



# Fuels Treatment Assessments

## Northwest Region

# 2015

### Abstract

The BIA Northwest Region experienced a very severe fire season in 2015, with over 500 fires burning over 481,000 acres, widespread evacuations, and losing 1.2 billion board feet of commercial timber as well as nearly 200 homes and other buildings.

Losses would have been even more severe without the 80,000 acres of fuels treatments implemented between 2003 and 2015 on the Region's five most affected Reservations: Spokane, Yakama, Warm Springs, Colville, and Nez Perce.

Fire spread was controlled most effectively where suppression actions occurred in fuels treatments strategically placed along roads. Fuels treatments located adjacent to communities also consistently reduced fire behavior and provided tactical advantage to suppression resources.

Tribal forest management activities including commercial harvest and thinning create jobs and income as well as promote forest health and resiliency, and fuels treatments are an integrated step in the management cycle to minimize highly negative wildfire effects.

In order to affect fire spread and behavior at the scales of the 2015 fires, larger fuels treatments, as well as using wildfire as a fuel treatment at less extreme fire weather, are two options to stretch limited fuels management funding.



**Bureau of Indian Affairs  
Branch of Wildland  
Fire Management**

## Contents

EXECUTIVE SUMMARY	2
ABOUT THE BUREAU OF INDIAN AFFAIR'S NORTHWEST REGION	4
2015 Wildland Fire Season	4
Fuels Management	4
Assessing Fuel Treatment Effectiveness	4
WASHINGTON – SPOKANE TRIBE OF INDIANS	5
Treatment History	5
Carpenter Road Fire Summary	6
Assessment Findings	7
Summary	7
OREGON – CONFEDERATED TRIBES OF WARM SPRINGS	9
Treatment History	9
County Line 2 Fire Summary	9
Assessment Findings	10
Summary	10
WASHINGTON – CONFEDERATED TRIBES OF THE COLVILLE RESERVATION	11
Treatment History	11
North Star and Tunk Block Fire Summary	11
Assessment Findings	12
Summary	12
IDAHO – NEZ PERCE TRIBE	13
2015 Nez Perce Wildfires	13
Treatment History	13
Assessment Findings	14
Summary	14
CONCLUSIONS AND RECOMMENDATIONS	15
ACKNOWLEDGEMENTS	16

## EXECUTIVE SUMMARY

Actively managed forests are among a tribe's most valued assets. As such, fuels, fire, and forest managers work closely together to identify strategic locations to treat hazardous fuels. From 2003 to 2015, the Northwest Region completed 3352 fuels management treatments that treated over 538,000 acres. The overall cost to plan and implement these treatments was about \$62,000,000.

In August of 2015, widespread lightning storms sparked hundreds of forest fires across the Northwest. Almost 340 fires occurred on the Spokane, Yakama, Colville, Warm Springs and Nez Perce Reservations burning over 407,000 acres. Nearly half the acres that burned were in actively managed forests. Nearly 200 primary homes, commercial buildings and outbuildings were destroyed along with 1.2 billion board feet of timber.

When the fires were out, fuels and fire management specialists from the Bureau of Indian Affairs (BIA) assessed how effective the fuels treatment were at modifying fire behavior and aiding fire suppression actions. They wanted to learn if treatments provided public and firefighter safety and if fuels management objectives were met.

The Team performed 11-15 assessments on eight large fires. They were rapid assessments, each taking two-to-three days. They were performed using National Fire Plan Operations and Reporting System (NFPORS) data, fire records, fire behavior modelling, and field observations. When available, Continuous Forest Inventory data and Burned Area Reflectance Classification data was used to measure fire effects at the landscape scale.

Areas treated mechanically and/or with prescribed fire increased public and firefighter safety. In some cases they slowed a fire's progress, increasing emergency responder's time to coordinate evacuations. Most treatments reduced fire behavior, giving firefighters bigger windows to make timely and complex decisions.

Strategically positioning treatments next to actively managed timber and rangelands created buffers that firefighters used to protect communities and tribal values. Placing treatments next to roads made it safer for firefighters to anchor or improve control lines, and accelerated firefighter's ability to control the fire. Roads that are defensible also protect communities and other sensitive areas.

The combination of mechanical and prescribed fire treatments most dramatically affected the fire's behavior. By reducing ladder and surface fuels and increasing tree spacing crown fire activity diminished, which left fewer damaged or dead trees. Furthermore, treatments that had varied burn severities successfully protected seed sources. This should allow many burned areas to naturally regenerate, reducing the need for artificial regeneration and its high per acre cost.

In general, the Northwest Regional assessments found that treatments, when tested against intense fire behavior, met planned objectives. However, extreme fire behavior can render all but the most recent fuels treatments ineffective. And to affect fire behavior at landscape scales, the scales of the 2015 wildfires, larger fuels treatments and the use of wildfire at moderate fire weather conditions should be considered by fire and fuels managers.

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## **ABOUT THE BUREAU OF INDIAN AFFAIR'S NORTHWEST REGION**

Forty-five federally recognized tribes call Alaska, Idaho, Oregon, and Washington home. A total of five million acres support over 95,000 Indians that live on or near reservations. Forests and woodlands make up over half of their land base and provide irreplaceable economic and cultural benefits. Tribes depend on healthy, resilient forests and effective forest and fuels management practices to generate sustainable income that supports tribal communities.

