

Harvesting and Utilization Technology

Southwest Fire Council Conference
November 2003

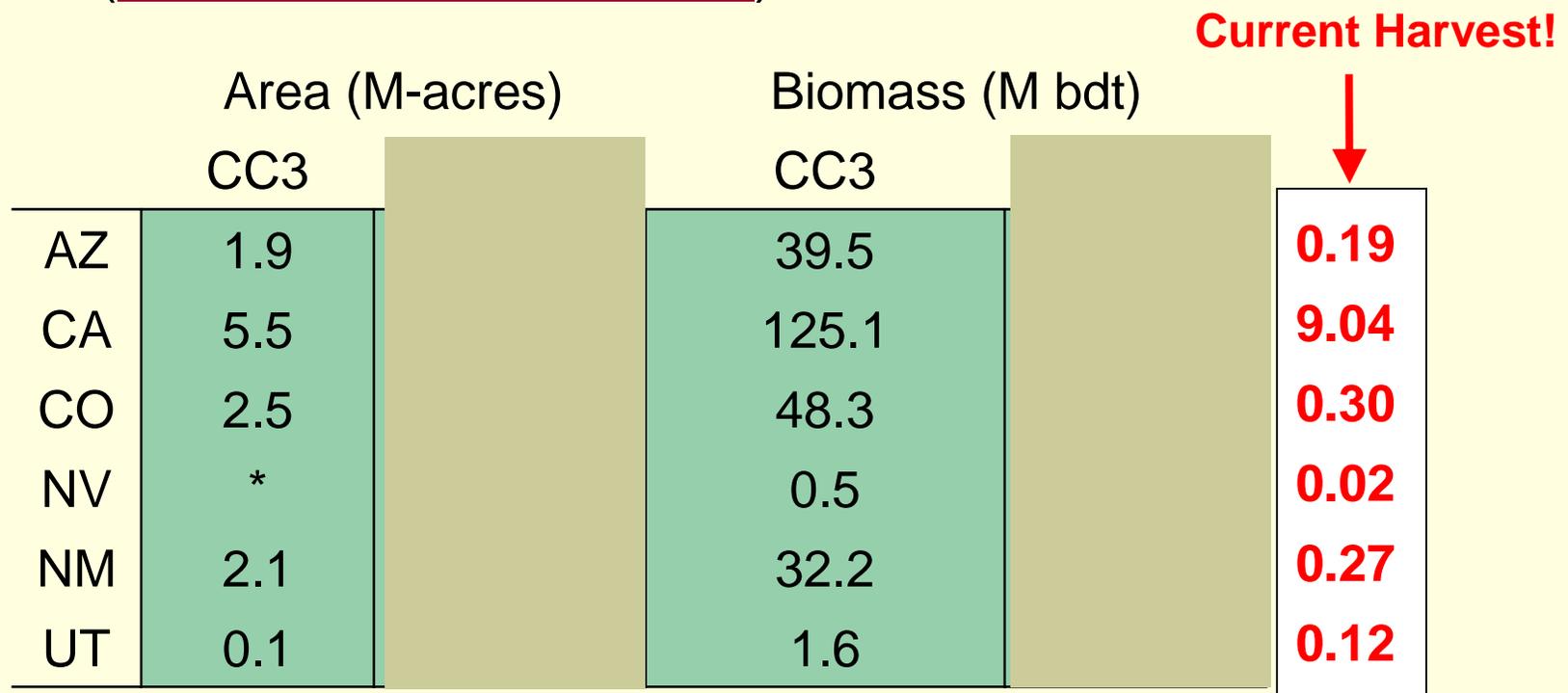


Forest Operations Research

USDA Forest Service

A big problem ...

