

Planning for Resilience: Partial Cutting, Fuel Reduction and Fire Effects

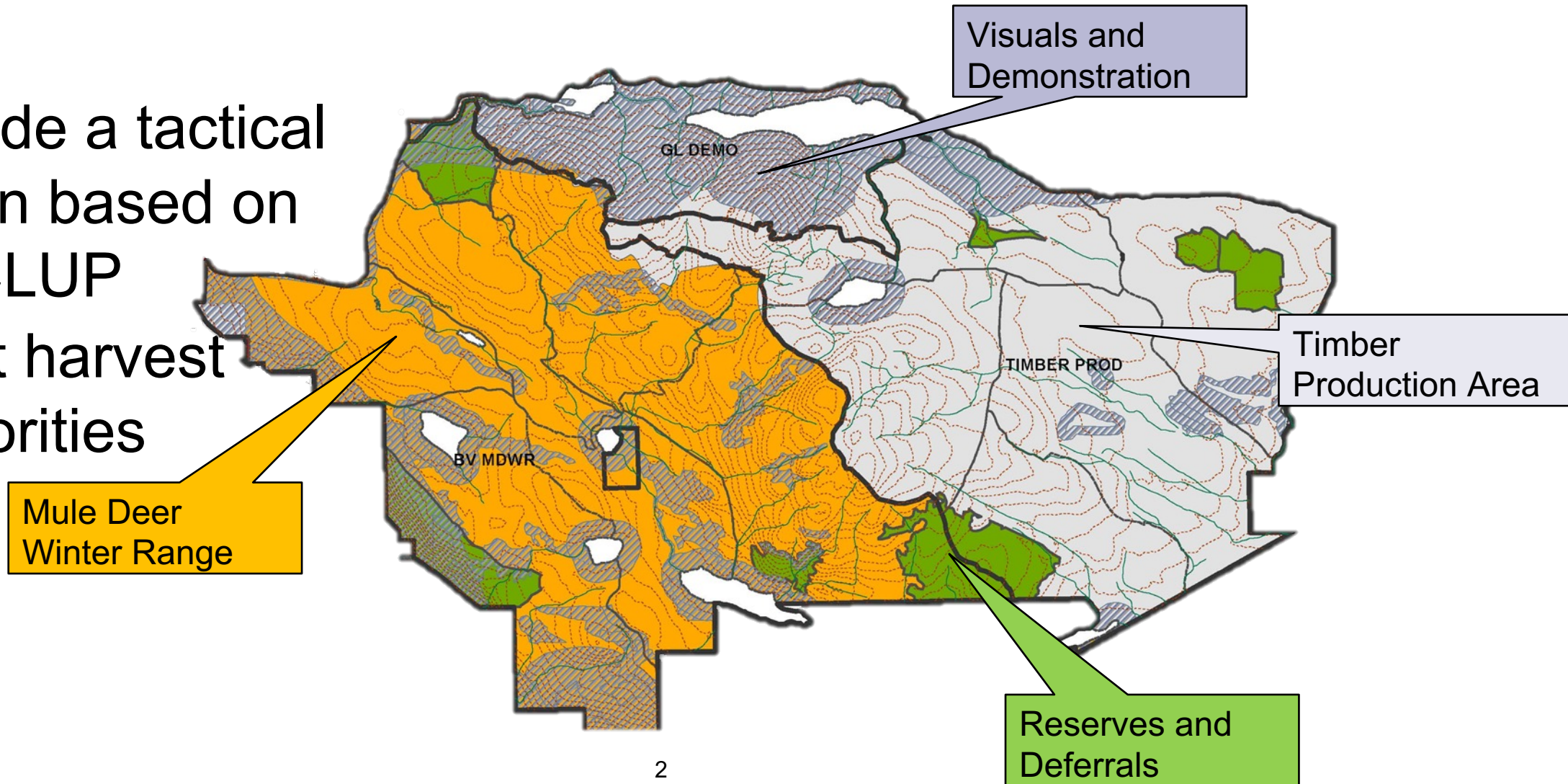
Ken Day, MF, RPF

KDay Forestry Ltd. Williams Lake, BC
Woodlot Conference, Cranbrook
October 28, 2023