### **2015 Wildland Fire Season**

In the Northwest Region, on average about 60,000 acres burn annually from over 350 wildfires. Typically, wildfires burn approximately 2% of all trust lands in the Northwest Region. The 2015 fire season in the Northwest broke records for area burned. From January 1 to December 31, over 500 wildfires burned more than 481,000 acres, a 463% increase above the 10-year average.

The Spokane, Yakama, Colville, Warm Springs, and Nez Perce Reservations accounted for 81% of the Region's total fire occurrence, and 99% of the total burned area in 2015. More than half the area that burned was in wildland-urban interface areas and prized timber-production forests. Commercial timber stands lost more than 1.2 billion board feet in the fires. Evacuations either occurred or threatened to happen on every large wildfire the reservations experienced. By the end, nearly 200 primary homes, commercial buildings and outbuildings were destroyed.

### **Fuels Management**

The Bureau of Indian Affairs (BIA) closely collaborates with Tribal fuels, fire, and forest managers to develop fuels treatment objectives that address areas at highest risk from wildfire. Designing and implementing fuels treatment projects that mitigate the negative effects of unwanted wildfire while protecting tribal values is the primary mission of the Fuels Management Program. From 2003 to 2015, the Northwest Region completed over 3300 projects that treated over 538,000 acres at a cost of almost \$62,000,000. Fuels management is seen as a strategic investment to sustain tribal resources and foster ecosystem health.

Between 2003 and 2015 on the Spokane, Yakama, Colville, Warm Springs and Nez Perce Reservations, 1454 fuels projects treated almost 378,000 acres. While typically a very small percentage of fuels treatments are burned over by wildfires, approximately 36% of the treatments on these five Reservations were either within or adjacent to the wildfires of 2015. This attests to both the size of the 2015 wildfires, and the strategic placement of the fuels treatments.

### **Assessing Fuel Treatment Effectiveness**

A team of five fuels and fire management experts from the BIA began assessing past fuels treatments shortly after the fires were declared out. As part of their assessments, they were interested in determining if treatments provided public and firefighter safety; if project objectives were met as planned, and if treatments minimized negative fire effects.

The Team performed multiple assessments on eight of the major wildfires where fires intersected with treated areas. This document highlights key findings from those assessments. Table 1 shows the fires that intersected fuels projects at each reservation.

Reservation	Fire Name	Fire Suppression				Fuels Treatments		
		Start Date	End Date	Fire Size	Cost	Total Treatments	Acres Treated	Costs of Treatments
Spokane	Carpenter Road	Aug. 14	Sept. 18	63,972	\$22 M	42	12,970	\$1,724,336
Yakama	Cougar Creek	Aug. 10	Sept. 20	53,534	\$23.5M	7	343	\$172,055
Warm Springs	Country Line 2	Aug. 12	Sept. 18	67,207	\$16.7M	114	39,067	\$5,891,334
Colville	North Star	Aug.13	Oct. 8	218,138	\$44.5M	151	12,449	\$2,266,111
	Tunk Block	Aug. 14	Oct. 15	165,947	\$11.6M	107	5,396	\$3,196,474
Nez Perce	Clearwater	Aug. 10	Sept. 12	47,260	\$13.2M	36	6,739	\$791,700
	Fisher	Aug. 12	Aug. 19	22,000	\$1.32M	12	1,753	\$569,323
	Municipal/ Hill	Aug.14	Aug. 25	1,774	\$5.6M	17	1,706	\$488,132
				<b>449,832</b>	<b>\$138.42M</b>	<b>523</b>	<b>80,423</b>	<b>\$15,099,465</b>

Table 1: Summary of wildfires that intersected fuels treatments conducted 2003-2015.

The assessment of fuels treatment effectiveness was performed through review of pertinent plans, maps, monitoring and remote sensing data, personal interviews, field observations, and spatial fire behavior modelling. Existing geographic information system (GIS), National Fire Plan Operations and Reporting System (NFPORS) and Continuous Forest Inventory (CFI) data were used in combination with high resolution infrared satellite imagery and Burned Area Reflectance Classification (BARC) data to evaluate differential fire effects at the landscape scale. Personal interviews were conducted with local Fuels and Forestry staff knowledgeable of fire behavior and effects within and adjacent to fuels treatments as well as the particular fire suppression actions taken. Field visits were conducted at representative sites to collect photos and other information to help illustrate specific examples of fuels treatment effectiveness.

While each site assessment varied based on data that was available, all assessments followed the Fuels Treatment Effectiveness Monitoring Template. The following six questions were asked:

1. Did the treatment assist in providing for public and firefighter safety?
2. Did the fire behavior change as a result of the treatment (as planned in the treatment objectives)?
3. Did the treatment contribute to control of the fire?
4. Was the treatment strategically located in order to facilitate control of the fire?
5. Did the treatment minimize negative fire effects?
6. Was damage to resources minimized by the fuels treatment?

## WASHINGTON – SPOKANE TRIBE OF INDIANS

Integrated forest management activities have modified the reservation landscape for more than half a century. With the exception of inaccessible areas and designated Forest Reserves, most of the Tribal timberlands within the fire perimeter have been managed over time through periodic commercial timber harvest, precommercial thinning, and hazardous fuel reduction projects. Timber has been harvested on nearly half of the acres within the fire perimeter within the last 16 years. These “working forests”, characterized by more open forest stand structure and reduced fuel loading, are managed with resiliency to wildfire as an underlying goal.

