The Setting
The Setting
Tanacross 2001

National Fire Plan objectives

- True Interagency effort
- Local hire
- Training and experience
- Improved level of protection
The Fuel Break
The Problem Fuel
26 May 2010
26 May
26 May
27 May Burnout
27 May End of Burn Period
28 May Burnout
28 May 2010
National fire plan objectives

True Interagency effort
Local hire
Training and experience
Improved level of protection
Summary

- “Active” defense system
  - A fuel treatment of this type is not meant to stand alone
- Provide defensible space
  - Implies defenders are present
- Provide fire tactic options
- Shaded fuel breaks should not be marketed to the public as a passive defense but rather an improved setting in which to set up an active suppression defense (using wetline, sprinklers, further fuel reduction, etc.) against fire incursion.
Tanacross Fuel Break

Treatment Effects

Eric A. Miller
Hazard Fuel Treatments

- Treatments to reduce crown fire hazard result from L48 science
  - Raise canopy base height
  - Reduce canopy bulk density
Adverse Effects?

- Tanacross
  - 3 Monitoring transects
    - Trees
    - Ground-layer vegetation
    - Woody fuels
    - Duff
    - Active Layer
    - Photo-points
- None of the transects burned in 2010
Transect Locations
Pre-Treatment Fuels 2001
2006
Treatment Effects

- Graminoid cover increased from 6% (pre-) to 15% after 8 years.
- Tree spacing 14’ x 14’ spacing. This exceeded the contract specifications for 12’ x 12’ spacing.
- After 8 years, seedlings numbered 5,867/ac: 45% white spruce and 55% aspen.
- Black spruce and birch seedlings were not found in the plots.
- Thinning induced moss mortality, increased fine woody fuels, reduced moss moisture content and increased grass and forb cover.
- Grass has increased in the understory but no invasion of mat-forming perennial grasses (bluejoint) that have caused problems elsewhere.
Soils

White Spruce  Black Spruce

No Thermokarst  “Dry Thermokarst”  “Wet Thermokarst”

No permafrost  Ice Poor soils  Ice Rich Soils

Tanacross Fuel Break  Nenana Ridge Fuel Break

Fort Wainwright Demo Site
Toghotthele Demo Site
Delta Bison Range Demo Site
Ice Rich Soils
Wet Thermokarst, Nenana Ridge
Active Layer at Tanacross

- Permafrost table?
- Well drained soils
- Probably weren’t measuring active layer but a “cobble” layer
- Reduction after year 1 is likely due to duff compaction

![Bar chart showing average active layer depths from 2001 (pre-treatment) to 2009 (YR8).](image)

*Figure 10. Average active layer depths (cm) from 2001 (pre-treatment) to 2009 (YR8).*
Tanacross Soils

- Tok fan deposit (Pleistocene): well-sorted, unconsolidated pebble, cobbly pebble, and pebbly cobble gravel with a matrix of dark-olive-gray sand.
- Glacial outburst flood, Donnelly Glaciation (30-10k years ago)
Bluejoint (*Calamagrostis canadensis*)

Nenana Ridge, edge of thinning unit  
Nenana Ridge, shearblade unit
Duff Moisture Effects

- Duff moisture samples collected 2002-2003 in the thinning and adjacent control areas.
- The forest floor tended to be drier near the surface in thinned units. Live and dead moss layers were found to be 49% and 36% drier.
- However, upper and lower duff layers exhibited the opposite effect, with post-treatment stand samples averaging slightly higher moisture contents than controls.
Fire Behavior Trade-off

- Thinning reduces crown fire and spotting potential
- Increases flashy fire potential
- Modelled rates of surface spread increase due to higher surface winds in thinned stands (1-4 mph greater in treatments) (Theisen 2003, Horschel 2007)
- Critical flame length to initiate crowning increases
  - Reduced canopy bulk density
  - Increased canopy base height
- Good news from Nenana Ridge 2009: grass season is asynchronous with black spruce season
Nenana Ridge 2009
The Larger Context/One Size Doesn’t Fit All

- Fuel treatment monitoring efforts
  - JFSP Demonstration Sites
    - Toghotthele
    - Delta Bison Range
    - Fort Wainwright
  - Nenana Ridge Experimental Fuel Treatments
  - Shannon Park
  - Tanacross
- Fuel break prescriptions must be matched to individual situations
Summary

- Shaded fuel break prescription works well at Tanacross
- Ice poor, dry soils
- Encourage the growth of hardwoods
- Surface fuels are not problematic
- No bluejoint problem
Little Duff Consumption

Plant propagules intact
Little Duff Consumption