Winter burning opportunities for private landowners

April, 2019 (no permit required)

Rob York, Forestry extension specialist, UC Berkeley

Outline

- What is winter burning?
- Ecosystem v. Permit burning windows
- Pros and cons
- Where and when it may be possible
- Examples of winter burning success

What winter burning is not:

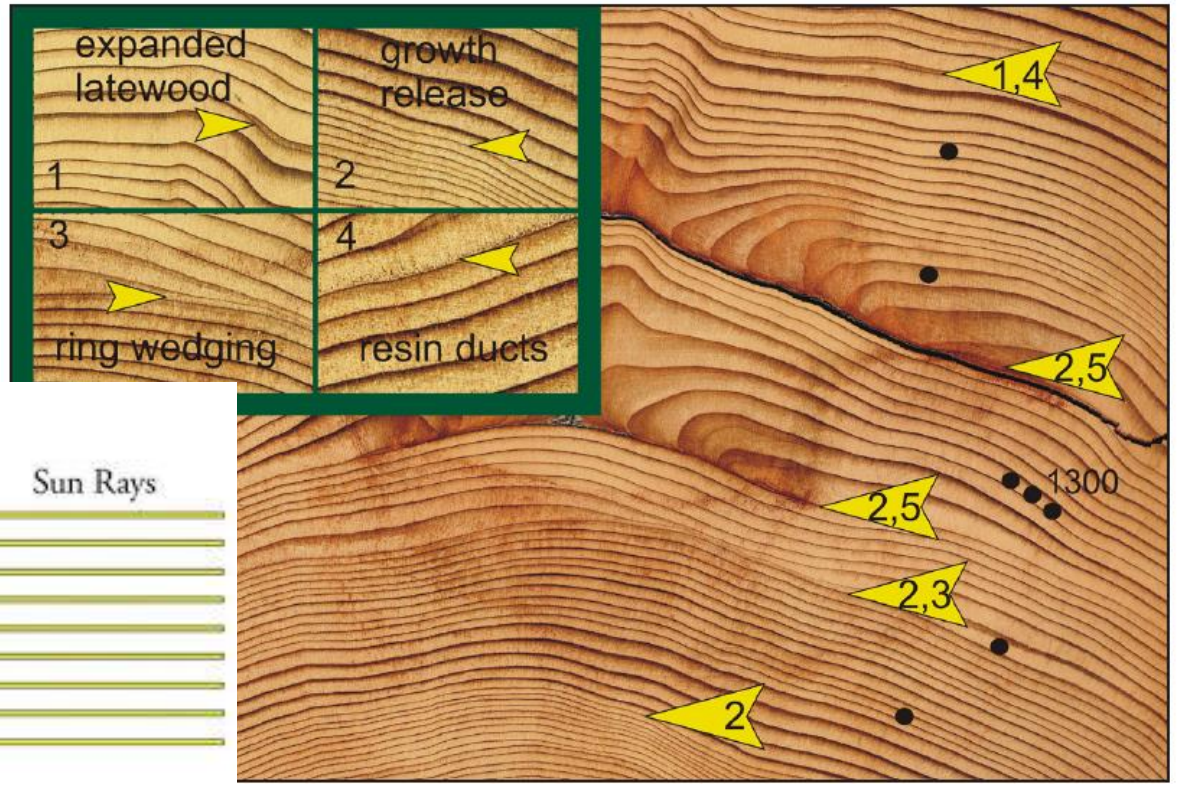
A song of ice and fire

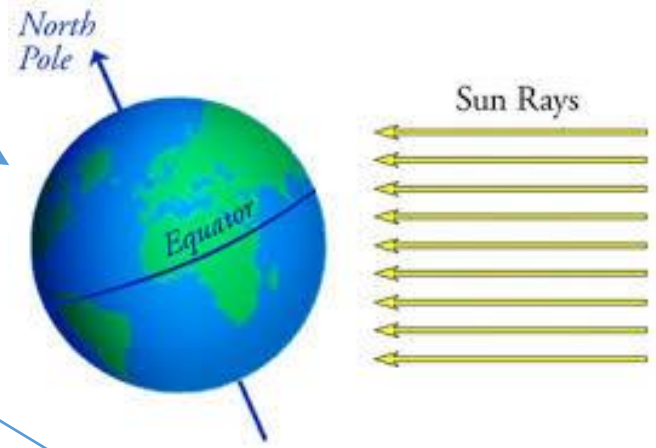
White walker not the best burn boss

What is winter burning?

Two definitions:

- The ecological definition
  - We *want* to use this one
  - Factors are *physical*
- The regulatory definition
  - We *have* to use this one
  - Factors are *social-political*





STATE OF CALIFORNIA
DEPARTMENT OF FORESTRY & FIRE PROTECTION
MINIMUM PRECAUTIONS FOR PROJECT TYPE BURNING
LE-8 (10/04)

