WUI Treatment Standards, Appropriateness, and Effectiveness

Colorado Wildland Fire Conference

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Robert W. Gray, Fire Ecologist, R.W. Gray Consulting, Ltd.

Outline

1. What are our treatment goals – what are we trying to accomplish?
2. Developing a treatment prescription:
   a. What are the specific objectives?
   b. What are appropriate input parameters?
   c. Gaming the prescription.
3. Fuel treatment effectiveness issues.

What are we Trying to Accomplish with our WUI Hazardous Fuel Treatments?

Safe and Effective Wildfire Suppression

- Remember that initial attack is likely to be rural, volunteer fire department with limited manpower and equipment, limited water, modest training, extended response time,
- Create a safe environment for fire fighting resources,
- Create an environment for success in suppressing a wildland fire.

A race against time....

How fast is the fire spreading?

How long will it take to re-load?

What is the linear distance of the perimeter?

How much water do I have on board?

Our water will cover 100 m distance if suppressing grass/litter but will drop to 60 m if we encounter downed wood/ ladder fuels

What are we Trying to Accomplish with our WUI Hazardous Fuel Treatments (cont'd)

In the event suppression is unsuccessful…the goal should be low intensity fire impacting structures, not high intensity fire!

- Important to remember that <10% of structures are typically fire hardened in any community,
- More structures can survive if fire is low intensity,
- Safer evacuation if fire is low intensity – shorter duration.

What are we Trying to Accomplish with our WUI Hazardous Fuel Treatments (cont'd)

Treatments that give us a safe and successful work environment, and a high potential for structures to survive, also gives us resilient landscapes,

- As was pointed out in the first day of the conference there are significant social, environmental and economic costs if we fail to fire harden the landscape around our communities!

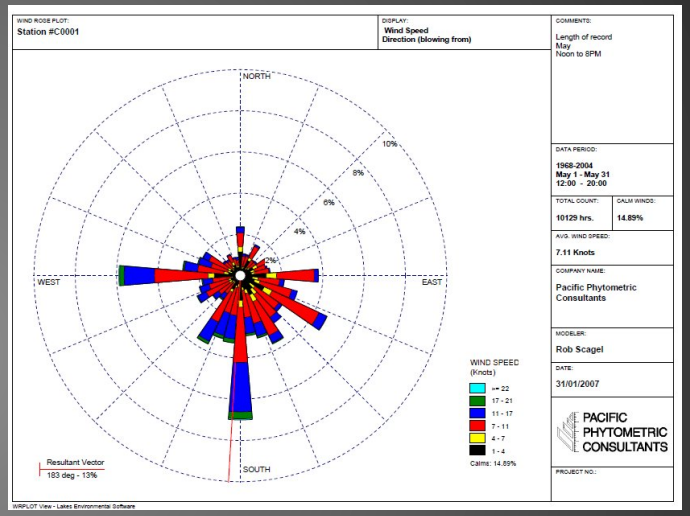
Key Treatment Prescription Objectives

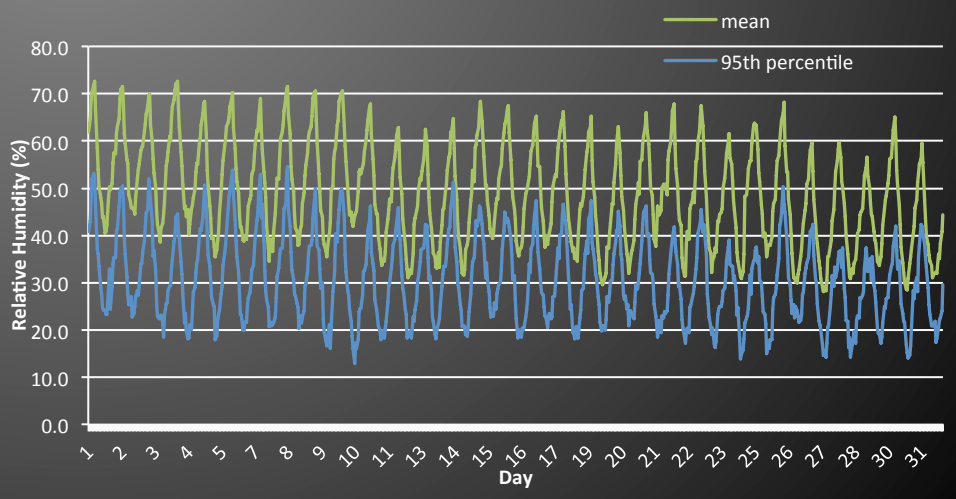
- Reduce the probability of “active” crown fire,
- Reduce surface fire intensity and spotting distance,
- Increase wildfire resilience of the environment.