### Treatment History

The rapid assessments addressed the fire's intersection with two prescribed fire treatments (Nixon Rock and Grouse Ridge) and one mechanical treatment (WUI Roads). The site-specific evaluation of the effectiveness of these three treatments is considered representative of the various other fuel treatments situated in or near the Carpenter Road Fire.

Nixon Rock is a 2,882 acre prescribed fire treatment located near the southwest edge of the Carpenter Road Fire area situated approximately 8.5 air miles northwest of the community of Wellpinit. The Nixon Rock project area has been managed over time through a combination of commercial harvesting and precommercial thinning to maintain desirable forest composition, structure, health, and productivity. Prescribed fire was subsequently applied to the project area for the purpose of reducing

surface fuels, modifying vegetation to reduce crown fire potential, to provide defensible space for firefighter and public safety, and to protect natural and cultural resource values in the event of a wildfire.

The Grouse Ridge treatment encompasses 5,560 acres and is located just north of Turtle Lake, about 6 air miles northwest of Wellpinit. The project is situated along a toe-slope of a northeast oriented ridge in the southern end of the Central Mountains. The northeast ridge is dissected on the south side by a series of small ridges in the uppermost reaches of the Little Chamokane drainage. The western portion drains south into Blue Creek. Topography transitions from gently rolling in the southeast near Turtle Lake to steep slopes along the northern upper ridge. Forest cover is dominated by dry open ponderosa pine forest, except in the north where Douglas-fir and other mixed conifer species occur on north slopes. Several young regeneration units are located in the northeast section of the treatment area. As with the Nixon Rock treatment, the Grouse Ridge project area has been managed over time through a combination of commercial harvesting and precommercial thinning, followed up by prescribed fire to reduce dead surface and live ladder fuels to lessen the risk and impacts of intense crown fire to the public, firefighters, and natural resource values.

The WUI Roads treatment consists of a series of roadside treatments strategically located to enhance fire protection and minimize potential resource damage in developed areas. At selected sites forests adjacent to homes and roads have been thinned and the natural fuels and activity slash have been removed or otherwise modified to create open, healthy forest conditions with a relatively clean forest floor. In the event of wildfire these conditions are intended to reduce potential fire intensity, preclude torching and crowning, and thereby provide defensible space for firefighters and other emergency services personnel. The treatments specifically consist of thinning tree seedlings and saplings to 12 to 16 feet apart and then chipping and spreading the slash. No mature trees were included in the treatments.

### **Carpenter Road Fire Summary**

The Carpenter Road Fire started August 14 on a hot, dry, windy day when resources to suppress it were critically low. Inadequate numbers of resources and oven-dry conditions allowed the fire to jump the northern Reservation boundary onto lands administered by the Bureau of Land Management, Washington State Department of Natural Resources, and the Stevens County Fire Protection District.

After a month of hard work the fire was contained on September 18. It burned nearly 21,000 acres of tribal land. An estimated 56 million board feet of commercial timber, valued at over \$14 million burned.



Picture 1: The Carpenter Road Fire on August 15. Photo taken near the town of Creston, Washington. Photo by Brett Larson

## Assessment Findings

### *Safety*

Where fuel loading was light, trees had been thinned and ladder fuels had been removed, fire intensity was lessened. This established tactical advantage for suppression activities because of increased options in fireline placement, escape routes, and safety zones. Ultimately these factors aided in keeping firefighters and public safe.

Although the treatments were able to serve as effective anchor points, at peak burning periods fire intensity the fire still burned with enough intensity that required additional support if the effort was to be successful.

### *Fire Management*

The extensive road system provided the best opportunities for wildfire control lines. Many of the road rights-of-way had received some type of fuel treatment where vegetation was reduced and/or rearranged. These treated road corridors required less work so rate of line construction increased as compared to untreated areas.

### *Fire Behavior*

Roughly 70% of the burned area had little scorch mortality, no crown fire, and limited torching. Creeping backing fires in treated areas had flame lengths as little as 6 inches. An estimated 9% of the fire area experienced crown fire however, with 100% mortality and another 5% of the landscape incurred crown scorch with 100% mortality. The largest crown fire affected 435 acres and ran for almost 2 miles; 200 foot flame lengths were observed. Portions of some fuel treatments overlapped with these areas of extreme fire behavior.

## Summary

Given the size of the Carpenter Road Fire, it's useful to consider the effectiveness of fuels treatments within the larger landscape of integrated forest activities. While a considerable portion of Tribal lands experienced intense fire and severe impacts, particularly in the upper watersheds, at the landscape scale the fire resulted, for the most part, in a mosaic pattern of mixed severity. The overall integrity of forest cover and its important benefits associated with watershed protection, wildlife habitat, forest products and other values is largely intact through the resulting patchwork of surviving timber stands.

A determination of fire impacts to forests was performed during the BAER process. The table below indicates acres in each mortality class by major forest type. Approximately 70 percent of Tribal lands within the Carpenter Road Fire area experienced low mortality levels, whereas 15 percent experienced high levels and 14 percent had extreme levels.

