

# Maple Ridge Prescribed Burn



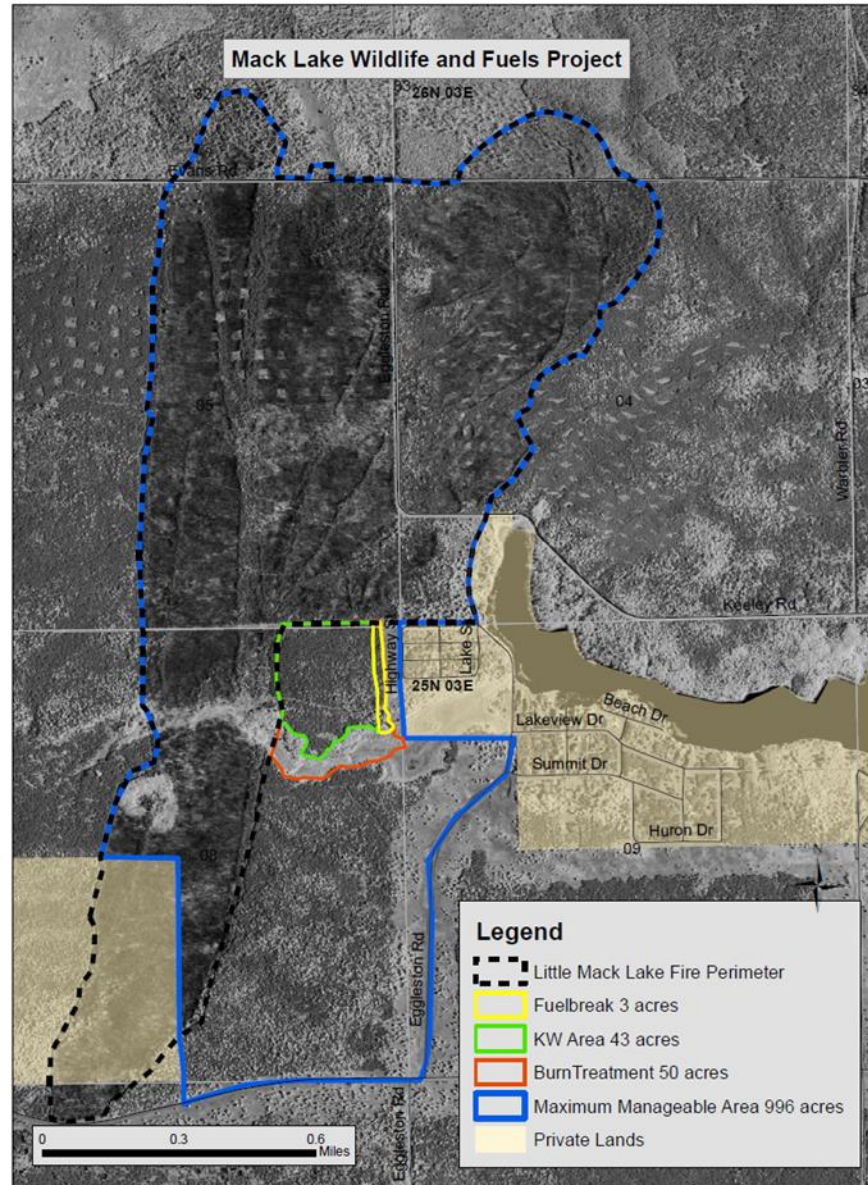
MIO RANGER DISTRICT  
2014





## 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 had light fuel loading due to 2012 fire



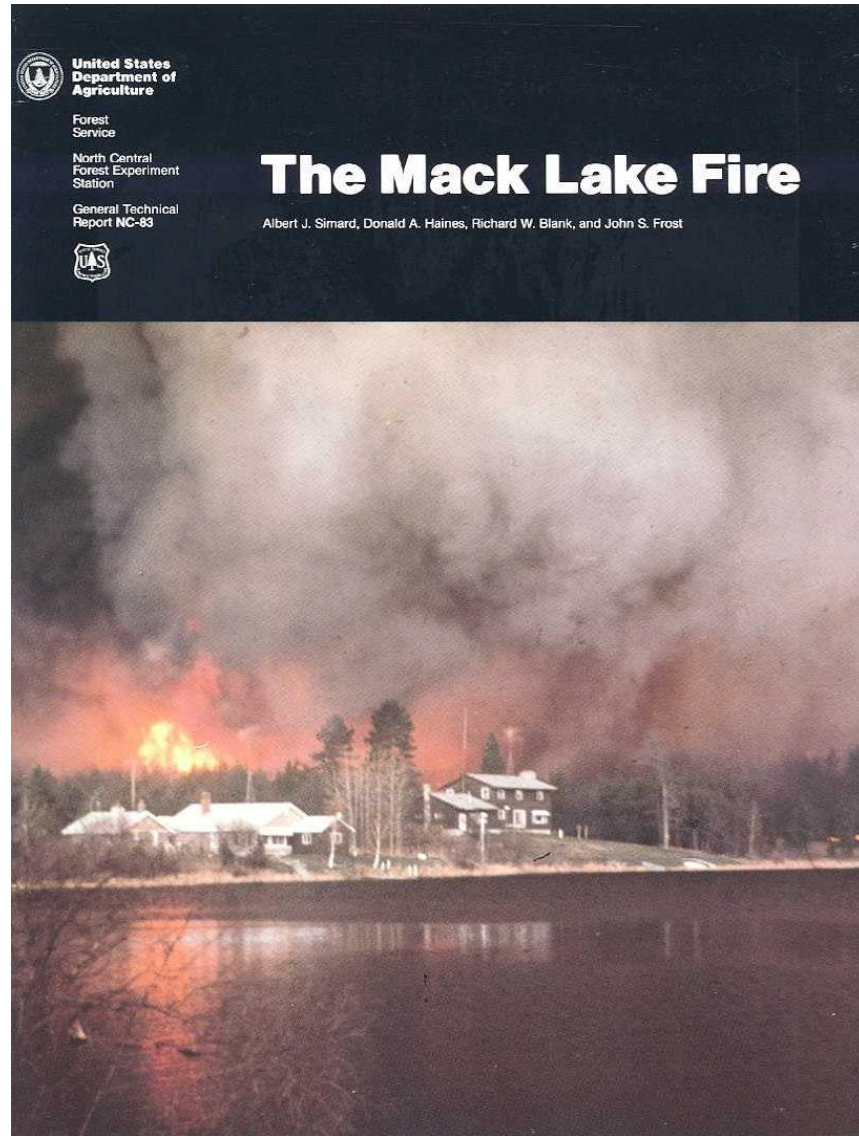