Every prescription should begin with as accurate an assessment of fuels as possible – it’s key to due diligence!

Appropriate Inputs to Treatment Prescription Elements

- What kind of fire has affected the site in the past (historical natural fire regime) and what kind of fire might affect it in the near future?
- Prescription should rely on best available science in the areas of fire behavior and fire effects prediction,
- Fire weather (temperature, relative humidity, wind speed, wind direction) and fuel moisture are the critical input parameters,
- 95th percentile or higher values from representative weather stations are often used to determine worse case scenario for wildfire conditions,
- Base treatment prescription on worse case scenario, or if otherwise, provide rationale!





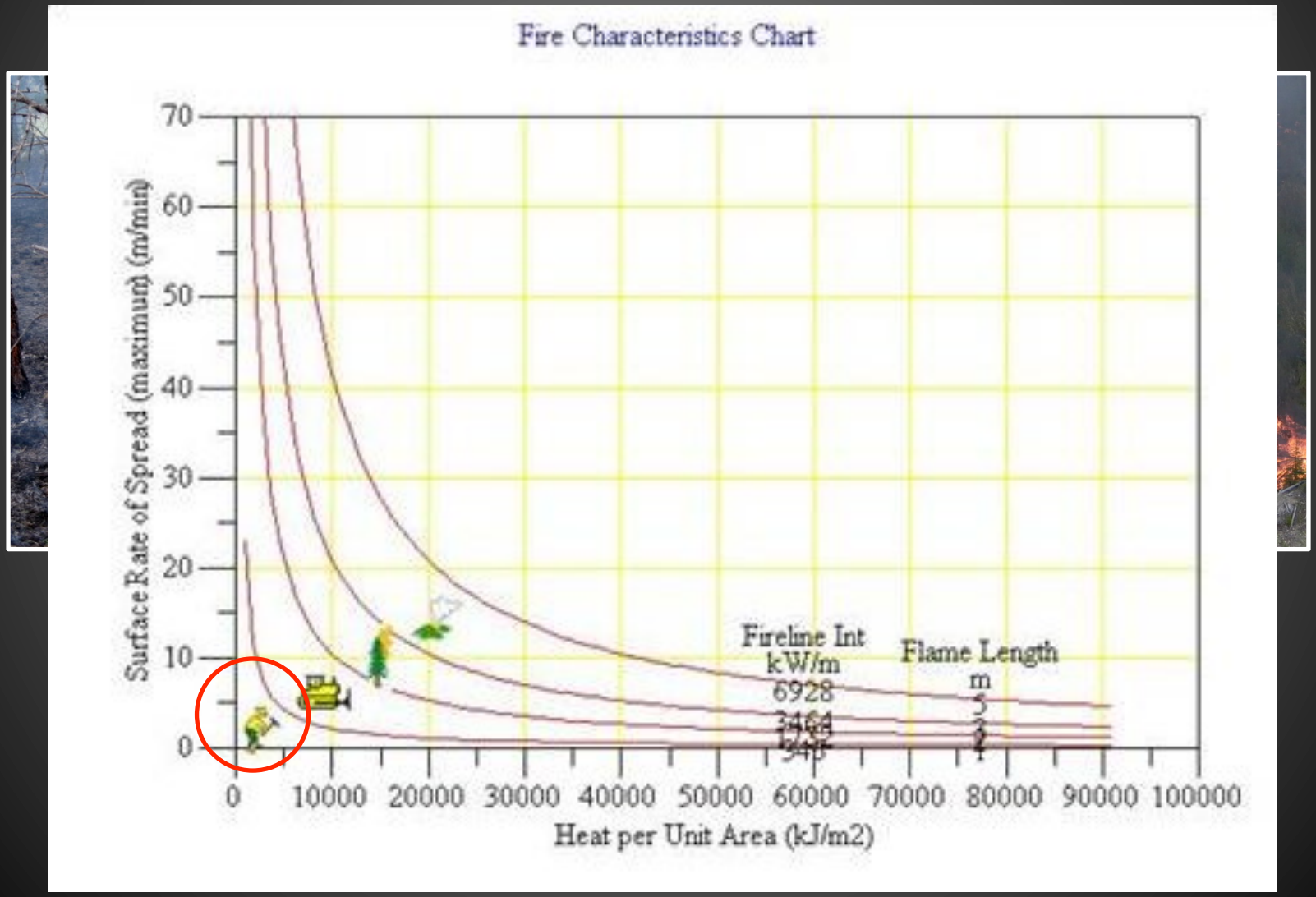
Reduce Probability of "Active" Crown Fire

Passive crown fire

Active crown fire

- Useful metric is Torching Index and Crowning Index
- Based on stand characteristics (CBH, CBD) and surface fuels, how much wind is necessary to initiate crown fire (passive) or propagate crown fire (active).
- Can be modeled using standard fire behavior prediction software.