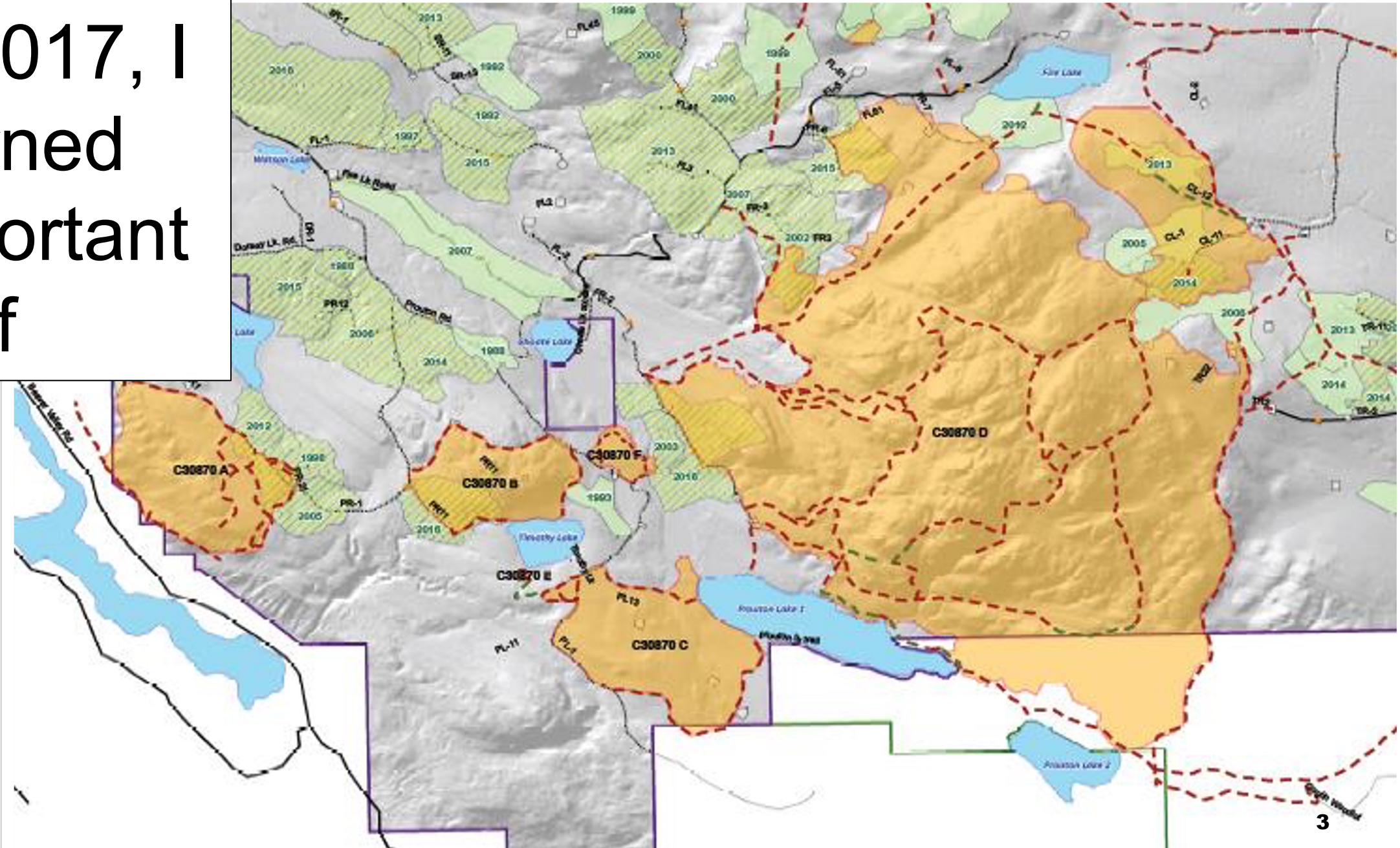


Management and Working Plan

- Made a tactical plan based on CCLUP
- Set harvest priorities



In 2017, I learned important stuff



I Learned Silviculture Matters

- Thinning reduces fire effects
 - More brush
 - More herbaceous
 - Less fuel
 - Higher Crown Base Hgt
 - Lower Crown Bulk Density



