SILVICULTURE OF THE COLORADO FRONT RANGE LANDSCAPE RESTORATION INITIATIVE

Silvicultural Practices & Implementation Methods Through 3 Years Of Fuels Reduction & Restoration Treatments

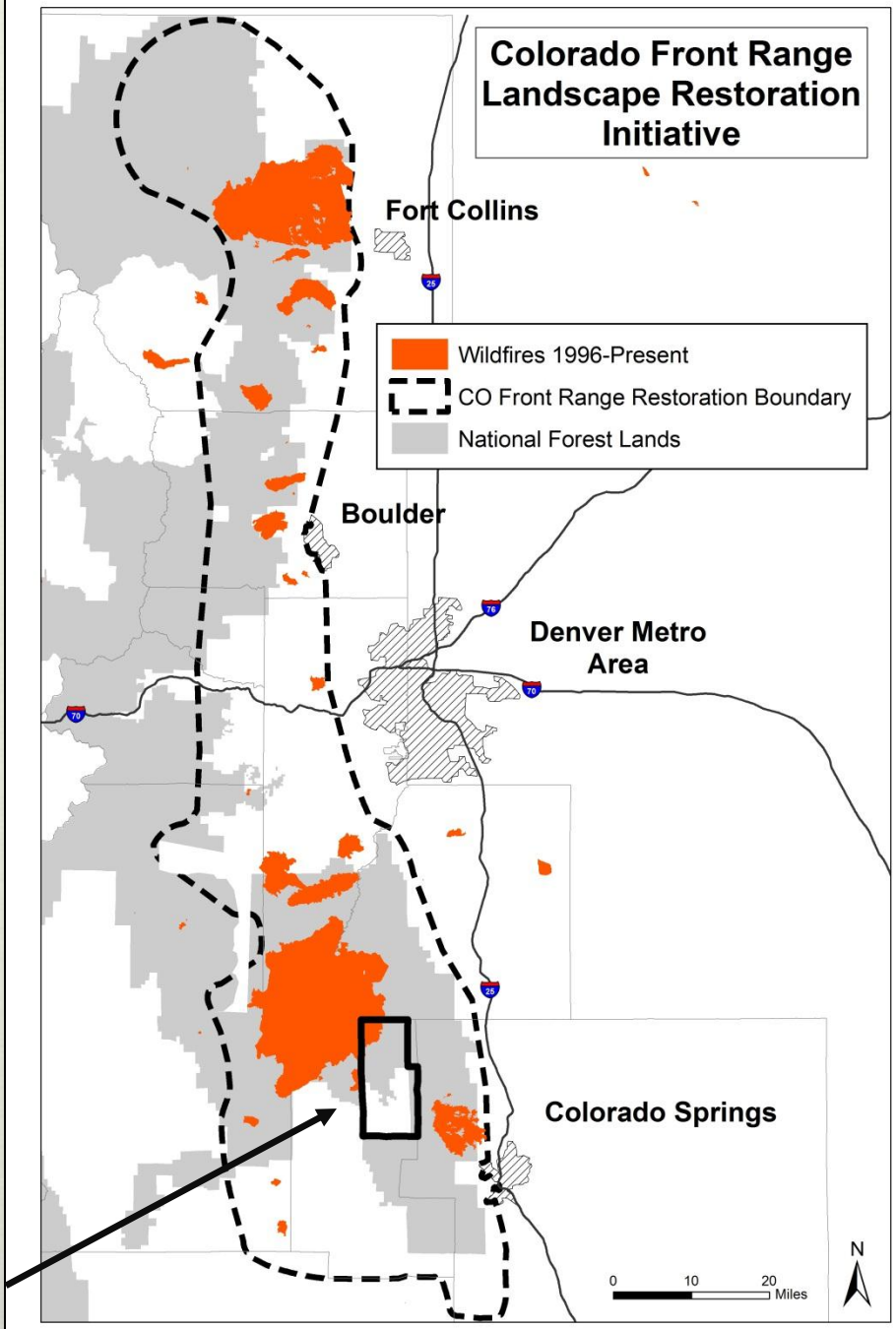
Collaborative Forest Landscape Restoration Project, Colorado Front Range Initiative, Pike National Forest.

