

# Landscape Design Series 14

Authored by  
Dr Mike Kuhns  
Forestry Specialist  
Utah State University



# Fire in Utah's Wildland/Urban Interface

Dr. Mike Kuhns  
USU Extension Forester



# Wildland/Urban Interface

- Between core urban and rural areas; also includes developed rural areas
- Popular for housing and recreation
- Increased pressure throughout the West
- Problems with wildlife, water quality, fire
- 374,000 acres in Utah



# Popularity Leads to Problems

- Attractive natural vegetation
- Fire often natural part of landscape
- Access and infrastructure problems
- Minor fires become major disasters
- Fires cost 8-10x more to fight in WUI





# Spokane Area Fires

- Spokane County Washington
- October 16-22, 1991
- 92 wildfires kill one person and burn 114 homes





Spokane area





Spokane area

# Oakland/Berkeley Hills Fire

- Berkeley Hills area in Oakland, California
- October 20-23, 1991
- 25 people killed, 3,354 homes and 456 apartments destroyed
- 790 homes in first hour
- Damages in excess of \$1,000,000,000
- Also 1923 – 584 homes & \$10M, 1970 – 38 homes & \$3.5M







Berkeley Hills before





Berkeley Hills after





Berkeley Hills rebuilding, 2/93





Berkeley Hills rebuilding, 2/93



# Los Alamos (Cerro Grande) Fire

- Prescribed fire in Bandelier NM
- May 2000
- 220 structures & 43,000 acres burned
- \$100 million to \$800 million in losses





Rick Wilking/Reuters

Los Alamos, Cerro Grande fire





Jack Cohen

Los Alamos; Cerro Grande fire

# Utah WUI Fires

- 1990-1992
  - 153 interface fires
  - 24 counties
  - \$1.6 million property damage
  - \$31.4 million threatened property
- 2001 -- At least 823 WUI fires
- Over 400 communities “at risk”



# Wasatch Mountain Fire

- Wasatch County, Midway area
- August 1990
- Two firefighters killed
- \$1.2 million property damage
- Twenty homes burned