CAL FIRE Lassen-Modoc — Unit Headquarters
530-257-4171 — Telephone

APPLICATION FOR BURN PERMIT

DATED (*Month, date and year*)
10/14/2019

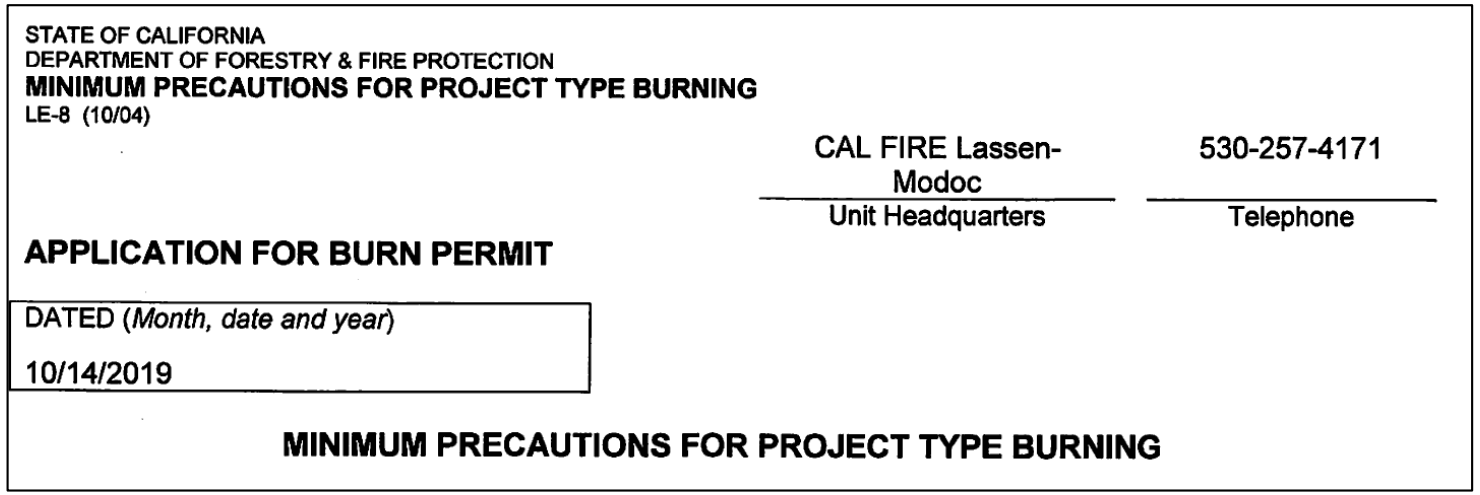
MINIMUM PRECAUTIONS FOR PROJECT TYPE BURNING

Review of the 3 permit seasons for private landowners in mountain counties

Winter, 2016

The 3 permit seasons for private landowners

1. Fire season (i.e. the middle of summer)
   - In fire world, called an “in-season” burn
   - Permits required, but are usually “suspended”
   - In theory you can still get a permit, but in reality, you have a snow ball’s chance in an in-season prescribed fire
   - Currently NOT REALISTIC for private landowners



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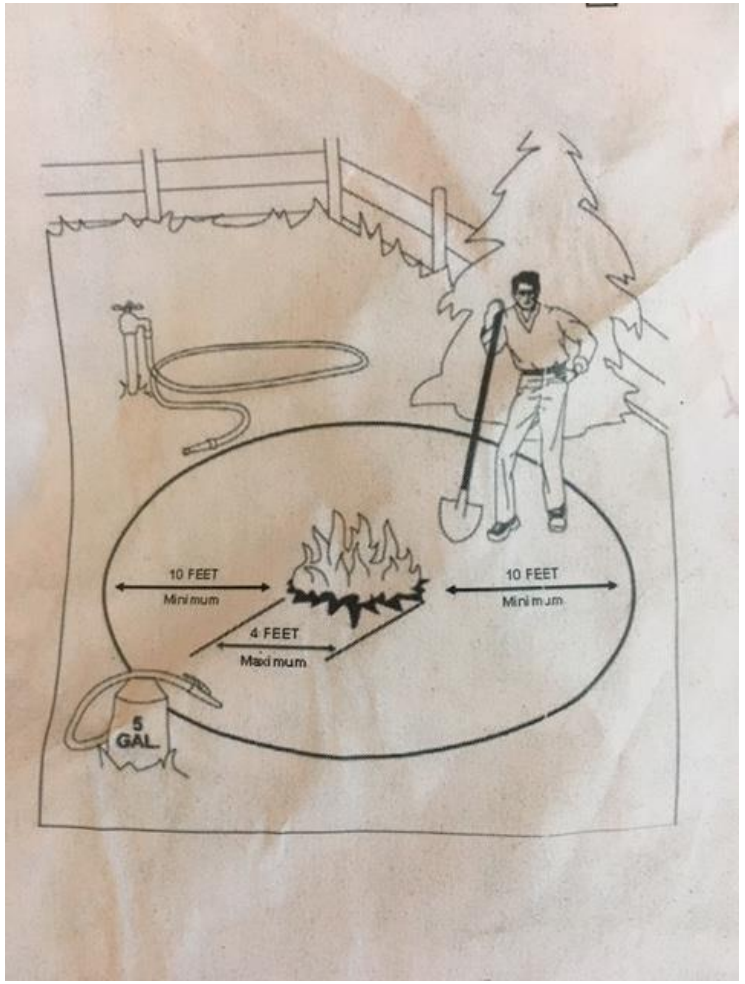
MINIMUM PRECAUTIONS FOR PROJECT TYPE BURNING

The 3 permit seasons for private landowners

2. Fire season, suspensions lifted (spring and fall)
   - I call “Permit season”
   - Permits still required, but are more attainable
   - Can be “door-yard” burning: Residential (LE-62A), small piles… super easy!
   - Can also be for broadcast burning (LE-7)… super hard!
   - Currently realistic only for private landowners who have technical expertise or have Cal Fire heavily involved



