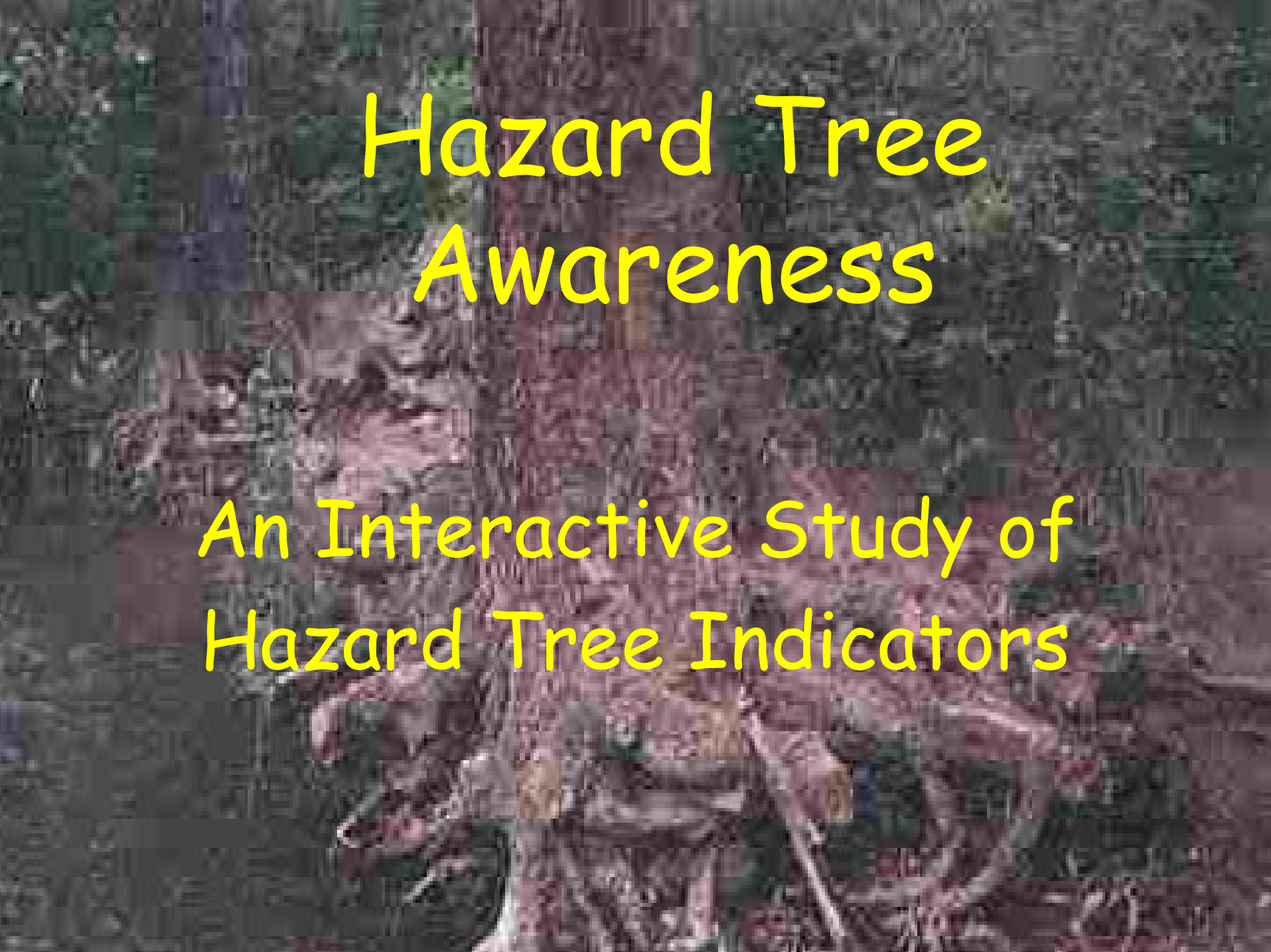

Hazard Tree Awareness
An Interactive Study of Hazard Tree Indicators

Hazard Tree Awareness

Presented with a sincere concern for your safety,
by
Northern Rockies Federal Land Management Agencies.

Interactive Discussion

Throughout this program, *discuss each example* as a risk to:

1. Someone walking or driving by.
2. A short term camp or work site.
3. A permanent camp site, or facility.

Where a significant risk exists:

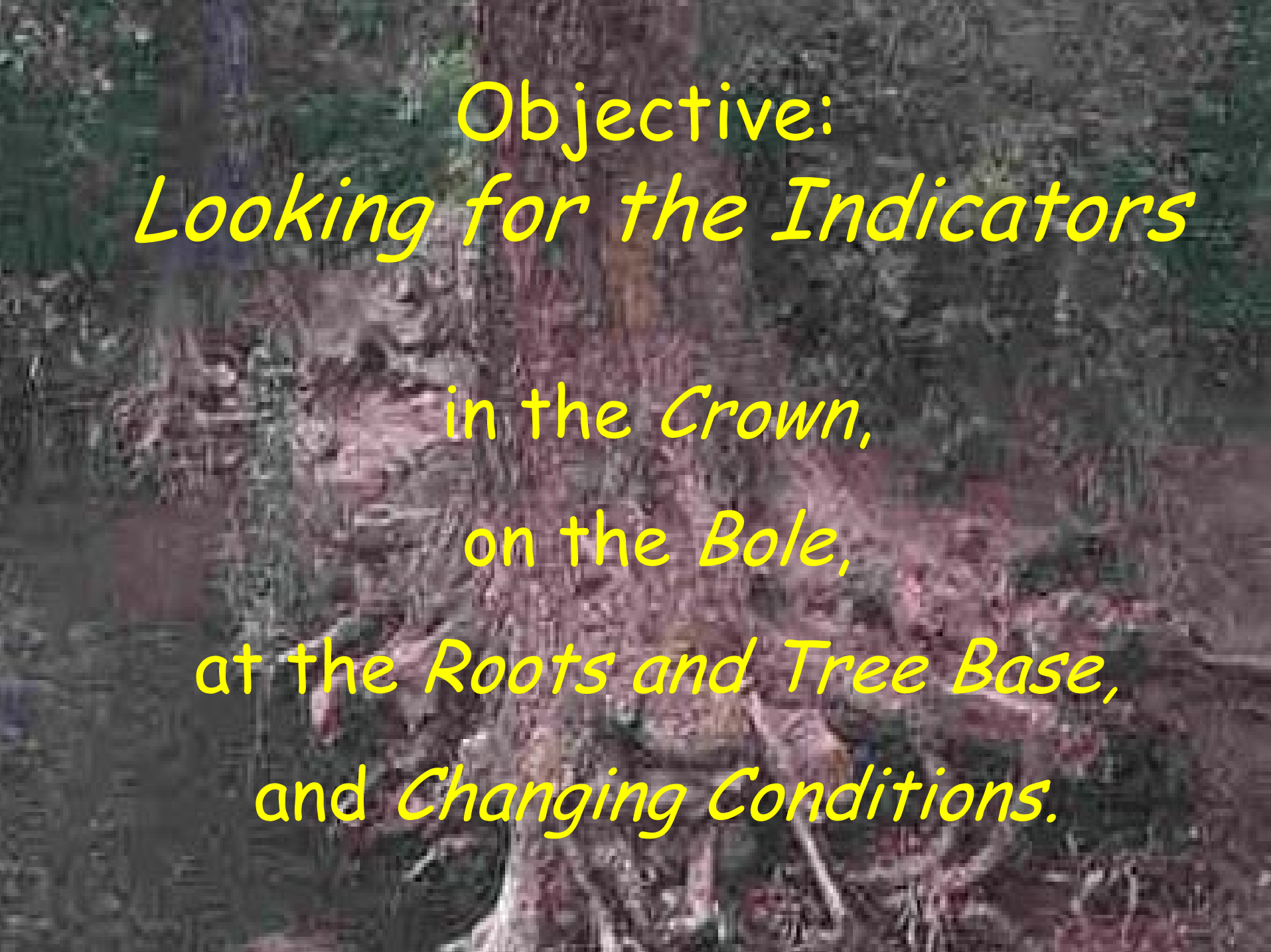
1. *Describe appropriate options.*
2. *Describe events that will change the risk level.*

Objective:
Looking for the Indicators

Learn about tree structural characteristics that may be a cause for concern.

