2014-2015 Webinar Series
October 16, 2014

Maple Ridge RX Burn
Mio Ranger District 2014

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Maple Ridge RX Burn

MIO RANGER DISTRICT

2014

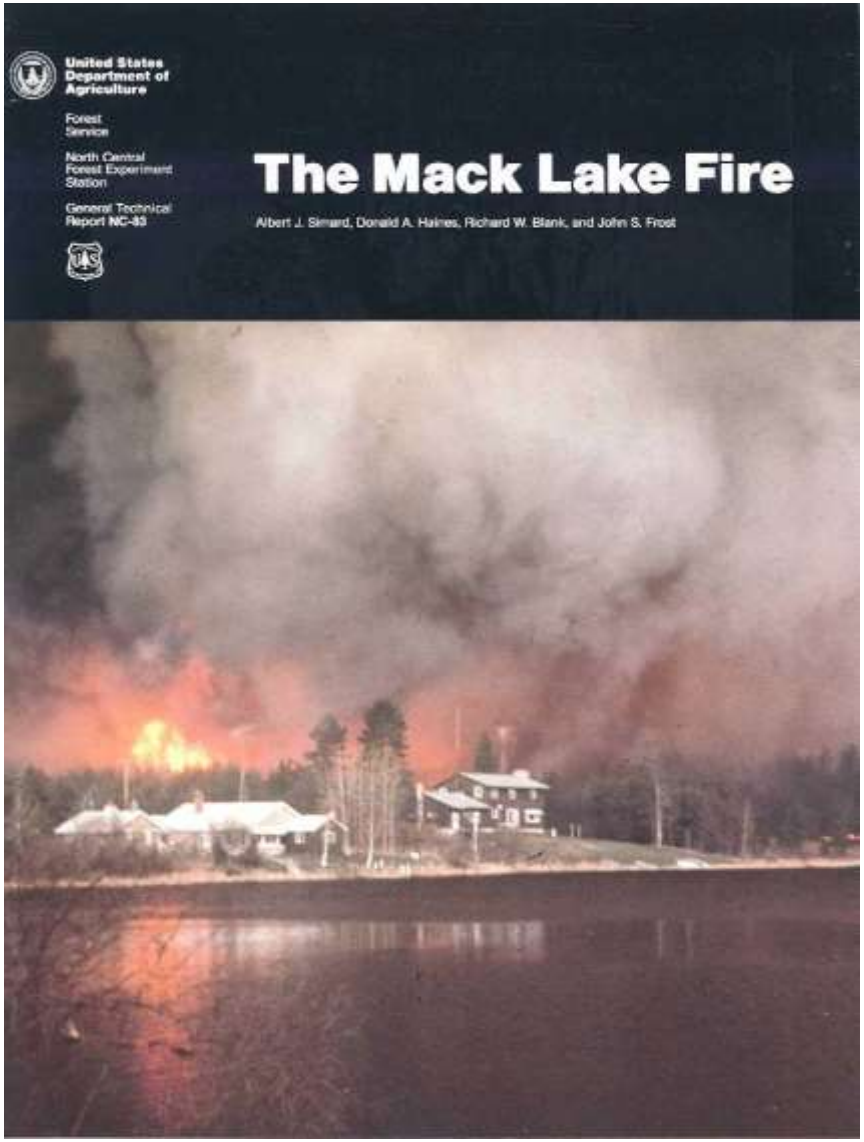
History of the Project Area

Maple Ridge RX within the 1980 Mack Lake Fire Perimeter

The 1980 fire was an escaped prescribed fire

USFS Dozer operator perished, 44 structures lost, 24,000 acres consumed. HMNF reputation destroyed

Maple Ridge RX burn proposed immediately adjacent to the Mack Lake subdivision and near the fatality site



2010 Fuelbreak Expansion

ARRA (Stimulus) funds used to more than double the size/width of most of the fuelbreak complex around Mack Lake

However, the fuelbreaks on the northwest portion of the subdivision are not improved.

2012 Little Mack Lake Wildfire

800 acre crown fire successfully suppressed by USFS, DNR, VFD's

Fuelbreaks along west side of subdivision allowed firefighters to burnout fuel and prevent structure loss

After 32 years the subdivision has a very positive impression of USFS firefighting capability and skill!!!!

Politics & Human Factors

USFS has a tarnished reputation, but very recent major successes

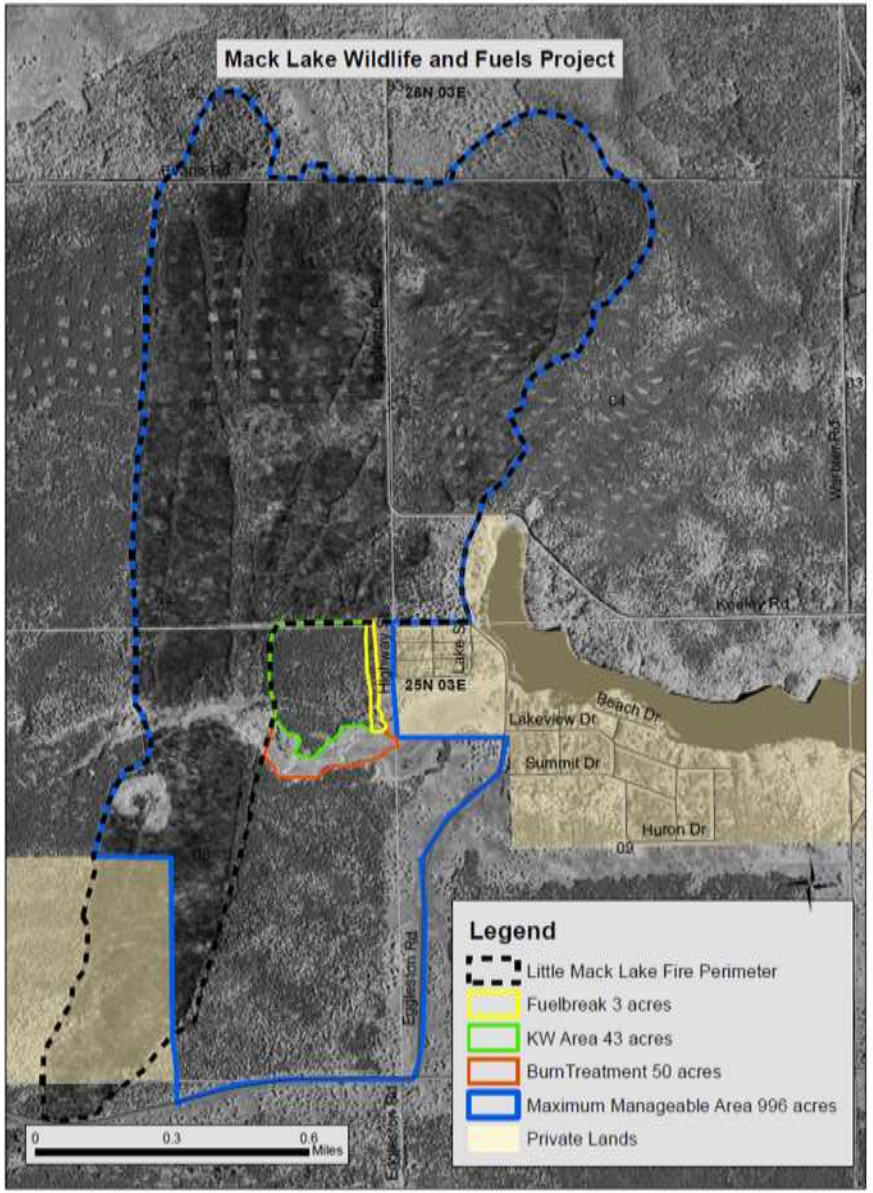
Some residents lived through the 1980 fire and remember it well