# History of the Project Area

Maple Ridge RX is 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



# 2008 Pile Burning and Fuelbreak Maintenance



**Need to Bring RX Fire  
Back Slowly to this Area**

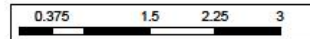
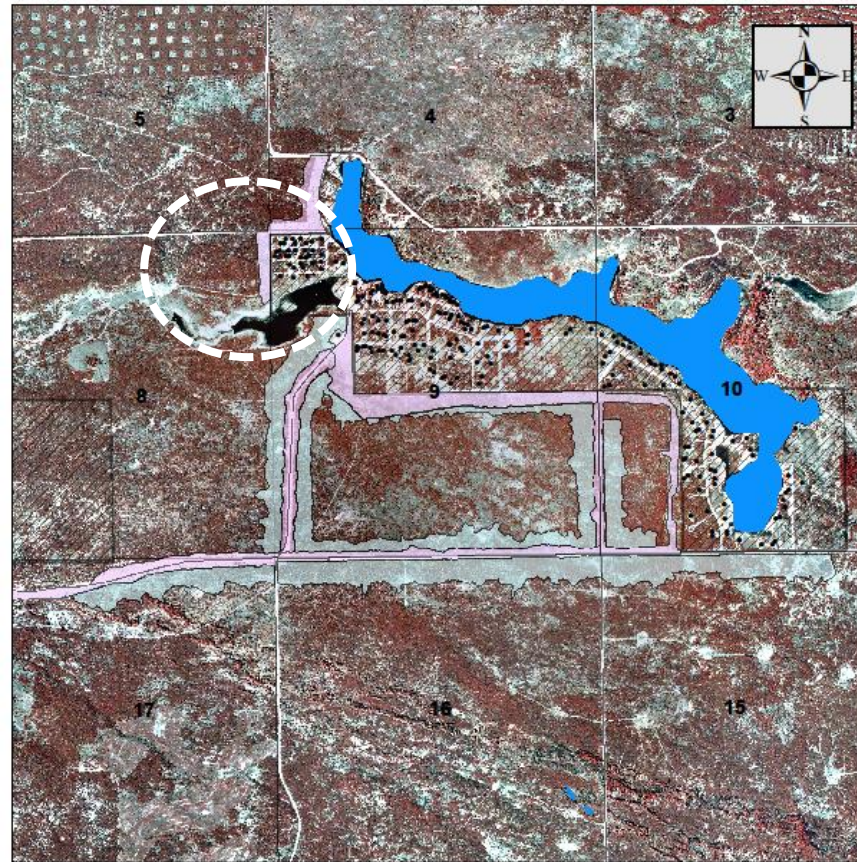
**Some Residents Very  
Concerned!!**



