produced from the fire in relation to the smoke plumes direction, height, dispersal, potential encroachments on Critical Impact Areas and hazards created from smoke incursions on surrounding highways or Spokane International Airport; second to provide input to the prescribed fire manager on the effectiveness of the techniques used to mitigate smoke impacts. This information can be used to refine various prescription variables such as wind speed and direction, mixing height, fuel moistures and firing techniques to obtain more desirable results in smoke management. Smoke management monitoring should take place both within the burn unit and from long range to view the smoke plume in relation to dispersal and potential impacts to target areas and the observations will be documented in the Burn Plan. Highway visibility should be monitored periodically throughout the burn.

In addition to monitoring the smoke dispersal characteristics of the prescribed fire, determinations of pre-burn fuel loading can be made for input into fuel consumption models (CONSUME) for purposes of calculating the amount of particulate smoke produced in relation to the fuel consumed. The CONSUME model uses standardized techniques for determining pre-burn fuel loads from various photo-series (photographs of dead fuels from similar habitats upon which detailed analysis of fuel loading has been measured), along with actual weather data taken on site during the burn to calculate prescribed fire emissions. This information is used for determining if the requirements of the *Washington State Smoke management Implementation Plan (SIP)* are being met on an agency basis and for determining baseline emission allocations for each agency. This emissions data is also used for determining how much each agency must pay for program administration (the current rate is approximately \$100.00 per 1000 tons of fuel consumed).

Monitoring of prescribed fires is intended to provide information for quantifying and predicting fire behavior and its ecological effects on refuge resources while building a historical record. Monitoring measures the parameters common to all fires: fuels, topography, weather and fire behavior. In addition, ecological changes such as species composition and structural changes will be monitored after a fire. This information will be very useful in fine-tuning the prescribed burn program.

All wildland fires will be appropriately suppressed. However, monitoring wildland fires may be appropriate and potentially valuable in mapping and documenting the growth of the fire, measuring on-site weather and fuel loading to provide the fire staff with present and expected fire behavior and effects. During prescribed burns, monitoring can serve as a precursor to invoking suppression action by determining if the fire is in prescription, assessing its overall potential, and determining the effects of the prescribed burn.

During prescribed burning, monitoring should include mapping, weather, site and fuel measurements and direct observation of fire characteristics such as flame length, rate of spread and fire intensity. Operational monitoring provides a check to insure that the fire remains in prescription and serves as a basis for evaluation and comparison of management actions in response to measured, changing fire conditions, and changes such as fuel conditions and species composition. All prescribed fires may be monitored regardless of size. Data gathered from monitoring efforts will be given to the Prescribed Fire/Fuels Specialist on the staff for entry into the FFI database for the fiscal years the treatment occurred in.

5.3 Research

Since the first lands were purchased establishing the Refuge, research projects (ranging from undergraduate class projects to post-doctoral studies) have been completed on the Refuge. In the past decade, the Refuge has hosted between 3 and 6 research projects annually. Research topics covered have included; parasitology of reptiles, wildlife habitat relationships, limnology, nesting ecology of waterfowl and cavity nesting birds, roosting ecology of bats, predator/prey interactions, effects of management actions on wildlife populations and habitats, evolution of predator defenses in zooplankton, insect/plant co-evolution, fire effects on the ecology of individual plant species, plant communities, animal/plant relationships, and impact of herbivory on plant growth and development.

Although researchers from as far away as University of Illinois, the University of Alberta, Canada and the University of California at Santa Cruz have conducted studies on the Refuge, the large majority of researchers have come from local colleges and universities including Eastern Washington University, Washington State University, Gonzaga University, University of Idaho, and the University of Washington. Eastern Washington University, which is just a few miles north of the Refuge in the City of Cheney, has been the most active.

The Refuge has worked with several of these universities to complete research directed at filling information gaps that hinder the development of management strategies to achieve wildlife and habitat objectives. This type of research is given priority in the approval process. The Refuge maintains a research needs list that is shared with potential researchers.