Reduce Fireline Intensity/Spotting Distance

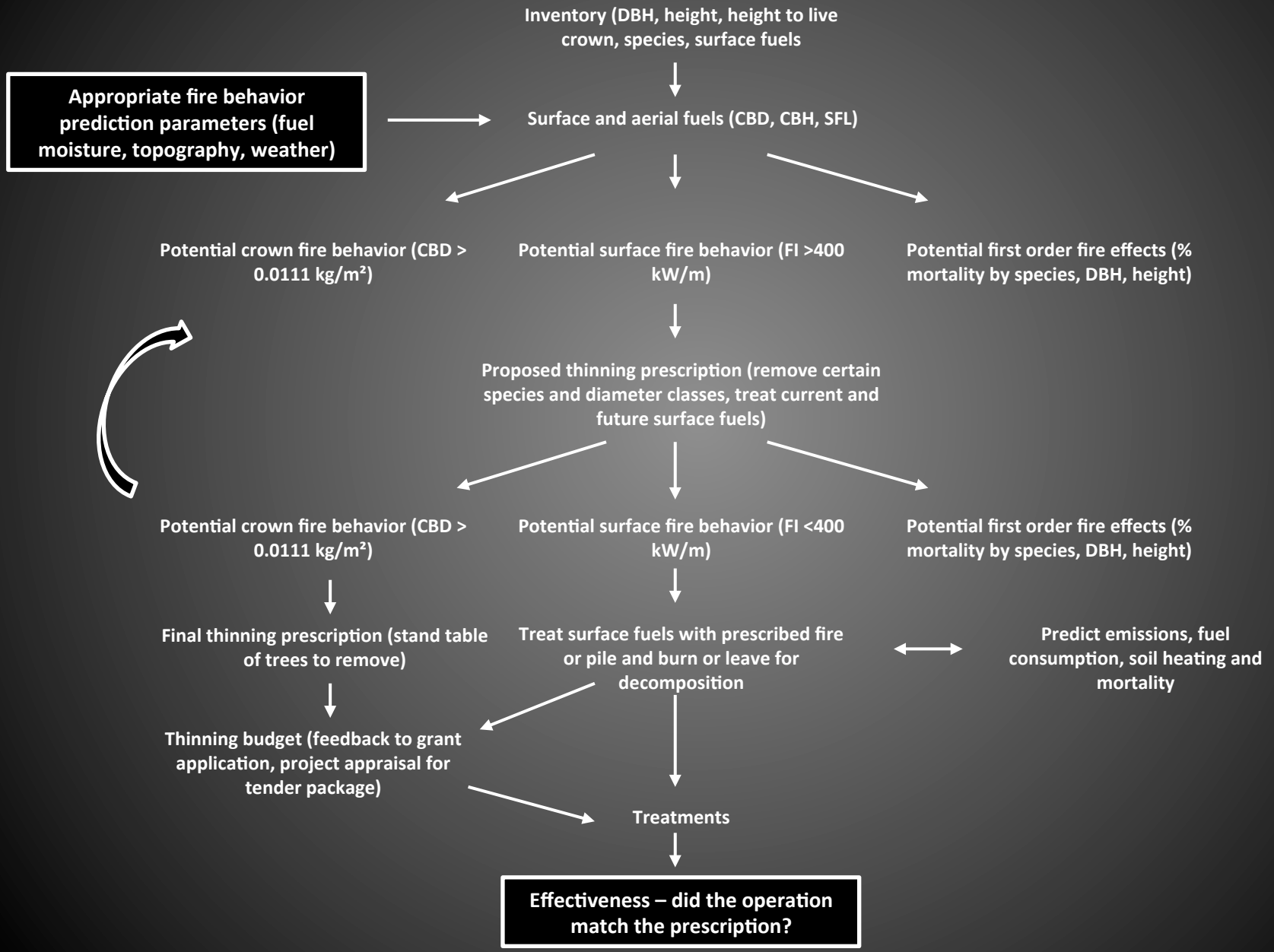


Increase Wildfire Resilience

• Goal is to create conditions where the majority of the forest can survive a fire,
• Significant costs are incurred (i.e., salvage, weed control, soil stabilization, replanting, spacing, etc.) and fire hazard can increase if the forest is lost.