Crown fire has never been used as a management tool, generally viewed as unsafe

1980 Mack Lake Fire naturally creates a lot of fear internally and externally

CE Decision 2013: Prescribed Burn, Fuelbreak, KW habitat, and MMA

- 50 acres burned once with high intensity fire
- 3 acre fuelbreak was constructed mechanically in 2013, and may be burned with low intensity fire for maintenance.
- Up to 43 acres would be allowed to regenerate to jack pine habitat for KW.
- 996-acre MMA has low fuels due to recent fire



Project Decision Appealed

- One resident appealed to project, primary concerns:
- Impacts to bald eagle nest to the east
- Visual aesthetics of the burned area
- Contend lack of need for KW habitat due to acres created by the wildfire
- Contend 200’ fuelbreaks are adequate, no need to increase the size
- Worried a repeat of 1980 escaped prescribed fire

Decision Upheld

- Appelants and the agency could not informally resolve the appeal
- Review of appeal points and project record found no breach of law, policy, regulation. Decision was upheld
- Project prohibited a west wind protecting subdivision and eagles nest
- Need for KW habitat clearly explained
- Impact to scenery was likely

What is the Risk?

Management Ignited	Wildfire
• Firelines pre-established • Weather in prescription • Resources trained, prepared, and onsite • No need for evacuations • Minimal to no aviation needs • Endangered species habitat created and hazardous fuels reduced at the optimum time and place • Very Remote chance of escape and resulting political and financial ramifications • Political risk is accepted by agency • Minimize safety risk to emergency responders and public	• Must construct firelines at the time of incident • Weather not favorable • Resources not on scene in a timely fashion • Evacuations are likely • Heavy dependence on aviation • Fuels reduction and habitat creation in the wrong place at the wring time • More resources will be needed thus more risk exposure (air, law, VFD, etc.) • Agency cannot be blamed for starting the fire • Transfer of safety risk to emergency responders and public

How Was The High Intensity Fire Controlled

- Extremely strong control features of fuelbreaks, crown fire scar, and wetlands surrounding the entire project
- Available grass fuels in the swamp and fuelbreak were ignited on a day prior to the jack pine burn. Threat of direct surface fire spread to the subdivision will be eliminated
- Burning was conducted during an evening forecasted for good humidity recovery overnight (See example)
- Ignition was conducted in the evening at the end of the burn window. Weather conditions did not support intense burning other than the 1-2 hours it will take to ignite the unit
- Evening conditions provided light winds allowing column to rise vertically, reducing spotting distance
- West winds are prohibited in the burn plan to prevent spotting into the subdivision
- MMA gave the Burn Boss flexibility in fire control, especially since humidity recovery will rapidly reduce fire behavior
- Project area is very small, water source (Mack Lake) is ¼ mile away
- Bottomline the RX fire did not have the fuel, weather, time, or space for any realistic chance of escape outside of the burn unit or the MMA.

We Have Done this Before!

- 300’ fuelbreak just west of Mio
- 8/19/2011 Temp 82 RH 42% winds 0-5 mph
- Pole size jack Pine
- Pockets of torching, group torching and high intensity surface fire. 30% stand mortality
- Fuelbreak on pressure side of burn
- 1 spot @ 200’ suppressed by shovel

Camp 10 RX burn: Jack pine mortality from moderate to high intensity fire with single & group torching

Why Not Mechanical Harvest & Planting

- Requires EA, cost, and timing concerns
- Submerchantable JP removal cost $710 an acre on neighboring FB's w/ARRA funds
- Planting after harvest can cost as much as $600 an acre
- RX burning cost estimated at $100 an acre, with no reforestation cost
- Burning cost $100 ace to harvest and planting of $600-1300 acre
- Time needed to complete EA 1+ years, Timber sale contract 2-3 years, then another year to plant makes age of trees different from 2012 wildfire which is not optimum for habitat.
- Ecologically stand replacing fire is best treatment method (soil nutrients, soil disturbance, snags, downed wood, etc.)

