



Protecting Tree Plantations From Fire

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Disclaimer

- Every site is different – fire threat varies
- Up to you to evaluate risk
- Insurance, banks, incentive programs, environmental review might call for some sort of fire plan
- Better safe than sorry – plan for the worst now and worry less later

Why Worry About Fire in Hawaii?

- Statewide there were 659 “wildland” fires reported between 1996 and 2000
- 61,446 acres burned
- Resource value \$85 million
- Mostly brush and “untended” forest
- No figures for privately owned tree plantations - how come?

My Trees Live Where It's Too Wet

- Good sites for trees = fast growth of grass and brush, especially before canopy closure
- Drought and high winds can happen at any time during the year
- High elevation and leeward sites often subject to low humidity

Fire Jargon

- Prevention
- Pre-suppression
- Suppression

Prevention

Don't let it start in the first place!

- Ignition sources:
 - Power tools
 - Mowers
 - Catalytic converters
 - Heavy equipment



More Things That Start Fires

- Welding
- Smoking
- Missing Spark Arrestor



Fire Danger

- Follow the weather
- If it's dry, close the area



Catch The Fire Before It Gets Away

- Fire extinguisher
- Water
- Fire tools
- Phone on site
- Keys to the Dozer



Life on the Plantation

- Protect the trees from the burning house and vice-versa
- 30 foot buffer
- Wildland-Urban Interface



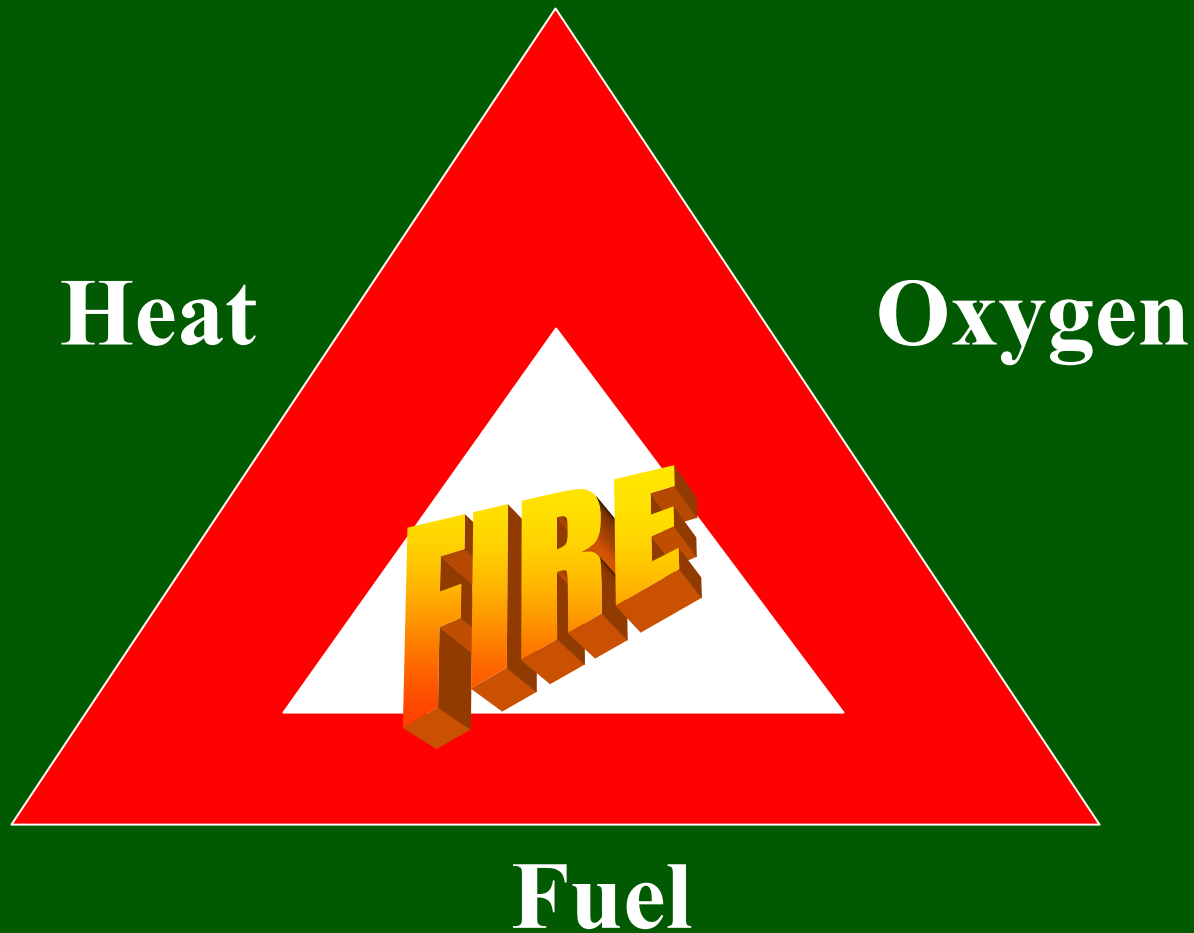
What About...