Wasatch Mountain area; oak-maple





Wasatch Mountain area; oak-maple





Wasatch Mountain fire





Wasatch Mountain fire

# Utah WUI At-risk Areas

- Wasatch Front
- Wasatch Back
- Southwest Utah
- Moab Face
- Others







Wasatch Front; Salt Lake City





Wasatch Front; Bountiful





Wasatch Front; Uintah, Ogden





Wasatch Front; Uintah, Ogden





Wasatch Back; Park City





Wasatch Back; Sundance





Wasatch Back; Logan





Southwest Utah; Cedar Highlands





Southwest Utah; Duck Creek





Castle Valley; P-J, oak





Castle Valley





Castle Valley, P-J





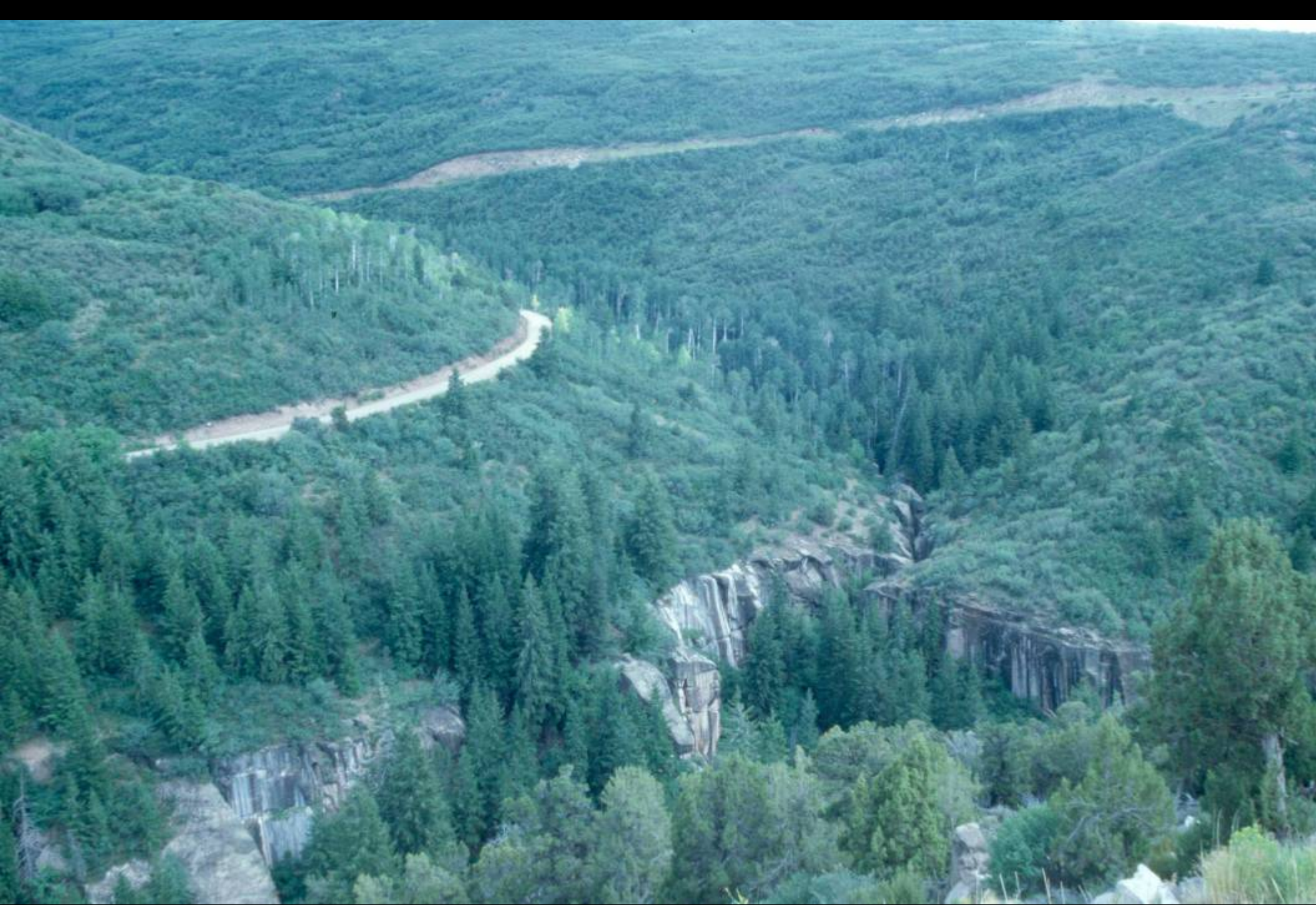
Castle Valley, P-J





Castle Valley; oak, P-J





Moab Face; oak, conifers





Moab Face; oak, P-J, ponderosa pine





Moab Face



# Solutions

- Community level
- Development level
- Individual level





# Community Level

- Planning and zoning
- Infrastructure requirements
  - Fire department
  - Road widths, grades, curves, etc.
  - Water supply
- Demonstration homes, landscapes
- Ordinances





Planning (SE of Cedar City, UT)



# MAPLE HILLS SUBDIVISION NO. 4

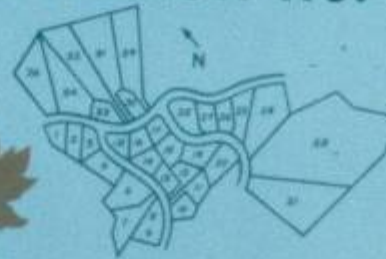
*Final Phase !*  
*FROM 1/2 to 8 ACRES*

MARKETED BY

MAPLE HILLS REALTY

298-3275

RONN MARSHALL 573-1178 • GREG CALL 298-6387



DEVELOPED BY :

THE MADISON CO. ———— RON FERRIN 364-7151

Planning (Bountiful, UT)





Fire station (Sundance, UT)



# Castle Valley Ordinance 99-4

“WHEREAS, fire fighting assistance from Moab or Grand County would take at least forty-five (45) minutes to get from Moab to Castle Valley...”







Steep, poor road (Cedar Highlands, UT)





Dead-end street (Uintah, UT)





Water supply (Uintah, UT)





Hydrant (buried; Uintah, UT)



# Utah County Ordinance #1993-07

- Building permit tied to fire safety permit
- Sets standards for roads, premises identification, water supplies, fire hydrants
- Requirements for sprinklers, maximum slopes, chimneys, driveways, roofs, landscaping





# Development Level

- Development location, layout
- Fuel breaks
- Water supplies
- Buried utilities
- Street, home signs
- Covenants that help
- Education, awareness





# GLADE HOLLOW



PLANNED UNIT DEVELOPMENT

MARKETED BY:

MAPLE HILLS REALTY

**298-3275**

GREGG  
REVELL

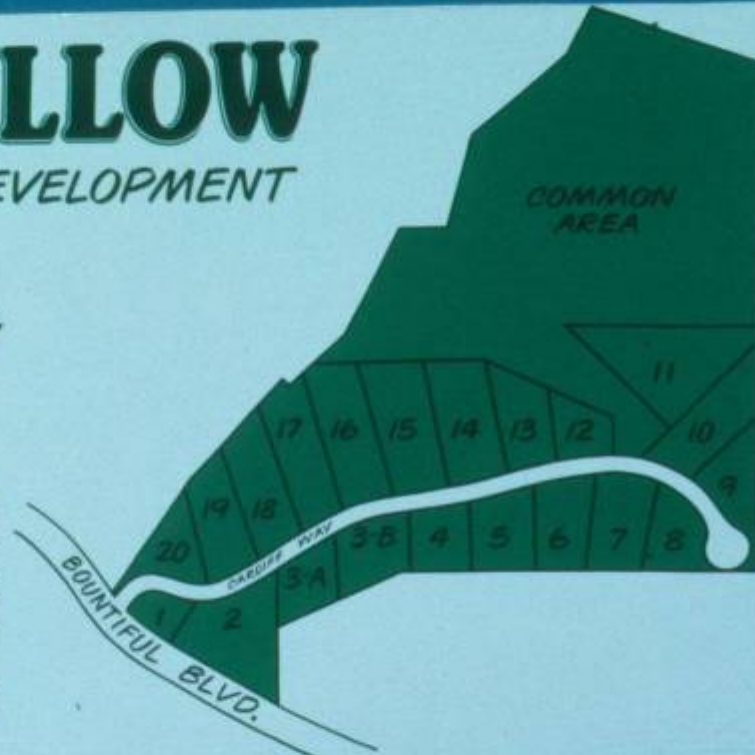
**292-1326**

RONN'  
MARSHALL

**573-1178**

DEVELOPED BY:

WOOD DEVELOPMENT 298-2240



Single road access (Bountiful, UT)





Possible water source (Uintah, UT)





Buried utilities (Uintah, UT)