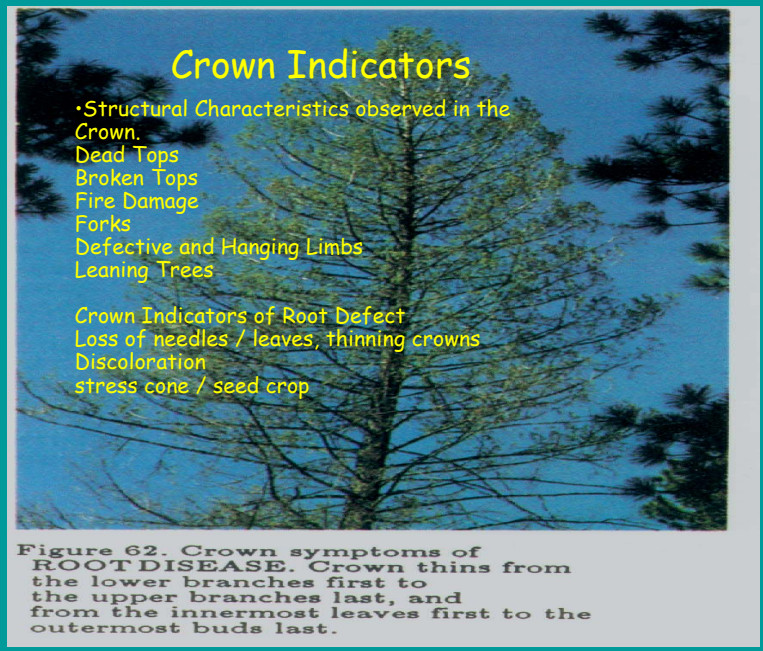
Recognize changed conditions that may effect a tree or forest.

Learn assessment tools to help ascertain risk.


Objective:
Looking for the Indicators
in the Crown,
on the Bole,
at the Roots and Tree Base,
and Changing Conditions.

INDICATORS

Crown Indicators



•Structural Characteristics observed in the Crown.
Dead Tops
Broken Tops
Fire Damage
Forks
Defective and Hanging Limbs
Leaning Trees

Crown Indicators of Root Defect
Loss of needles / leaves, thinning crowns
Discoloration
stress cone / seed crop

Figure 62. Crown symptoms of ROOT DISEASE. Crown thins from the lower branches first to the upper branches last, and from the innermost leaves first to the outermost buds last.

Bole Indicators

•Indicators of Butt, Stem and Bole Defects:

-Decay
-Swelling
-Cracks and Splits
-Fire Scars
-Burned out bole

Root and Tree Base Indicators

•Observed at the base of the tree

-Basil Resin Flow
-Mushrooms
-Butt Rots
-Wind Throw
-Burned root
-Water
-Soil Erosion
-Fire Damage
-Compaction
-Sprung Roots

Changed Condition

Tree Basics

- Anything that causes stress on a tree will weaken it.
- Tree Stresses are Cumulative and Inter-related.
- The structural integrity of a tree is affected when these stresses result in damage and or decay.
- Very elementary – the scientific names of

Crown Indicators

- Structural Characteristics observed in the Crown.
  - Dead Tops
  - Broken Tops
  - Fire Damage
  - Forks
  - Defective and Hanging Limbs
  - Leaning Trees
- Crown Indicators of Root Defect
  - Loss of needles / leaves, thinning crowns
  - Discoloration
  - stress cone / seed crop

Structural Characteristics - Crown


Figure 48

- Dead Trees and Broken Tops

Structural Characteristics - Crown

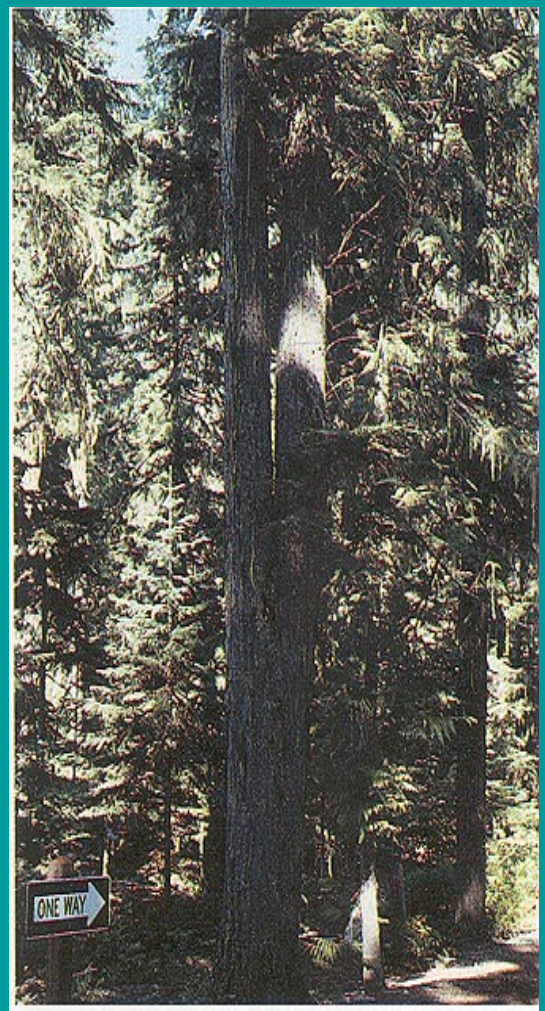
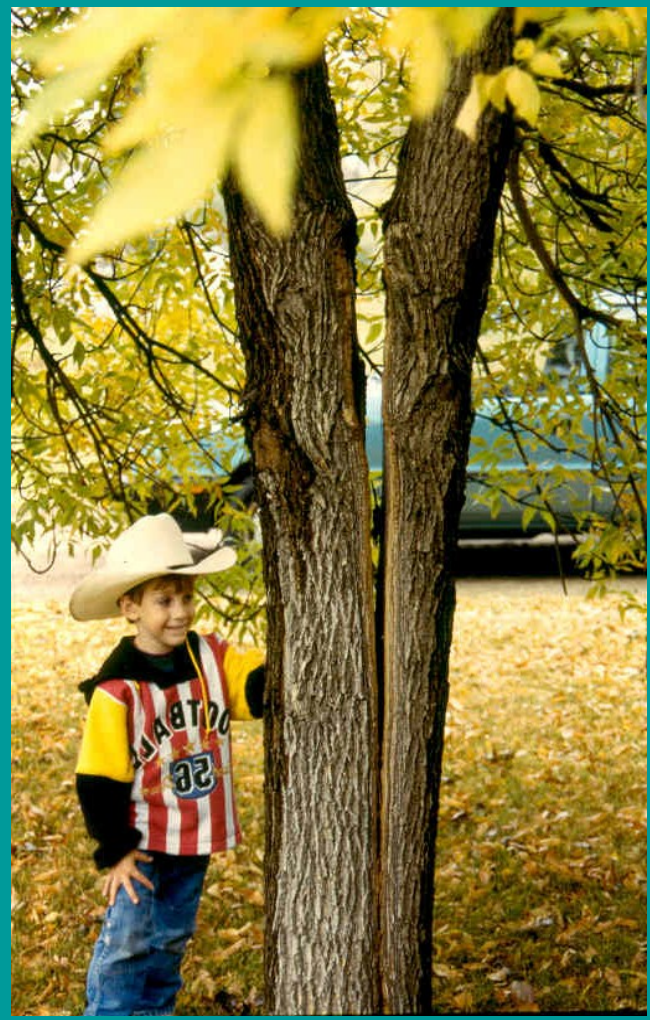