- Roadside starts
- Arson
- Idiot neighbor
- Big wildfire in the neighborhood

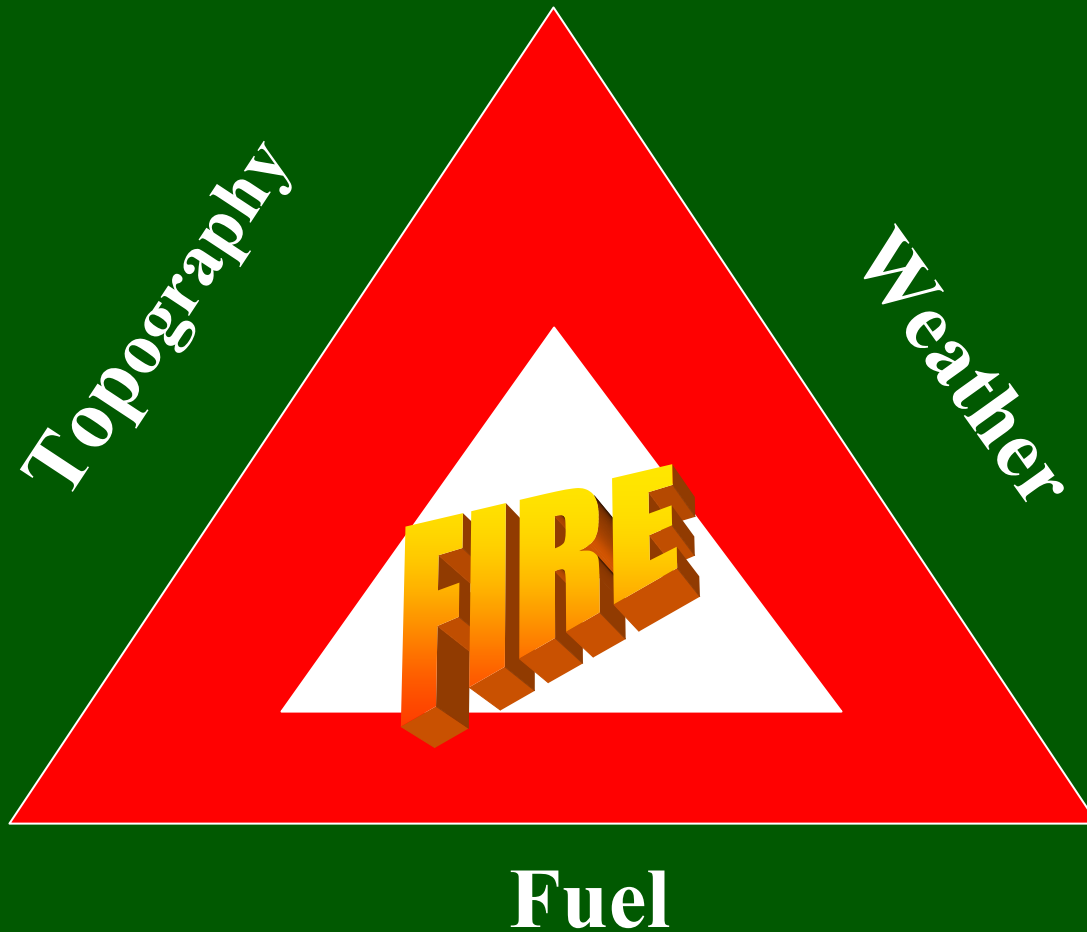
Pre-suppression = Plan Ahead

- Fuels
- Access
- Water

Fire Triangle



Fire Behavior Triangle



Fuel

- The only component that you can really control
- Availability to burn and fire behavior depend on:
 - Moisture
 - Arrangement
 - Size
 - Loading
 - Continuity
- Live trees aren't fuel; the dead stuff on the ground is

Fuel Moisture

- Fine, Dead Material Carries Fire
- Subject to Rapid Changes
- Depends on Weather



Fuel Arrangement

- More available oxygen makes a hotter burn



Fuel Size and Loading

- Heavy fuels mean prolonged heat
- Damage to base of trees
- Harder to put out



Loading

- Site Preparation
 - Cat piles
 - Chip mounds



Continuity - Vertical

- Remove “ladder” fuels
- Canopy not likely to burn unless supported by surface fire



Continuity - Horizontal

- Preheating ahead of fire – dries fuels
- Increased intensity



Vegetation Management

- Plantation is more than just trees
- Select for less fire-prone understory
- If you can't keep the fuel under control, then you need breaks



Breaks



Fire



Fuel

How Wide?