Powerlines (Bountiful, UT)





Road sign (Cedar Highlands, UT)





No road signs (Midway, UT)





Wood roof, oak brush (Uintah, UT)



# Individual Level

- Building design
- Building placement, access
- Landscaping, maintenance
- Water supply
- Readiness





# Building Design

- Non-flammable roof
- Non-flammable siding
- Short, boxed eaves
- Decks
- Screened openings, chimneys
- Down-slope windows
- Sprinkler systems in and out







Wood roof (Uintah, UT)





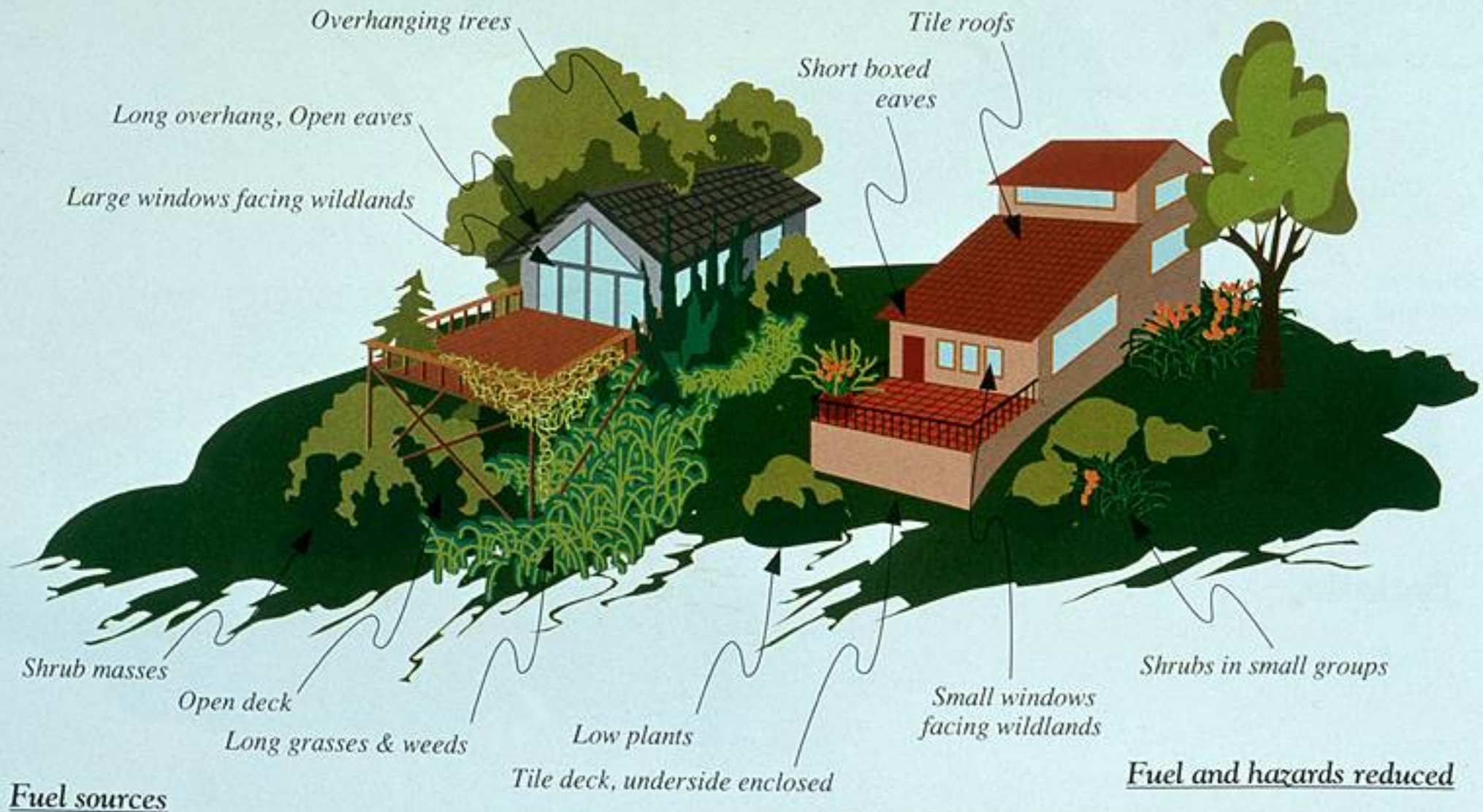
Class A roof, boxed eaves (Uintah, UT)





Wood decks (Boulder, CO)