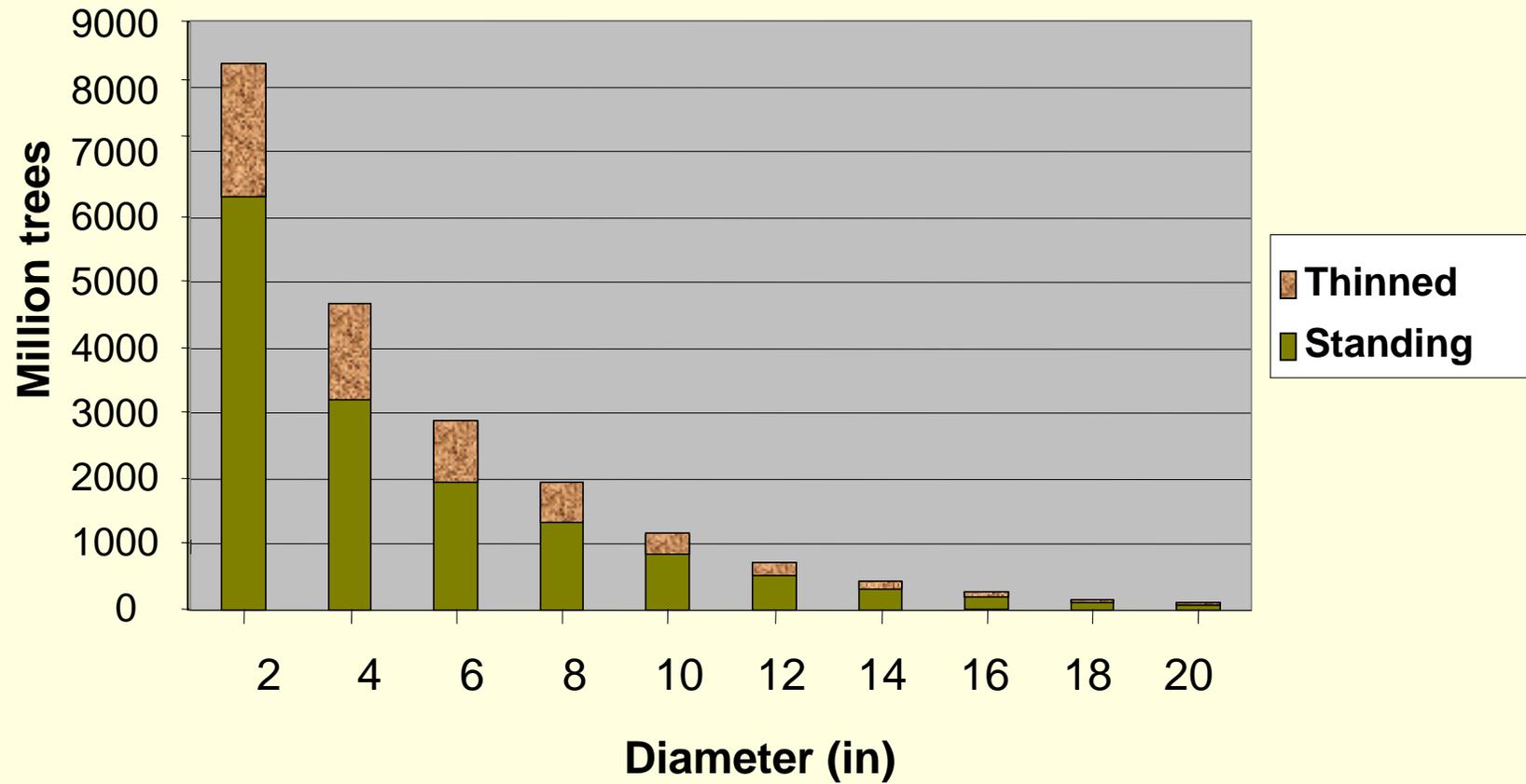
- Strategic Assessment of Forest Biomass and Fuel Reduction Treatments in the West (www.fs.fed.us/research)



