

Multiparty Monitoring on the Middle Applegate Pilot



Max Bennett, Oregon State University Extension Service

Thanks to Gwyn Myer, Southern Oregon Forest Restoration Collaborative, for many of these slides!

Why?



What's happened so far

- Initial stakeholder meeting
- Formed MPM team
- Developed MPM plan
- Field work
 - FIREMON plots
 - Photopoints
 - Spatial plots
 - Learning conversations
- Funding, coordinator
- Proposal development
- Interim report, community meetings

Increase forest ecosystem resistance and resilience

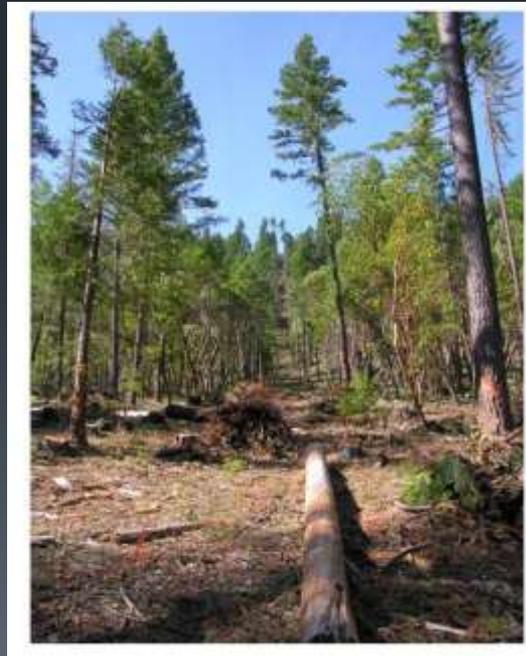
Indicators:

- Fire behavior
- Stand density
- Tree vigor
- Mean diameter
- Composition of tree and understory diversity
- FIREMON PLOTS, PHOTOPOINTS





Permanent photopoints





Increase spatial heterogeneity to benefit biodiversity and species of concern at the stand and landscape scale

Indicators:

- Canopy cover
- Stand level skips and gaps
- Stand level structural complexity
- Seral stage composition at landscape scale
- Snag and down woody material abundance
- Bird species composition
- **SPATIAL PLOTS CO-LOCATED WITH FIREMON PLOTS, PHOTOPOINTS**

Conserve and improve northern spotted owl habitat through LSEA (late seral emphasis area) design

Indicators:

- Fire behavior adjacent to LSEAs
- Percentage of NRF, dispersal, and unsuitable habitat
- Spotted Owl reproduction and pattern of use
- FIREMON PLOTS/MODELLING
- PROPOSED STUDY WITH USFW/OSU/BLM

P10
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5/30/12
N



Generate jobs and support regional manufacturing infrastructure

Indicators:

- Jobs created or maintained
- Volume/value of material harvested
- Market utilization by product category
- **DATA COLLECTION IN PROGRESS**

Gain public support for active management in federal forests

Indicators:

- Awareness and support of engaged public
- Success of community outreach and engagement
- Scoping and EA comments
- **LEARNING CONVERSATIONS**

Examples from learning conversations

- “And there’s just so much pressure out there. The pressures are just huge. And the extremes on both ends are driving the bus right now. And in my perfect world we would be able to marginalize the extremes because I think we have a lot of consensus in the middle. I think we have a lot of people who are willing to compromise, who are willing to take some chances and try some new things, but unfortunately that group isn’t in charge right now.”
- “What about, one of the questions I think we don’t really adequately address often, what happens 20 years from now? What kind of follow-up treatments do we anticipate are going to be necessary to maintain these components on the landscape if ultimately that’s our goal?”
- “There is always a tension though, if you were saying we were going to do pure restoration, I think you might end up treating different stands than if we were always as we always are, under the gun to get this volume out. And so there’s this tension between those goals, that true restoration and the volume commitment. “
- “ A lot of times I’ve seen the NEPA document says this but when it comes to implementation they just totally radically go away from that – even like logging systems become cable, they go from cable to tractor – or things like this that we never analyzed for. That’s always been a real big concern. We very infrequently do ID team reviews of projects, at least in my experience, to go out and look at a project afterward and say, ‘what could we have done better to learn from that?’, and in fact we haven’t even done that for Pilot Joe, as far as I’m aware of.”