The 3 permit seasons for private landowners

3. Open burning

- End of fire season
- Permits NOT required
- Burning is still limited by smoke emissions
- You can do a broadcast burn without a permit
- Any given day can still be no-burn because of hazardous weather or air quality
- Beginning is variable, end is usually May 1

Spring, 2016
No burn permit
Yes smoke management plan (SMP)

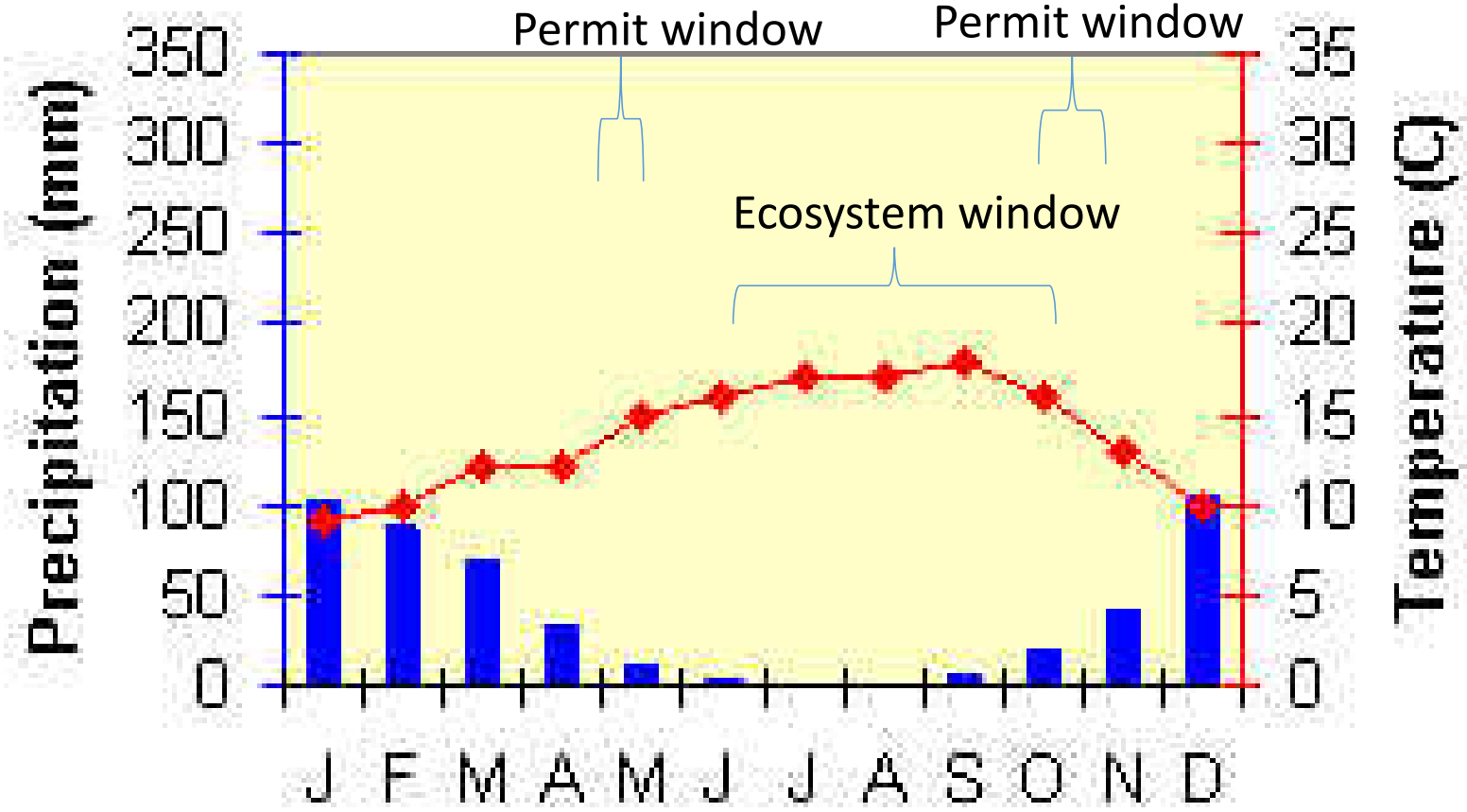
Burning windows: Ecosystem v. permit seasons in CA

Overlap is small (2018 in El Do County… 3 days; so far in 2019… 0 days)

For landowners, effective windows don't exist

Constraints:

1. Permit
2. Air quality
3. Politics/resources
4. Fuel conditions
5. Weather forecast



Instead of windows, how about winks?

Nudging burning “winks”

Wink = hours to a few days in prescription

Constraints:

1. Air quality
2. Fuel conditions
3. Weather forecast

Winter burning at 4,000’ elevation
February, 2018
No burn permit, yes SMP

Winter burning pros:

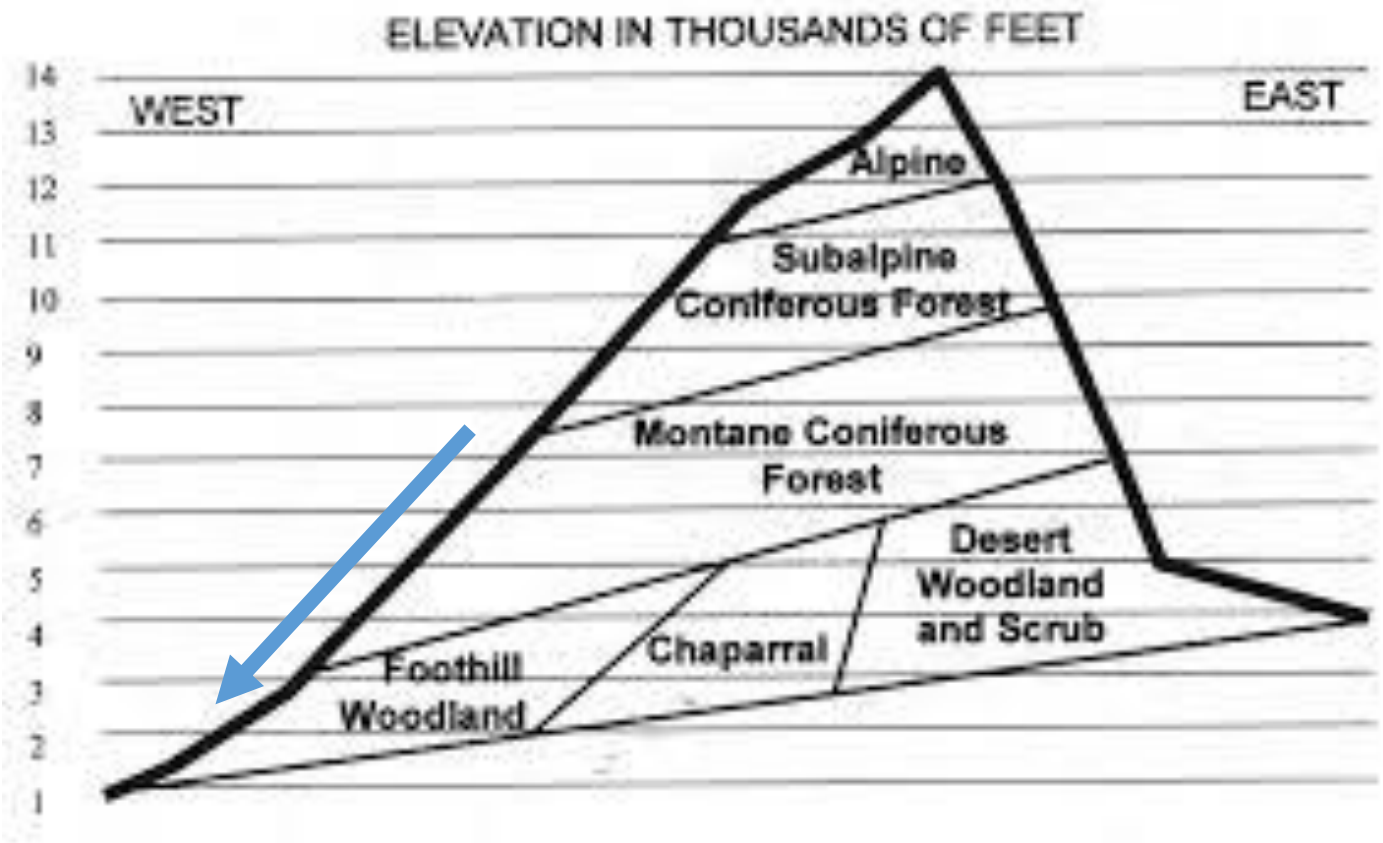
- No permit required
- Low risk (relatively)
- Effective at inhibiting ladder fuel development
- Effective at reduce the fuel size that has the biggest impact on fire behavior (smaller diameter fuel)
- Gateway burning, to get experience for permit-burning

Winter burning cons:

- High-density forests need prep work, potentially
- Less consumption, generally
- May take multiple burns/years to accomplish objectives
- Local fire suppression personnel may not understand it
- Not aligned with natural disturbance regime seasonality (but neither is most permit burning)

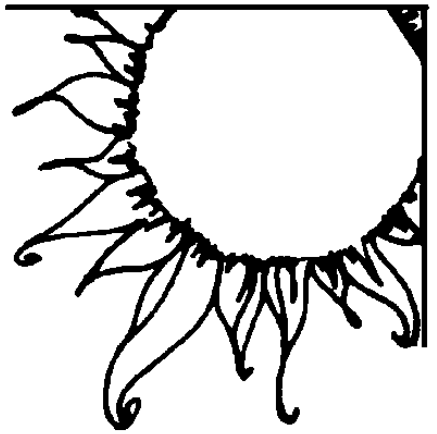
Physical geographic factors- elevation

Most likely below snow-rain transition (i.e. the snow melts in between storms)