All potential researchers are required to submit a research proposal for review and recommendation by the Refuge Biologist and approval by the Refuge Manager. The Refuge has limited on-going research projects to six per year. Proposals are reviewed for their potential benefit to the Refuge, Eco-region and Region, their compatibility with the Refuge purposes, and the possibility of conflicts with on-going studies, Refuge monitoring efforts and management activities. Once a project is approved, a Special Use Permit is issued that may stipulate certain special conditions to minimize impacts to Refuge resources and conflicts.

Glossary and Acronyms

Note: the official complete National Wildfire Coordinating Group (NWCG) glossary of terms is found on the web at: <http://www.nwcg.gov/pms/pubs/pubs.htm#PMS205>.

Agency Administrator. The appropriate level manager having organizational responsibility for management of an administrative unit.

BI (Burning Index). A number combining the spread and energy release component related to the contribution of fire behavior to the effort of containing a fire.

Class of Fire (area of wildland fires)

Class A - ¼ acre or less.

Class B - more than ¼ but less than 10 acres.

Class C - 10 acres to 100 acres.

Class D - 100 to 300 acres.

Class E - 300 to 1,000 acres.

Class F - 1,000 to 5,000 acres.

Class G - 5,000 acres or more.

ERC (Energy Release Component). A number related to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. It is generated by the National Fire Danger Rating System, a computer model of fire weather and its effect on fuels. The ERC incorporates thousand hour dead fuel moistures and live fuel moistures; day to day variations are caused by changes in the moisture content of the various fuel classes. The ERC is derived from predictions of (1) the rate of heat release per unit area during flaming combustion and (2) the duration of flaming.

Extended attack. A fire that escapes initial attack, in which initial attack forces are reinforced by additional forces.

Fire effects. Any consequences to the vegetation or the environment resulting from fire, whether neutral, detrimental, or beneficial.

FLI (Fireline Intensity). The amount of heat produced by the fastest moving part of a fire. Usually compared by reference to the length of the flames.

Fire management. All activities related to the prudent management of people and equipment to prevent or suppress wildland fire and to use fire under prescribed conditions to achieve land and resource management objectives.

FMP (Fire Management Plan). A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational procedures such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

Fuels. Materials that are burned in a fire; primarily grass, surface litter, duff, logs, stumps, brush, foliage, and live trees.

Fuel loading. Amount of burnable fuel on a site, usually expressed in pounds/acre or tons/acre.

Hazard fuels. Those vegetative fuels which, when ignited, threaten public safety, structures and facilities, cultural resources, natural resources, natural processes, and other values at risk.

IA (Initial Attack). An aggressive suppression action consistent with firefighter and public safety and values to be protected.

KBDI (Keetch - Byram Drought Index). An indicator of drought on the availability of fuel to burn in the heavier fuels and litter and duff layers.

Maintenance burn. A fire set by agency personnel to remove debris; i.e., leaves from drainage ditches or cuttings from tree pruning. Such a fire does not have a resource management objective.

NFDRS (National Fire Danger Rating System). A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.

NFDRS Fuel Model. One of 20 mathematical models used by the National Fire Danger Rating System to predict fire danger. The models were developed by the US Forest Service and are general in nature rather than site specific.

NFFL (National Forest Fire Laboratory).

NFFL Fuel Model. One of 13 mathematical models used to predict fire behavior within the conditions of their validity. The models were developed by US Forest Service personnel at the Northern Forest Fire Laboratory, Missoula, Montana.

Prescription. Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions.

Prescribed fire. Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements (where applicable) must be met, prior to ignition.

Preparedness. Activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives through appropriate planning and coordination.

Prevention. Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards (fuels management).

Rehabilitation. Efforts undertaken within three years of a wildland fire to repair or improve fire damaged lands unlikely to recover to management approved conditions or to repair or replace minor facilities damaged by fire.

Suppression. All the work of extinguishing or confining a fire beginning with its discovery.

Wildfire. An unwanted wildland fire.

Wildland fire. Any non structure fire, other than prescribed fire, that occurs on the wildland.

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.

WUI (Wildland-Urban Interface). The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

APPENDIX A. Fire Management Units and Pre-Attack Maps