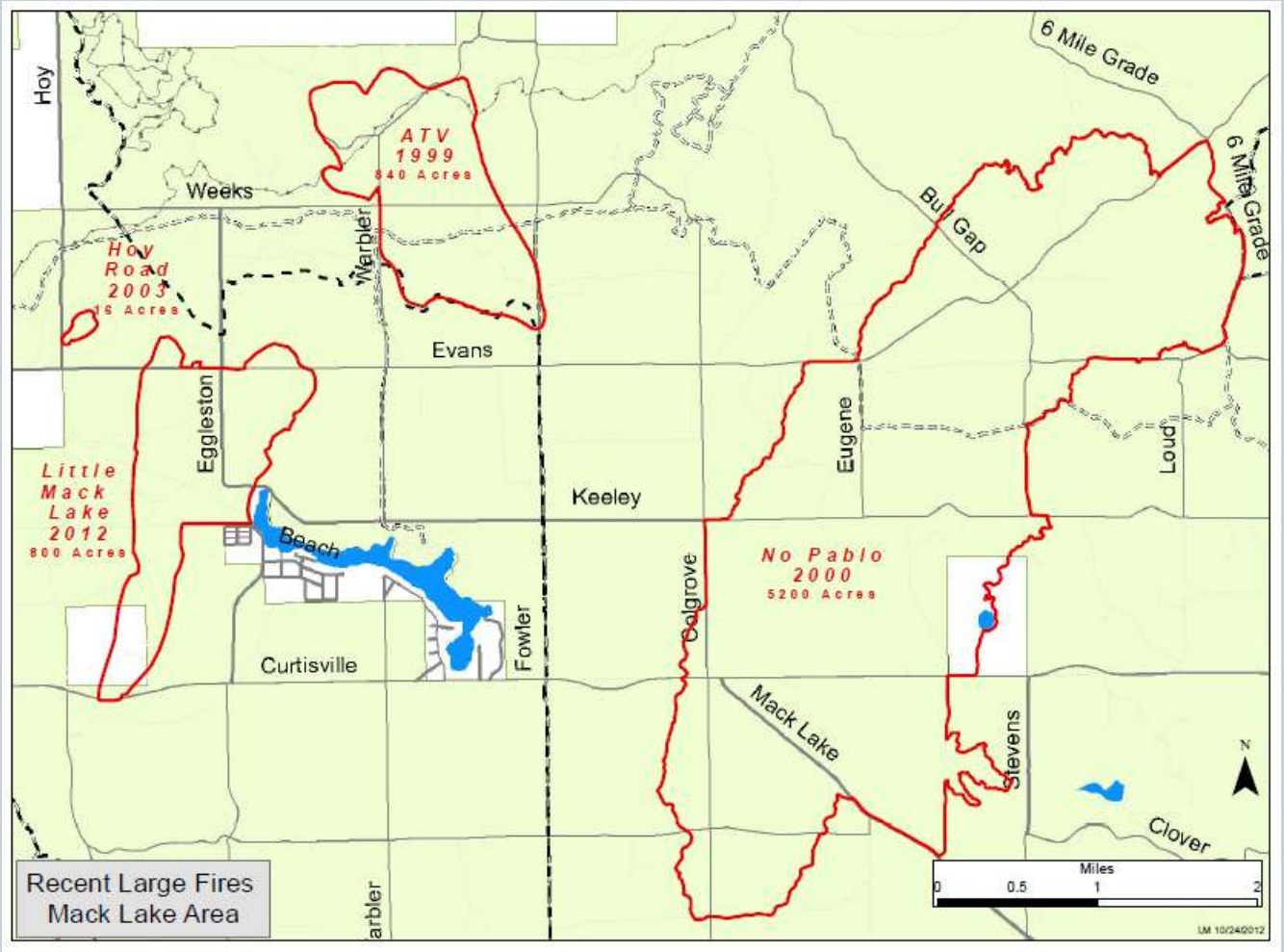
Sample Burn Window

Tabular Listing: May 8, 2013 - 11:49 through May 9, 2013 - 12:49 EDT

Time(EDT)	Temperature ° F	Dew Point ° F	Relative Humidity %	Wind Speed mph	Wind Gust mph	Wind Direction	Quality check	Solar Radiation W/m*m	Precipitation accumulated in	Fuel Temperature ° F	10 hr Fuel Moisture gm	Battery voltage volt
12:00	79.0	36.9	22	4	9	WSW	OK	889.0	0.21	93.0	9	13.70
11:00	76.0	39.6	27	4	6	WSW	OK	105.0	0.21	87.0	10	14.00
10:00	71.0	40.4	33	3	7	SW	OK	583.0	0.21	81.0	11	13.90
9:00	60.0	41.8	51	3	4	SSW	OK	109.0	0.21	66.0	14	13.60
8:00	52.0	41.8	68	2	6	ESE	OK	232.0	0.21	52.0	14	13.00
7:00	44.0	39.5	84	5	7	W	OK	59.0	0.21	41.0	11	13.00
6:00	41.0	39.7	95	2	3	NW	OK	0.0	0.21	35.0	10	13.00
5:00	41.0	39.9	96	2	3	NW	OK	0.0	0.21	33.0	8	13.00
4:00	41.0	40.5	98	1	2	WNW	OK	0.0	0.21	33.0	7	13.00
3:00	42.0	40.7	95	0	0		OK	0.0	0.21	36.0	7	13.00
2:00	44.0	42.1	93	0	0		OK	0.0	0.21	36.0	7	13.00
1:00	46.0	42.9	89	0	0		OK	0.0	0.21	39.0	6	13.00
0:00	49.0	41.4	75	0	0		OK	0.0	0.21	43.0	6	13.00
23:00	53.0	41.6	65	0	2	WNW	OK	0.0	0.21	45.0	6	13.10
22:00	57.0	39.5	52	0	4	WSW	OK	0.0	0.21	49.0	6	13.10
21:00	65.0	37.4	36	3	6	E	OK	5.0	0.21	60.0	6	13.10
20:00	71.0	38.0	30	5	10	ESE	OK	59.0	0.21	70.0	7	13.10
19:00	74.0	35.9	25	7	12	SE	OK	105.0	0.21	74.0	7	13.10
18:00	76.0	36.6	24	5	9	ESE	OK	260.0	0.21	78.0	7	13.30

Ex. RX window 2000-2200, light winds, dry fuels, recovering humidity

Wildfire Not if, But When!

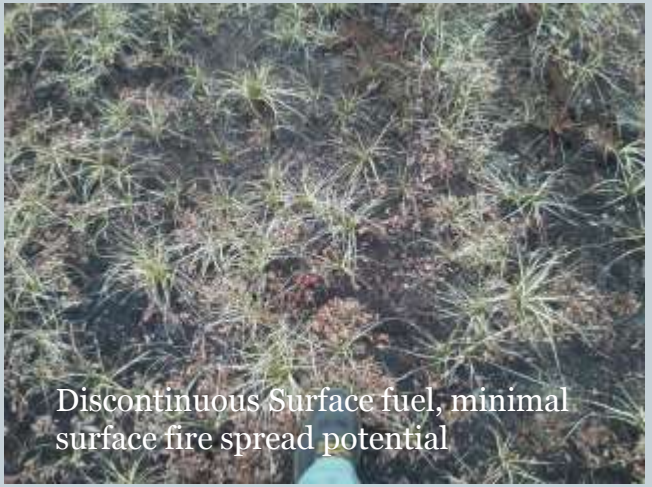


Fire Control Features

No Crown Fire Risk in most of the 2012 wildfire scar North & West flanks

300’ fuelbreak protects west flank of subdivision, RX fire completed fall 2013, no available fuel

Swamp is full of water on south flank, is green in the summer, RX fire April, 2014 removed dead thatch