# Building & landscape maintenance & design





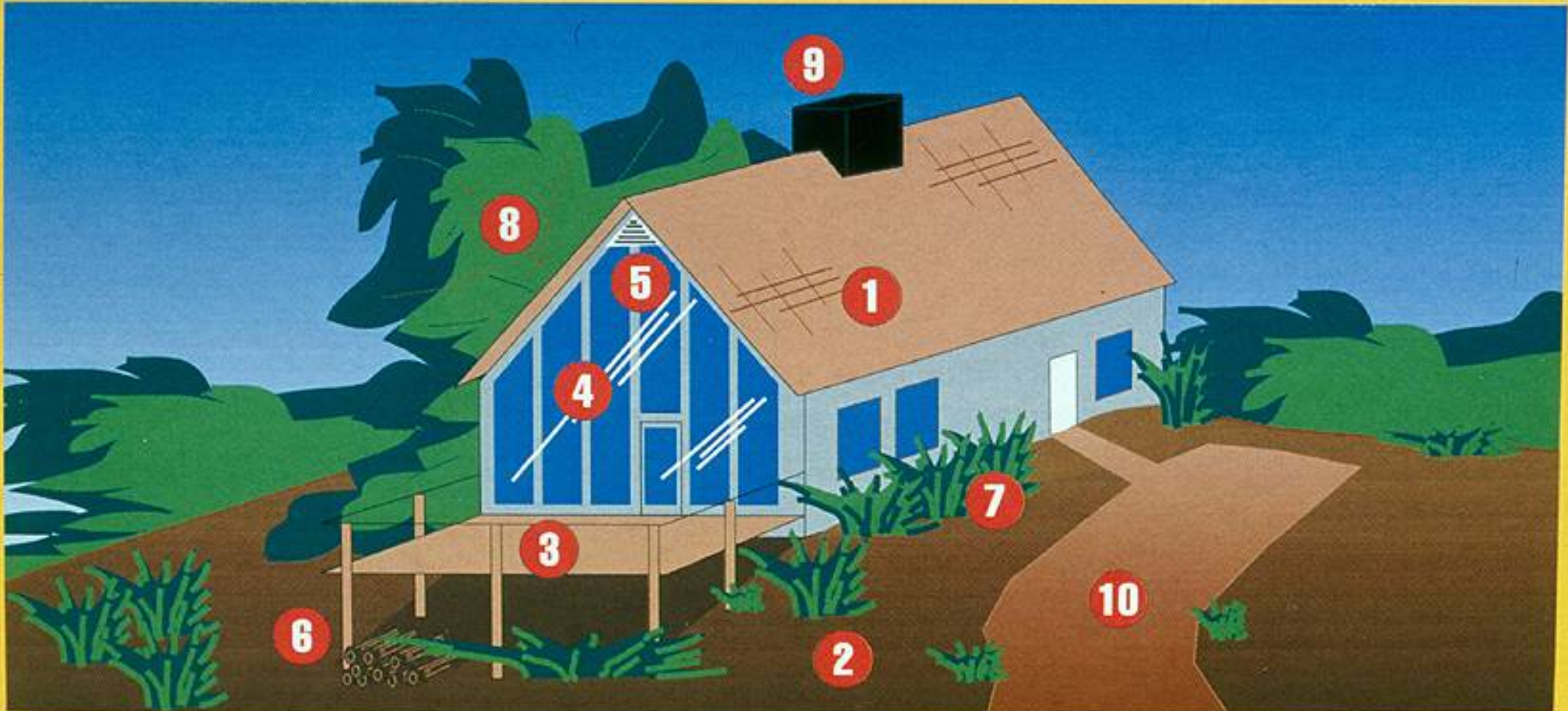
Screened chimney (Uintah, UT)



1. Untreated wood shake roof  
2. Home located on a slope  
3. Wood deck facing slope  
4. Large glass windows facing slope