Figure 44



Forks

Structural Characteristics - Crown

- Fire Damage to Crown of Tree

Structural Characteristics - Crown

- Witches Brooms are an example of defective limbs.
- Heavy snow, wind, or other conditions can cause these limbs to break and fall

Structural Characteristics - Crown

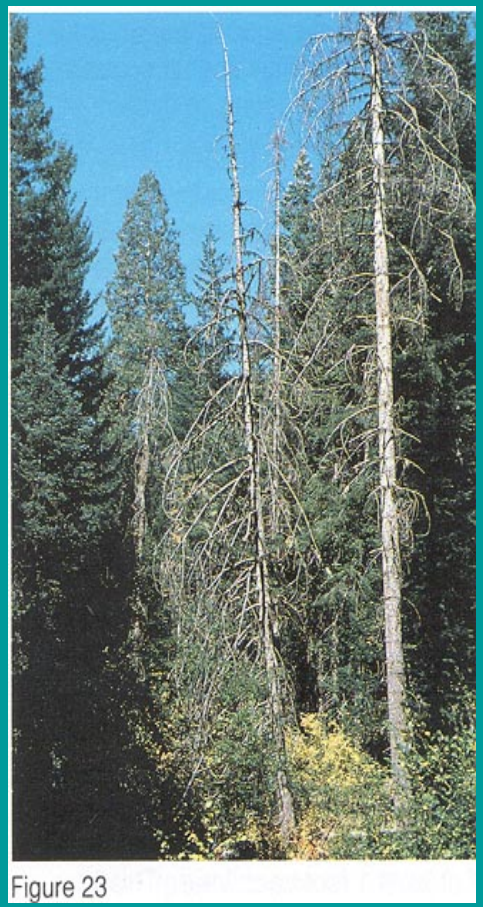


Figure 23

Dead branches

Structural Characteristics - Crown

Figure 51

Recent leaning trees as opposed to……..

Figure 27

Structural Characteristics - Crown

…..Long standing leaning trees have grown a vertical top

- Developed re-enforced root systems to compensate
- Are less of a hazard than recent leaning trees

Crown Indicators of Root Defect

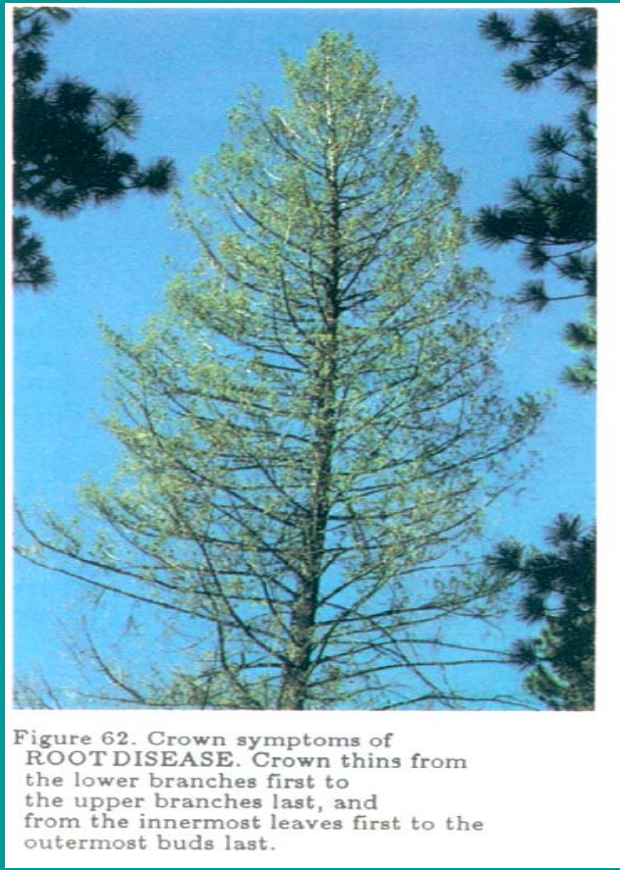


Figure 62. Crown symptoms of ROOT DISEASE. Crown thins from the lower branches first to the upper branches last, and from the innermost leaves first to the outermost buds last.

- Loss of needles/leaves, thinning crowns, dieback

Crown Indicators of Root Defect

Stress cone crop on infected Douglas-fir (IDL)

- Stress cone

Bole Indicators

- Indicators of Butt, Stem and Bole Defects:
  - Decay
  - Swelling
  - Cracks and Splits
  - Fire Scars
  - Burned out bole

Indicators of Butt, Stem, Bole Defects

Figure 5. CEDAR BROWN POCKET ROT occurs in isolated large pockets of brown cubical decay.

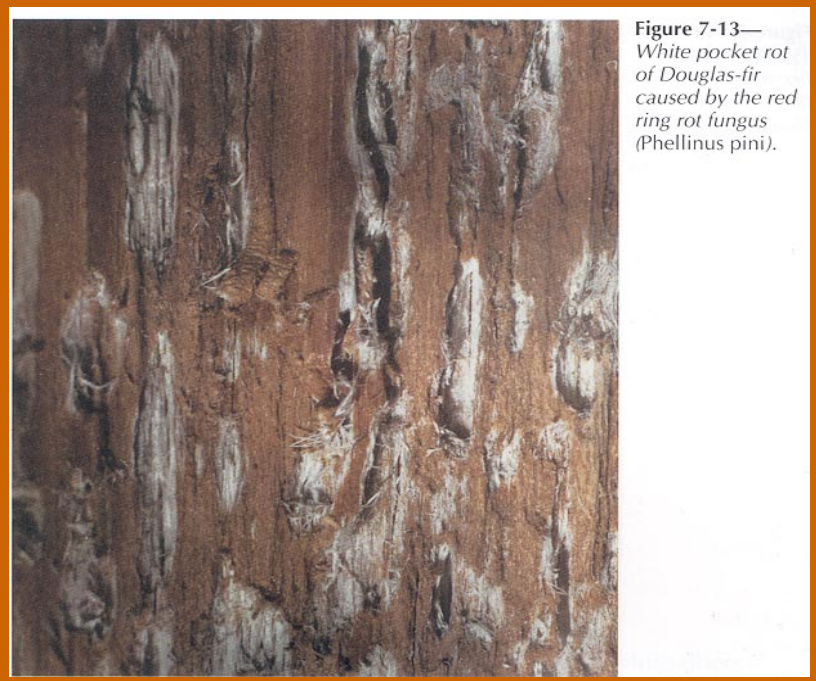
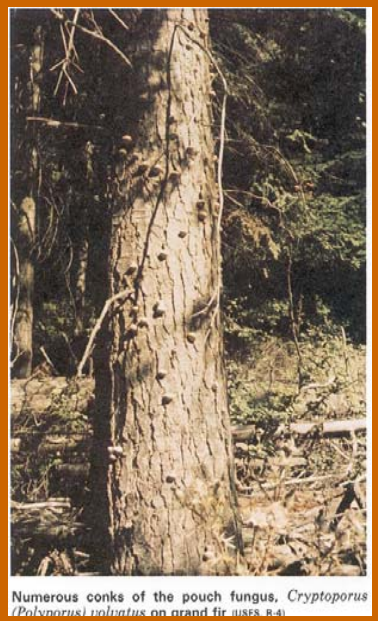