**Carpenter Road Fire Stand Mortality by Major Forest Type**

Forest Mortality Level	Dry Pine Acres	Pine-Fir Acres	Ninebark Acres	Wet Grand Fir Acres	Riparian Acres
Low (<30%)	2,198	5,270	4102	2,698	138
Moderate (30-50%)	49	85	85	51	0
High (50-85%)	183	1,371	841	652	35
Extreme (>85%)	112	806	833	1,134	2
All Combined	2,542	7,532	5,861	4,535	175

A clear causative relationship between fire effects and the variable spatial and temporal pattern of timber management activities over the landscape could not be identified through GIS analysis. However, given the fact that the Carpenter Road Fire burned under near record hot and dry conditions, more severe impacts to forests, soils and watersheds could have been anticipated. These moderated impacts can, to some degree, be attributed to the Tribe's longstanding program of active forest management.

A coarse scale analysis was performed to estimate forest mortality for the fire area outside of the Reservation. The BAER mortality classification was extrapolated through use of the fire BARC image in an iterative ocular process. The results are displayed in the table below. (Mortality classes differ somewhat from the previous table due to the nature of the data.)

**Fire-Related Forest Mortality Levels for Spokane Reservation and Other Ownerships**

Forest Mortality Level	Spokane Reservation		Other Ownership	
	Acres	% of Area	Acres	% of Area
Low (<25%)	11,040	53	14,681	33
Moderate (25-50%)	5,936	29	11,073	25
High (50-75%)	1,849	9	6,578	15
Extreme (>75%)	1,914	9	11,614	26
<b>Total</b>	<b>20,739</b>	<b>100</b>	<b>43,946</b>	<b>100</b>

Based on this methodology, other ownerships experienced more severe fire effects than Reservation lands, with 41% of other ownership lands experiencing high or extreme mortality versus only 18% of Reservation lands.

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# OREGON – CONFEDERATED TRIBES OF WARM SPRINGS

## Treatment History

The County Line 2 Fire intersected several Fuel Treatments including Sunnyside, Westside, Tenino, Muddy Run, and Wolford Canyon treatments. Near communities, fuels treatments focused on reducing brush cover and creating fuelbreaks in continuous cheatgrass fuels. Most treatments not immediately adjacent to communities shared the goal of lowering the probability of catastrophic wildland fire by reducing forest stand density and fuel loading with combinations of thinning and prescribed fire. For example, the Wolford Canyon area had not burned for over 100 years, but the Wildland-Urban Interface Phase 2 Fuel Treatment Project was designed to reduce wildfire intensity and protect the Warm Springs Tribe’s valuable timber assets. It was also intended to provide a landscape-scale buffer for the

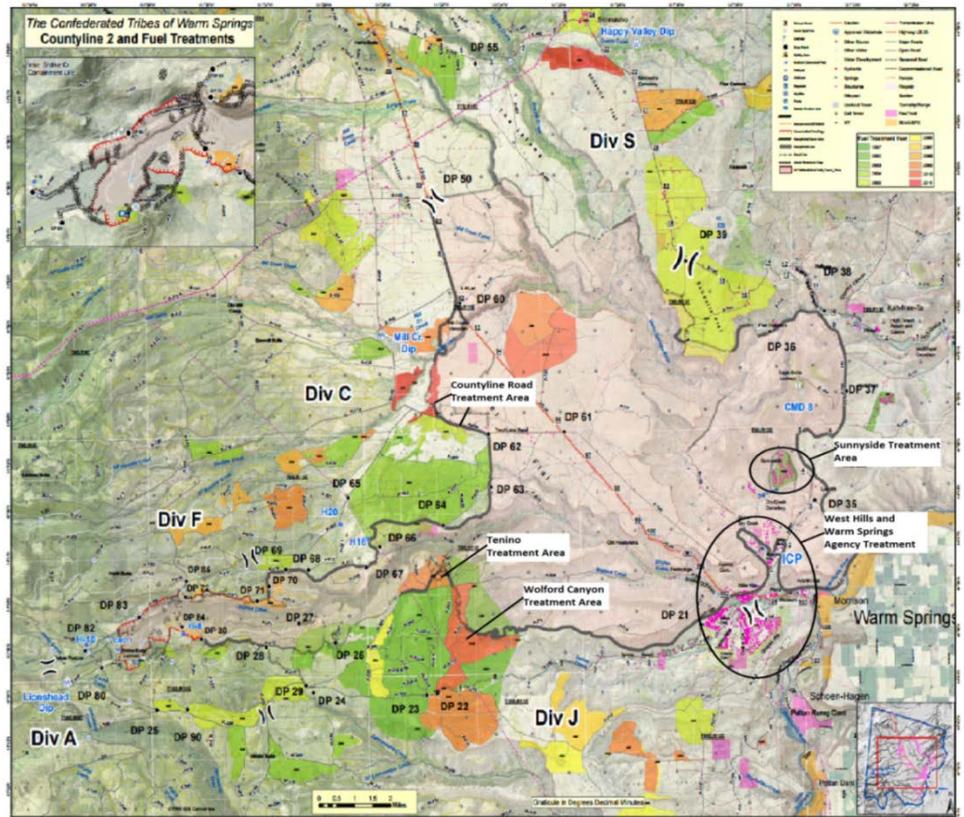


Figure 1. Warm Springs Tribe fuels treatments affected by the County Line 2 Fire.

community of Warm Springs to the east, given the area’s predominantly west and northwest wind patterns. Thinning and pile burning were implemented in 2013 to reduce hazardous fuels, break up vertical and horizontal fuel continuity, and to reduce the risk of stand replacement wildfire.