COLORADO FRONT RANGE LANDSCAPE INITIATIVE

Front Range Fuels Treatment Partnership & Roundtable

- 800,000 acre Wildland-Urban Interface landscape.
- Dominated by ponderosa pine and Douglas-fir.
- Conduit for 75% of Colorado's drinking water.

Woodland Park Healthy Forest Initiative Area



PIKE NATIONAL FOREST PROJECTS

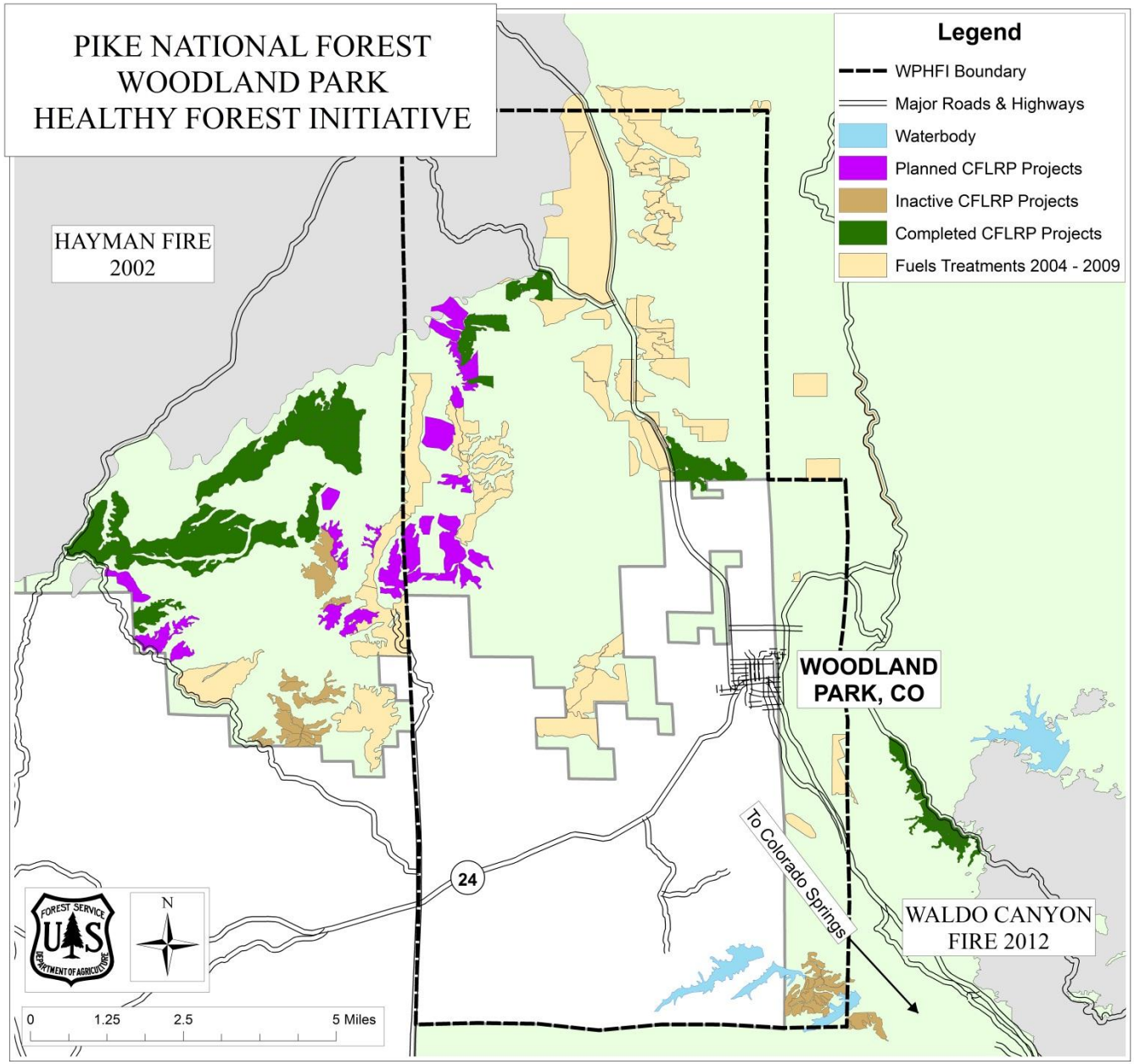
2004 - 2013

- 12,600+ acres of fuels reduction & restoration projects in WPHFI

2010 - 2013

- 8 CFLRP projects completed to date (4,000 acres)

Target: 1,600 ac/year 2010 - 2019



PROJECT VEGETATION: 3 MAJOR TYPES

Ponderosa Pine/Douglas-fir

- PIPO on south and west aspects
- Denser stands of PSME on north-facing slopes

Dry Mixed Conifer

- Ridge tops and upper slopes. PIPO, PSME, PIFL, and PIPU

Mesic Mixed Conifer

- Near riparian. PSME & PIEN are often canopy dominants
- PIPO in small groups or isolated sites. PIFL & PIPU are less common

General

- POTR is present in all types in varying degrees
- PICO is minor component but may be present in Dry & Mesic Mixed Conifer

ABIOTIC CHARACTERISTICS

Elevation Range

- 8,000 - 9,500 feet

Precipitation

- 15 - 24”/year from summer monsoons during July and August and from winter snows, October through April

Growing Season

- 70 - 125 days

Soils

- Weathered from granite, somewhat excessively drained, and have very low available water capacity (< 1”)

MAJOR TREATMENT GOALS

- Fuels Reduction
  - ✓ Reduce canopy closure (mid structure stage, closed to open)
  - ✓ Reduce ladder fuels
- Increase Heterogeneity (ICO - Individuals, Clumps, Openings)
  - ✓ **Clumpy (tree spacing)**
  - ✓ **Variable residual density (structure)**
  - ✓ **Openings (structure)**
- Favor early seral / shade intolerant species for retention
- Enhancement of Aspen
- Retention of Legacy Trees
- Product Utilization
  - ✓ Biomass, non-sawtimber, sawtimber
  - ✓ Reduce post treatment surface fuels and follow-up work

TREATMENTS – PIPO (VARIABLE SPACING)

Pre - Treatment:

- 130 sq. ft. live conifer basal area
- Sample area, Leave Tree Marking

Post - Treatment:

- 52 sq. ft. live conifer basal area

SILVICULTURAL METHODS

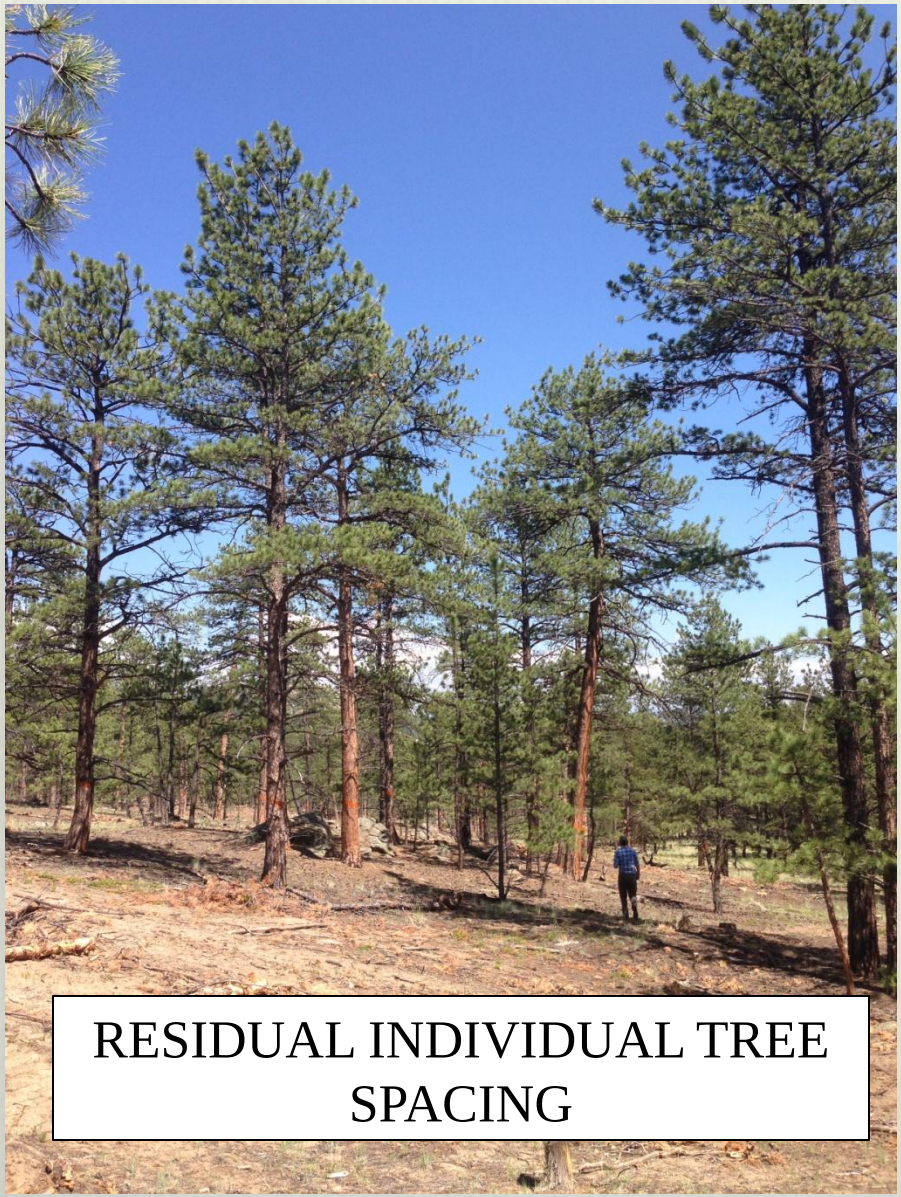
- Variable Spacing - Thinning
  - ✓ Clumps & Groups: Experimenting with different implementation methods

- Variable Residual Density
  - ✓

COVER TYPE	LIVE BASAL AREA (sq. ft.)
Ponderosa pine / Douglas-fir	40 – 60
Dry Mixed Conifer	60 – 80
Mesic Mixed Conifer	80 – 100
Aspen	*(live conifer BA)* 0 – 40

- Openings
  - ✓ Patch cutting around aspen
  - ✓ Persistent openings on south facing slopes
  - ✓ Patch cuts on north slopes that regenerate aspen and pine / remove dense Douglas-fir & spruce