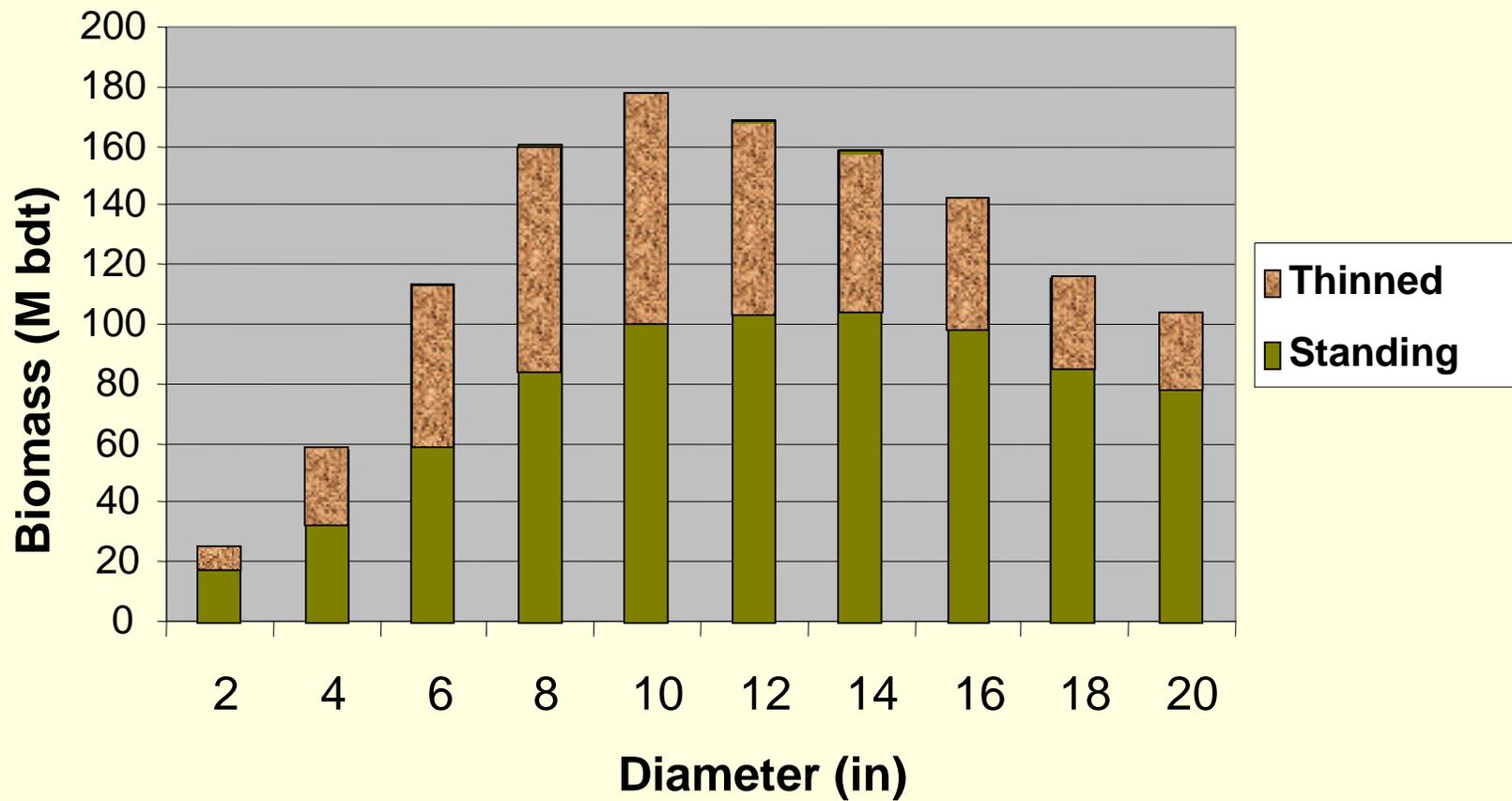


Monument Canyon, NM

Lots of small trees

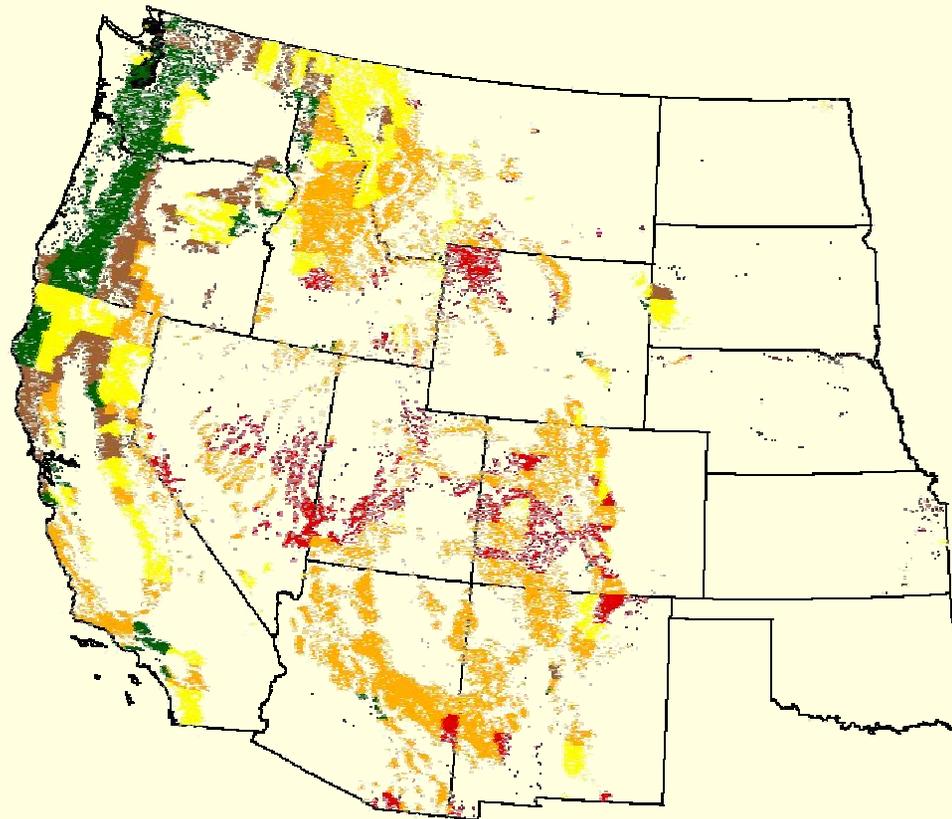


Most volume is merchantable



Availability of Contractors

Workers/100 mi²



Context

- Modify fire conditions
- Treat millions of trees < 4"
- Utilize huge volumes of fiber
- Ecologically-acceptable manner
- Limited workforce and markets

This Afternoon

- Forest Operations as Tools
- Issues of Efficiency and Costing
- “Tools for Fuels”