## County Line 2 Fire Summary

On August 12, several fires started within Confederate Tribes of Warm Springs lands. Extreme fire behavior the first few days resulted from high winds driving the fire through dry flashy fuels. The Kah-Nee-Ta Resort, a subdivision and various residences were immediately evacuated. Seven homes and several structures were destroyed within the first few days. The town of Warm Springs remained threatened throughout the fire’s duration. The fire grew to 67,207 acres before it was safely contained in September. Preliminary suppression costs were approximately \$16.7 million.



Picture 1: County Line 2 Fire in Oregon. Photo by Sam Swetland

## Assessment Findings

### Safety

The Sunnyside, Warm Springs and Muddy Run treatments provided safe locations for burnout operations conducted on the western flank of the fire and protected the public as well as primary structures along Countyline Road. The Tenino and Wolford Canyon treatments protected a major powerline and served as anchor points where suppression forces safely contained the southern advance of the fire.

### Fire Management

All these fuel treatments were utilized in some way by the Incident Management Team. By their strategic placement, fuels treatments near communities provided buffer zones and anchor points. The larger landscape fuels treatments became logical locations to build fireline and control fire spread.

### Fire Behavior

As the wildfire spread west through Wolford Canyon, widespread group torching and crown fire left few green trees (Picture 3). When the fire reached the Wolford Canyon fuel treatment however, this extreme fire behavior ended and the fire continued as a surface fire with only isolated group torching.

Spatial fire behavior modeling depicts the effectiveness of the fuel treatment in mitigating the extreme fire behavior (Figure 2).



Picture: 2: Aerial view looking north at top of Wolford Canyon. Left side of photo shows WUI Fuels Treatment. Note widespread tree mortality at the top of the canyon (right) and only isolated patches of mortality within the treatment (left). Photo by Bob Sjolund

2). Simulating the observed fire behavior using weather and fuel inputs from the time of the fire demonstrates how risk of catastrophic wildfire can be reduced by fuel treatments even during periods of extreme fire danger.

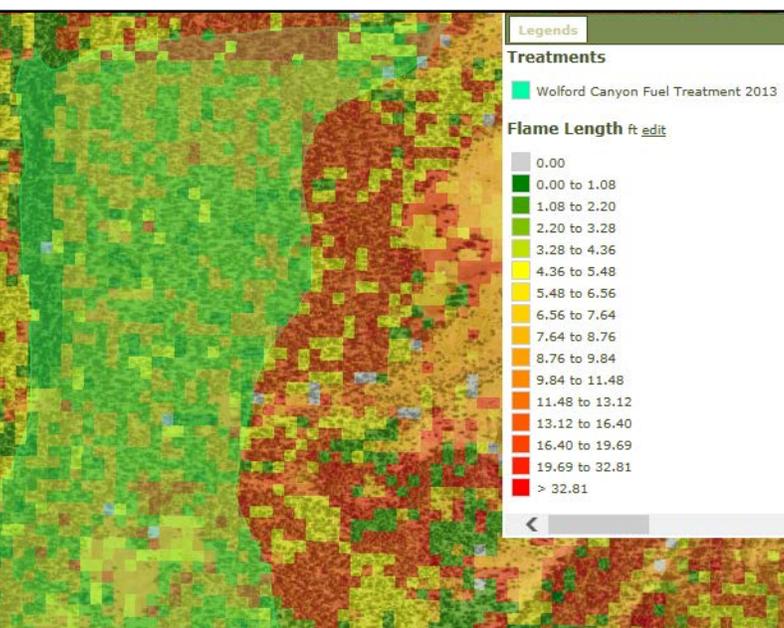


Figure 2. Fire behavior model showing greatly reduced flame lengths inside the Wolford Canyon fuel treatment.

2). Simulating the observed fire behavior using weather and fuel inputs from the time of the fire demonstrates how risk of catastrophic wildfire can be reduced by fuel treatments even during periods of extreme fire danger.

## Summary

The fuels treatments were designed with objectives aimed at mitigating extreme fire behavior in the form of high rates of spread and crown fire. Fuel breaks near communities protected homes and served as anchor points to initiate burnout operations. The Wolford Canyon and Tenino treatments dramatically mitigated extreme fire behavior. Effectiveness of the fuels treatments that encountered the County Line 2 Fire was due to their strategic placement near highly valued assets and resources such as homes and timber stands. Incident Management Teams tactically leveraged fuels treatments during the fire to safely enhance and hasten fire containment.

# WASHINGTON – CONFEDERATED TRIBES OF THE COLVILLE RESERVATION

## Treatment History

There were four assessments that took place on the Confederated Tribes of the Colville Reservation within the North Star and Tunk Block Fires. These were the Clark Creek thin and broadcast burn treatment (completed in 2011), and the Jim Creek thin, machine-pile, and pile burn treatment (completed in 2010), North Nespelem thin and underburn (2011), and Highway 155 mechanical (2007-2008) and prescribed burn (2010).

The Clark Creek Treatment is a 1,100 acre treatment comprised of thinning, and broadcast burning. The Jim Creek Treatment is a 171 acre treatment consisting of thinning, machine piling, and pile burning. Similar in eco-types, both treatments are designed to protect communities, infrastructure, and natural resources.

Ponderosa pine, scattered Western larch and Douglas-fir, and an understory of pine litter and shrubs make up the dominant vegetation of the North Nespelem Homesites Fuel Treatment. Located along a main dirt road on the edge of a valley that contains houses, ranches, and associated infrastructure, the treatment is strategically placed to protect the homes and infrastructures in the valley and to serve as anchor points for burnout operations.

