

Taylor Park Science Team Update



Jonathan Coop

SPEADMR/Taylor Park Meeting April 2023

2022 Focus



- Development of **Applied Silviculture for Climate Change (ASCC)** project – additional stand sampling, treatment development workshop.
- Assistance with fen project and beetle trapping.

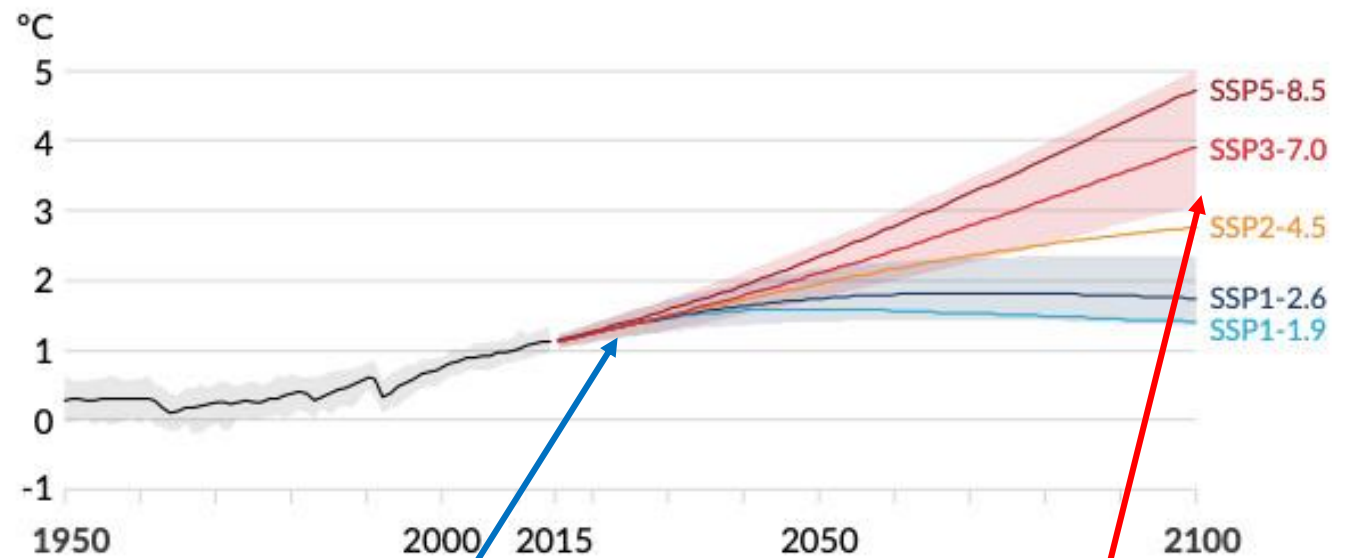
2022 Field Crew

Camryn Uetz (lead), Madeleine Foster, Sam Finnie (ASCC data collection + beetle traps)
Shane Kolinski (temperature and moisture sensors)

What is ASCC?

- A multi-region study with locally-suited climate change adaptation treatments, using input from an expert panel of regional scientists and local managers
- What kinds of forest management and silvicultural treatments will best sustain forests through a changing climate?
- <https://www.adaptivesilviculture.org/about-ascc>
- <https://www.adaptivesilviculture.org/project-site/Taylor-Park>
- <https://forestadaptation.org/adapt/demonstration-projects/taylor-park-adaptive-silviculture-climate-change-ascc>