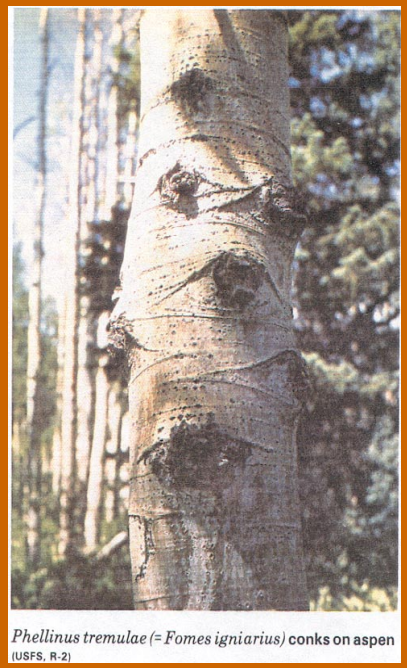
Figure 7-13—*White pocket rot of Douglas-fir caused by the red ring rot fungus (Phellinus pini).*

- Decay - Rots

Indicators of Butt, Stem, Bole Defects



Numerous conks of the pouch fungus, *Cryptoporus (Polyporus) volvatus* on grand fir (USFS, R-4)



Phellinus tremulae (= Fomes igniarius) conks on aspen (USFS, R-2)

- Decay - Conks

Indicators of Butt, Stem, Bole Defects

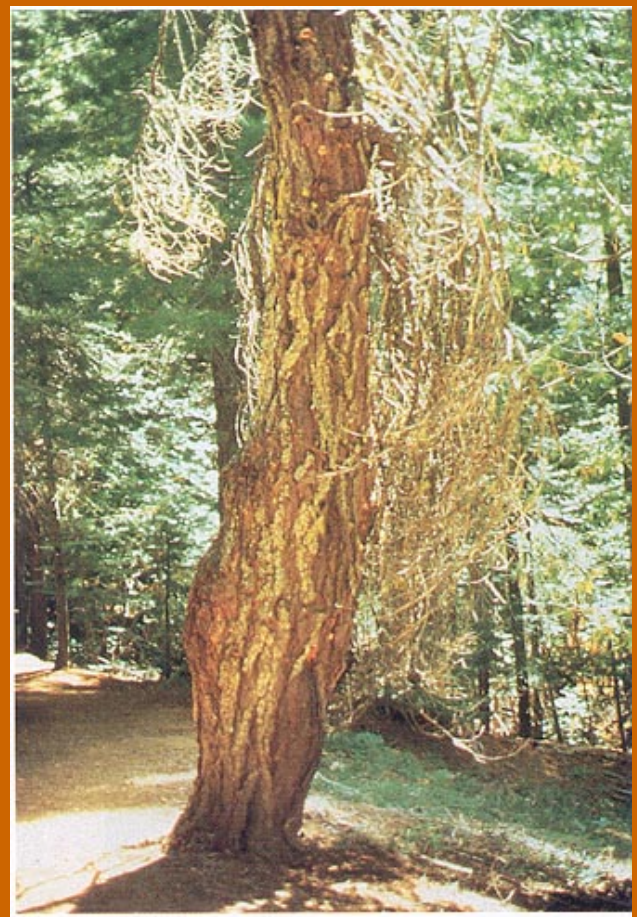


Figure 39

- Bole swellings

Indicators of Butt, Stem, Bole Defects

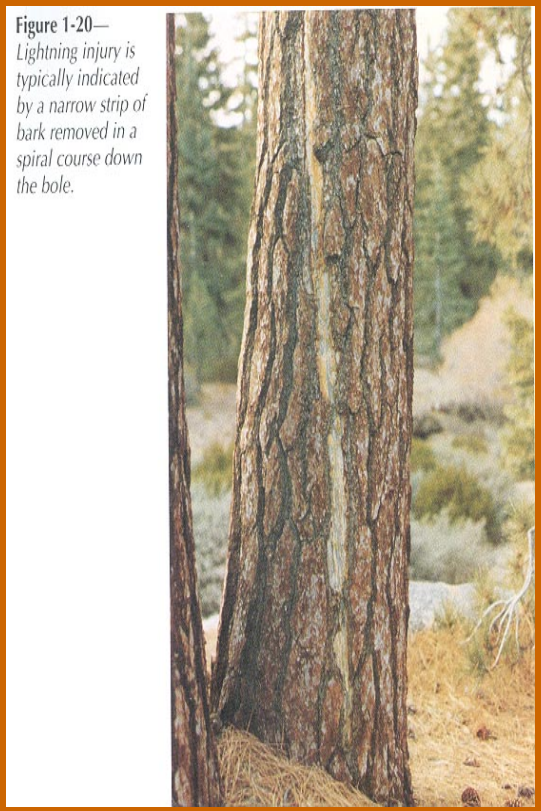


Figure 1-20— *Lightning injury is typically indicated by a narrow strip of bark removed in a spiral course down the bole.*

- Cracks and Splits - Lightning

Indicators of Butt, Stem, Bole Defects

Figure 36

- Cracks and Splits - Windshake

Indicators of Butt, Stem, Bole Defects

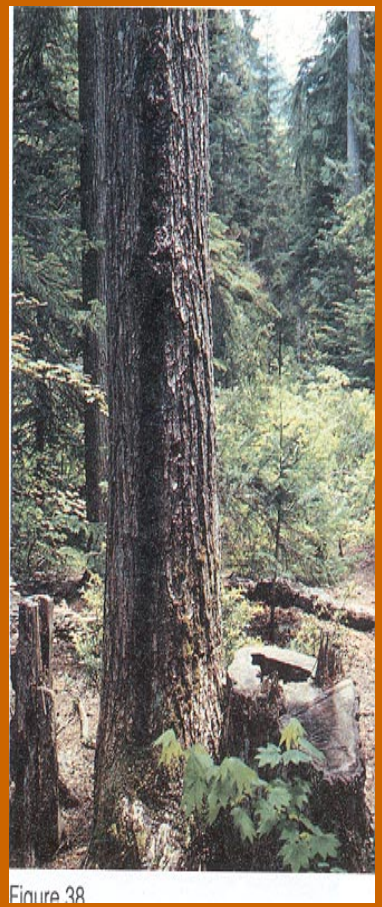
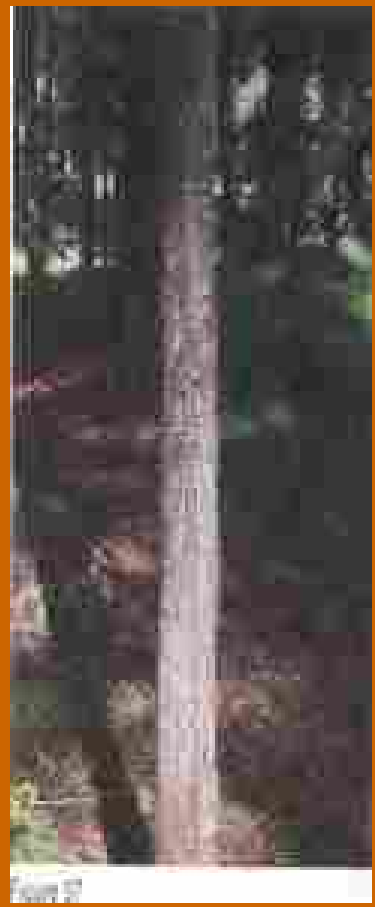