Highway 155 is a major highway corridor on the Colville reservations. Colville forest management activities along the Highway corridor compliment the mechanical and prescribed fire fuels treatments that took place in 2010. Although not specifically aimed at fuel reduction, thinning treatments were strategically placed and help to reduce the potential for active crown fire.

## North Star and Tunk Block Fire Summary

The North Star fire was a human caused fire that started on the Colville Reservation on August 13. Prolonged hot weather, dry conditions, and sustained winds provided perfect conditions for large fire growth. Over the course of the 57 days only one minor structure was burned despite frequent evacuations, road closures, and intense fire behavior. Total size of the fire was 218,000 acres, 165,000 acres on the Colville Reservation, and it cost roughly \$48 million to suppress. It was the state's largest fire in 2015.

The lightning-caused Tunk Block Fire was discovered the afternoon of August 14 about ten miles northeast of Omak, Washington on privately owned land north of the Colville Reservation. It burned for 64 days through timber, grass, shrubs, and logging slash, burning close to 166,000 acres while destroying 98 residences and 47 other structures. About half of the fire was within the Colville Reservation. When it was declared out on October 9, suppression costs were projected to reach \$12 million.

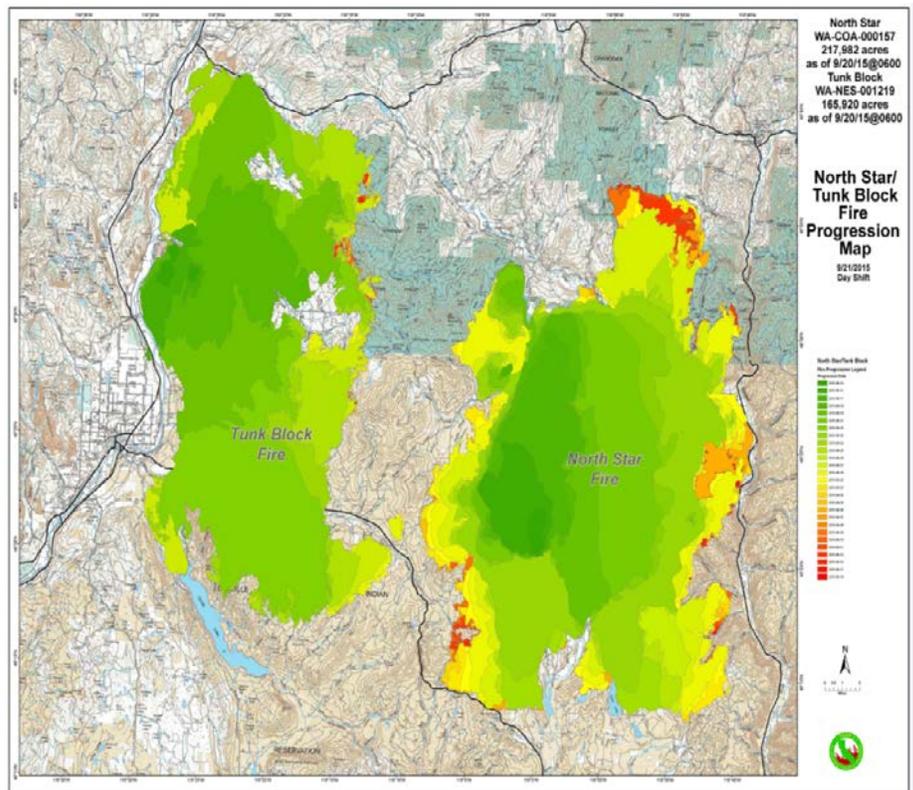


Figure 3: Fire Progression map of the Tunk Block and North Star Fires

## Assessment Findings

Hazardous fuel treatments and forest activities provided firefighter and public safety, particularly where they were located near the community of Nespelum and highway 155. Tree mortality was minimized in these treated areas. At the landscape scale, however, the scale of the two fires overwhelmed the scope of existing fuels treatments.

### *Safety*

Thinning and broadcast burning reduced overall fuel loading. The resultant reduced fire behavior made it safer for firefighters to provide protection to the communities in and around the Moses Meadows and North Nespelum areas. The North Star Fire was able to stay below the canopy and creep downhill slowly. Crown fire activity became less active. In the Jim Creek Thinning Treatments, firefighters were able to use direct tactics safely. In the Highway 155 treatment area there was no need to place firefighters at risk to hold the southern perimeter of the North Star Fire. Combining forest management and fuels treatments along this major highway also maximized firefighter's ability to access containment lines.

### *Fire Management*

Low fire intensity inside the North Nespelum treatment made it safer for firefighters to hold a road below the treated area. Along the Highway 155 Treatment area, the fire treatments significantly lengthened the distance necessary for fire to spot across. When the approaching fire hit the treated area, fewer firefighters were needed to hold the fire. With firefighters already in short supply, this was a key success.

### *Fire Behavior*

In the Clark Creek treatment, active crown fire with over 100-foot flame lengths changed to a surface fire, which also aided firefighter's ability to safely conduct more direct suppression tactics. By reducing the amount of vegetation on the ground, the highly-valued middle-aged to old-growth stands adjacent to the Clark Creek and Jim Creek and treatments were protected. Heavy thinning and pile burning along the Highway 155 corridor removed a lot of potential energy, so that when the fire did enter the treated area, there was little overstory mortality.