Successes



- Strong initial community interest
- Truly a multi-party group
- Developed a monitoring plan with focus and substance
- Field monitoring is occurring
- Secured \$40K in RAC funds
- Advocating for/seeking add'l funding
- Learning & relationship building
- Capacity building

Challenges

- Clearly defining objectives & deciding what's feasible
- Need more resources for:
 - Owl monitoring
 - Other effectiveness monitoring (e.g., bird response)
- Gauging public support has been challenging
- Sustaining the effort in the long run

Building Capacity, Accountability, and Support

- Clarify objectives
- Monitor compliance, treatment effectiveness, and increase accountability
- Engage public and build trust
 - Work as citizens on ID teams
- Convene partners and volunteers from diverse stakeholder groups
 - Sponsored a conference in Oct 2010, sponsor field trips
- Inspire collective action
- Leverage stakeholder expertise to increase agency capacity
- Advocate for agency funding and procure outside funding
 - Title II funds received from RAC
- Provide framework for additional questions
 - From agency and others
- Create(d) jobs

Measuring & Monitoring Spatial Heterogeneity



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Spatial Heterogeneity

Heterogeneous (Merriam-Webster): consisting of dissimilar or diverse ingredients or constituents

Homogeneous: of uniform structure or composition throughout

Traditional—uniform spatial structure



“Restoration”—variable spatial structure



A common treatment objective

Definition

“In both Dry and Moist Forest stands, there is a goal of restoring **spatial heterogeneity** --*a non-uniform distribution of forest structural elements, such as trees, snags, and canopy density*—when appropriate.... at all spatial scales, from centimeters (logs) to meters (stands) to kilometers (landscapes).

Uniform silvicultural treatments which create homogeneous conditions will be uncommon [in ecological restoration] at either the stand or landscape scale.”(Franklin and Johnson 2009)

Demonstration

“The silvicultural prescriptions for [the Pilot Joe Demonstration] project are designed to *move the current condition of crowded, uniform forest stands to site conditions that are more open and spatially heterogeneous (clumpy) in nature.* “ (Pilot Joe Demonstration Project Environmental Assessment p 2-4)

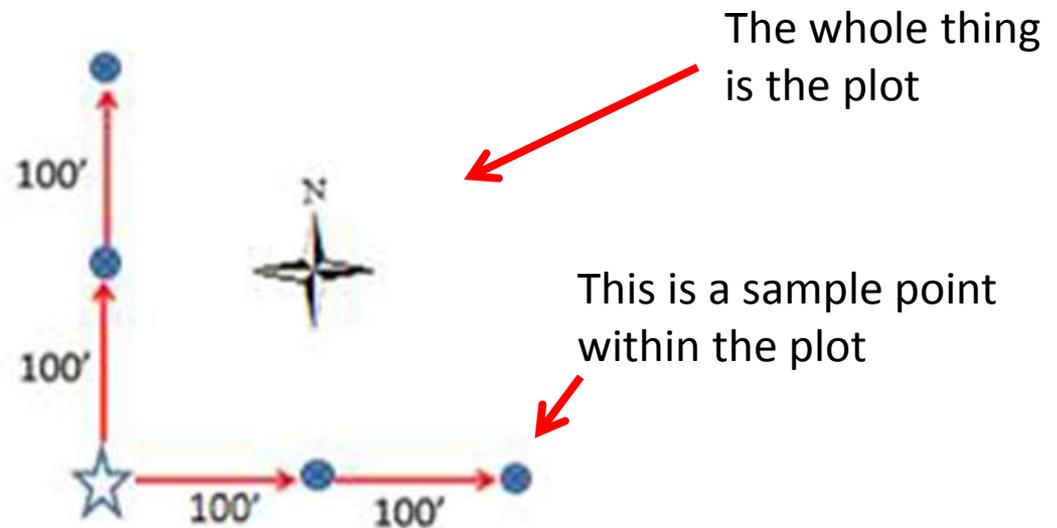
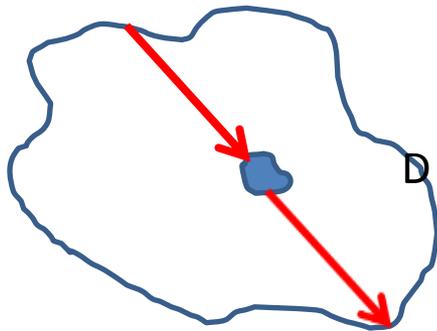
Our approach