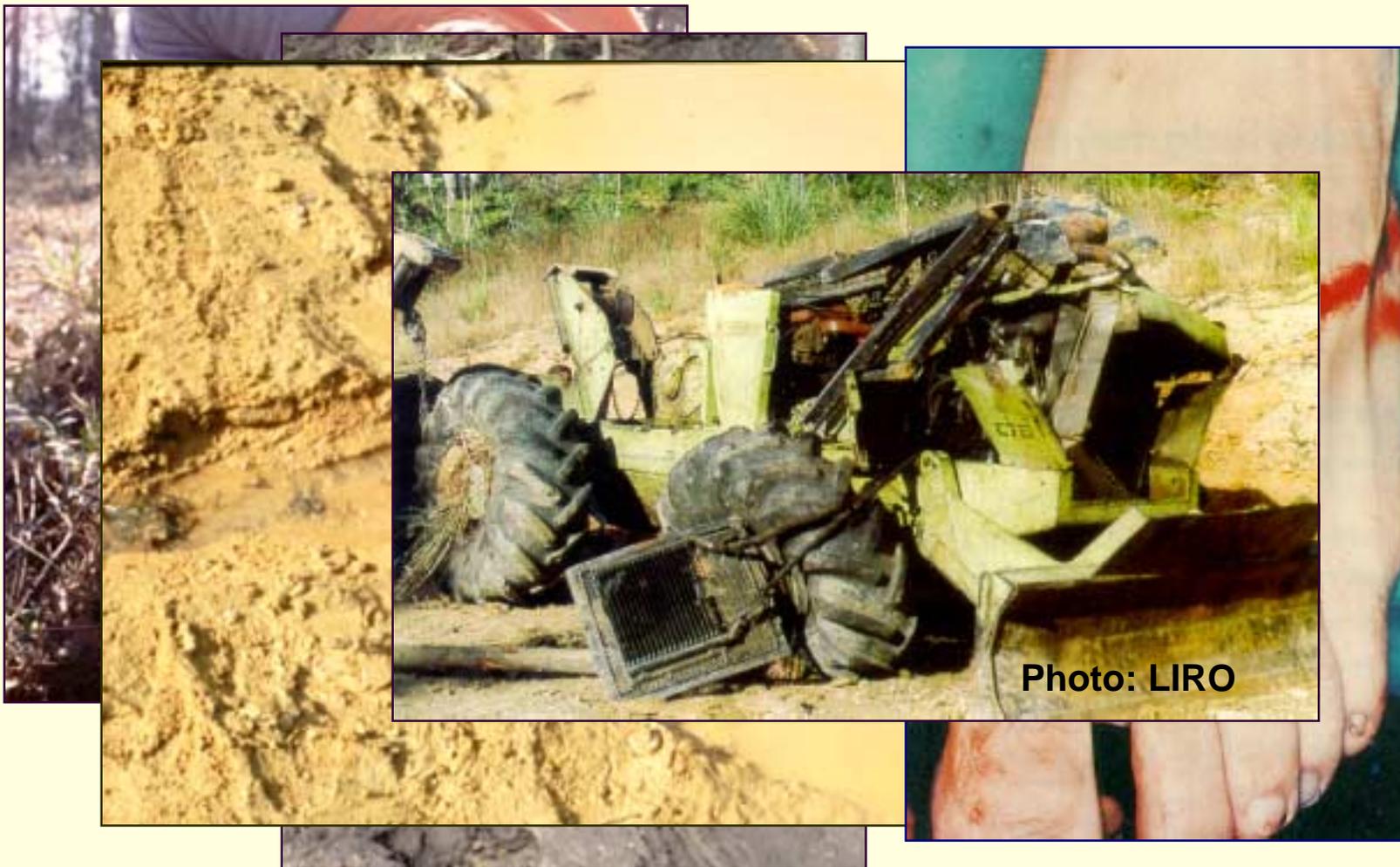
A tool for every job