## Summary

Fuels treatments composed of thinning followed by prescribed fire routinely reduced fire behavior and minimized negative fire effects. Although the treatments were effective and strategically placed, the magnitude of the fires eclipsed their effectiveness at landscape scales.



Picture: 3: Before and after pictures showing Jim Creek Treatment Area

## IDAHO – NEZ PERCE TRIBE

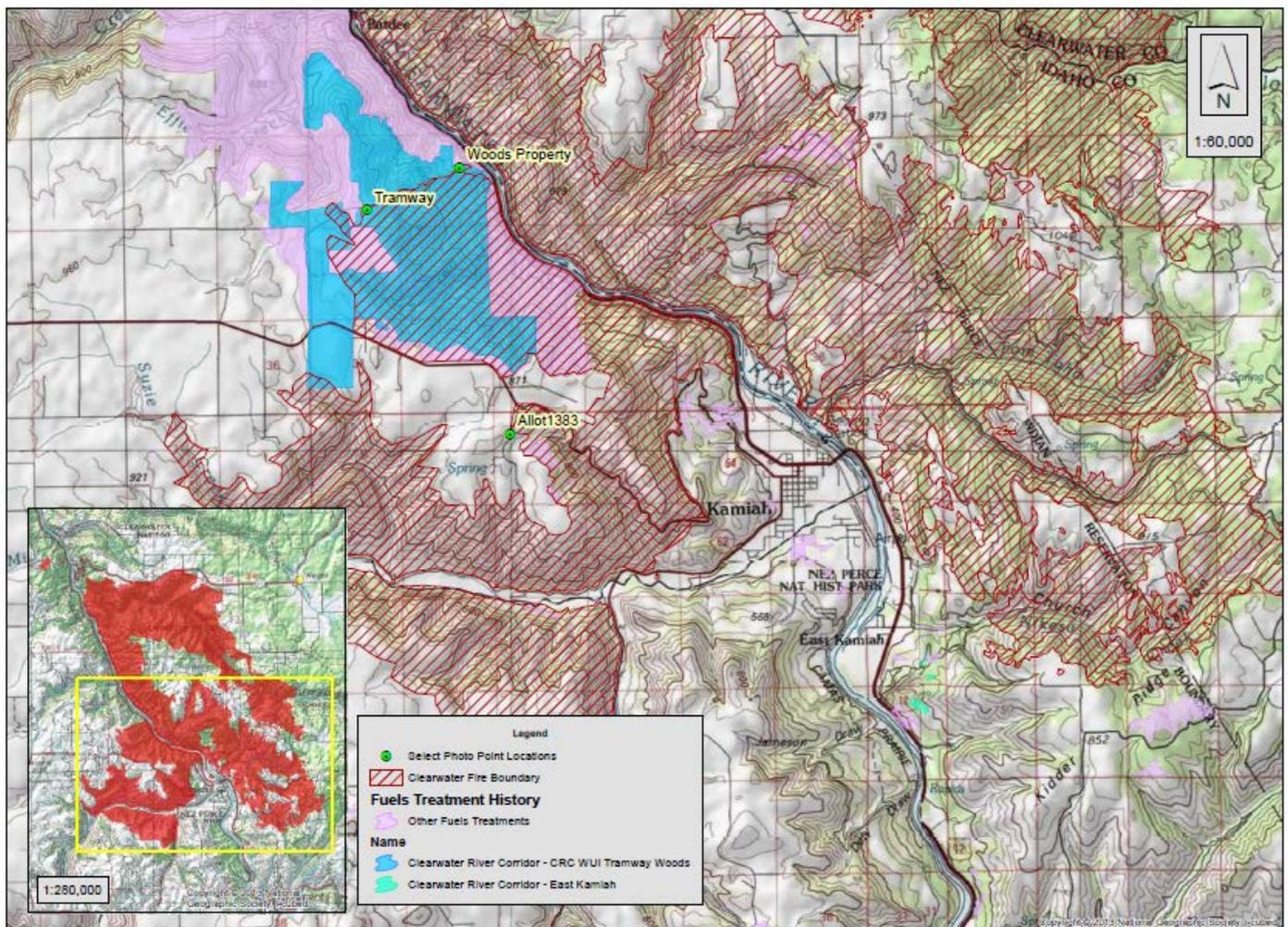
The Nez Perce Reservation has been integrating land management activities such as commercial timber harvest, precommercial thinning, and livestock grazing for decades. Between 2003 and 2015, the Tribe has completed 31,633 acres of fuel treatments. Grazing, prescribed burning, mastication, and thinning account for 84% of the acres treated.

### 2015 Nez Perce Wildfires

The Clearwater Complex Fires were originally comprised of 21 separate wildfire ignitions started from a lighting event August 10. Most of these fires eventually coalesced into three major wildfires: Clearwater, Fisher, and Municipal/Hill. The fires burned for 34 days, mostly under extremely hot, dry, and windy conditions that contributed to extreme fire behavior and rapid growth. During the initial phases of the Clearwater and Fisher fires, 46 primary residences and more than 75 outbuildings were destroyed. In total 71,034 acres burned.

### Treatment History

The Clearwater Complex Fires intersected 18 fuel treatment projects that totaled 3,325 acres. Due to the checkerboard ownership of the tribe, treatments were scattered throughout the wildfire area.