Figure 38



- Cracks and Splits – Frost Cracks

Indicators of Butt, Stem, Bole Defects

Fire Scars

Indicators of Butt, Stem, Bole Defects

- Burned bole of tree, adjacent to road

Root and Tree Base Indicators

- Observed at the base of the tree
  - Basil Resin Flow
  - Mushrooms
  - Butt Rots
  - Wind Throw
  - Fire Damage
  - Burned root
  - Water
  - Soil Erosion
  - Compaction
  - Sprung Roots

Indicators of Root Defects

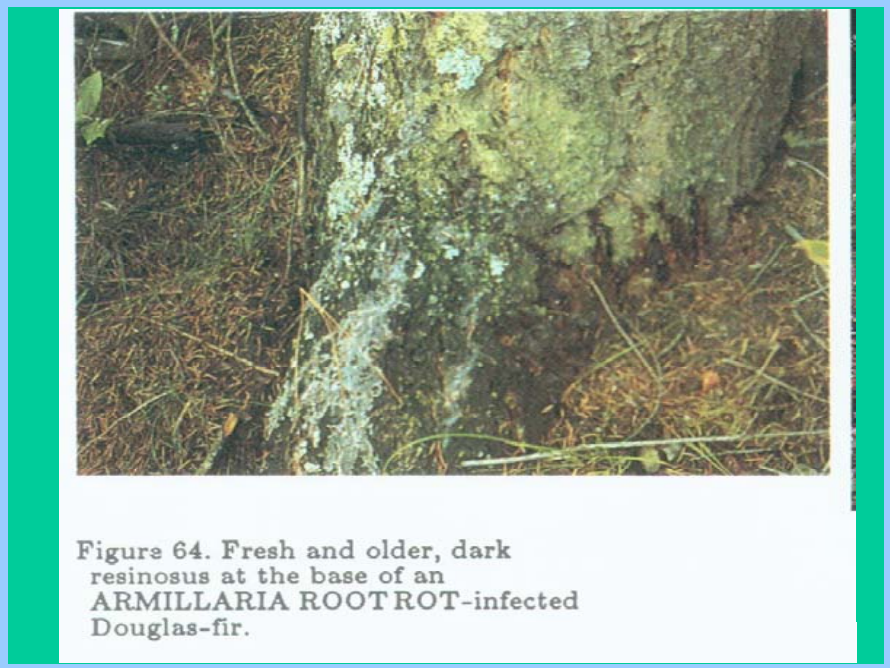


Figure 64. Fresh and older, dark resinosus at the base of an ARMILLARIA ROOT ROT-infected Douglas-fir.