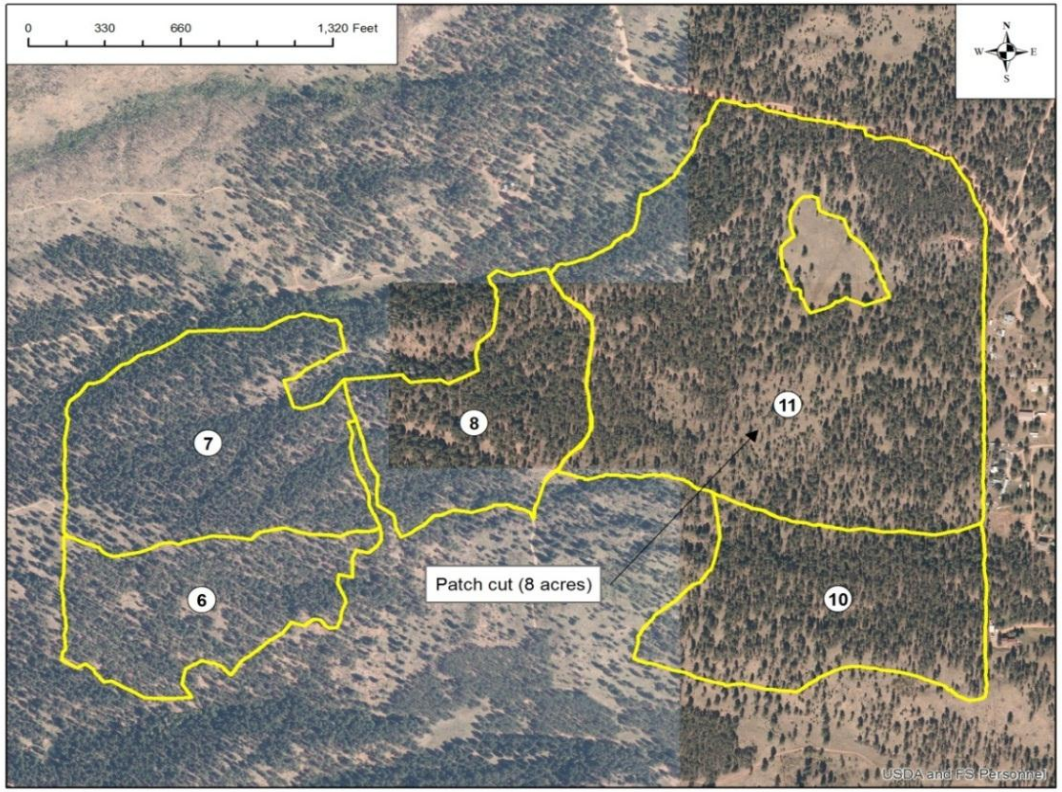
INDIVIDUAL TREES & CLUMPS



RESIDUAL INDIVIDUAL TREE SPACING

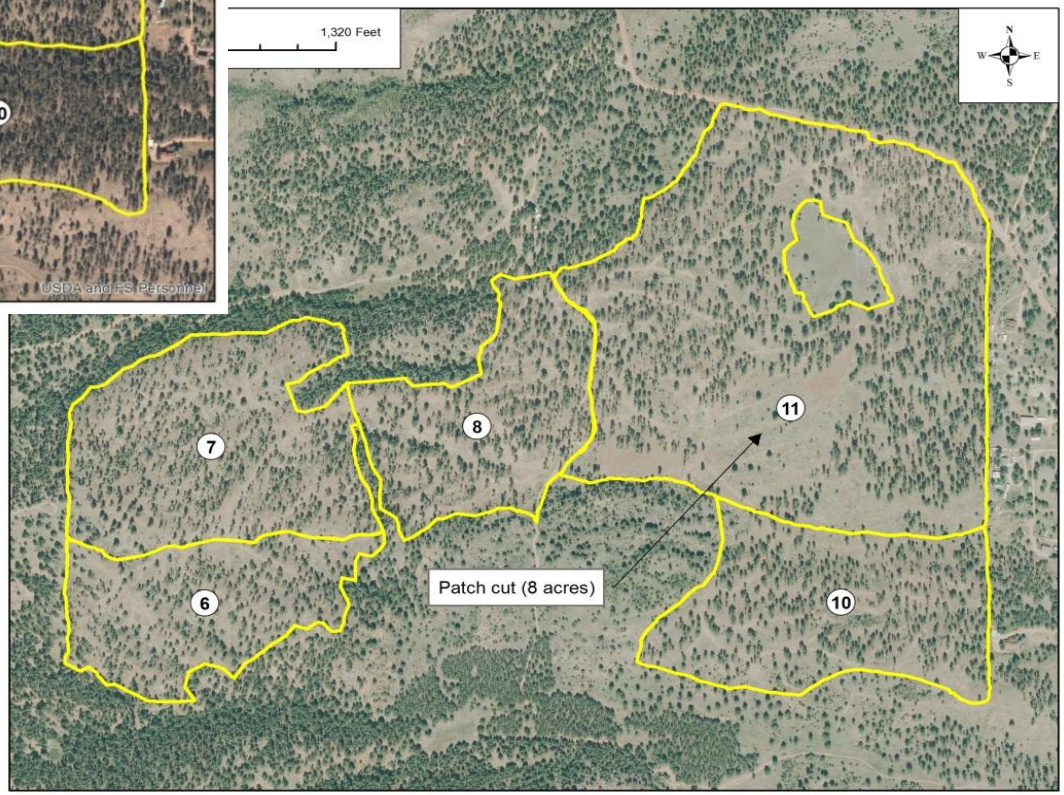
RESIDUAL CLUMPS

VARIABLE DENSITY & OPENINGS



Pre - Treatment:

- Ryan Quinlan Project
- East facing ponderosa pine & dry mixed conifer sites



Post - Treatment:

- 10 - 68 sq. ft. live conifer basal area,
- Avg. 39 sq. ft. live conifer basal area

TREATMENTS – OPENINGS

IMPLEMENTATION METHODS

- Tree Designation

Prescriptions are becoming more complex

- ✓ **DxP -** Designation by Prescription: contract specs with residual density range, species preference, etc.
- ✓ ITM (Individual Trees Marking) **- Leave Tree**
- ✓ ITM **- Cut Tree**
- ✓ **Sample Marking** to demonstrate DxP
- ✓ Combination **ITM w/ DxP**: cut tree mark openings or sawtimber