Picture 4: Clearwater River Corridor Grazing Treatment, Tramway site. Grazing reduced loading and continuity of herbaceous fuels. After wetting rain and subsequent green-up cattle soon returned to the burned area.

## Assessment Findings

Using a variety of treatment methods, activities are effectively reducing vegetation built up and fire risk. Strategically placed treatments moderated fire intensity and aided in controlling the spread of the fires, thereby possibly avoiding damage to additional areas. The benefits were most tangible within the rural communities of Kamiah, Orofino, Nezperce and Reubens. The treatments also improved the success of various evacuation efforts that took place on all the fires within the Clearwater Complex.

### *Safety*

Fuel treatments were scattered throughout the fire area due to the checkerboard ownership pattern but moderated fire behavior where risk was highest near communities.

### *Fire Management*

Mechanical and grazing fuel treatments reduced the overall fuel loading available for

the wildfire to burn. Due to limited firefighting personnel the fire was allowed to burn through these fuel treatment areas so that efforts could be focused on higher priority areas. Other areas along the perimeter of the fuels treatment were used as control points, especially those adjacent to roads.

Fuels treatments also minimized damage to resources. In the treatment areas, the fire had low to moderate fire behavior and was spreading with flame lengths less than four to six feet. Additionally, the overstory trees had minimal damage with very little tree mortality.

### *Fire Behavior*

The wildfire burned as a surface fire through the treated areas with minimal torching and fire spread rates were also reduced.

## Summary

Treatments in this area were designed to reduce large fire growth in order to protect communities, infrastructure, and natural resources. Assessments showed strategically located treatments did assist in controlling the fire and reduced large fire costs. By reducing the fuel loading, treatments reduced the intensity of the fire, allowing for easier containment and control.

## CONCLUSIONS AND RECOMMENDATIONS

- Fuels treatments that are strategically placed to protect communities and other assets in the Wildland Urban Interface consistently reduced fire behavior, provided tactical advantage to suppression resources, or both. Anecdotal evidence suggests that the moderated fire behavior provided additional time for evacuation efforts.
- Control of fire spread was most effective where suppression actions were executed in fuel treatments strategically placed in areas with good roads. These roads not only provided access for suppression resources, but were commonly used as control lines (Carpenter Road, North Star, Tunk Block).
- Mechanical treatment such as thinning followed by prescribed fire had the most pronounced influence on reducing fire intensity, the incidence of crown fire, and resulting tree damage and mortality (Carpenter Road, North Star, County Line 2).
- Wildfire impacts were moderated as a result of resilient forest characteristics created and maintained by long-term Tribal forest management activities, including commercial harvest and forest development. Forest management is not a substitute for objective-based fuels management, however. The history of active forest management in the BIA Northwest Region has undoubtedly promoted forest health and resiliency by modifying stand structure, but working forests also generate “activity” fuels that have the potential to worsen fire intensity and result in severe fire effects. Timely fuels treatments with quantifiable fuel reduction objectives are the final step in an integrated forest/fuels management cycle aimed at minimizing highly negative fire effects when the inevitable wildfire occurs.
- Extreme fire behavior can render all but the most recent fuels treatments ineffective or only partially effective. Fuels treatments shouldn’t be considered as “one-time” activities. Fuels planning should consider the concept of treatment longevity and address scheduling of “maintenance” treatments. Spatial modeling tools have become more accessible in recent years and should be used to design fuels treatments with particular problem fire weather in mind.
- Generally highly effective at protecting values-at-risk in WUI areas, to be able to affect fire spread and behavior at landscape scales (the scales of the 2015 wildfires) fuels treatments must also be landscape scale. Programs should explore the potential for designing larger individual fuel treatments in the Northwest Region, and larger treatments can have lower per acre costs due to economies of scale. Due to finite fuels management funding however, an additional option for fuel reduction at landscape scales is using wildfire as a fuel treatment at moderate fire weather. Suppressing every fire during less than severe fire weather conditions results in additional fuel buildup that will eventually burn at extreme fire weather when suppression is ineffective.
- Grazing effectively reduced fire intensity and spread rate in grass fuels during the Nez Perce fires. Often overshadowed by forest-based fuels treatments adjacent to communities, fuels treatments in grass and brush fuels are critically necessary, sometimes on an annual basis, to protect homes, infrastructure, and lives from racing, wind-driven wildfires.

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Marissa Stradley – Confederated Tribes of Warm Springs Specialist  
Rebecca Peone – BAER Coordinator & Fire Monitoring Specialist Colville Tribes  
Phil McGlaughlin – Monitoring Specialist Colville Tribes  
Lonnie Cawston – Fuels Planner Colville Tribes  
Steve Laramie – Fuels Program Manager Bureau of Indian Affairs for Colville Agency  
Brandon Sutton – Assistant Fire Management Officer Colville Tribes  
Henry Kuhne – Engine Boss Colville Tribes  
Tim Droegmiller, Nez Perce Tribe Fuels Management  
Jeff Handel, Nez Perce Tribe Fire Management  
Kim Kelly, BIA Northwest/Rocky Mountain/Alaska Region Fire Ecology  
Fred von Bonin, BIA Southwest Region Fuels  
Hal Luedtke, BIA Southwest/Navajo Region Fire Ecology  
Paul Pooler, BIA Midwest/Great Plains Region Fire Ecology  
William Grauel, BIA National Fire Ecology