a) Global surface temperature change relative to 1850-1900



we're still down here

where we're headed

Taylor Park ASCC Site

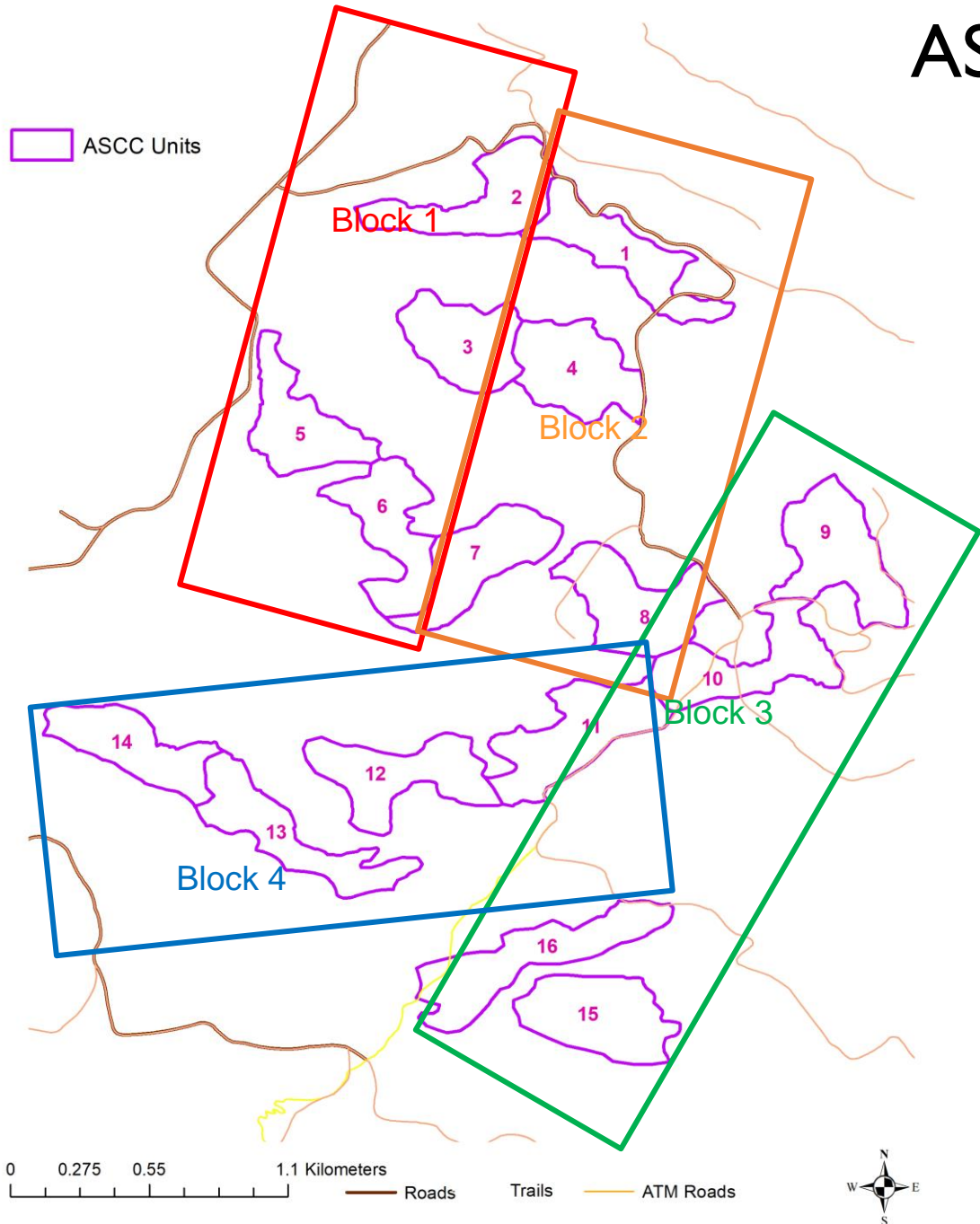
- Located above Trail Creek (northern portion of Taylor Park, near FS 748)
- Lodgepole pine dominated (93%) with Engelmann spruce and subalpine fir.
- Moderate elevations (10,000-10,500')
- Shallow slopes (0-20 degrees) on decomposed granite substrate.



ASCC Sites

ASCC Design

ASCC Units



Experimental Layout

- 20 Treatment units
- Each 25-35 acres
- 4 blocks with (mostly) similar elevation, slope, aspect, and forest canopy structure

ASCC Treatment Development



1. Workshop at Western July 6-8, 2022
2. ~ 25 participants representing different fields of scientific expertise, management, and other values (timber, water, environment).
3. Developed desired Future Condition statements, Objectives, and Tactics for three major climate adaptation trajectory: Resistance, Resilience, Transition.

ASCC Treatments

Resistance

- Retain lodgepole pine on landscape, increase snowpack and soil water, reduce likelihood of fire, beetle, drought impacts.
- Commercial thin - crown thinning down to 80 to 100 ft²/ac (>7 inch d.b.h live lodgepole pine); ~30% reduction and Non-commercial thin in >3 and <7 inch d.b.h live lodgepole pine;
- Lower surface fuels, open-up crown spacing
- Reduce surface fuel continuity, concentrate through spot/group piling
- Retain shading to increase snow water equivalent [achieved by only removing 30% overstory]
- Sanitation thin
- Retain Engelmann spruce and subalpine fir component (leave all of it)
- Retain 300 snags/100 acre (>8 inch d.b.h lodgepole pine; >10 inch d.b.h Spruce)
- Maintain or Reduce Coarse Wood Debris (>3"+) to 5-10 tons/acre