Discontinuous Surface fuel, minimal surface fire spread potential

Fuel break on the east border of the burn is now black and 300’ wide

North and West sides already burned in 2012 Little Mack Lake Fire (reduced fuels)

Wetland on the south border of the burn, thatch burned off April 2014

Aerial View of Fire Control Features

Ignition of perimeter began at 1900 hours

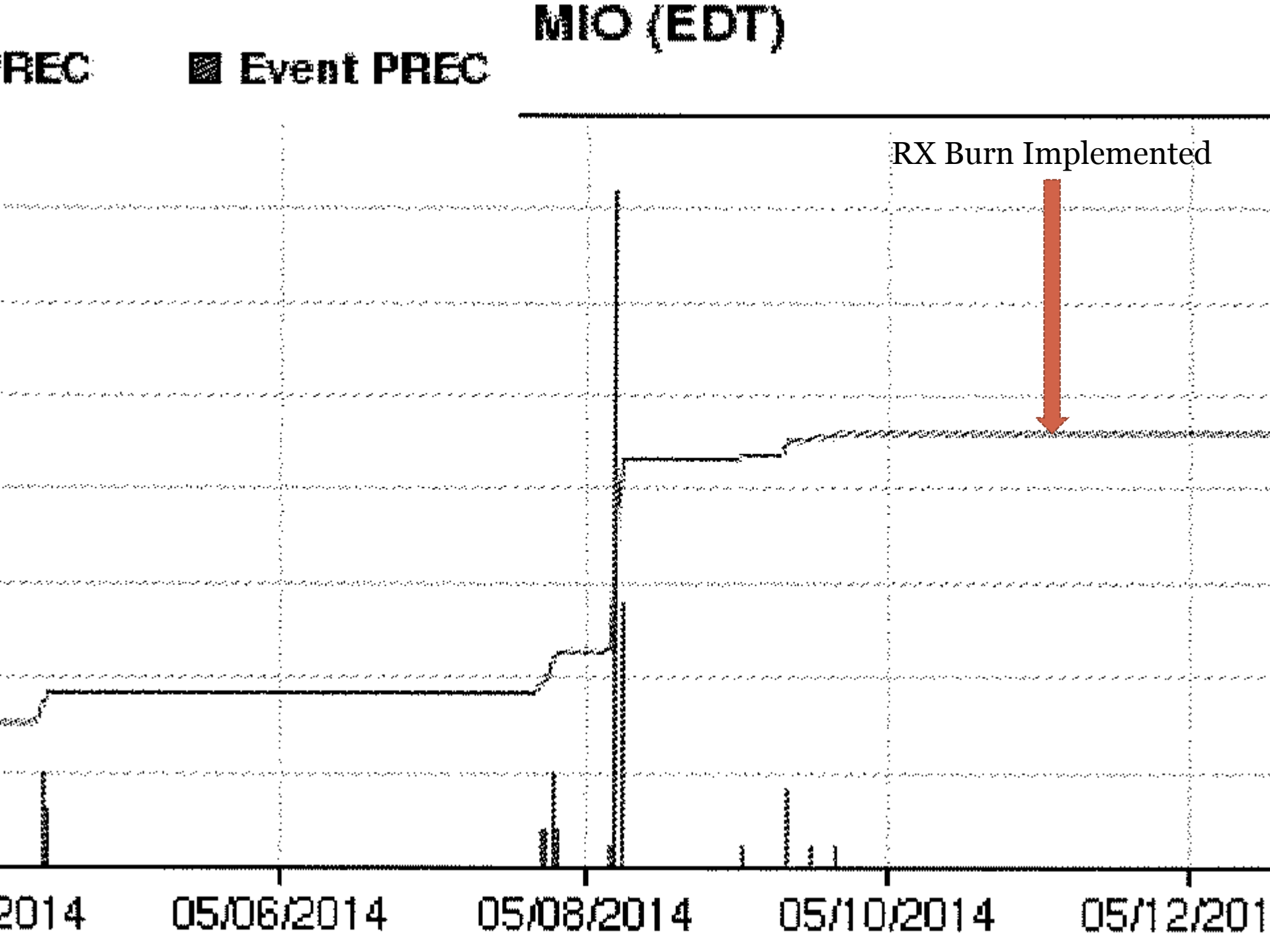
3 Dozers, 6 engines, 1 UTV on scene. Spotter plane and T3 helicopter on scene and available for recon

1900 on site weather temp 75, RH 31%, Winds south 1-3 MPH, PIG 40%

Two days since rain of .07” on 5/9

One week period prior to burn approx. 1” of rain in multiple events

Maple Ridge Burn Implemented on 5/11/14 @ 1900 hours. Backing fire off of north control line.


MIO (EDT)
REC
Event PREC
RX Burn Implemented
2014
05/06/2014
05/08/2014
05/10/2014
05/12/201

Initial stages of ignition required creating black on north control line due to south winds

Patrol 7 (fixed wing) used to detect any long range spotting. Only short range spotting occurred during this stage of ignition

Strip head fire being used to blacken north control line. South wind pushing smoke and fire north

Ignition of north, east, and west flanks proceeded from 1900-2000

On site weather at 2020 temp 71, RH 38%, winds light S-SE

Backing fire was predominantly <2' flame lengths with occasional flare ups and isolated torching in fuel jackpots

Active backing fire, north flank of the burn unit

No control problems other than spotting immediately across north control line

Crews using strip head firing, interior spot ignition with hand fired munitions, and begin a center firing operation.

Picture taken from resident's front yard along the east fuelbreak

Ignition of main crown fire initiated at approx. 2030 with strip head fire after N, E, & W control lines blackened

Black line along north control line complete

Spot ignition of interior, and ignition of east and west flanks underway

Equipment parked in east fuelbreak adjacent to the subdivision

Picture from Patrol 7, east fuelbreak, east flank ignition

Southern portion of the unit ignited by strip head fire.

Flanking fire and centerfire, combine with north running strip head fire to consume the majority of the unit within approximately 5 minutes.

2100 weather temp 68, RH 47%, winds light S-SW

Flame lengths 100-200’ during peak of crown fire run

Crown fire run through the main body of the unit at approximately 845 pm

Crown fire travelled an estimated 1041 feet in 3-5 minutes.