- Basil Resin Flow

Figure 21

Indicators of Root Defects

- Mushrooms

Indicators of Root Defects

- Butt Rots

Figure 20

Indicators of Root Defects

Figure 22

Wind-throw

Indicators of Root Defects

- Fire Damage

Indicators of Root Defects

- Burned Root

Indicators of Root Defects

Figure 25

- Water Erosion

Indicators of Root Defects

- Soil Erosion

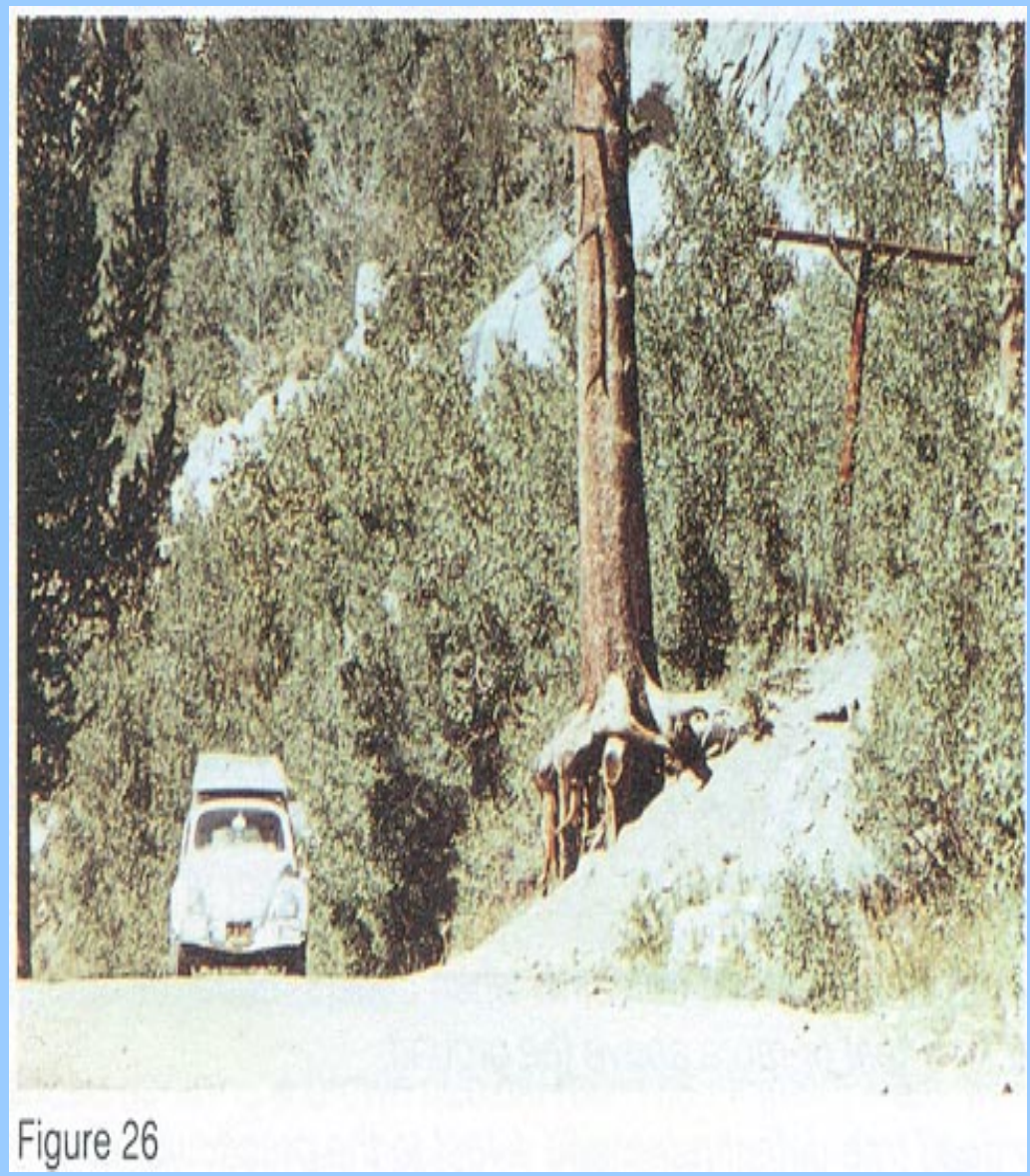


Figure 26

Indicators of Root Defects

- Compaction

Indicators of Root Defects

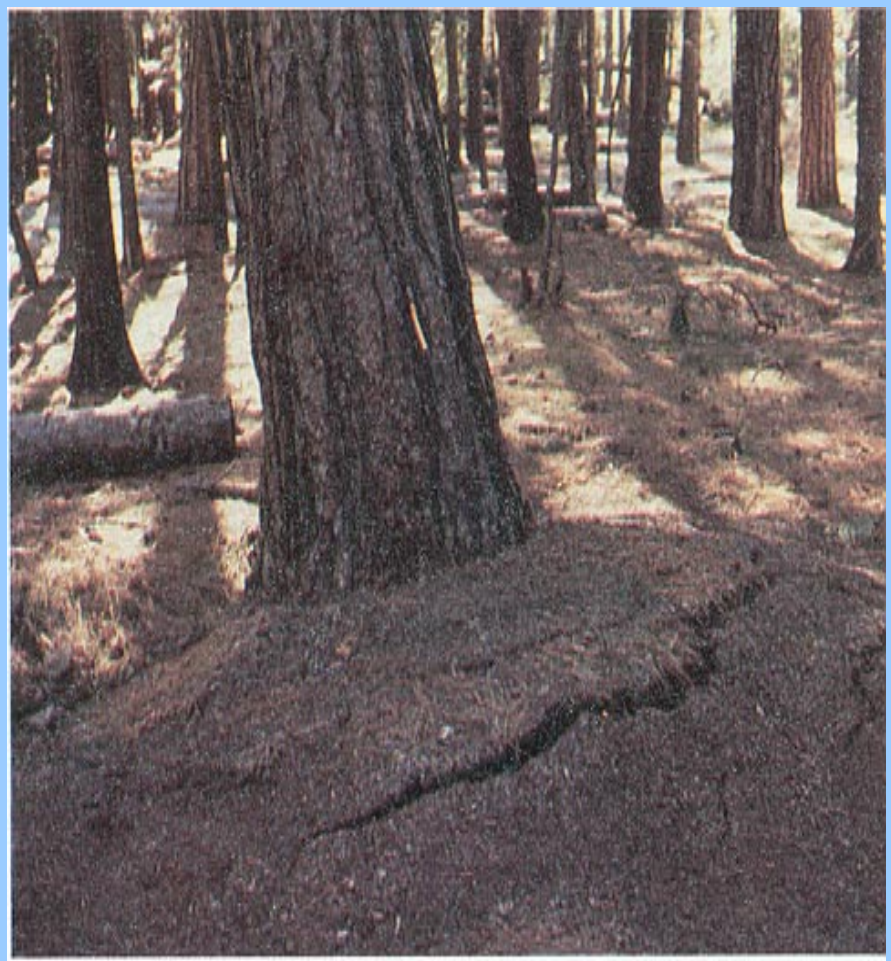


Figure 28

Sprung Roots


Changed Condition

Changed Condition

Changed Condition

Changed Condition

Changed Condition

Changed Condition

Changed Condition

Change Condition

Root Rot Pockets

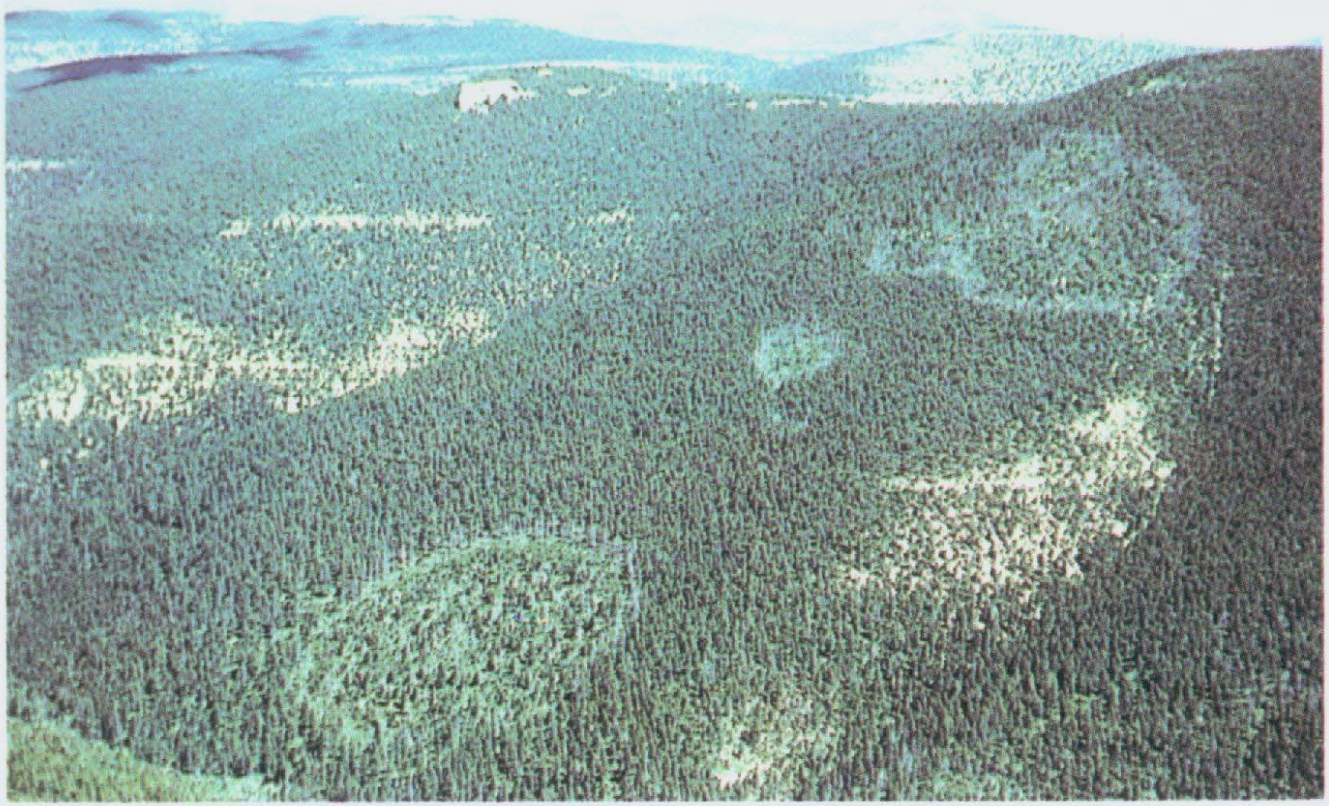


Figure 58. Aerial photograph of ROOT DISEASE POCKETS. Ringworm pattern in an otherwise uniform canopy.

Change Condition
Beetle Infestation

Changed Condition

Beetle Infestation

Figure 40. Red-brown boring dust is evidence of successful attack by DOUGLAS-FIR BEETLE.

Figure 38. Pitch tubes are usually evident at MOUNTAIN PINE BEETLE attack sites.

Examples of beetle attacks on selected trees.

Beetles in and of themselves do not cause structural defects.

However, beetles do bring in decay fungi that over time may cause additional defects in the tree.

.