• Standard fire behavior and fire effects prediction models can be used to determine levels of mortality by species and diameter.

Gaming the Treatment Prescription



Fuel Treatment Effectiveness Issues

- Is it in fact a “fuel” treatment or is it a “silvicultural” treatment?
- Fuel succession dynamics – fuel treatments aren’t forever!
- How long is a treatment successful in meeting the stated objectives?
- When a fuel treatment isn’t effective it hurts the greater effort – many detractors who argue that treatments aren’t at all effective and worse are a waste of money.

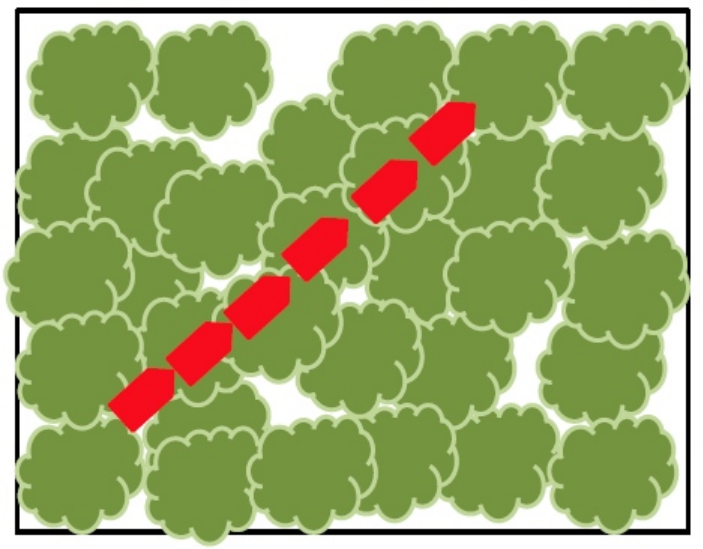
Fuel Treatment Effectiveness Issues

Mutually exclusive objectives: growing "clear" future fiber while reducing wildfire hazard.

Mutually exclusive objectives: cannot reduce heavy surface fuel load with prescribed fire under a forested canopy.

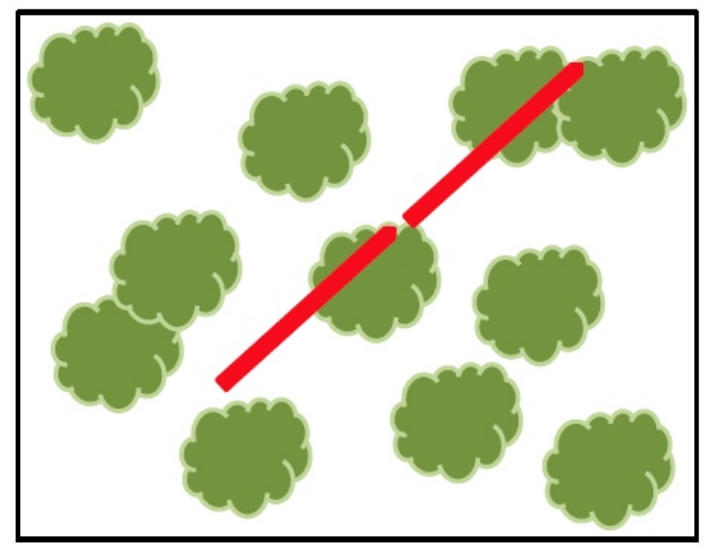
Canopy Layer Impacts on Suppression Effectiveness

Air tankers and rotary-wing resources have to use more retardant to "punch" through the canopy – limits how far each load can go.



Closed-canopy

More open canopy means each drop can cover a longer distance – critical if turn around time is long – and more retardant reaches the surface and not hung up in tree crowns.



Open-canopy

Unforeseen and Unintended Consequences of Treatment

- Herbaceous response to thinning,
- Conifer regeneration responding to ground disturbance and increased light.

