Decay Fungi- Indicators of Tree Defect in Southeast Alaska

by Paul Hennon
USDA Forest Service
Alaska Region, Forest Health Protection

Ken Dinsmore
USDA Forest Service
Alaska Region, Forest Management

Decay fungi cause enormous economic loss to the forests of coastal Alaska. They also play vital ecological roles by cycling nutrients, causing gap-level disturbance, providing wildlife habitat, and enhancing diversity. This guide is designed to assist in the recognition of decay organisms and other possible tree defect factors.

RED BELT FUNGUS

Fomitopsis (Fomes) pinicola

- Any location on wood; abundant
- Conk is perennial, shelf shaped
  - Top is black or grey, with or without red band on edge
  - Bottom is creamy white
- Causes brown cubical rot
- Young-growth: cull 8’ above and below, Old-growth: cull 16’ above and below

CHICKEN OF THE WOODS

Laetiporus sulphureus

- Usually on lower main bole
- Conk large, shelving in clusters
  - Upper and lower surfaces are bright yellow or orange
  - Conk is white, soggy after it dies
- Causes brown cubical rot
- Cull 8’ above and 8’ below conk

VELVET TOP FUNGUS

Phaeolus (Polyporus) schweinitzii

- Located at base of tree, lower bole, or arising from roots near tree
- Conk is annual, large clustering
  - Top and bottom brown, velvety yellow, green, or brown margin
  - Conk is dark brown when dead
- Causes brown cubical rot
- Cull first 16’

QUINING CONK

Fomitopsis (Fomes) officinalis

- On bole with branch stubs, wounds, usually on spruce or pine
  - Conk is large, hoof shaped
  - Top white, grey, or white-green
  - Bottom is white
  - Inside is white, chalky, bitter
- Causes brown cubical rot
- 1 conk=cull entire tree

RED RING ROT

Phellinus (Fomes) pini

- Any Location on bole of live trees, especially under branch crotches
  - Conk is perennial, shelf-shaped
  - Top is dark brown, hairy
  - Bottom is rusty, pores angular
  - Inside is bright rusty brown
  - Causes white pocket rot
- Cull 20’ above and below conk, 1 conk on hemlock=cull whole tree

ARTIST'S CONK

Ganoderma (Fomes) applanatum

- On bole, usually of downed trees
- Conk is perennial, shelf shaped
  - Top is dusty with orange-tan spores
  - Bottom is white, turning dark brown rapidly when touched
  - Inside is dark brown
- Causes white rot
- Cull 8' above and 8' below conk

ARMILLARIA SHOE STRING ROT

Armillaria spp.

- Usually on roots or lower bole
- Mushrooms uncommon, occur at tree base, variable, yellow-tan
- Black shoe-string-like structures & white mycelia fans common
- Causes white stringy rot
- Cull first 16’

BOREALIS CONK

Climacocystis (Polyporus) borealis

- On bole, near base of tree
- Small, annual shelving white conk
  - Top is white, shaggy
  - Bottom is white, has large pores
- Causes white mottled rot
- Host is Sitka spruce
- Cull 4’ above stump height

YELLOW CAP FUNGUS

Pholiota adiposa

- On bole, usually near base
- Mushrooms in clusters, yellow-brown scales on cap
- Gills yellow or brown
- Causes brown-mottled white rot (classified as white rot)
- Cull first 16’ of tree if occurring at base, if above base of tree cull 16’ above and below conk

LACQUER CONK

Ganoderma tsugae

- On bole, usually on downed tree
- Conk is often large, solitary on stalk
  - Top is shiny, red-brown crust
  - Bottom is white with pores
  - Inside is creamy white
- Causes white rot
- Cull the entire log/ tree

CORAL FUNGUS

Hericium abietis

- On bole, usually with large scar
- Conk is large, white or cream, fragile pendant spines (teeth)
- Causes white rot with small pockets
- Deduct 6’ above and 6’ below the conk

INDIAN PAINT FUNGUS

Echinodontium tinctorium

- Any location on bole of hemlock
  - Conk is perennial, hoof-shaped
  - Top is black, hard, cracked
  - Bottom is grey spines or teeth
  - Inside is bright red or orange
- Causes laminated stringy white rot
- Cull 20’ above and 20’ below a single conk. If conks are seperated by more than 25’ cull the entire tree

ANNOSUS BUTT ROT

Heterobasidion annosum

- Located at tree base, often in duff
- Conk uncommon
  - Top is brown or black
  - Bottom is white, no pores in wide band around irregular margin
- Causes white spongy or pocket rot
- Cull the first 16’ of tree

BLACK SEAM

- Can appear on all tree species
- Indicates some level of decay
- Amount of defect determined by judgment

BASAL SCAR

- Large open wound at base of tree
- Some caused by animals, logging equipment, falling trees, etc.
- Decay amount is related to size and age of scar

BOLE SCAR

- Open wound below merchantable top and above ground
- Old and large scars have the highest degree of wood decay

BOLE FLUTING

- On boles of western hemlocks, sometimes far up bole
- Ridges and deeply incised folds, with bark occurring in wood
- Not necessarily associated with rot unless tree has other indicator

BOLE DEFORMITY

- Usually on western hemlock
- Often caused by dwarf mistletoe
- May have sound wood, or may be associated with decay, especially if exposed decay or conks are present

BURLS

- Common on Sitka spruce
- Cause is unknown
- Many burls are sound, unless they have visible decay or conks

DEAD STANDING TREE

- May be sound, or have:
  - Internal heartwood decay
  - Sapwood decay
  - Staining
  - Checking
- Amount of decay carries greatly by time-since-death and tree species