5. Unprotected louvres in front  
6. Firewood stored too close to home  
7. Inadequate weed clearance

8. Tree limbs overhanging roof  
9. Chimney spark arrestor missing  
10. No access for emergency vehicles



Fire trouble spots

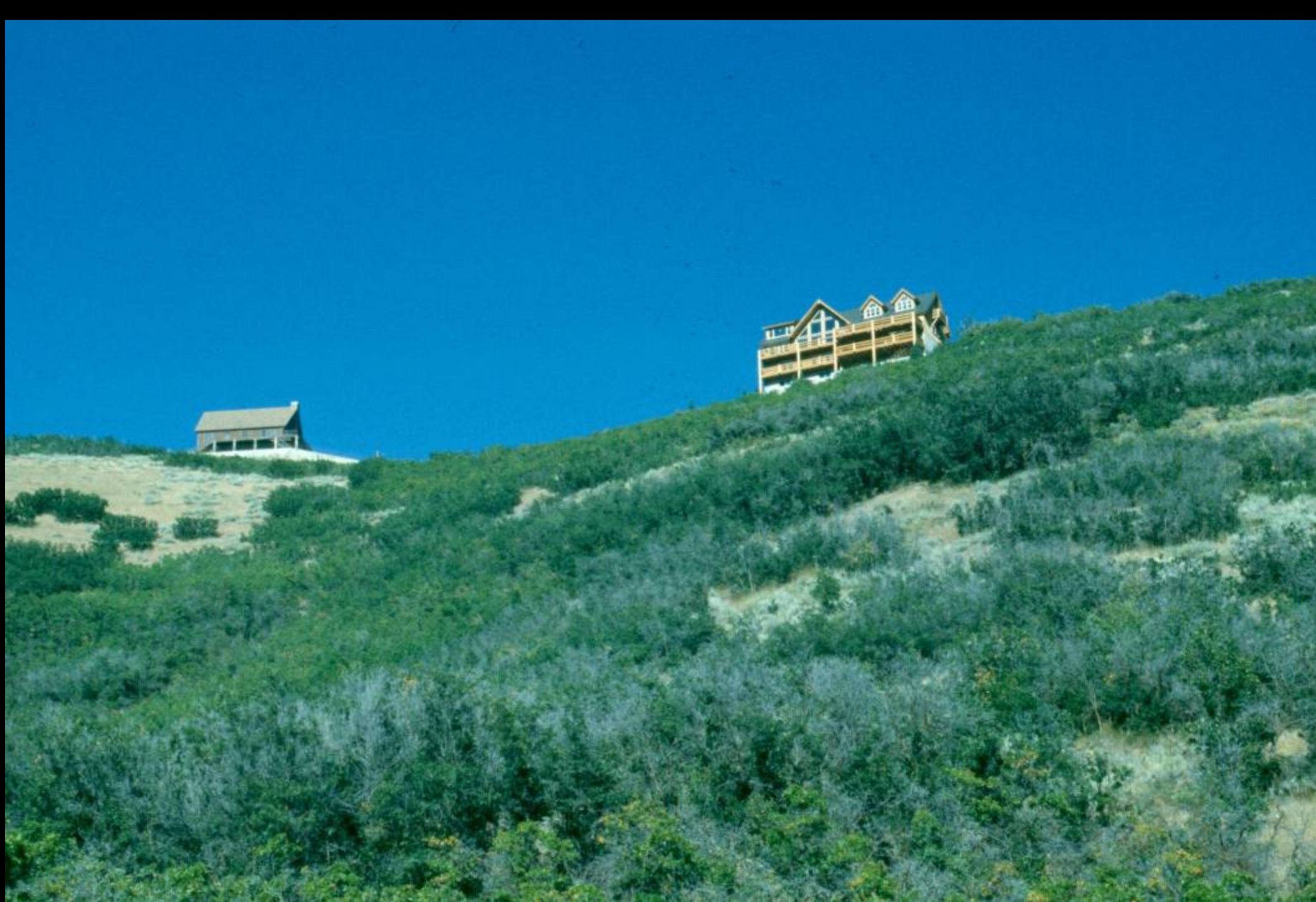


# Building Placement, Access

- Slope location, steepness
- Driveway design
- Fire department access to all parts of property



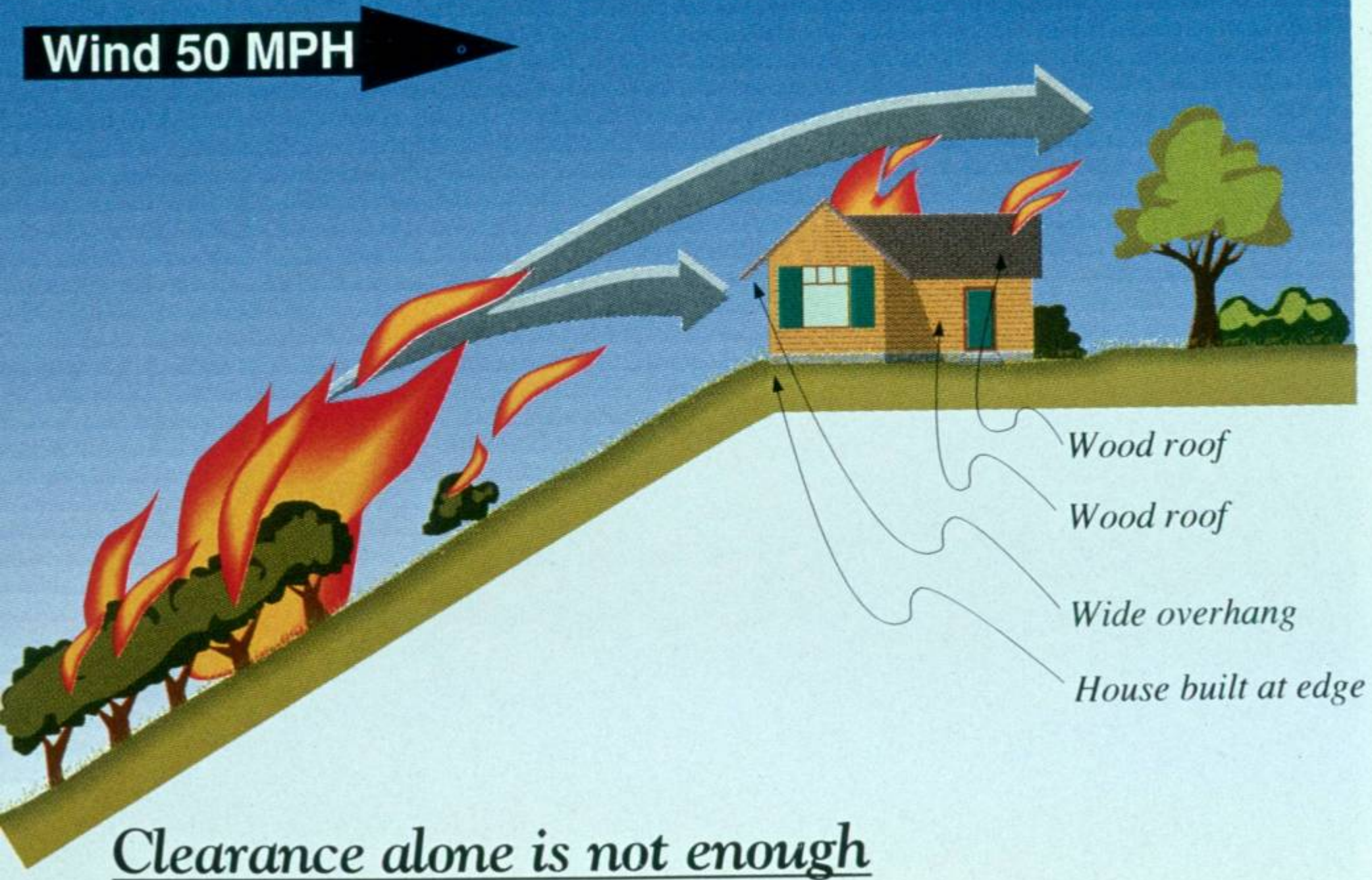




Homes on steep slope, oak (Midway, UT)



Wind 50 MPH



Fire burns uphill faster than downhill



**Wind 50 MPH**



**Set-back from top of hill**



Wind 50 MPH



Structure to deflect fire





Long driveway (Uintah, UT)





Driveway & vegetation (Uintah, UT)





Access gate (key?)