Resilience

- Lodgepole pine remains dominant species, but species diversity, structural diversity, and spatial heterogeneity is enhanced
- 2-step Group shelterwood with variable thinning in the matrix
- 1st harvest (establishment cut)[removing trees on 40-45% of the area; regenerate those areas], removal cut overstory removal (20-40 yrs)
- Reserves in clumps for wildlife E.g. spruce, legacy trees (watch wind exposure), snags, etc.
- Gaps from 0.25 to 5 acres in size [mix of Small (0.25 to 1 ac) and medium (1 to 3 ac), 1 large (3 to 5 ac) gaps (group cuts) 11.25 acres to distribute across the gaps] for snow retention based on aspect and wind; irregularity for edges (curved) and to provide lodgepole pine regeneration opportunity
- Density reduction throughout the matrix - 80-90 ft for tree length [30 to 35% of overstory]
- Plant Douglas-fir (matrix & gaps), limber pine (gaps), Engelmann spruce (in gaps & matrix)

Transition

- Transition away from a lodgepole pine dominated forest to mixed conifer forest (maintain some lodgepole)
- Clearcut – with reserve groups (6 to 50 wildlife trees; live or dead; character trees)
- Harvest: [commercial >7"+; noncommercial via site prep]
- Whole tree skid and scatter throughout
- Average of >300 snags/100 acres of 10" DBH or greater [some in the reserve group]
- Site prep - broadcast burn to prevent lodgepole pine establishment
- Haul back slash for burning if needed
- Protection of desired snags and reserve groups by pulling back slash and digging fire line
- If cannot burn, we will full machine pile and burn (which will take care of the little trees)
- Plant seedlings - all species in summer (after 4th of July)
- Planting variety of species throughout; including Douglas fir, blue spruce, ponderosa, limber pine, and bristlecone pine