Rule of thumb:
Presence of ponderosa pine = potential for winter burning

Physical geographic factors- aspect
Look for south- and west facing slopes



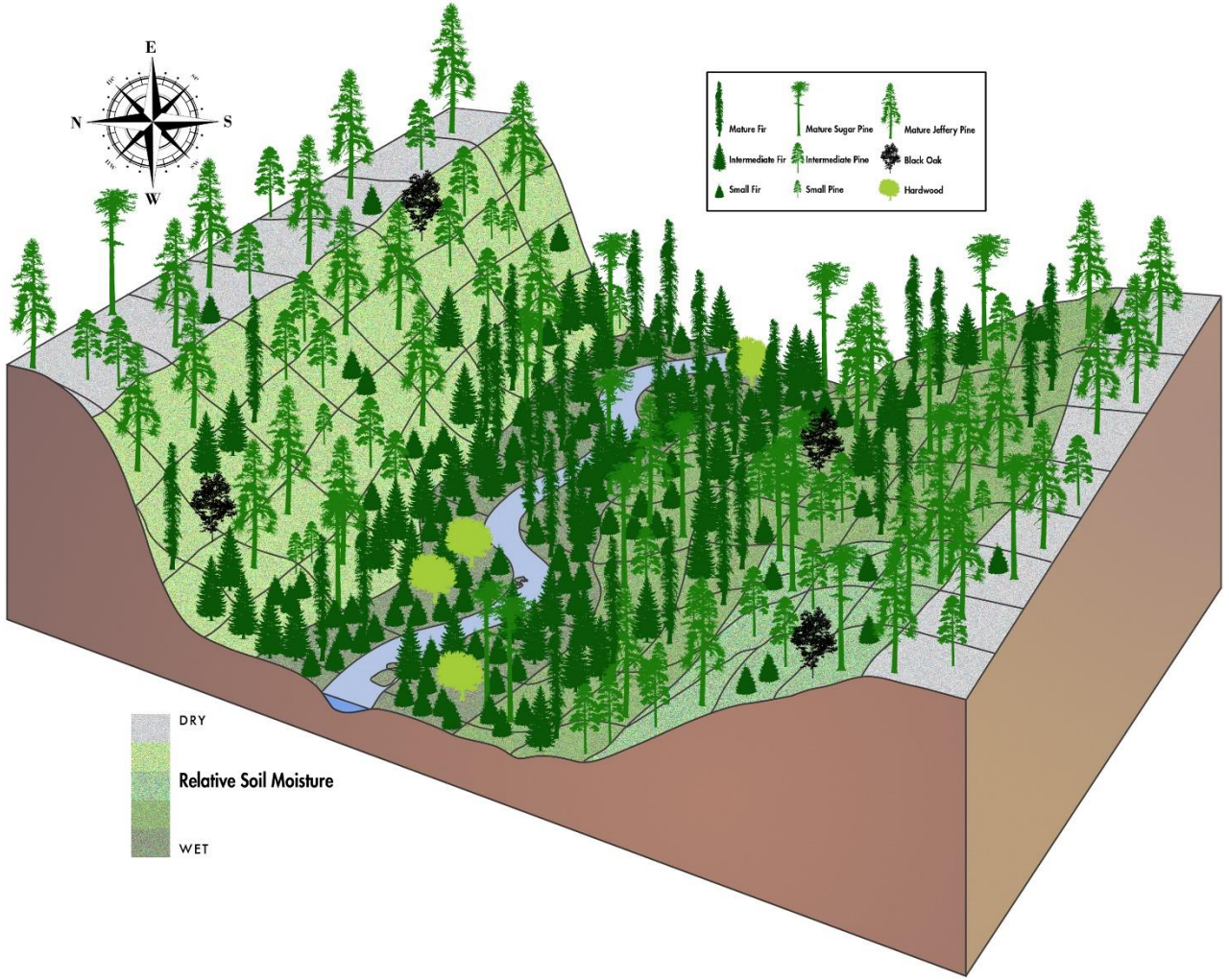
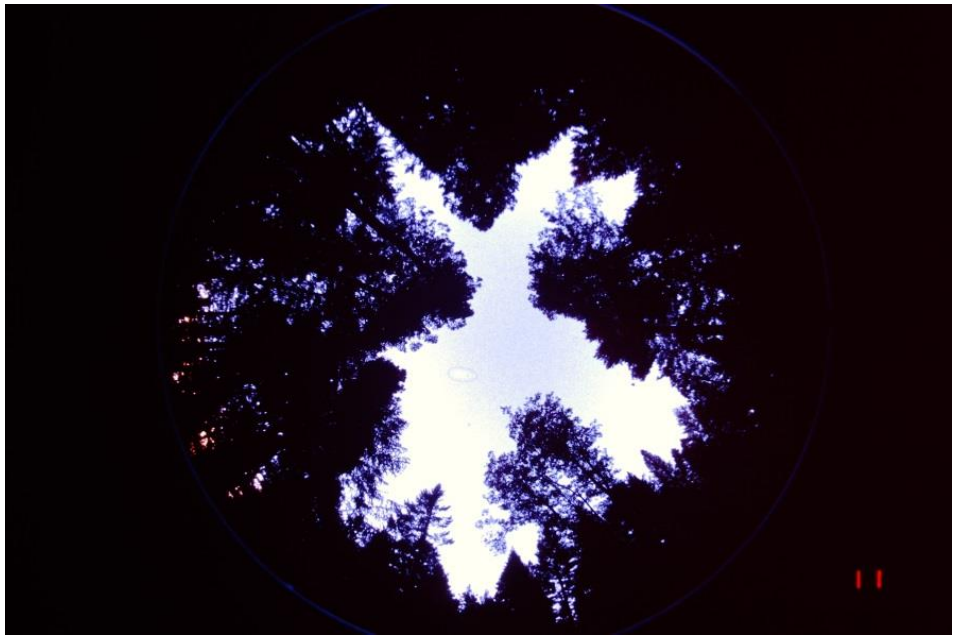