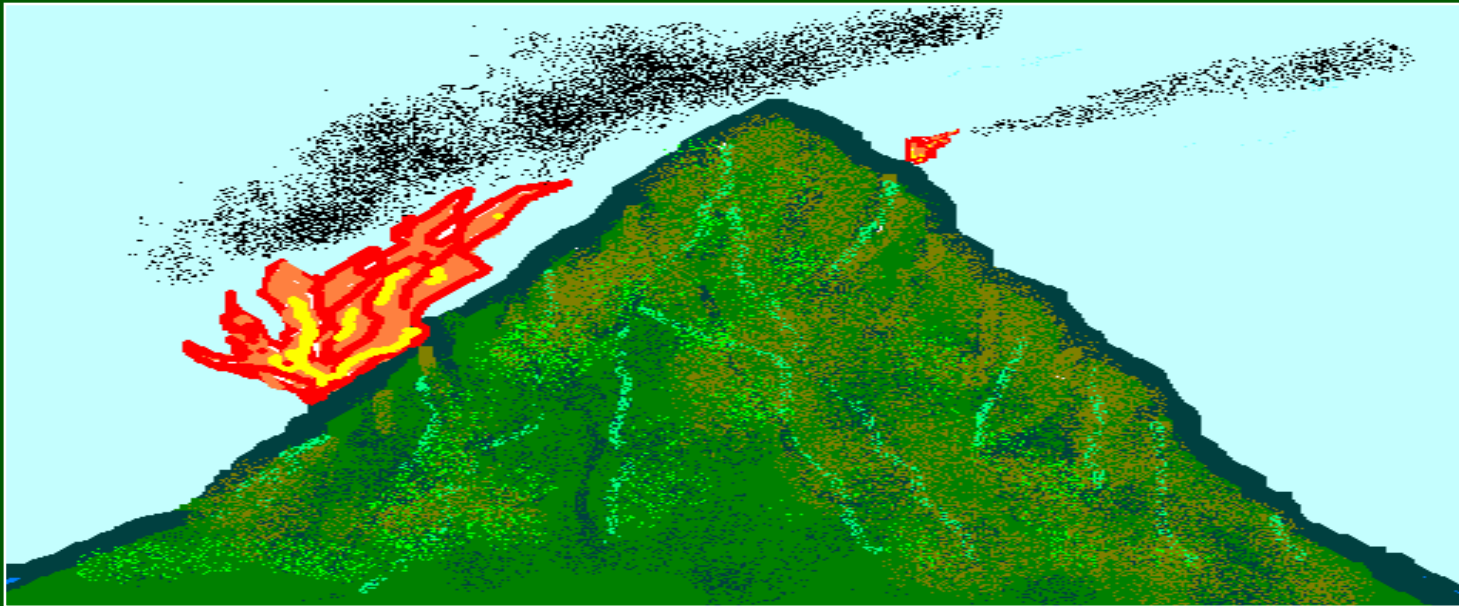
- Short answer = 2 times fuel height

Location of Breaks

- Perimeter
- Compartments
- Build into Harvest Plan



Orienting Breaks



- Fires are wind driven
- Perpendicular to prevailing wind
- Lee side of ridges

Access

- Address posted
- Gates and locks
- Contact phone #
- Maps



Access

- Roads
 - Condition
 - Width
- Bridge loads
- Vehicle turn-outs
- Safety zones



Part of Harvest Planning

Water

- Sources
 - Hydrants
 - Ditches
 - Reservoirs
 - Natural bodies
 - Water tanks
 - Fold-a-tanks
 - Tank trucks



Water Is No Help If You Can't Get to It!

- Standard threads on pipes
- Deepen streams or ditches
- Harden edge of reservoirs or install standpipes