# 2010 Fuelbreak Expansion

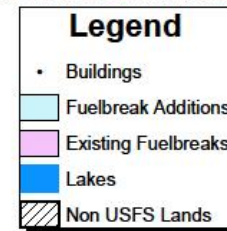
ARRA (Stimulus) funds used to more than double the size/width of most of the fuelbreak complex around Mack Lake

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



**Mack Lake Fuelbreak Additions  
and Existing Fuelbreaks**

PJL 08/27/10

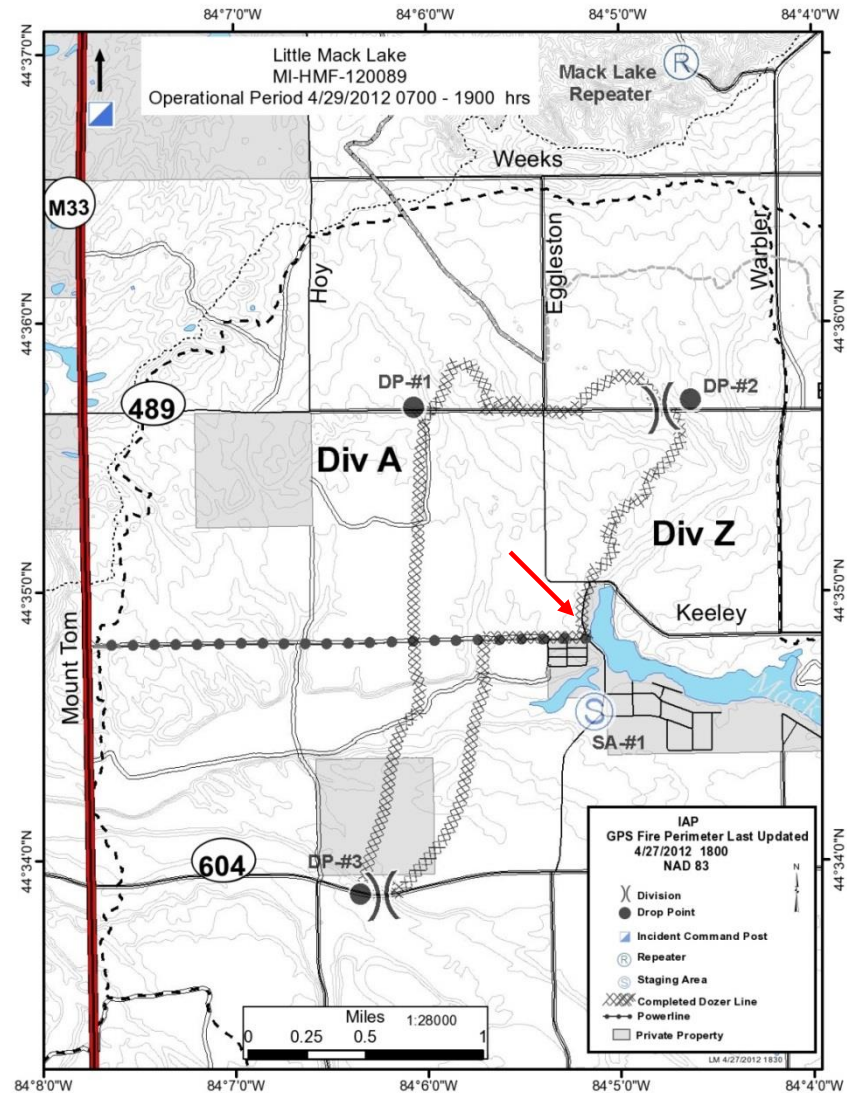


# 2012 Little Mack Lake Wildfire

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

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

After 32 years some residents have a very positive impression of USFS firefighting capability and skill.