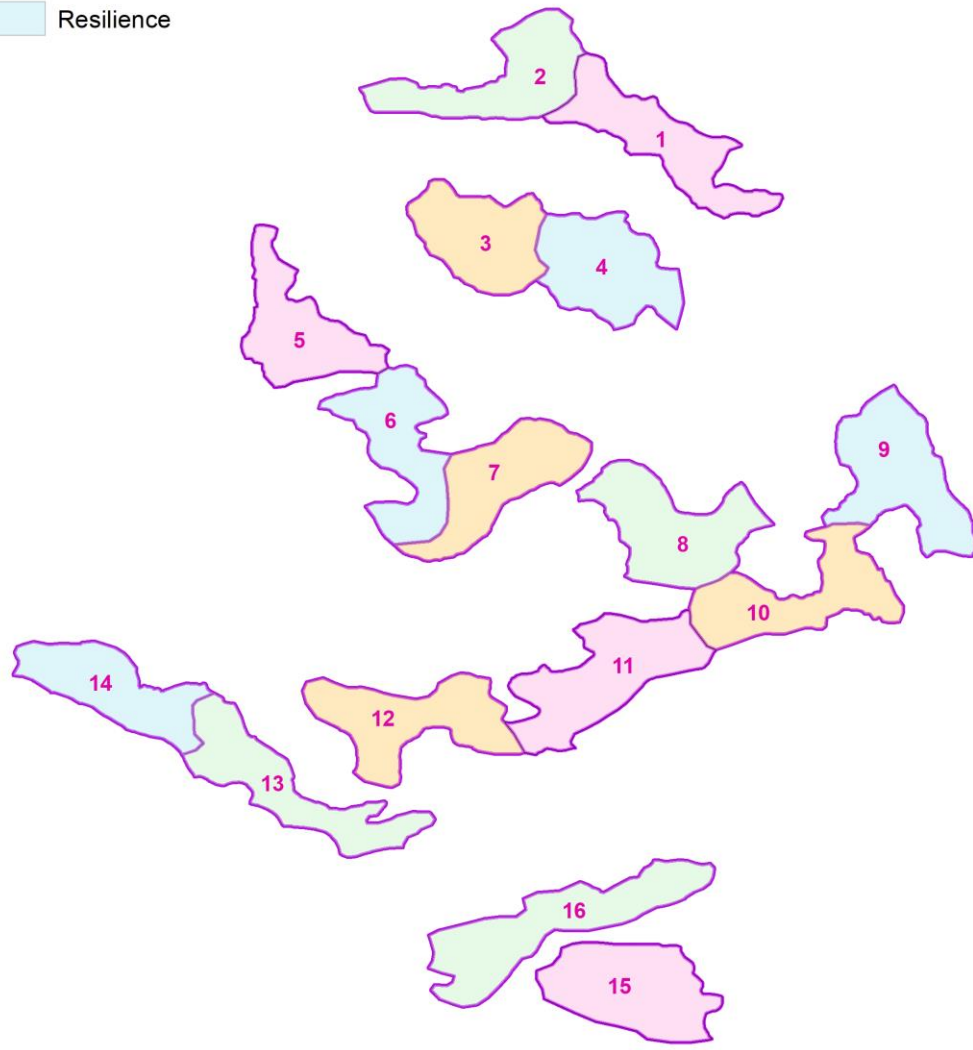
ASCC Sites



ASCC Treatments

Treatments

- Resistance, Resilience, Transition, Control (1 per block, 4 replicates of each)
- Currently designing stand prescriptions for each treatment (with Lance Asherin, RMRS, Mike Battaglia, RMRS, and Art Haines, GMUG).