- Helicopter dip access



Suppression

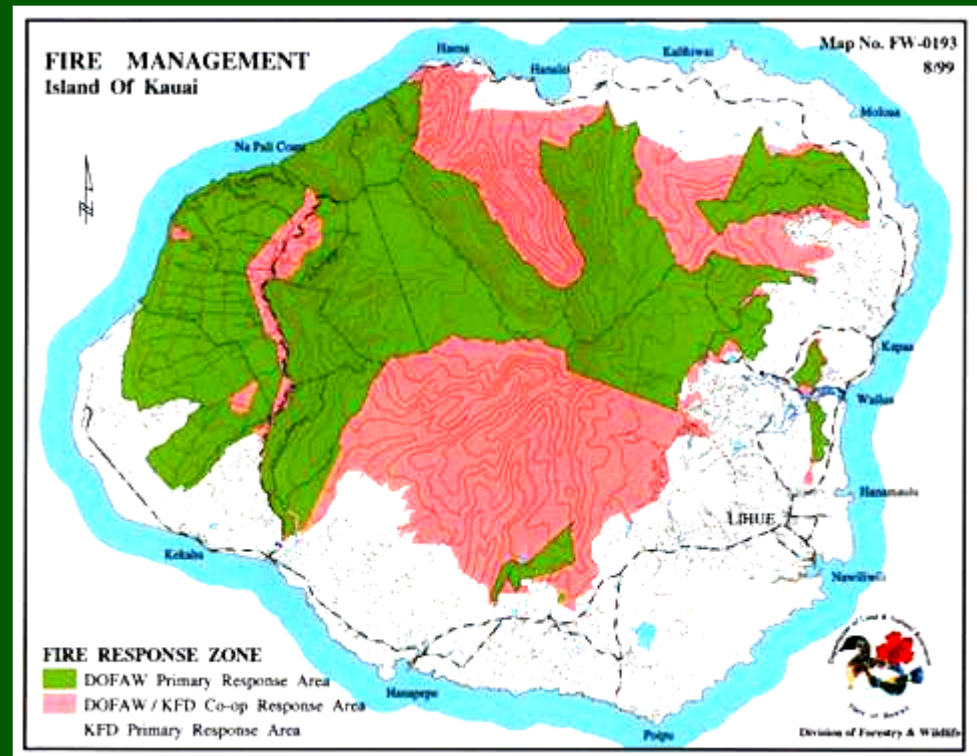
Will almost always be
the County Fire Dept.

- Life and structure protection
- Wildfire experience varies
- Have other things to do



What if it's a BIG Fire?

- Cooperative agreements between County, State and Federal agencies
- DOFAW role to protect State lands and watershed



Tactics



- Direct Attack
 - Kill the fire while it's small
 - Response time is key

Tactics

- Indirect Attack
 - Defending the fire line
 - “Fighting fire with fire”
 - Backing fires have lower intensity than head fires
 - Ways to protect trees



Take Home Points

- Mow your grass
- Plan for the worst
- Make friends with the Fire Department

Thank You – Any Questions?