# 2013 Cross-Boundary Treatment Mack Lake Subdivision



**Before Treatment**

**After Treatment**





## Politics & Human Factors

Public confidence and credibility of the USFS still affected by the Mack Lake Fire.

Residents remember the 1980 fire

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





# Wildfire Risk Compared to RX Fire Risk



## Management Ignited

- 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
- Remote chance of escape and resulting public safety & political implications

## Wildfire

- 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 wrong time
- More resources will be needed thus more risk exposure (air, law, VFD, etc.)
- Agency not responsible for ignition
- Transfer of safety risk to the public and elevated risk to emergency responders

# Why Not Mechanical Harvest & Planting



- Requires EA, cost, and 1-2 years to complete documentation
- RX Burning cost \$100 acre compared to harvest and planting of \$600-1300 acre
- 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.)
- RX fire has more risk and results are not as predictable as harvest and planting methods

# Project Decision Appealed



- One resident appealed the 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



- Minimum fuelbreak width of 300' was calculated using estimated 75' flame length from IRPG safety zone guidelines  $4 * 75' = 300'$  fuelbreak
- Project prohibited a west wind protecting subdivision and eagle's nest
- Need for KW habitat clearly explained
- Impact to scenery was likely, but concerns for firefighter and public safety took precedence
- Review of appeal points and project record found no breach of law, policy, regulation. Decision was upheld

# How Was The High Intensity Fire Controlled



- Design reverse engineered from the 1980 Crane Lake RX
- Fuelbreaks on the west side
- Crown fire scar north and east
- Wetlands to the south
- Evening burn, to reduce time of burn window and moderate burning/spotting conditions
- Maximum Manageable Area (MMA) used to give burn boss discretion and time/space to make suppression decisions.

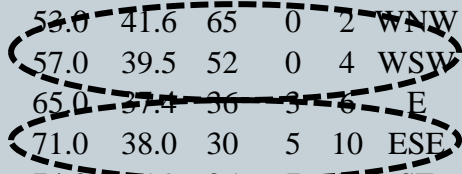
# Example - Collapsing Burn Window, Mio RAWS



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	<del>53.0</del>	<del>41.6</del>	<del>65</del>	<del>0</del>	<del>2</del>	<del>WNW</del>	<del>OK</del>	<del>0.0</del>	<del>0.21</del>	<del>45.0</del>	<del>6</del>	<del>13.10</del>
→ 22:00	57.0	39.5	52	0	4	WSW	OK	0.0	0.21	49.0	6	13.10
→ 21:00	<del>65.0</del>	<del>37.4</del>	<del>36</del>	<del>3</del>	<del>6</del>	<del>E</del>	<del>OK</del>	<del>5.0</del>	<del>0.21</del>	<del>60.0</del>	<del>6</del>	<del>13.10</del>
→ 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