Estimated ROS of 189-315 ch/hr, or 2.3-3.9 MPH

Very fast walking pace on smooth ground (pack test) is 4MPH

Only one 20'x20' spot fire detected by ground personnel 298' from the north control line within the MMA in light grass fuels from the 2012 wildfire. Suppressed by hand tools

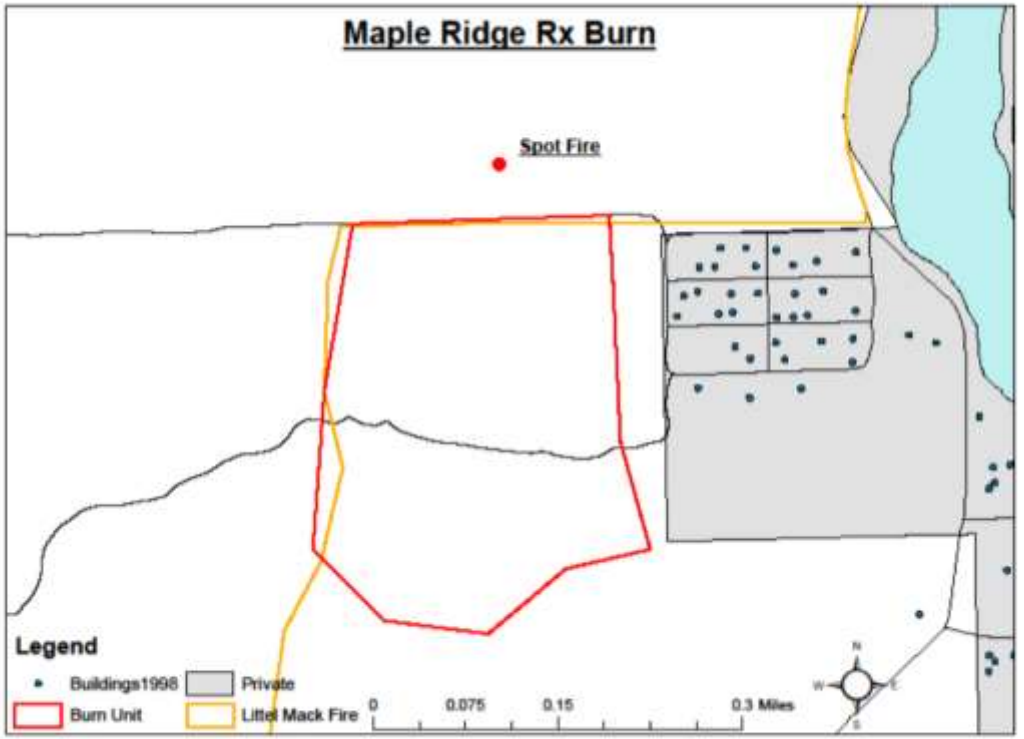
Multiple small spot fires within 50' of the line suppressed by hand tools. No other suppression problems

Crown fire advancing on the north control line

Add Short Movie!!!

PIG was 40% @ 1900 eliminating most spot fire ignitions even with very intense crown fire

Surface & Crown (3'-16' measured height) temperatures measured as low as 200 degrees up to 800+ w/ heat sensitive paint tiles



One main spot fire at the head of the RX burn, approximately 300' from the line, short grass fuels, 20x20'

Southern most strip of unit adjacent to swamp ignited just before 2100. Temp 68, RH 47%

Crown fire consumed remaining jack pine by approx. 2110

No spotting or holding concerns

2200 weather, temp 61, RH 50%, light winds. 2 dozers and 3 engines released

Last strip of crown fire moving north from swamp at 2105

Humidity increased by 20 percentage points during the burn

Temperature decreased 9 degrees during the burn

Winds dropped from 8 MPH to 3 MPH

Wind direction changed from SW to NE during those 2 hours of ignition at the Mio RAWS

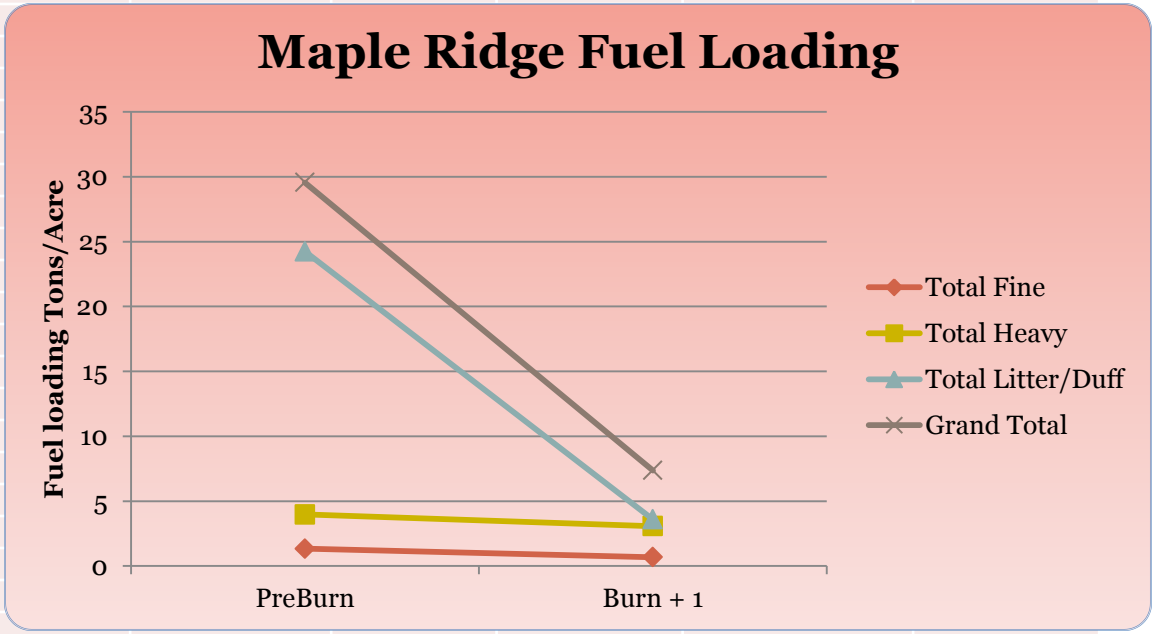
Time(EDT)	Temperature	Dew Point	Relative Humidity	Wind Speed	Wind Gust	Wind Direction	Quality check	Solar Radiation	Precipitation accumulated	Fuel Temperature	10 hr Fuel Moisture	Battery voltage
	° F	° F	%	mph	mph			W/m*m	in	° F	gm	volt
23:00	59.0	38.2	46	3	7	NE	OK	0.0	28.15	55.0	7	13.20
22:00	63.0	39.5	42	4	9	NE	OK	0.0	28.15	61.0	7	13.20
21:00	67.0	46.7	48	3	10	NE	OK	0.0	28.15	63.0	7	13.20
20:00	74.0	42.3	32	5	10	SSE	OK	50.0	28.15	73.0	7	13.30
19:00	76.0	40.5	28	8	11	SW	OK	191.0	28.15	79.0	7	13.40
18:00	77.0	39.5	26	9	16	W	OK	314.0	28.15	82.0	7	14.00
17:00	78.0	37.2	23	9	15	SSW	OK	701.0	28.15	90.0	8	14.40
16:00	78.0	37.2	23	7	14	WSW	OK	948.0	28.15	88.0	8	13.70
15:00	76.0	36.6	24	7	19	SW	OK	401.0	28.15	82.0	8	14.60
14:00	76.0	36.6	24	9	17	W	OK	410.0	28.15	85.0	8	13.90
13:00	76.0	30.8	19	4	12	W	OK	980.0	28.15	92.0	9	13.80
12:00	73.0	30.8	21	4	12	S	OK	870.0	28.15	90.0	10	13.80
11:00	67.0	32.8	28	5	11	SW	OK	328.0	28.15	77.0	11	14.00
10:00	61.0	35.9	39	4	7	W	OK	287.0	28.15	65.0	12	13.80
9:00	56.0	35.5	46	4	5	WSW	OK	223.0	28.15	61.0	14	13.40