Changed Condition
Lightning

Change Condition
Thunderstorms & Wind

Change Condition
Tornados

Changed condition
Blow-down

Changed condition

Blow-down

Changed Condition
Vegetation Management

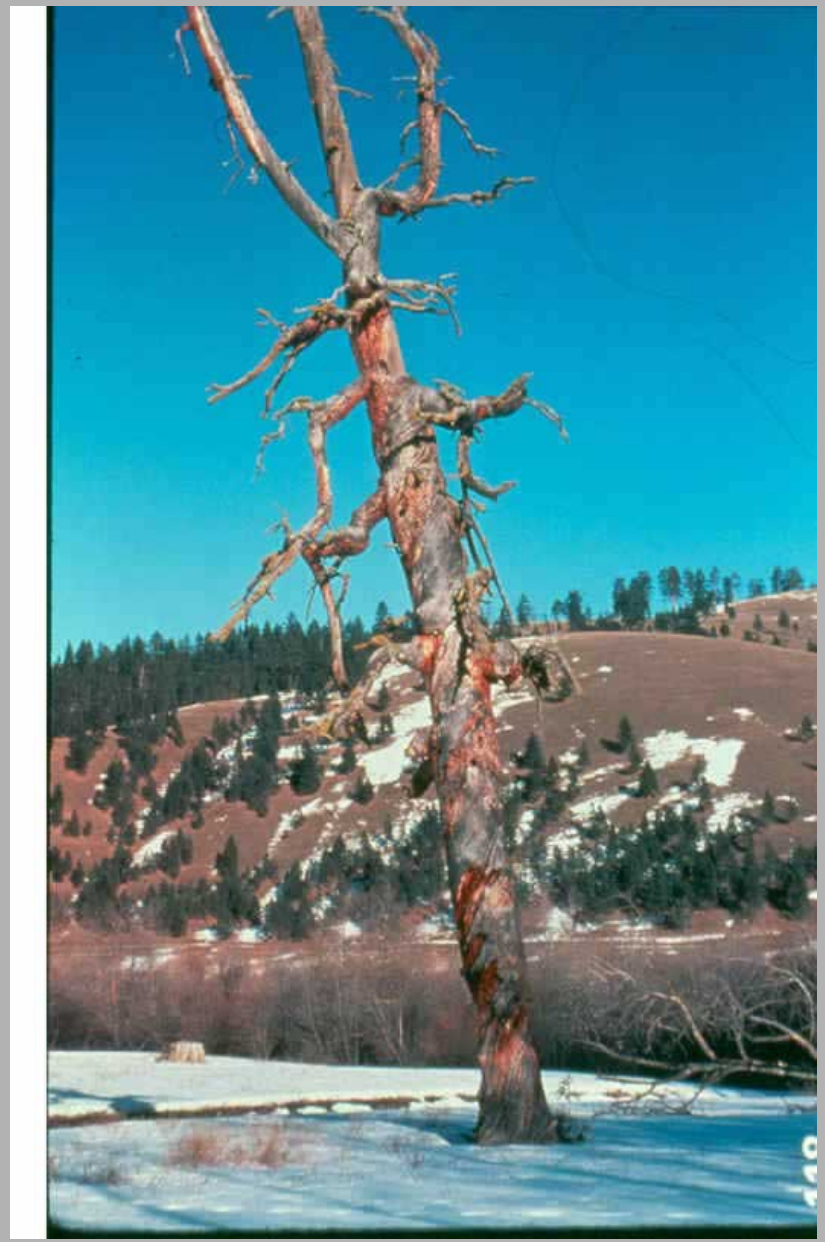
Hindsight is 20/20.

This was an actual close call, no one was hurt.

What were the indicators?

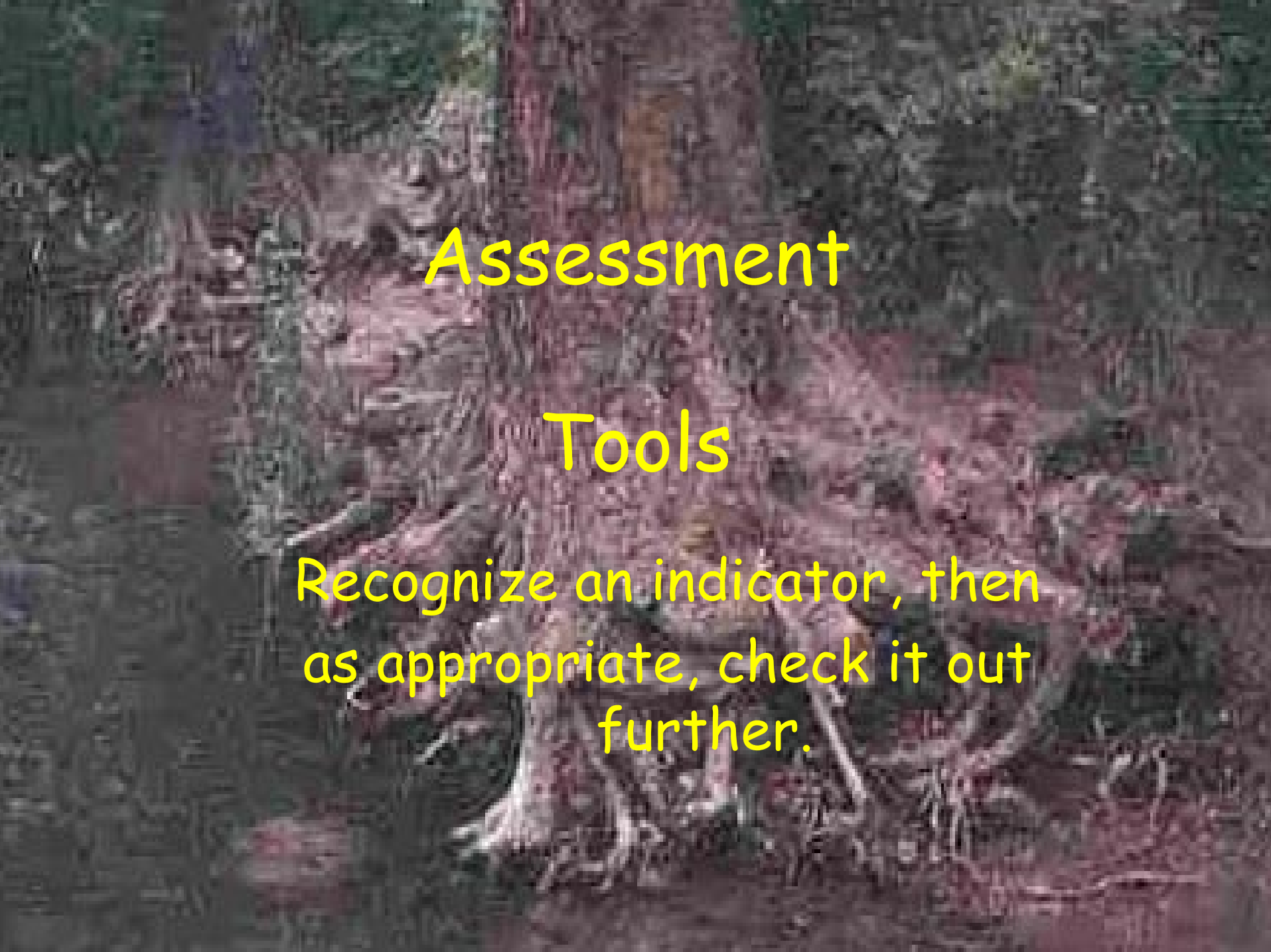
When do you think this tree will fall?