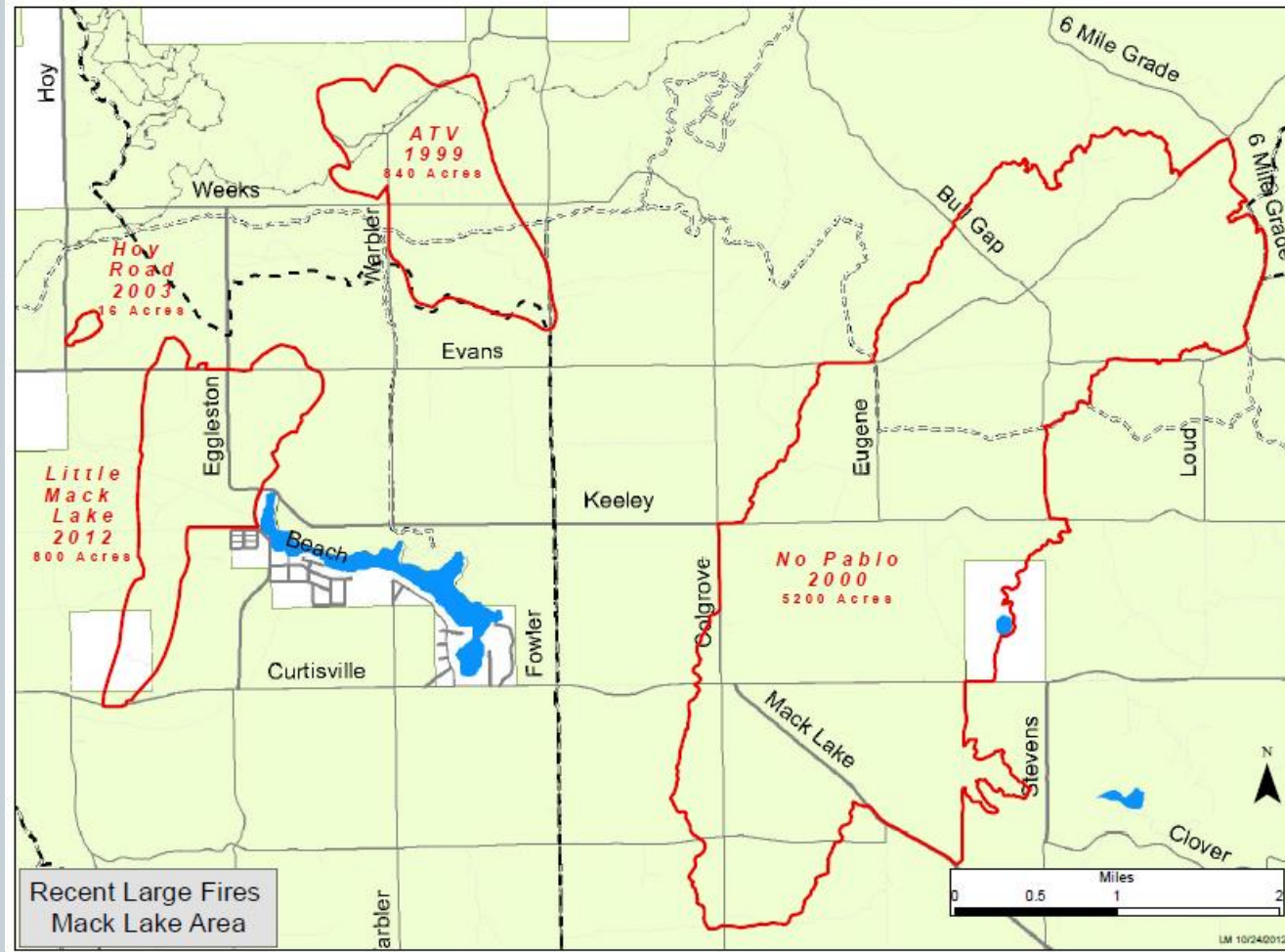
# Previous Jack Pine RX Projects – Camp 10 RX

- RX Fire, pole size jack pine
- 300' fuelbreak was west flank control feature
- 8/19/2011 Temp 82 RH 42% winds 0-5 mph
- Pockets of torching, group torching and high intensity surface fire. 30% stand mortality
- Fuelbreak on pressure side of burn
- 1 spot @ 200' within the fuelbreak



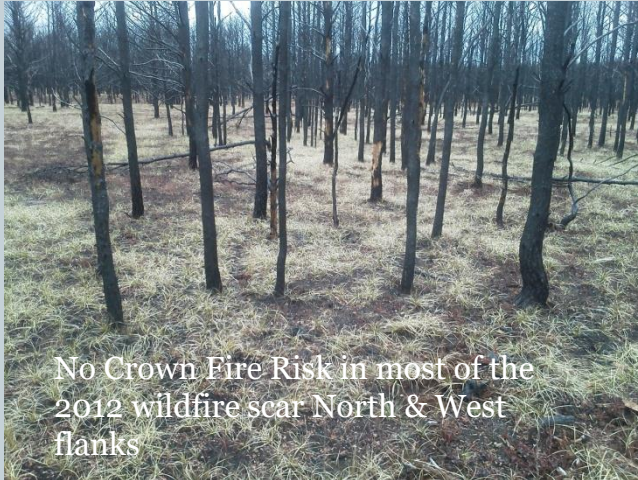
**Camp 10 RX burn:** Jack pine mortality from moderate to high intensity fire with single & group torching