Mio RAWS reading 8 miles NNW of project site

Fuel loading reduced from 30 tons/acre to 7 tons/acre

Fuels reduction primarily in litter & Duff

Date	Treatment	Total Fine	Total Heavy	Total Litter/Duff	Grand Total
5/11/2014	PreBurn	1.334	3.981	24.242	29.557
5/12/2014	Burn + 1	0.689	3.081	3.59	7.36



Pre & Post burn fuel loading Data

Majority of the jack pine unit is in this condition.

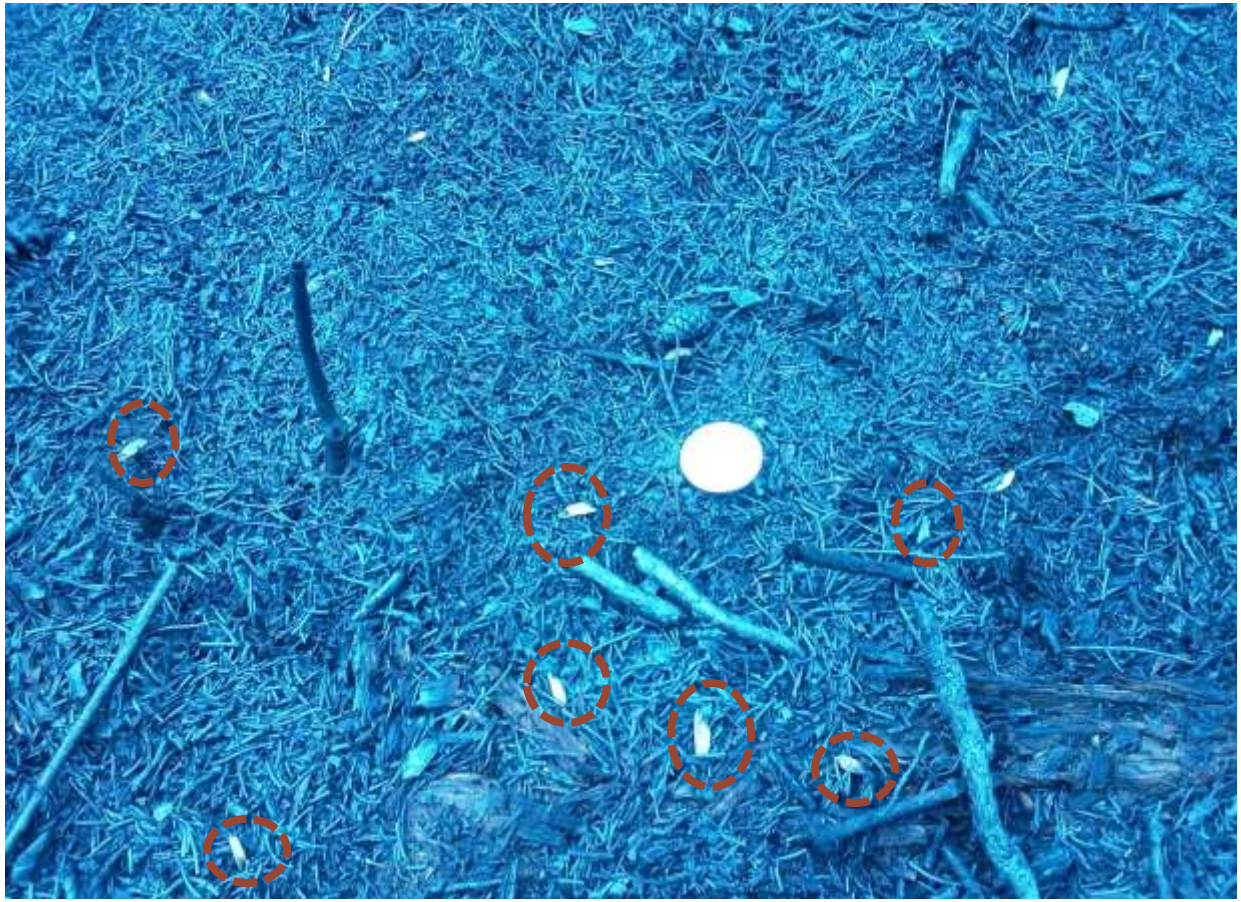
More detailed mapping will provide exact acreage in the near future

Crown fire scar, interior of unit

Seed can be seen on the ground and falling from trees

Visual estimates indicate significant seeding within the burn area

Will have to wait for 1st and 3rd year stocking surveys to determine stand regeneration statistics



Seeding from crowned jack pine

By August 1, 2014 jack pine regeneration was clearly visible

This has been a cool and wet summer possibly benefitting regeneration

1st year stocking surveys next summer will quantify the extent of regeneration and spatial distribution of trees.