Image from Malcolm North

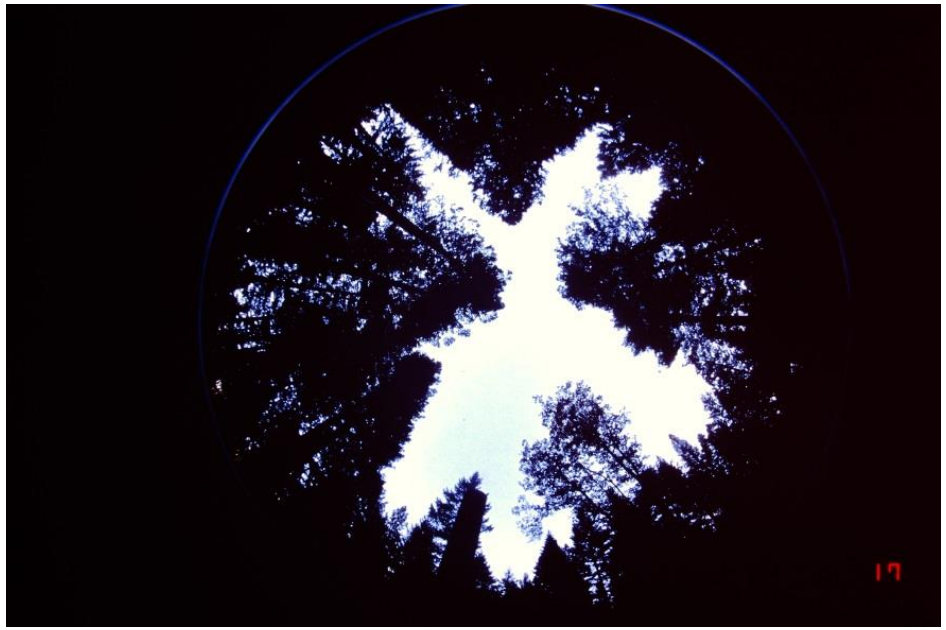
Forest structure and composition factors- Canopy cover

Rule of thumb: <50% = Good winter burn opportunity

Unfortunately, removing just small trees often won't get you there:

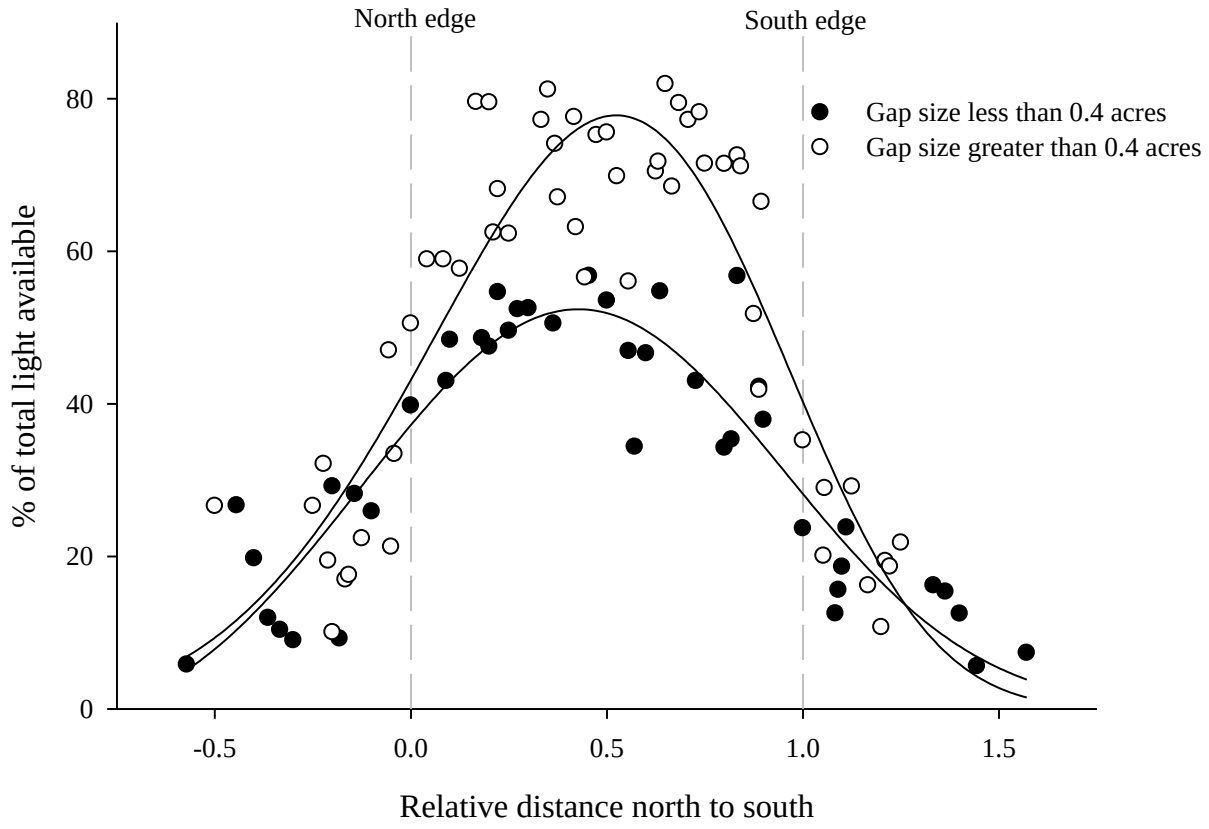


Pre-treatment cover = 66%



Post-treatment cover = 63%

Forest structure and composition factors- Canopy gaps



3000 ft elevation; Burned winter, 2018-19

Overstory species composition

Ponderosa pine is the winter burner's friend

- Low crown density
- Low bulk density litter (dries out faster)
- Rule of thumb: Pine needle snap test

Understory species composition

- Flammable species
  - Winter season senescence
    - E.g. Bracken fern, grass
  - Volatile leaves
    - E.g. Bear clover

February, 2018
NE facing slope
4,000’ elevation
Thinned canopy
Bracken fern understory

Understory structure: “Brown and burn?”