# Wildfire Not if, But When!





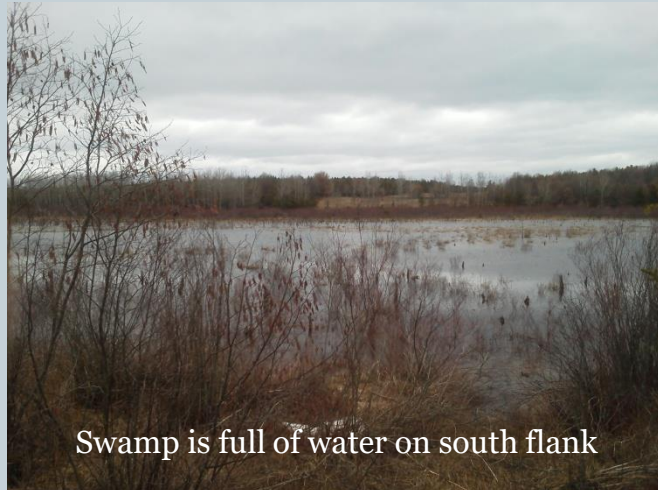
# 2014 Fire Control Features



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



Discontinuous surface fuel, minimal surface fire spread potential



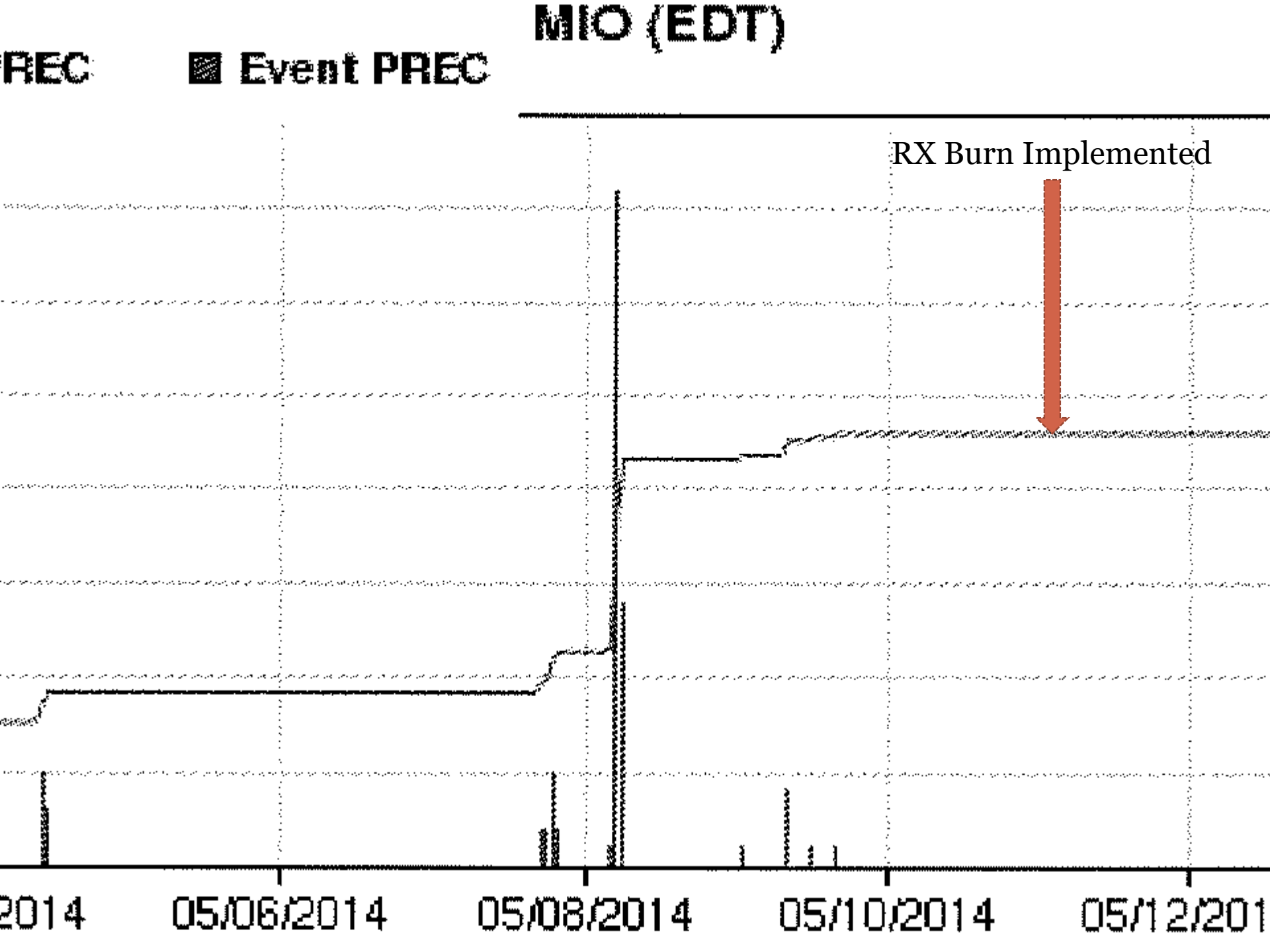
300' Fuel break on the east border of the project is RX burned in Fall of 2013