The 2012 fire scare and the RX burn are not expected to support KW habitat until at least 2017-2019

Numerous seedlings now visible within the crown fire scar

Results & Conclusions

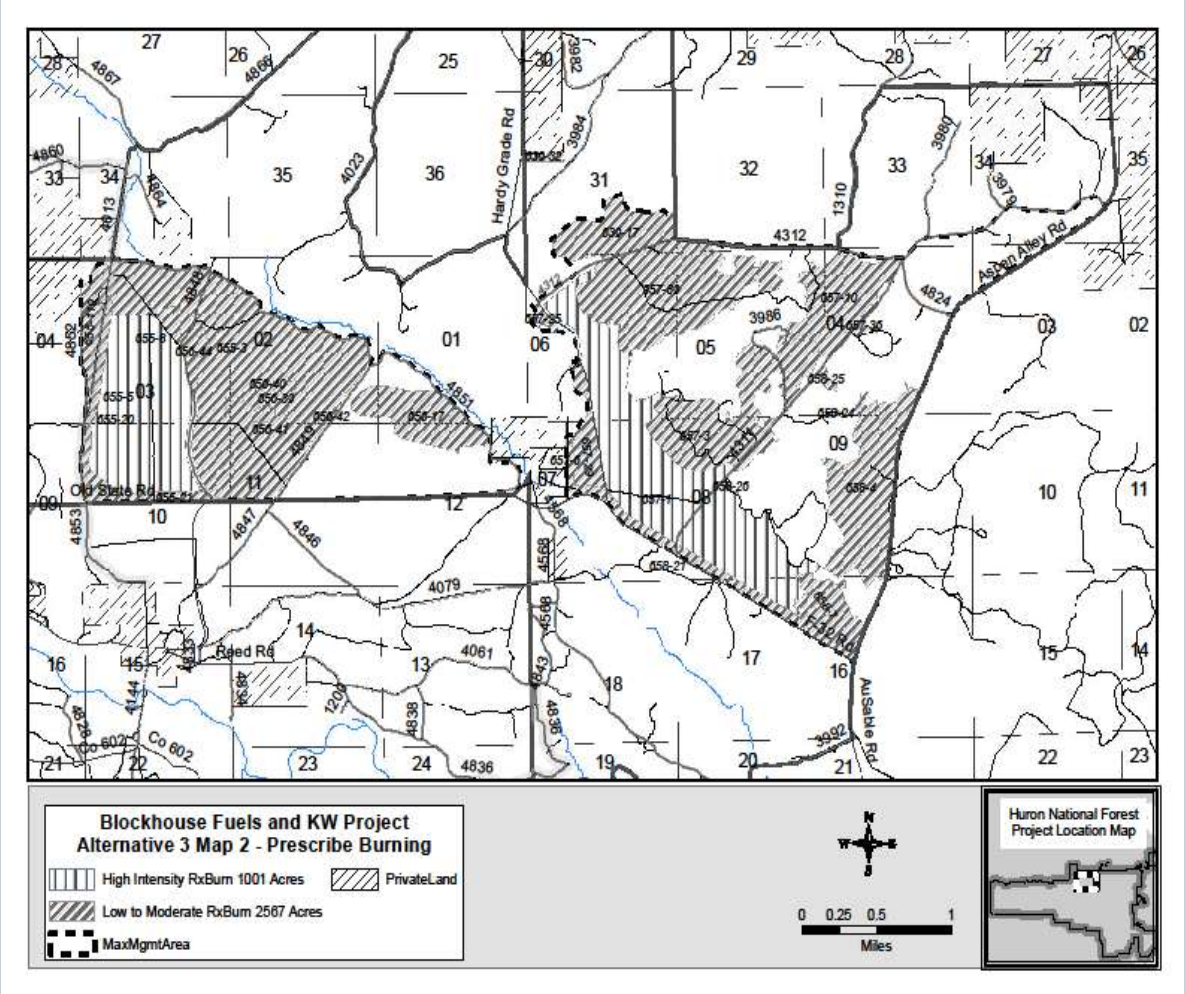
Objectives	Results
• Could fire be Controlled? • Was hazardous fuels reduction objective achieved? • Will jack pine regenerate for KW habitat objective? • How far can these fires spot? • Will RX fire be used in the future for these objectives?	• Prescription and holding features made control of fire simple • Yes, fuels reduction was complete!! • Trees are regenerating, density and spatial distribution still unknown. • Several hundred feet under similar conditions. • Yes, with increasing frequency