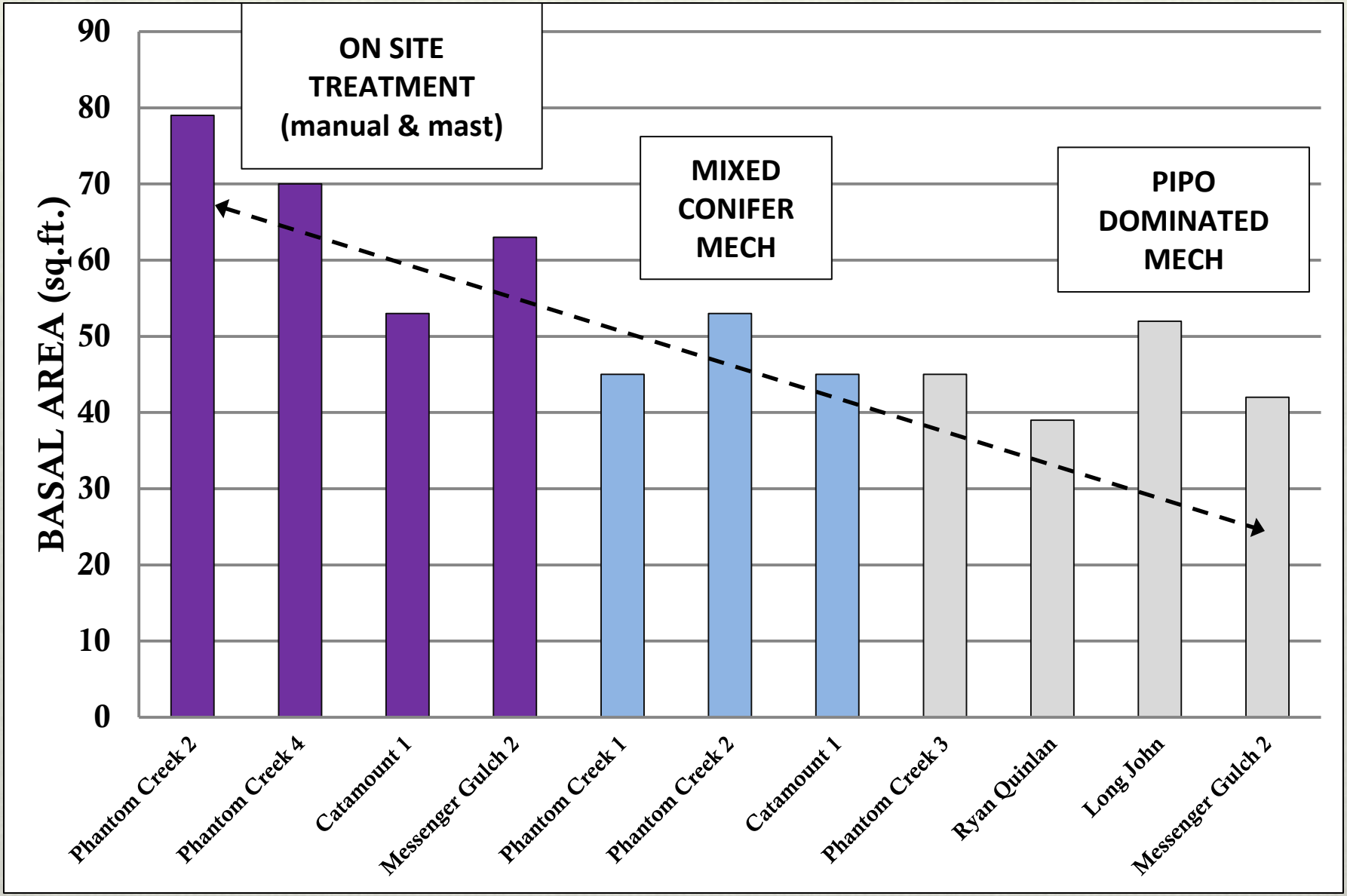
IMPLEMENTATION RESULTS

General Post Treatment Findings

- Removal of 30 - 40% of pre treatment density
- Increase in QMD 9.9” to 11.0” dbh
- Slight increase in ponderosa pine, reduction of Douglas-fir (± 5 - 6%)
- Heterogeneity may be decreasing in the short - term

RESIDUAL DENSITY BY TREATMENT & COVER TYPE

- Residual density is dependent upon treatment type, project cover type, & NEPA



MONITORING

- Within-stand Scale

  Common Stand Exam (CSE) protocol

  - ✓ Forest composition and standard measures of forest structure (BA, TPA, QMD etc.)

  Aerial image analysis

  - ✓ “Groupy-clumpy” distribution of canopy

- Landscape Scale

  - ✓ Investigating use of remote sensing to monitor canopy changes across the landscape

- Socio-economic monitoring

ECONOMIC

- Variety of products:

  lumber, post and poles, garden mulch, pellets, & firewood

- Primary product is landscaping material

- Material also used for post fire rehab

Product (2012)	Tons Removed
Sawtimber	1,566
Non-sawtimber	6,210
Fuelwood	1,215
Wood shreds (fire rehab)	8,599
Landscaping material	20,427

KEY TAKE HOME MESSAGES

- Colorado Front Range is departed from historical conditions and is more susceptible to uncharacteristic high-intensity wildfire, insects, and disease.

- The Colorado Front Range Initiative was initiated through the CFLRP in 2010 in response to destructive wildfire seasons

- The restoration goals of CFLRP require an innovative perspective on:
  - ✓ *Silvicultural, and*
  - ✓ *Implementation methods*
  - ✓ *with a focus on increasing heterogeneity.*

PARTNERS

- Boulder County
- Coalition for the Upper South Platte
- Colorado Springs Utilities
- Colorado State Forest Service
- Colorado State University
- Denver Water
- El Paso County
- Jefferson County
- Natural Resources Conservation Service
- Teller County
- The Colorado Division of Wildlife
- The Nature Conservancy
- The Wilderness Society
- US Geological Survey
- West Range Reclamation

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