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 from north control line.**



Initial stages of ignition required creating black on north control line due to south winds and protect the powerline serving the subdivision

Aerial detection aircraft 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 into the 2012 fire scar

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

Fuelbreak was  
burned earlier in the  
spring

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

Equipment parked in  
east fuelbreak  
adjacent to the  
subdivision



## East fuelbreak ignition





Southern portion of the unit ignited by strip head fire.

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

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

Flame lengths est. 100'+ during peak of crown fire run



**Crown fire moves 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

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.

Multiple small spot fires within 50' of the line. No other suppression problems



## **Crown fire advancing on the north control line**



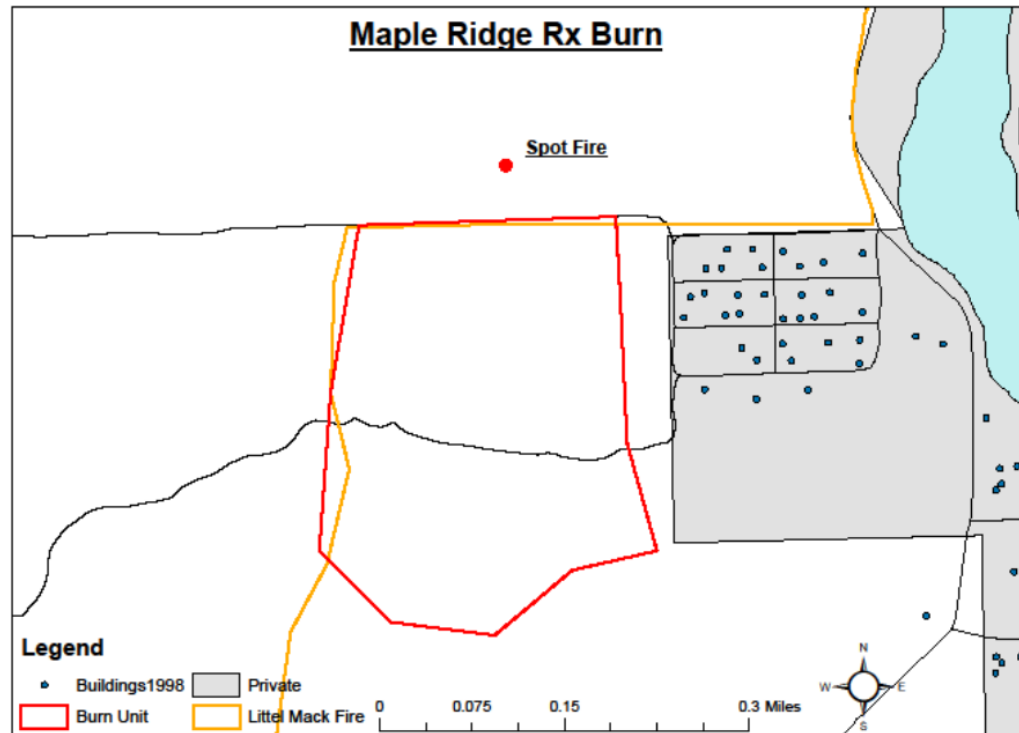
- The Maple Ridge RX crown fire is from light winds, recent rainfall, with only 2+ days of drying
- What would it be under high winds, drought, 5+ days of drying?
- Is a 300' wide fuelbreak overkill, or not enough?