- No stem mapping
- Sample plot measurements of:
 - Canopy closure variation
 - Regularity of tree distribution (Winkelmass)
 - Distance to nearest/farthest neighbors
 - Gaps
- Focus on fine-scale variability, but look at all scales
- Compare pre & post treatment – is there a change?

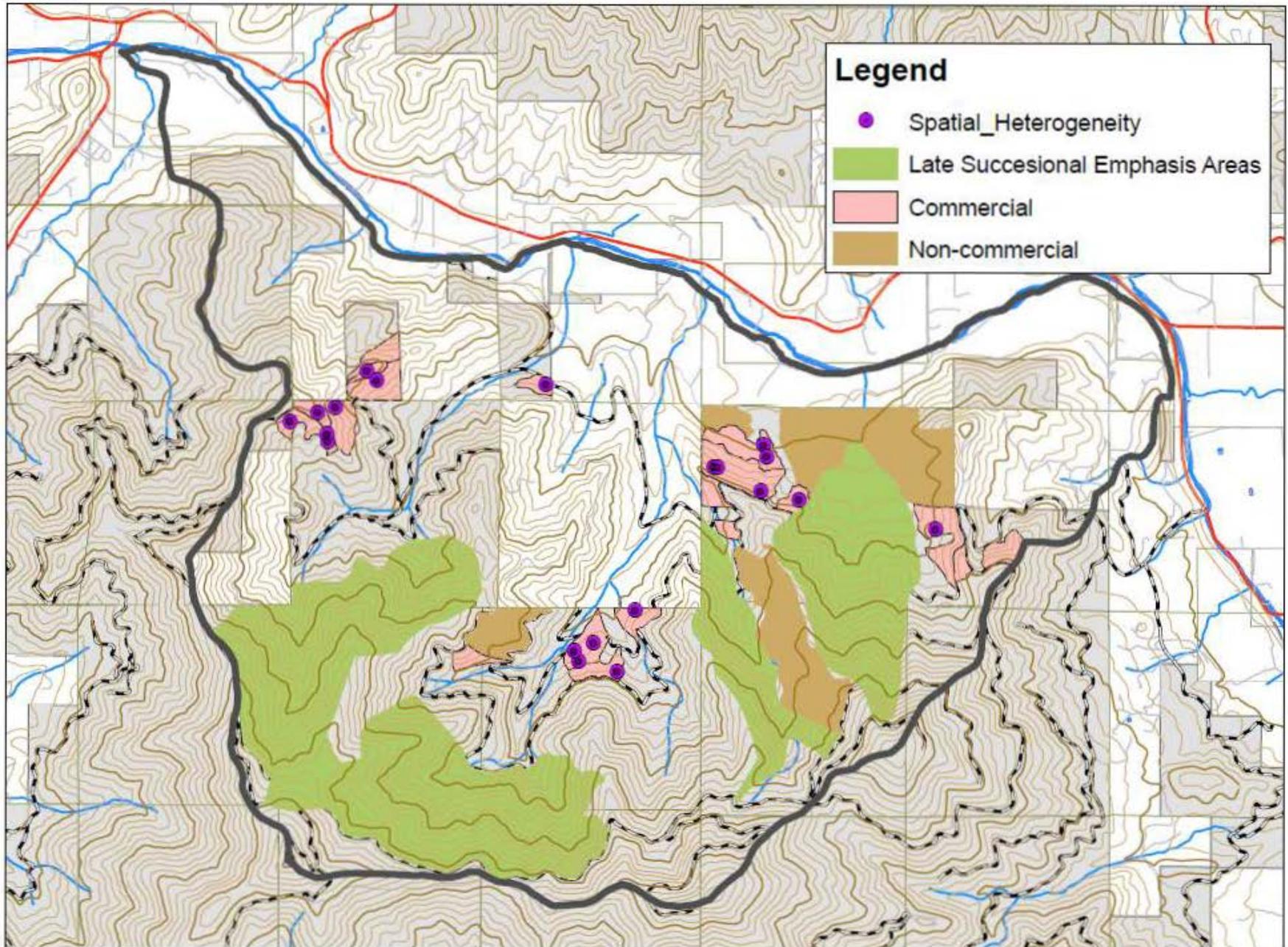
Plot layout

☆ Plot center. Canopy closure (densiometer), Winkelmass, distance to nearest & farthest neighbor.

● Sample point. Canopy closure (densiometer), Winkelmass, distance to nearest & farthest neighbor.



100' transects. Record start & end distance of any canopy gaps >25' (dripline to dripline). Do not consider trees <30' tall when evaluating canopy.



0 0.5 1 2 Miles





Canopy closure

- Canopy closure is reduced after treatment. Is it also more variable (more heterogeneous)? At what scale?



Canopy closure variation within plots

- Measured using coefficient of variation (ratio of SD to mean).
- If canopy closure is more variable within plots following treatment, this suggests that fine scale spatial heterogeneity has increased.



Example (Plot 31-5)

| Plot 31-5 | PC | Pt-1 | Pt-2 | Pt-3 | Pt-4 | Range | Average | CoVar |
|-----------|-----|------|------|------|------|--------|---------|------------|