Propane tank away from house



# Landscaping, Maintenance

- Defensible space
- Pruning, thinning
- Mowing
- Firewood storage
- Debris disposal
- Monthly check
- Fire-resistant (firewise) plants





ZONE ONE (NEAR AREA)

ZONE TWO (MID AREA)

ZONE THREE (FAR AREA)

*Fire-retardant  
foundation  
plantings*

*Low plants to  
18" high act  
as fuel break*

*Trim and thin fringe areas*

Zones

Defensible space; zones



# Defensible Space

- Clearance for firefighters to stay, work safely
- Clearance in case firefighters aren't available
- Zone 1 (near) – well tended, neat, clean-up litter, firewise plants, Class A roof
- Zone 2 (mid) – low growing plants; few or no trees, shrubs; step fire down
- Zone 3 (far) – managed native vegetation, thinned, pruned, cleaned-up



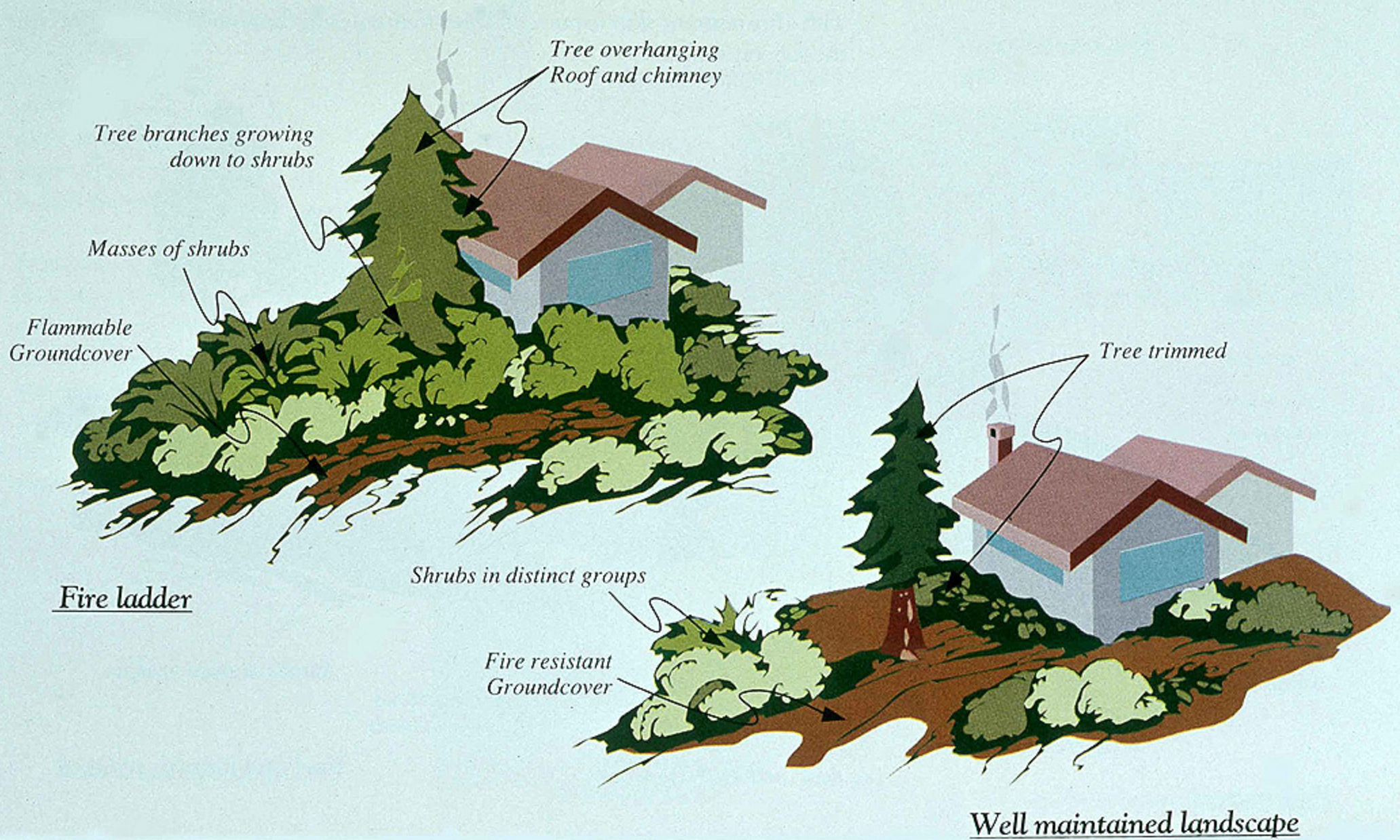


# Defensible Space

- As little as 60-100 feet of clearance can save a home, even with an intense crown fire
- More clearance is better
- Litter and wood roofs ignited by brands/embers burns many buildings
- [www.firelab.org/fbp/fbresearch/wui/home.htm](http://www.firelab.org/fbp/fbresearch/wui/home.htm) for info on fire behavior and building ignition