**What is the Flame Length??**

PIG was 40% @ 1900  
eliminating most spot  
fire ignitions even with  
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	Relative	Wind	Wind	Wind	Quality	Solar	Precipitation	Fuel	10 hr Fuel	Battery
		Point	Humidity	Speed	Gust	Direction	check	Radiation	accumulated	Temperature	Moisture	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	6	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	8	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

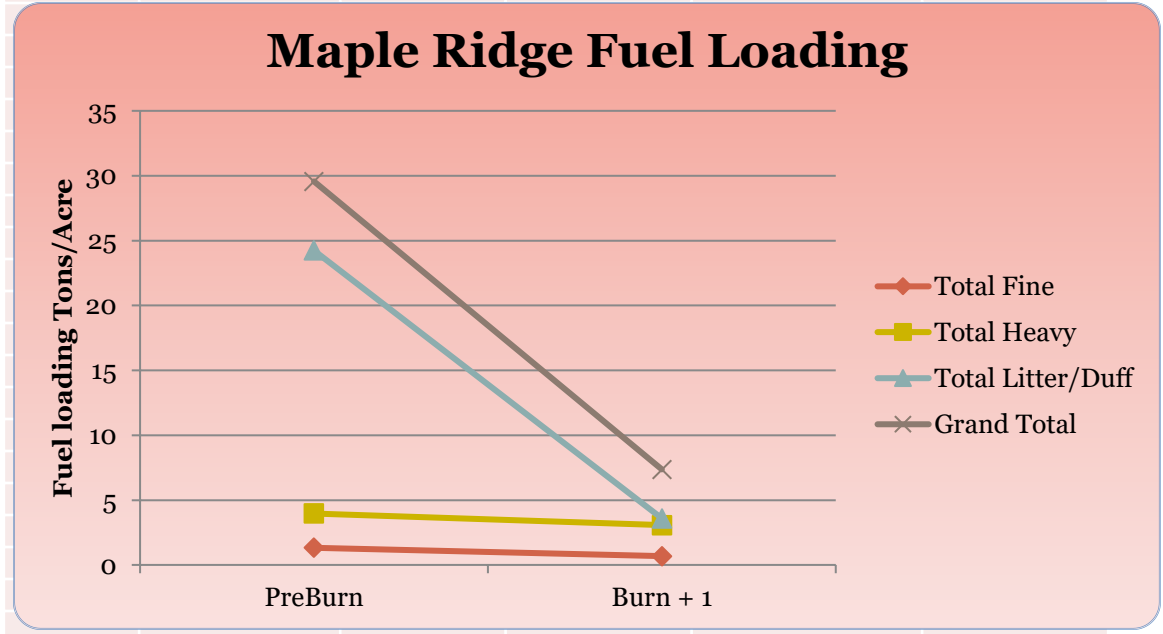
Mio RAWS reading 8 miles NNW of project site



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

# Crown Fire Scar, Interior of Unit





# Seeding from Crowned Jack Pine



# Numerous Seedlings visible by 8/1/14 in the Crown Fire Scar



# Results & Conclusions



## Objectives

- Control the intense fire behavior prescribed
- Hazardous fuels reduction of dense jack pine?
- Regenerate jack pine for KW habitat objective?

## Results

- Prescription and holding features made control of fire simple
- Yes, fuels reduction was complete and permanent due to regeneration failure!!
- No, jack pine germinated but did not survive. Area is now mostly free of jack pine serving as more of a wildlife opening.

# Questions?



## 2021 Imagery of Burn Unit and 2012 Wildfire Scar



## Pre-burn Imagery of RX Project