0 0.275 0.55 1.1 Kilometers

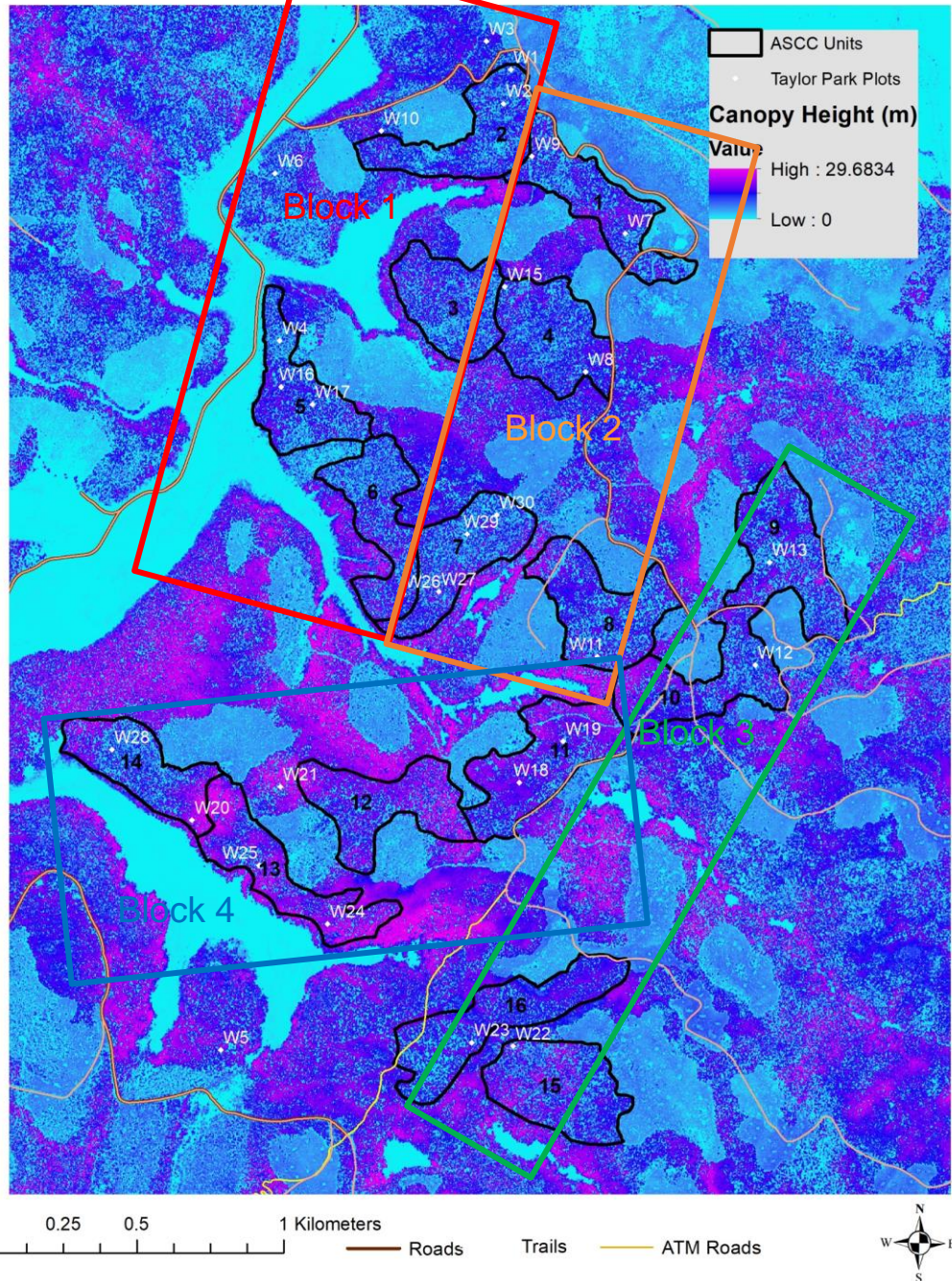
Roads

Trails

ATM Roads



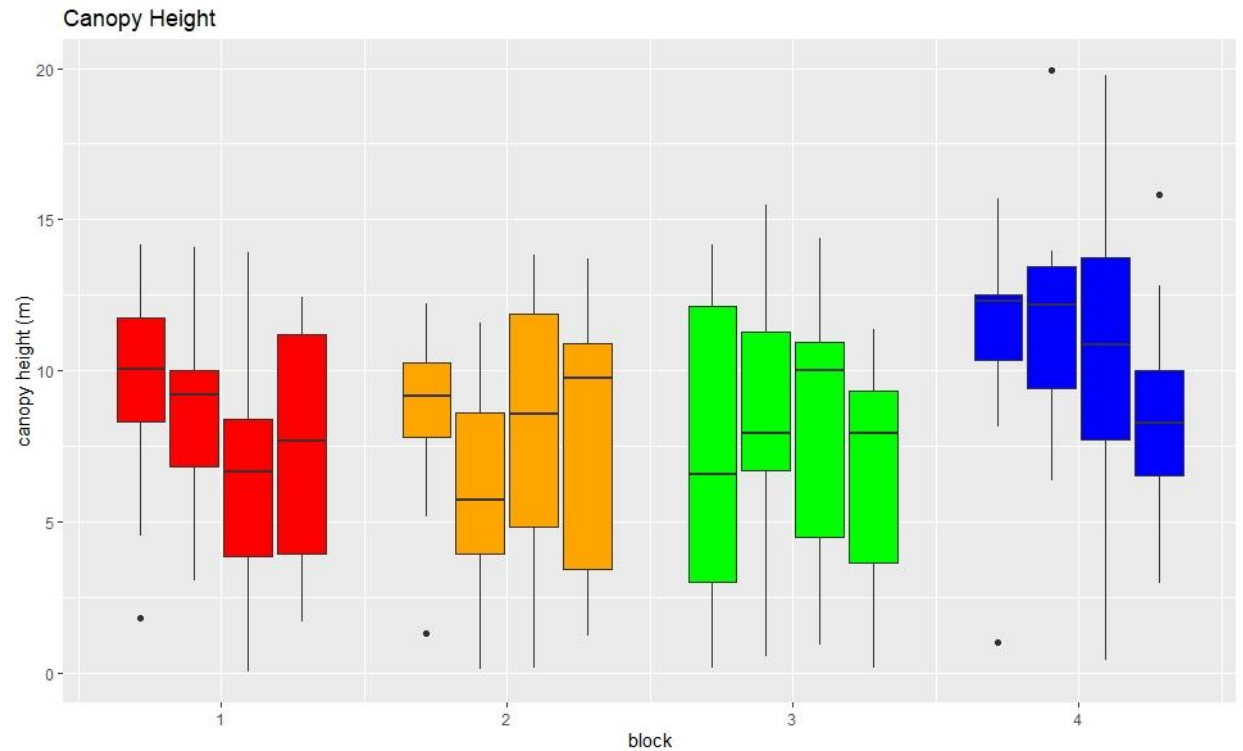
Trail Creek ASCC 2022



ASCC Data

80th percentile LiDAR Canopy Height (thanks to I. Breckheimer)