Using the Fuel Tool



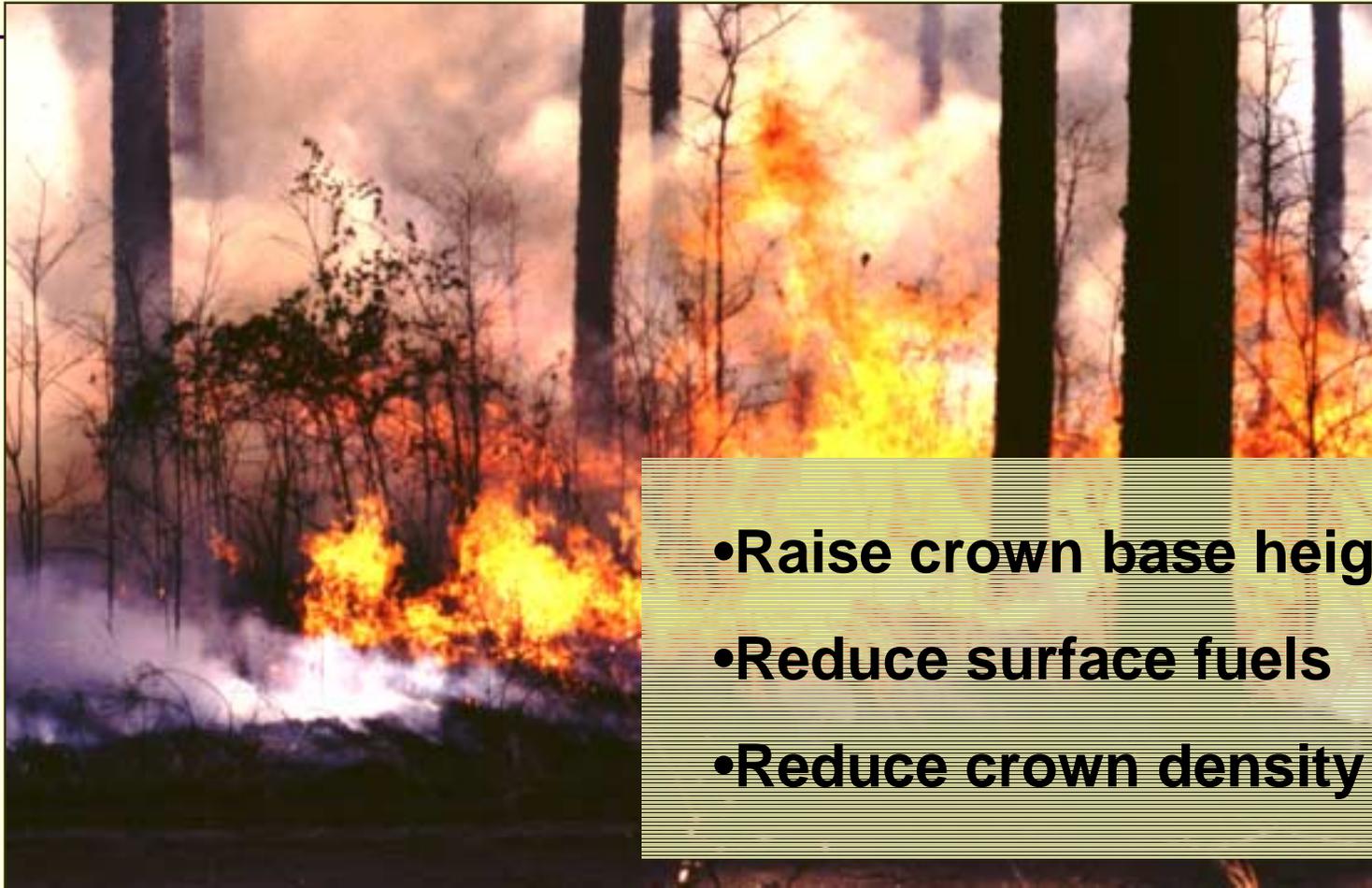
Damage occurs ...