Brown with low-concentration herbicide

Then burn

Fuel bed:
-Density
-Piece size

January 2, 2019
NE facing slope
60% canopy
4,200’ elevation
Masticated fuelbed (1-yr cured)
A fire fighter tried to put it out

How do you do it?

Weather is king

- Track days since last precipitation
- Measure 10-hr fuel moisture, look for 8% or lower
- And/or do snap test (snaps at ¼ to ½ “ diameter of pine needle loop)
- Develop a prescription that works on YOUR property
  - E.g. 25 to 40% RH
  - Wind < 9mph
  - Temp < 70 degrees

Winter burning opportunities- what do weather data suggest?

- E.g. 2012-2013 at 4,300’ in the central Sierra Nevadas:
- How many days during the winter period had:

	Number of days
• More than 10 days since last precipitation?	48
• AND Minimum Relative Humidity < 45%?	37
• And were allowable burn days for air quality?	26

Case study: Blodgett Forest

- If it is the Disneyland of forestry, then…

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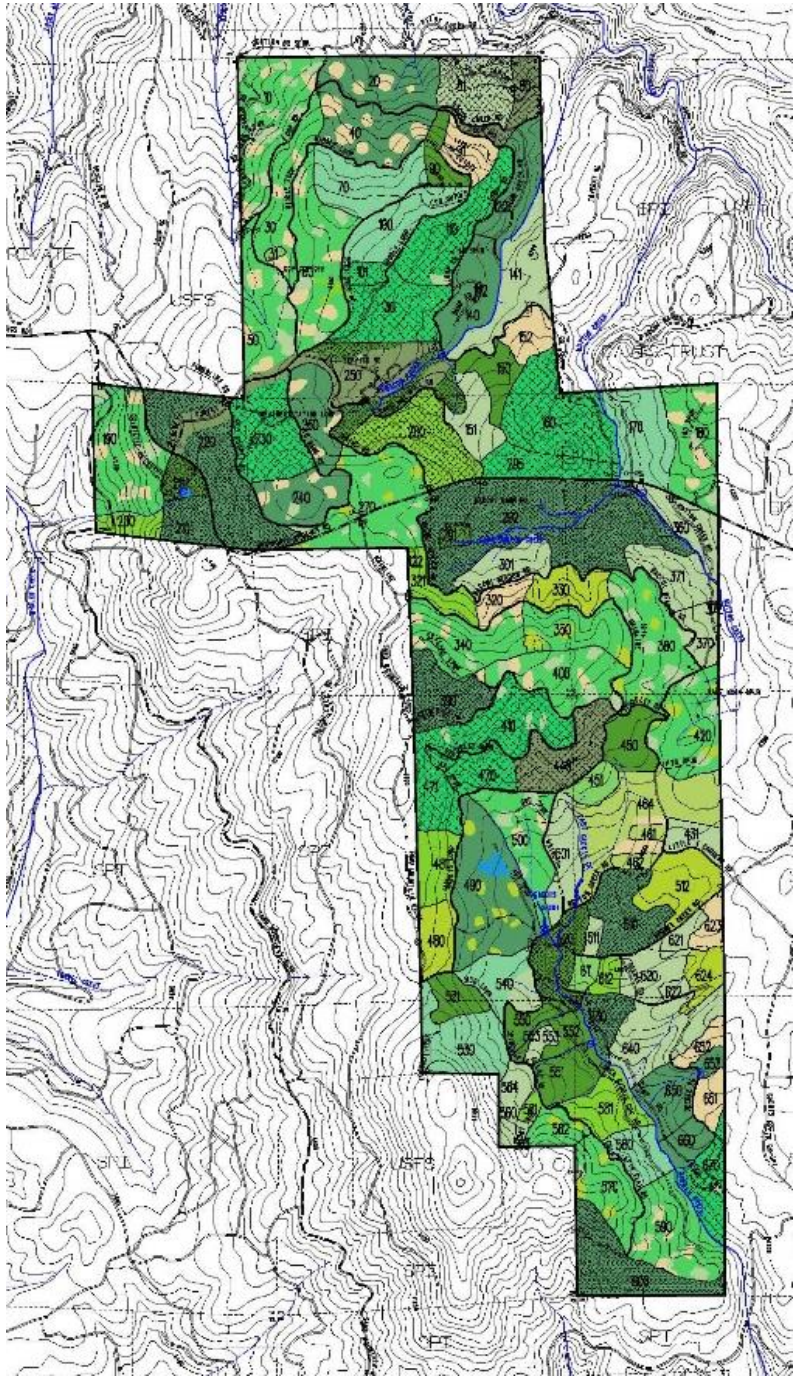