- moderately tall trees (max ~ 20 m).
- most stands **variable with a mix of closed and open patches**



meadow

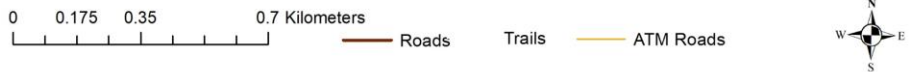
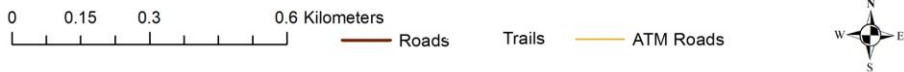
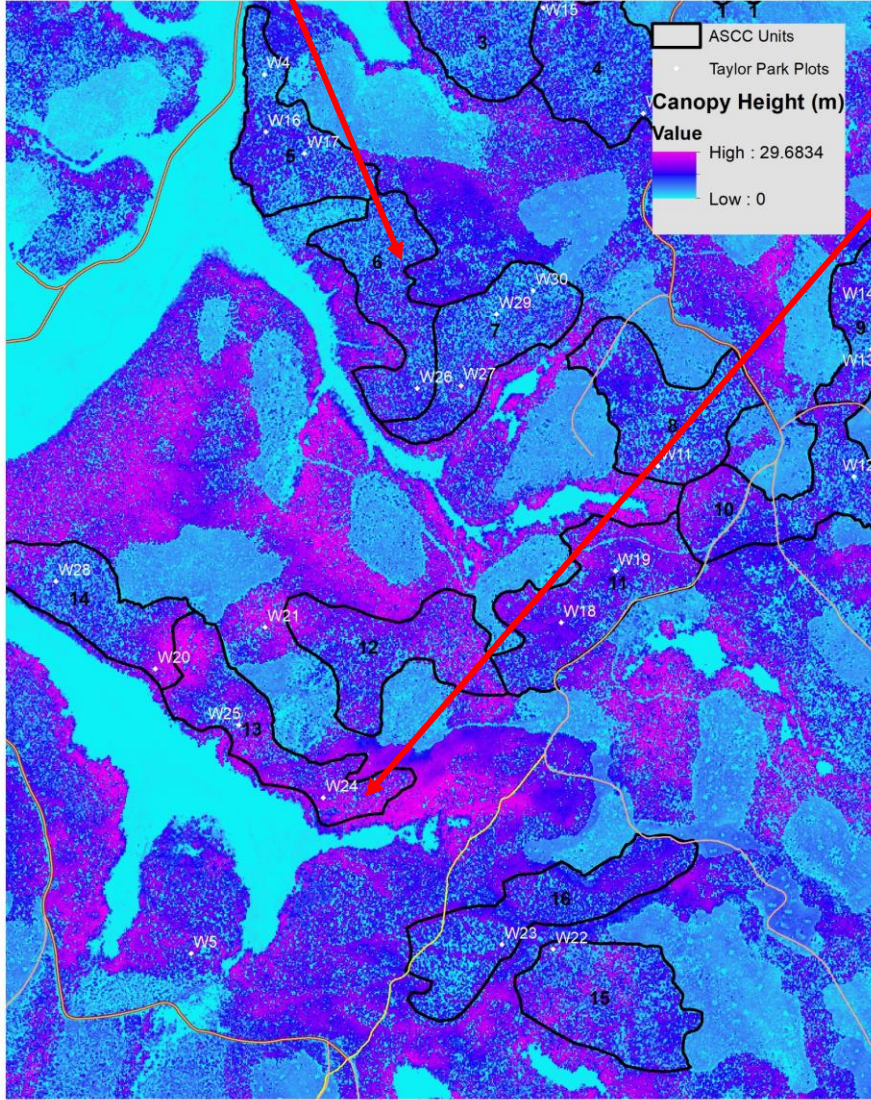
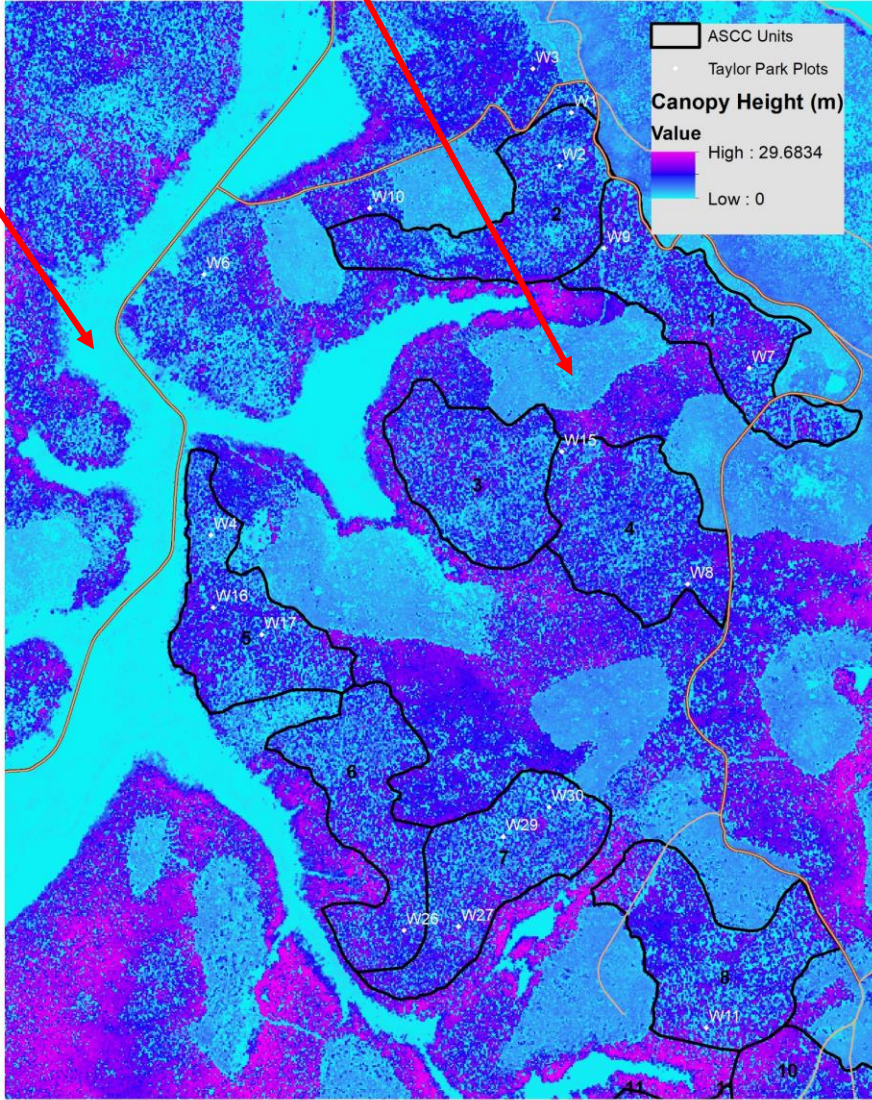
old clearcut