What is planned for the Future

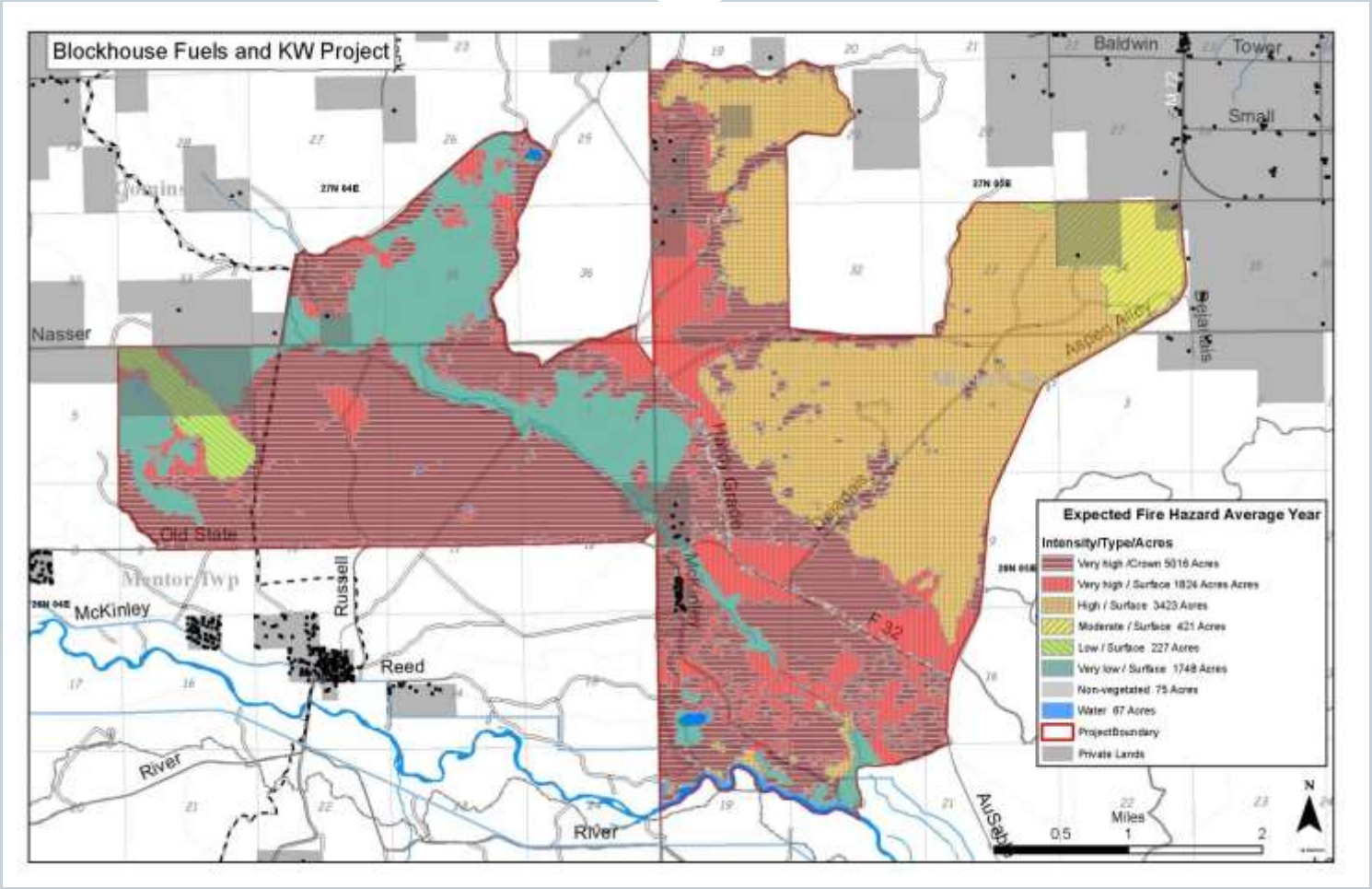
Blockhouse KW and Fuels EA

- Planning process for this project started in 2008
- EA & Public involvement complete. Waiting on RO 40 acre (550 acre for HMNF) review before moving forward with Decision Notice (July 2014)
- Implementation of fuelbreak construction, timber sales, and underburning in preparation of high intensity burns from (2014-2018)
- 282 acres of fuel breaks (2014-2015)
- 1,170 acres of thinning treatments primarily in oak with a minority of red pine (2015-2018)
- 123 acres of clear cut and plant for KW habitat (2015-2018)
- 2,610 acres of low intensity burning for variety of objectives including fire control for high intensity burning and oak regeneration (2017-2021)
- 1,001 acres of high intensity jack pine burning for KW habitat creation and fuels reduction. Expected implementation (2018-2021)
- 5,373 acre Maximum Manageable Area (MMA) for high intensity burning.

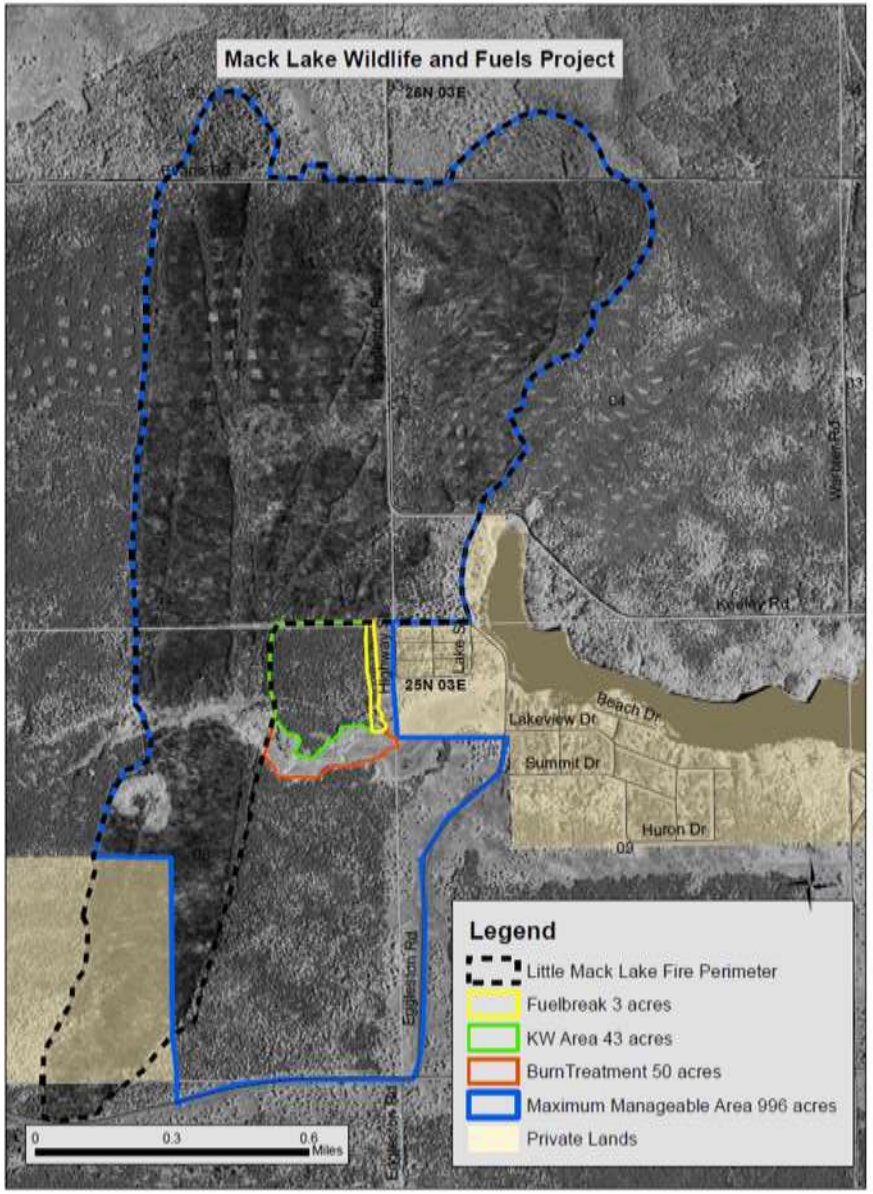
Blockhouse Project: RX Burning & MMA



Expected Fire Hazard – Blockhouse Project



Questions?


Mack Lake Wildlife and Fuels Project
26N 03E
25N 03E
Lakeview Dr
Summit Dr
Huron Dr
Beach Dr
Legend
Little Mack Lake Fire Perimeter
Fuelbreak 3 acres
KW Area 43 acres
BurnTreatment 50 acres
Maximum Manageable Area 996 acres
Private Lands
0
0.3
0.6
Miles

Next Webinar:

November 20, 2014 at 2:00 PM Eastern (1:00 PM Central)

Long-term structural and compositional development of fire-origin red pine forests in north central Minnesota

Anthony D'Amato

University of Minnesota