Would you bet your life on it?



What does this scene indicate?

What's wrong with this picture?


Assessment
Tools
Recognize an indicator, then as appropriate, check it out further.

Assessment Tools: Checking Further

Objective: Participants will learn 5 basic assessment tools to ascertain risk level.

Evaluate External Factors

Thump

Dig at the Roots

Chip at the Bark

Bore

Assessment Tools:
Checking Further

Objective: Participants will learn 5 basic assessment tools to ascertain risk level.

All of these techniques require field practice and experience to become proficient.

Assessment Tools:
Evaluate External Factors

- Lean
- Wind
- Widow Makers
- Rot Pockets
- Burnt or Damaged Soils and Roots
- Eroded Soil
- Soggy Soil
- Adjacent Leaners

Assessment Tools: Thumping

Striking the bole with a solid object, usually the back of an axe, will produce a revealing tone.

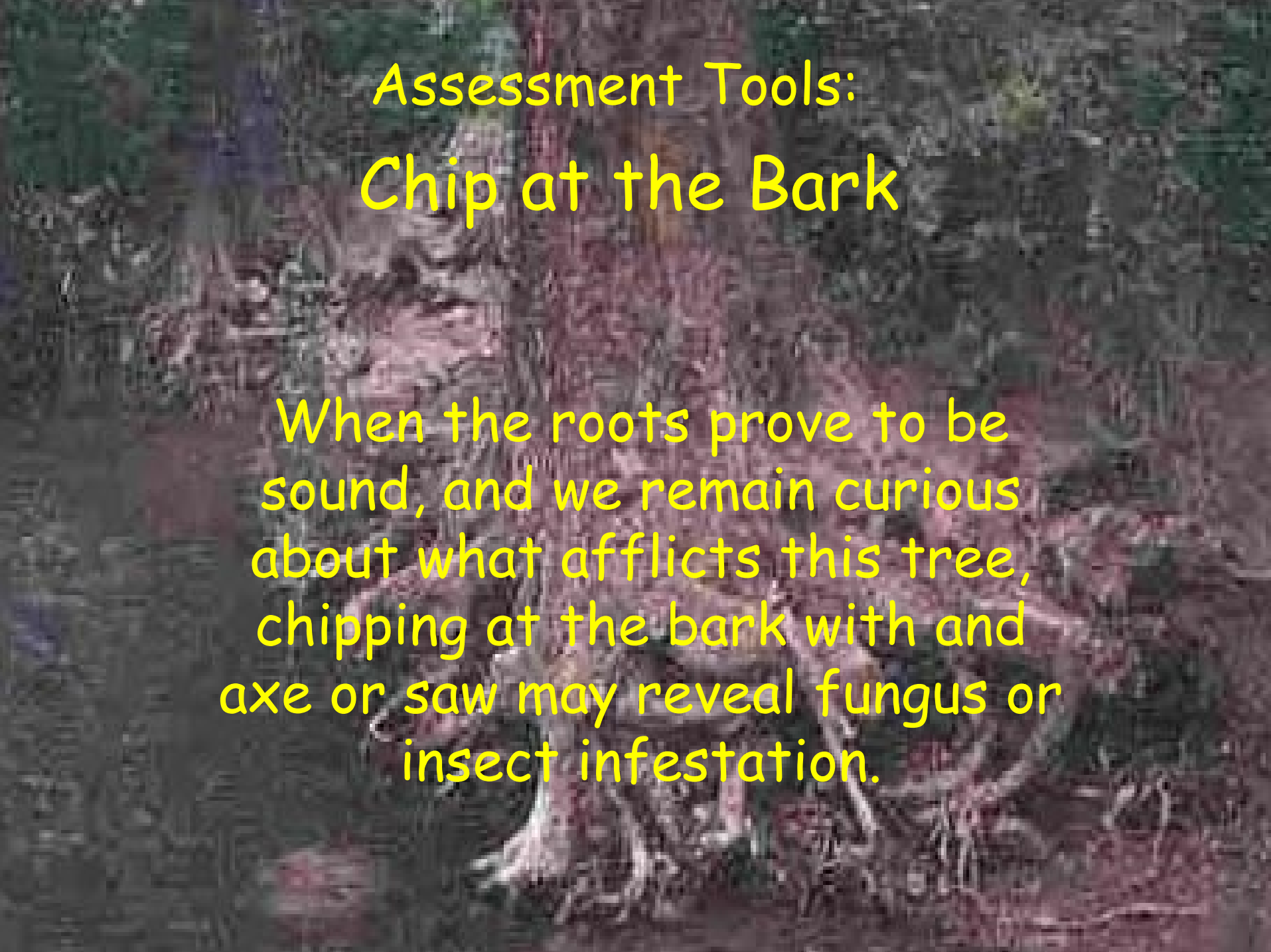
Practice thumping trees and then fell or bore to confirm suspicion.

In time, and with good coaching, one will become quite proficient at predicting a tree bole's condition.

Assessment Tools:
Dig at the Roots

Digging around the roots will reveal important information. If the roots are really bad, you will know it. However, if you see good roots at the base of the tree this doesn't tell you if there are bad roots…the bad roots may be further away from the tree or in the tap root.

- Rotten
- Green and Solid
- Dead and Solid
- Burned Off or Damaged



Assessment Tools:

Chip at the Bark

When the roots prove to be sound, and we remain curious about what afflicts this tree, chipping at the bark with and axe or saw may reveal fungus or insect infestation.

Assessment Tools:
Bore

Using the tip of a chainsaw, a drill, or an increment bore, burrow into the into the interior of the bole and assess the wood.

The nature of the chips, and the resistance to the cutting action will reveal the condition of interior wood.

Summary

- Be Aware
  - Look Up, Look Down, Look All Around
- Develop a curious mind
- Seek out local and site specific information for the area you are working in.
- Mitigate hazards – avoid or eliminate

Conclusion
What did you learn?

Tree structural characteristics that may be a cause for concern.

Changed conditions that may effect a tree or forest.

Assessment tools to help ascertain risk.

Acknowledgements

Kim Johnson, USDA Forest Service, Bitterroot National Forest, and Paul Chamberlin, USDI, Fish and Wildlife Service, thank the following individuals for their slides and contributions:

- Marcus Jackson, USDA Forest Service, Region 1
- Blakey Lockman, USDA Forest Service, Region 1
- Ken Gibson, USDA Forest Service, Region 1
- RC Carroll, USDA Forest Service, Lolo National Forest
- Todd Wilson, USDA Forest Service, Bitterroot National Forest
- Winston Rall, USDA Forest Service, Region 6
- Charlie Miller, USDA Forest Service, Bitterroot National Forest
- Thomas Thompson, USDA Forest Service, Bitterroot National Forest
- Keith Woods, USDA Forest Service, Aerial Fire Depot

Acknowledgements

The Following Publications were used as information and photograph sources:

-Hagle, Tunnock, Gibson, and Gilligan, 1987, *Field Guide to Disease and Insect Pests of Idaho and Montana,* R1-89-54

-Harvey and Hessburg, 1992, *Long Range Planning for Developed Sites in the Pacific Northwest,* FPM-TP039-92

-USDA, Forest Service, R6, *Disease Management Notes*

-USDA, Forest Service, R1, Montana Department of Natural Resources and Conservation, and Idaho Department of Lands, *Forest Insect and Diseases Identification and Management*