CB 144A Commercial Thin 2012, Alpha Fire



CB 135 Pine removal 2002, Delta Fire



1977 Pre-Commercial Thin, Charlie Fire

Silviculture Matters

- Salvage helps
 - Less fuel
 - More herbaceous
 - More brush
 - Higher Crown Base Hgt
 - Lower Crown Bulk Density



Pine salvage site, 1998-2000 Bravo Fire



No salvage, Foxtrot Fire

Silviculture Matters

- Group selection and strip thinning had little benefit



CB 173 Group Selection 2016, Delta Fire



CB 128 Strip selection, Bravo Fire

Silviculture Matters

- Deciduous component reduced fire behaviour

Douglas-fir with
aspen and birch,
Alpha Fire



Deciduous
stands, Delta Fire

Silviculture Matters

- Cedar and subalpine fir residual--burnt out regenerated stands



CB 133 &150, Delta Fire

CB 133 (2000, 2014),
150 (2005) &
139 (2000, 2013) ,
Delta Fire

Zone 2 – 0-100 m from private property

- Low surface fuel
 - Target 2,000 kW/m head fire intensity in 90th percentile weather
 - 10-15 tonne/ha less than 7 cm diam depending on slope, aspect, pruning height
 - Prune to 3 m above the ground
 - Remove fuel promptly
- Shaded fuel break
- Plan for maintenance burning



Zone 3 – 100-300 m from private property

- Moderate surface fuel
 - Target 4,000 kw/m Head Fire Intensity
 - 15-20 tonne/ha less than 7 cm diam depending on slope, aspect, pruning height
 - Prune to 3 m above the ground
 - Remove fuel – gather or prescribed burn
- Shaded fuel break
- Plan for maintenance burning



21 tonne/ha



32 tonne/ha

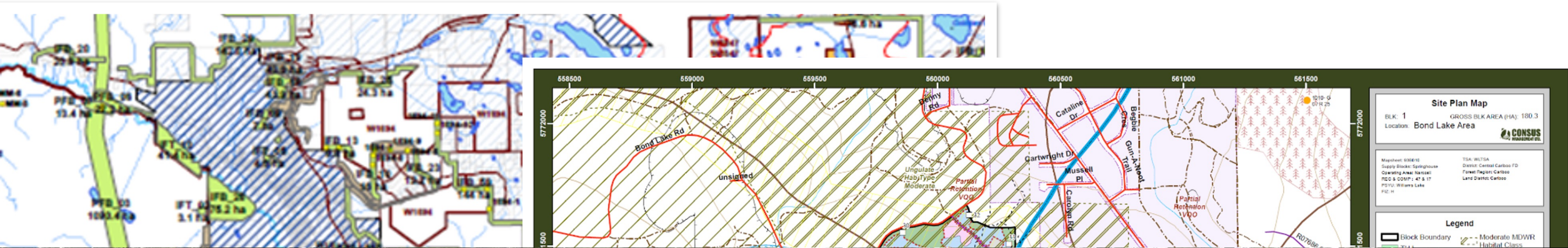
Zone 4 – 300-2000 m from private property

- Moderate surface fuel
 - Target 4,000 kw/m Head Fire Intensity
 - Modify fuels for burning
 - Shaded fuel break
 - Safe access routes
- Manage for resilience
- Don't make things worse



Going Forward

How do we get this done, efficiently?
- E.G. Williams Lake First Nation



How Can We Manage For Resilience?