| Pre-tmt | 78% | 72% | 76% | 82% | 84% | 72-84% | 79% | 6% |
| Post-tmt | 65% | 34% | 3% | 47% | 44% | 3-65% | 39% | 59% |

Conclusion: Treatment reduced average canopy closure from 79% to 39%. It also *increased* the variability of canopy closure within these 5 points, from a pre-tmt CV of 6% to a post-tmt CV of 59%. Fine scale canopy heterogeneity has increased.

Comparison of 4 plots

Values in cells are % canopy closure

| Within-plot | | | | | | | | |
|-------------|-----|------|---------|------|------|--------|---------|-------|
| Pre-tmt | PC | Pt-1 | Pt-2 | Pt-3 | Pt-4 | Range | Average | CoVar |
| PIJO-31-6 | 71% | 79% | 76% | 35% | 78% | 35-79% | 68% | 27% |
| PIJO-31-1 | 76% | 81% | 84% | 65% | 90% | 65-90% | 79% | 12% |
| PIJO-32-1 | 85% | 94% | 87% | 90% | 88% | 85-94% | 89% | 4% |
| PIJO-31-5 | 78% | 72% | 76% | 82% | 84% | 72-84% | 79% | 6% |
| | | | | | | | | |
| Post-tmt | PC | Pt-1 | Pt-2 | Pt-3 | Pt-4 | Range | Average | CoVar |
| PIJO-31-6 | 13% | 32% | 29% | 19% | 78% | 13-78% | 34% | 74% |
| PIJO-31-1 | 24% | 44% | 26% | 68% | 13% | 13-68% | 35% | 61% |
| PIJO-32-1 | 63% | 1% | No data | 63% | 43% | 1-63% | 43% | 68% |
| PIJO-31-5 | 65% | 34% | 3% | 47% | 44% | 3-65% | 39% | 59% |