Match the tool to the job



The Job: Modify Fire Behavior



- **Raise crown base height**
- **Reduce surface fuels**
- **Reduce crown density**

The Job: WUI constraints



- **Small tracts**
- **Fire use restricted**
- **Safety concerns**
- **Visuals**
- **Access**

Tool catalog



www.fs.fed.us/fmhc/sdu

Whole-tree harvesting



Flagstaff fuel treatment



Whole-tree harvesting

- Integrated treatment
- Reduce the number of entries
- Safely handle anything
- High capital investment
- Needs larger areas, volumes, markets
- Requires good access
- Costs increase with slope, ave stand diameter
- Lower impact systems more costly

Think small



Think small



ATV-based equipment



Farm tractors



Industrial tractor adaptations



Economies of Scale



Economies of Scale



The Urban Logger



Mid-Town Logging

Memphis, TN

Sortyards



Small-scale equipment

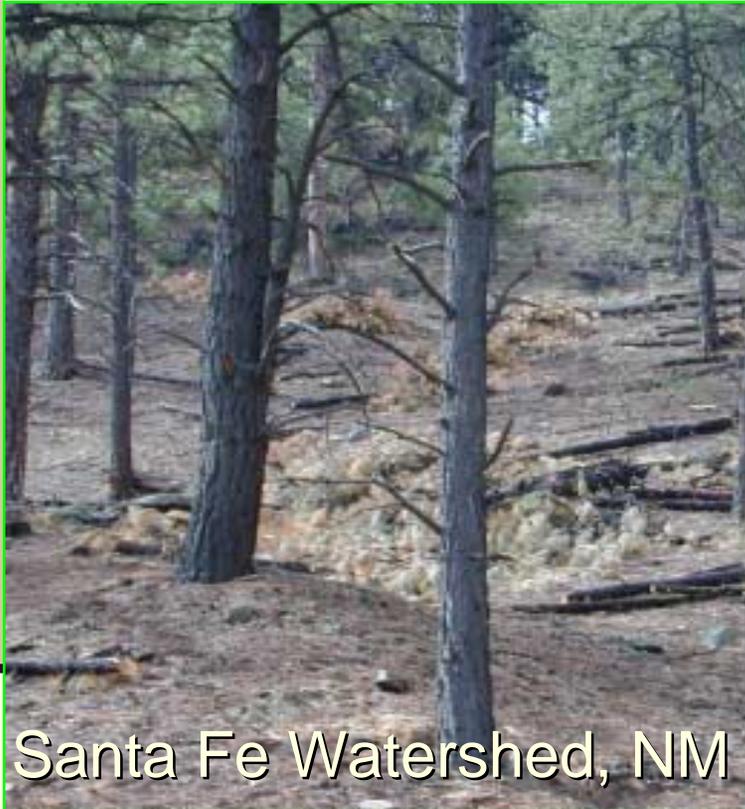
- Small areas, volumes
- Cheaper, lower moving costs
- Lower impacts (?)
- Higher per unit costs
- Safety concerns

<http://www.osha-slc.gov/>

Make it go away



Pile and burn



Treat it in the stand





Atlanta, ID





Mastication

- Wide range of equipment and capabilities
- Can create specific fuel conditions
- 1 pass treatment
- Can work in lieu of or as prep for Rx fire
- Questions about soil impacts

Air Curtain Burners





ACD's

- \$15-20/ton (Fell/Skid)
- \$70/ton burning
- Limited throughput (10 tons/hr)
- Primary value is “smokeless” disposal

The Potential of Biomass ...



AVISTA Kettle Falls, WA

Biomass Collection



Forwarding residues, Flagstaff, AZ

Biomass Bundling





Bundling juniper



Prineville, OR

Extraction



Transportation



Conversion



Biomass One White City, OR

Biomass Bundling

- Recovers biomass for use
- Low impact
- Slopes to 40%
- Productivity reduced by residuals, volume
- Biomass doesn't pay the freight
- Cost of bundling can be competitive with alternative fuel treatments

www.fs.fed.us/fmsc/sdu/biomass

Tools for Fuels

- There is a huge selection of options
- Know your choices
- Know how operations are affected by job
- Many existing operations were not designed for fuels treatments
- Careful prescriptions
- Keep looking at new developments

You are not alone ...



CANBERRA, AUSTRALIA



The future?



Idaho City, ID July 2003