- Permanent roads as fire breaks and for access
- Widespread thinning
- Keep deciduous stands and components on the landscape

- Low flammability as an objective
 - Low surface fuel
 - Herbaceous or brushy understory
 - High Crown Base Height
 - Reduced Crown Bulk Density

We Can Improve Resistance & Resilience



Untreated

Treated 2010

Williams Lake Airport, BCWS Fire Centre, Burned 2017

Widespread Thinning

- Northern European practices can give us some insights




An aerial photograph of a vast, forested landscape. In the foreground, a dense forest of evergreen trees covers the terrain. A large, dark blue lake is situated in the middle ground, surrounded by a mix of evergreen and deciduous trees. The background features rolling hills and mountains under a clear blue sky with some light clouds. The overall scene is a serene natural setting.

Questions?

J.Kenneth.day@gmail.com

How Did This Happen


- July 7 Danger Class 4 (high) at Gavin Lake
- Operations were shut down
- Temp was high (31.4 max)
- rH extremely low (8% min)
- Dry lightning at about 3:00 PM
- Winds gusting 33 km/hr and avg nearly 20 km/hr
- At these ISI and BUI values, red book predicts continuous crown fire in C3 fuel types, ROS=31 m/min
- City of Williams Lake was surrounded by very active wildfires by late afternoon



Fire Weather System
All Hours for GAVIN
From 2017/07/07 09:00 to 2017/07/07 23:00
Ancillary Data

[Guide to abbreviations](#)

Date	Wind Gust	Max 10-Min Wind	Gauge Total	Precip Status	Snow Depth
2017/07/07 09:00	16	8.2	0	0	0
2017/07/07 10:00	16.6	8.5	0	0	0
2017/07/07 11:00	21.2	8.5	0	0	0
2017/07/07 12:00	16.6	9.4	0	0	0
2017/07/07 13:00	24.1	9.4	0	0	0
2017/07/07 14:00	21.8	11.4	0	0	0
2017/07/07 15:00	33.3	18.7	0	0	0
2017/07/07 16:00	35	19.9	0	0	0
2017/07/07 17:00	23.5	12.5	0	0	0
2017/07/07 18:00	21.2	12.3	0	0	0
2017/07/07 19:00	17.7	8.3	0	0	0
2017/07/07 20:00	23.5	10.7	0	0	0
2017/07/07 21:00	16	7.5	0	0	0
2017/07/07 22:00	9.7	4.6	0	0	0
2017/07/07 23:00	7.4	3.8	0	0	0



Fire Weather System
All Hours for GAVIN
From 2017/07/07 09:00 PST to 2017/07/07 23:00 PST
[View Min/Max](#)

[Guide to abbreviations](#)

Date	Temp.	Dew Point	RH	Wind Dir.	Wind Sp.	Precip.	FFMC	ISI	FWI
2017/07/07 09:00	27.1	3.5	22	177	8	0.0	93.0	9.8	32.8
2017/07/07 10:00	29.2	4.0	20	187	7	0.0	93.4	10.1	33.6
2017/07/07 11:00	30.2	3.3	18	151	8	0.0	93.9	11.4	36.3
2017/07/07 12:00	29.0	3.8	20	157	5	0.0	94.1	10.0	34.0
2017/07/07 13:00	30.9	1.3	15	254	8	0.0	94.7	12.6	39.5
2017/07/07 14:00	27.8	2.8	20	281	7	0.0	94.7	11.6	37.4
2017/07/07 15:00	27.2	-1.7	15	241	19	0.0	95.0	22.1	56.4
2017/07/07 16:00	26.6	1.8	20	262	10	0.0	95.0	14.5	43.2
2017/07/07 17:00	25.8	1.2	20	270	10	0.0	95.1	14.5	43.2
2017/07/07 18:00	24.6	1.4	22	291	9	0.0	95.1	13.9	42.1
2017/07/07 19:00	21.7	1.4	26	273	4	0.0	95.0	10.5	35.2
2017/07/07 20:00	20.9	2.9	31	245	7	0.0	94.8	12.0	38.4
2017/07/07 21:00	18.4	5.5	43	190	4	0.0	94.4	10.0	33.9
2017/07/07 22:00	14.9	6.8	58	180	3	0.0	93.6	8.5	30.4
2017/07/07 23:00	14.5	6.9	60	164	3	0.0	92.9	7.5	27.9