… then winter burning is Mr. Toad's Wild Ride

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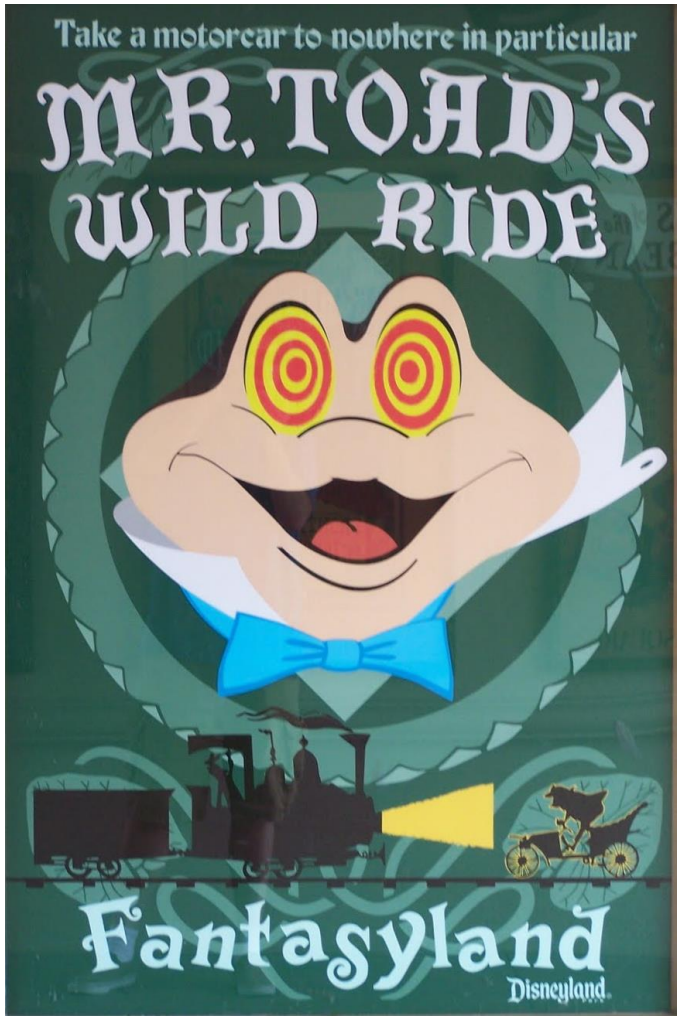
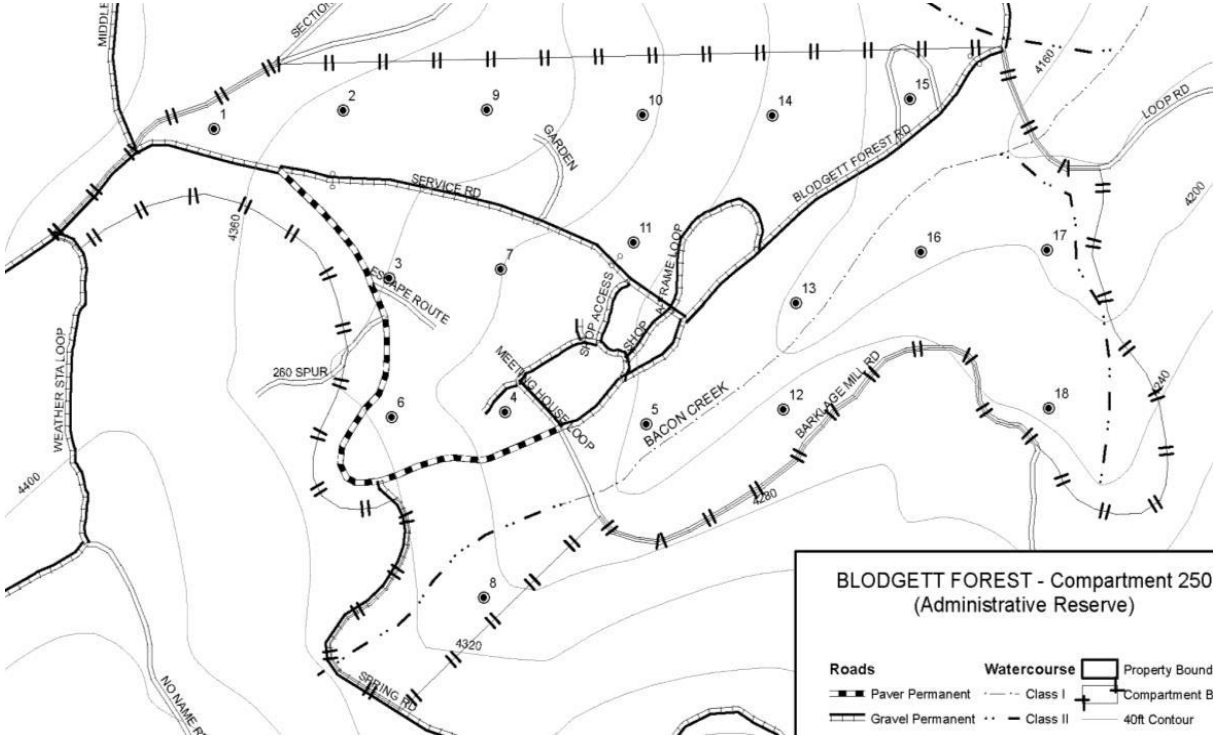


Compartment 250: 60 acres burned in past 6 years



Current torching probability: 0.1
Torching index: 80 mph

Key factors:
Being nimble
Commercial harvest to reduce canopy to 50%
Retention of ponderosa pine trees
Bracken fern in wetter areas

A winter weather toolkit

Tools:

- Drip torch $140
- McCloud $60
- 5-gal backpack pump $150
- Pocket weather meter $100

Total: $450*

*Local RAWS station gives 10-hr FMC

Fiat flamma!

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Masticated fuelbed

High fireline intensities
- Predicted AND observed
- Winter burning a good option?