- Windthrow risk increases with thinning – especially if young forest that has grown under dense conditions for decades (poorly developed root systems)

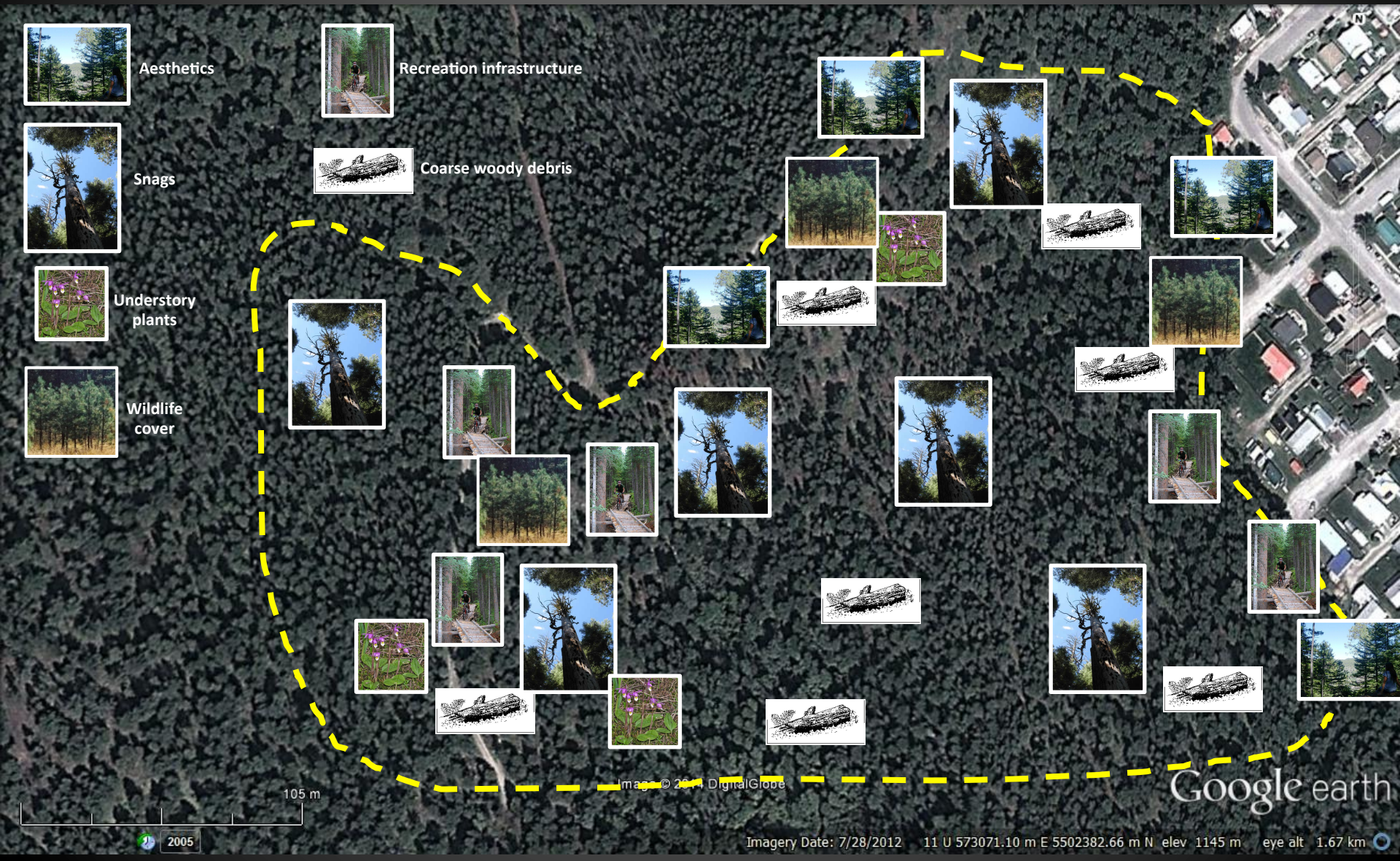
Unforeseen and Unintended Consequences of Treatment

- Not thinning heavily enough – the crowns
- Dense canopy traps convective and radiant heat below the canopy, which eventually has to escape,
- Ponderosa pine can survive high levels of scorch but most other species cannot,
- Subsequent bark beetle infestations can cause severe mortality

Scale of Treatments

- How much of the landscape needs to be treated to have an effect?
- What is the "effect" we're after?
- What are the costs associated with treatment arrangements?

How Much Do We (Can We) Compromise



Summary

- Must always stay rooted to what we are trying to accomplish with our hazard reduction treatments,
- Significant social, environmental, and economic consequences of poorly designed and implemented fuel treatments,
- Due diligence is tied to using the best available information and ensuring that implemented matches prescribed,
- Fuel treatments are forever!