patchy PICO

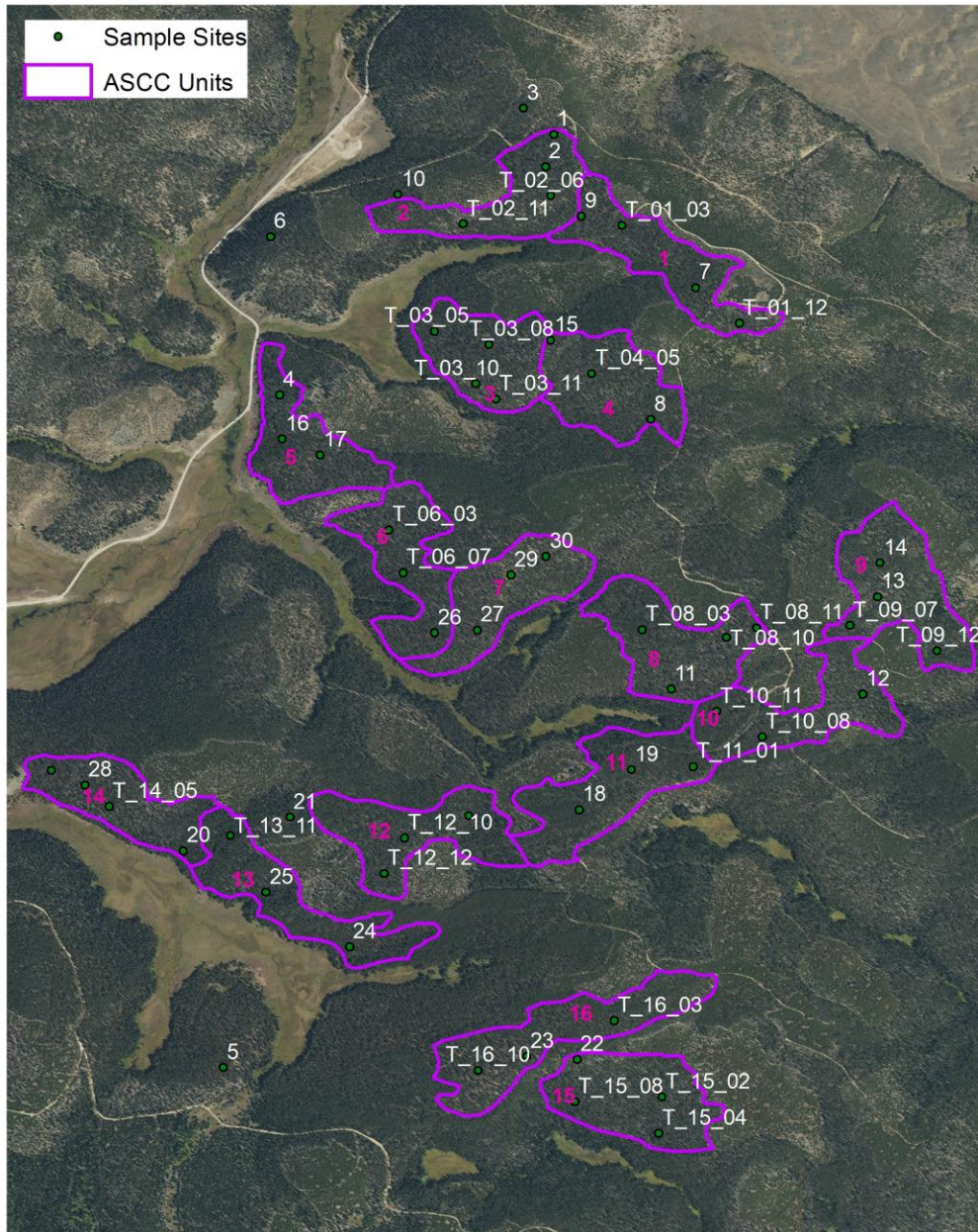
taller closed canopy

Forest Canopy Northern Trail Creek

Forest Canopy Southern Trail Creek



ASCC Sites



ASCC Data

Field plots

- Data on stand structure, health, tree growth, regeneration, fuels collected at 30 new sites, all sites permanently monumented.
- Additional data collected at 30 sites from last year = 60 total samples.
- Temperature + rh sensors, loggers installed at 40 sites fall 2023.





ASCC SOUTHERN ROCKIES

Appendix C Plot Photo Placard

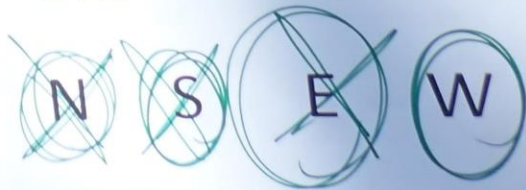
Area: TAY

Location: AS14

Stand: _____

Rep: _____ Plot: _____

M1 - Installation



Appendix C: Plot Photo Placard

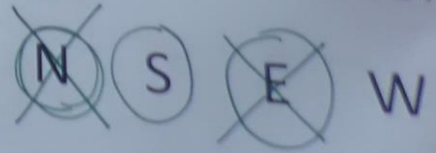
Area: TAY

Location: AS 24

Stand: _____

Rep: _____ Plot: _____

M1 - Installation





ASCC-SOUTHERN ROCKIES

Appendix C: Plot Photo Placard

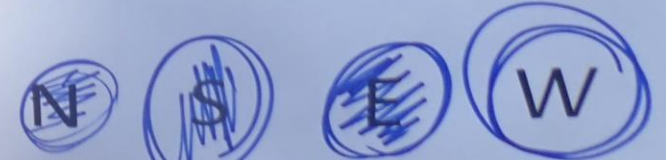
Area: TAY

Location: AS Ø 9

Stand: _____

Rep: _____ Plot: _____

M1 - Installation





Area: TAY
Location: A.S.O.R.
Stand: _____
Rep: _____ Plot: _____
M1 - Installation





Alt: 7811
Location: S. 4
Stand:
Rep: Plot:
M: Installation
XXXX W

ASCC timeline



1. Continued development of ASCC treatment prescriptions, planning for seedling planting.
2. Additional stand sampling (ca. 60 additional plots) in 2023 & 2024.
3. Options for additional instrumentation.
4. Offer sale in Oct-Dec of 2023
5. Roadwork in summer 2024
6. Winter logging – Dec 2024/ Jan 2025; contract clean-up and release by winter 2025
7. Site prep in 2026 (burn)
8. Plant in Summer 2026; maybe July 2027



2023 plans

The science team will continue to focus on ASCC in 2023, but also support additional monitoring and research as desired by the Taylor Park AMG and GMUG.

Thanks to

- Western Center for Public Lands – Courtney King
- GMUG—Pam King, Carlyn Perovich, Art Haines, Dayle Funka, Michael Salazar, many others...
- Mike Battaglia (RMRS)
- Courtney Peterson (CSU)
- Taylor Park AMG members

Questions? jcoop@western.edu