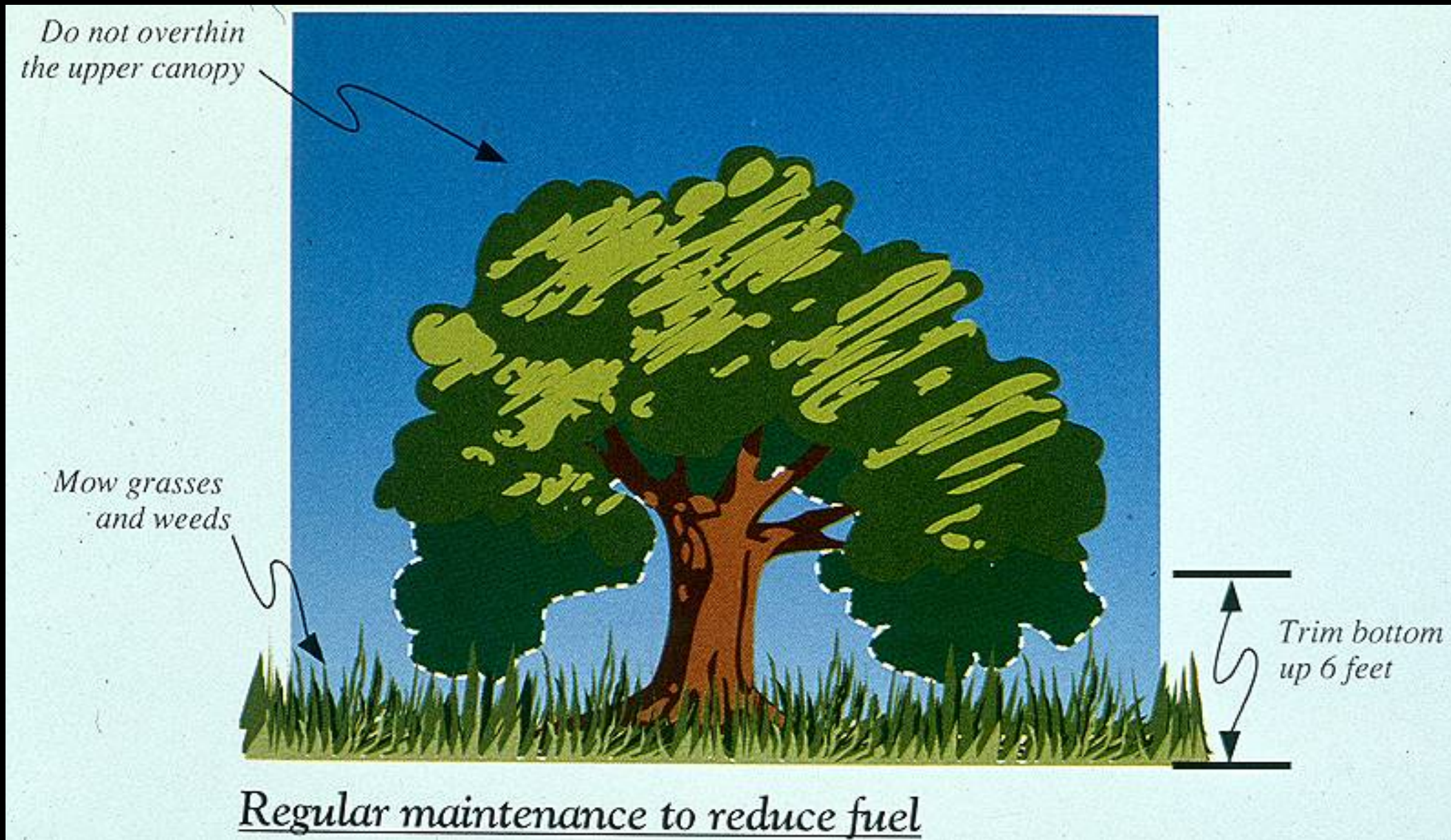






# Removing ladder fuels





Landscape maintenance, near zone





House in oak (Uintah, UT)





House in oak (Uintah, UT)





Contrasting landscapes (Uintah, UT)





Good landscape; appropriate?





Debris near house (Midway, UT)





Debris along road (Uintah, UT)





Firewood under wood deck





Firewood near house





Clean litter away from structure



# Home Protection Guidelines\*

- Eliminate all flammable materials within 10' of house
- Consider wood roof as flammable; wet frequently
- Remove flammable materials from decks, boardwalks
- Remove pine needles from gutters and roof.
- Staple metal screen over openings or gaps
- If possible, wet around house; especially within 60'
- Reduce or eliminate surface fuel within 100' of house; prune lower limbs of trees at least 8' above ground
- Remove fuel from around propane tanks

\* See [www.firelab.org/fbp/fbresearch/wui/home.htm](http://www.firelab.org/fbp/fbresearch/wui/home.htm)





# Fire Resistant or Firewise (not Fire-proof) Plants

- Mowed grasses
- Clover, alfalfa
- Well-pruned shrubs like lilac, elderberry, snowberry, sand cherry
- Many broadleaved trees
- Avoid conifers

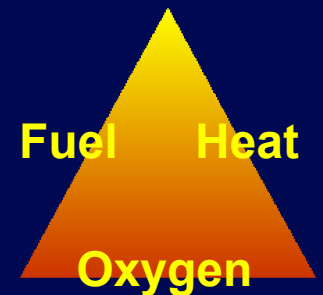




# Firewise Plant Characteristics

- *No plant is fireproof. All will burn in intense fire.*
- Firewise plants have one or more of these traits:
  - contain more moisture, esp. during fire season
  - don't contain readily flammable oils, chemicals
  - low fuel -- produce less litter or stay small
  - compact or low to the ground; can be used in landscape to interrupt fire pathways.
- Firewise plants generally low to ground, compact, stay green and healthy with low maintenance and minimal water.

Interrupt at least one leg of the fire triangle.





# Firewise Plant Characteristics & Management

- Trees provide large amounts of fuel; carefully place and maintain.
- Broadleaved trees generally less flammable than conifers (pines, firs, spruces, junipers).
- Most do well in sunny areas typical of some fire-prone sites.
- Some need minimal or no irrigation; over-irrigation can harm or cause fast growth. Some require irrigation.
- Some can be weedy in certain circumstances.
- Consider plant availability and cold-hardiness.



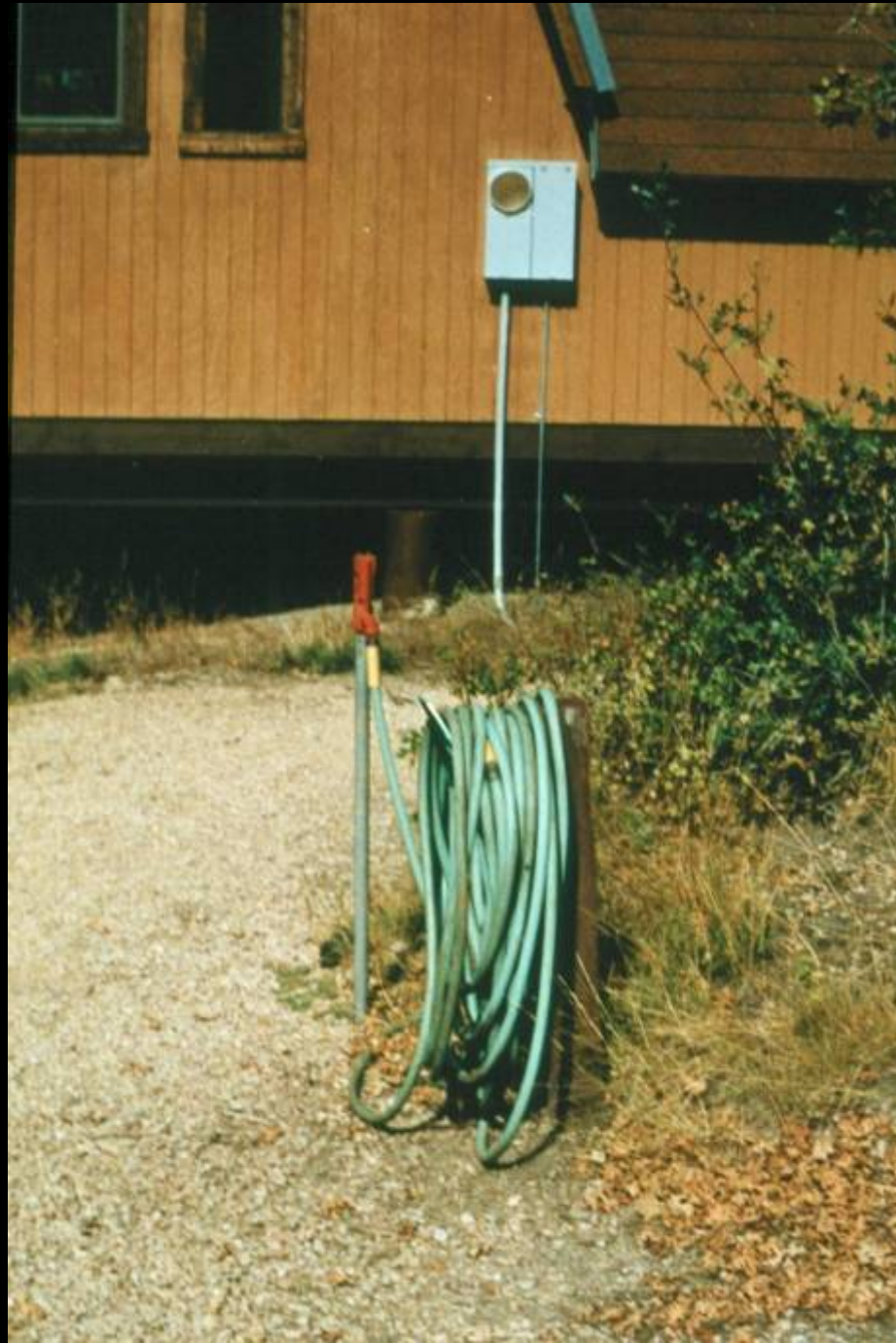


# Water Supply

- Supplemental water supply – pool, stream, lake
- Stand-pipe away from building
- Is supplemental power needed?







Water supply



# Readiness

- Affected by attitude, awareness
- Need for education
- Escape plan
- Tools, equipment
- Communication with neighbors





# Sources of Assistance

- Local fire department
- County Fire Marshal
- Utah Division of Forestry, Fire & State Lands
- State Fire Marshal
- USU Cooperative Extension
  - [extension.usu.edu/forestry](http://extension.usu.edu/forestry)
- USDA Forest Service; BLM
- [www.firewise.org](http://www.firewise.org)
- [www.firelab.org/fbp/fbresearch/wui/home.htm](http://www.firelab.org/fbp/fbresearch/wui/home.htm)