Within Stand Heterogeneity “skips & gaps”

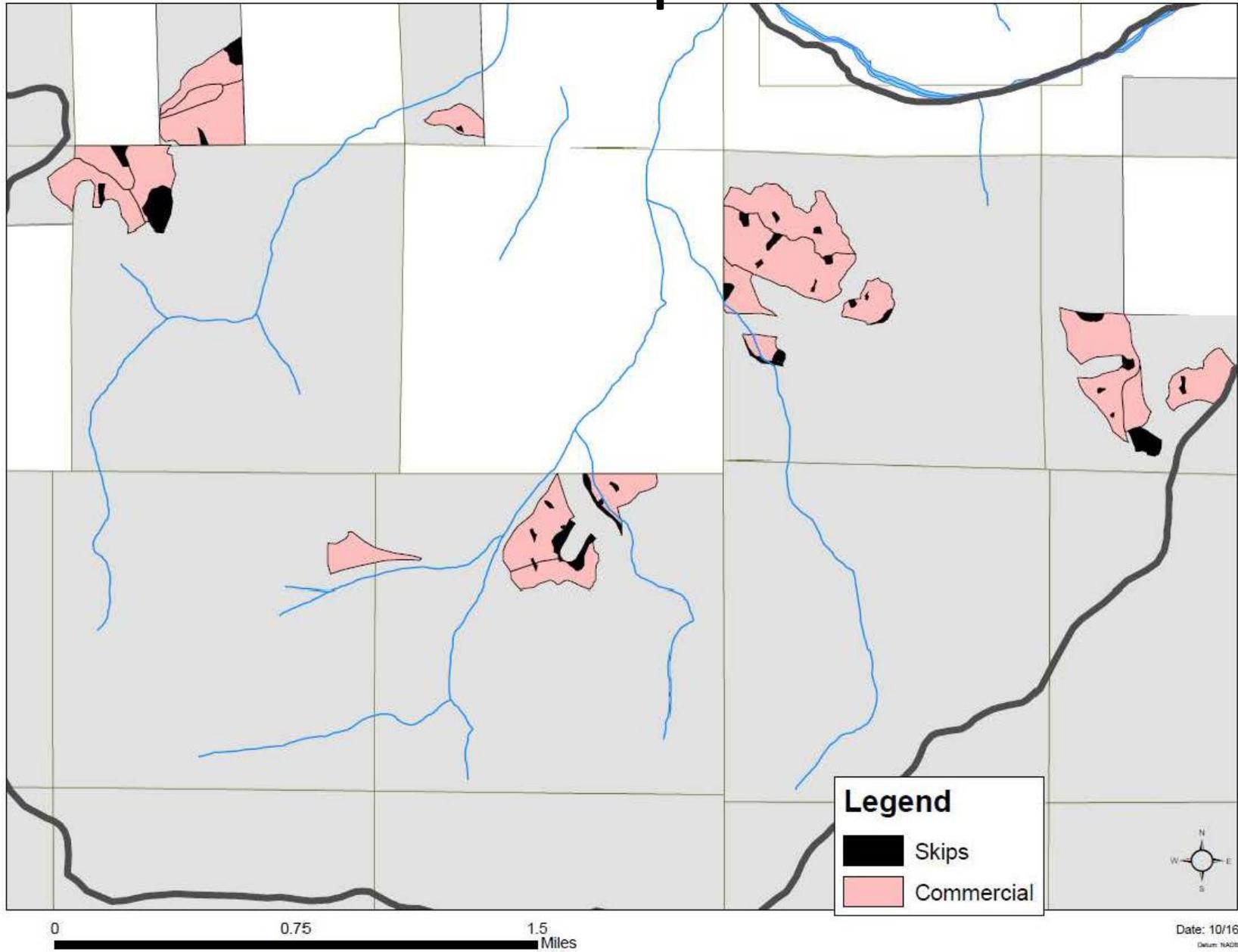


Gaps

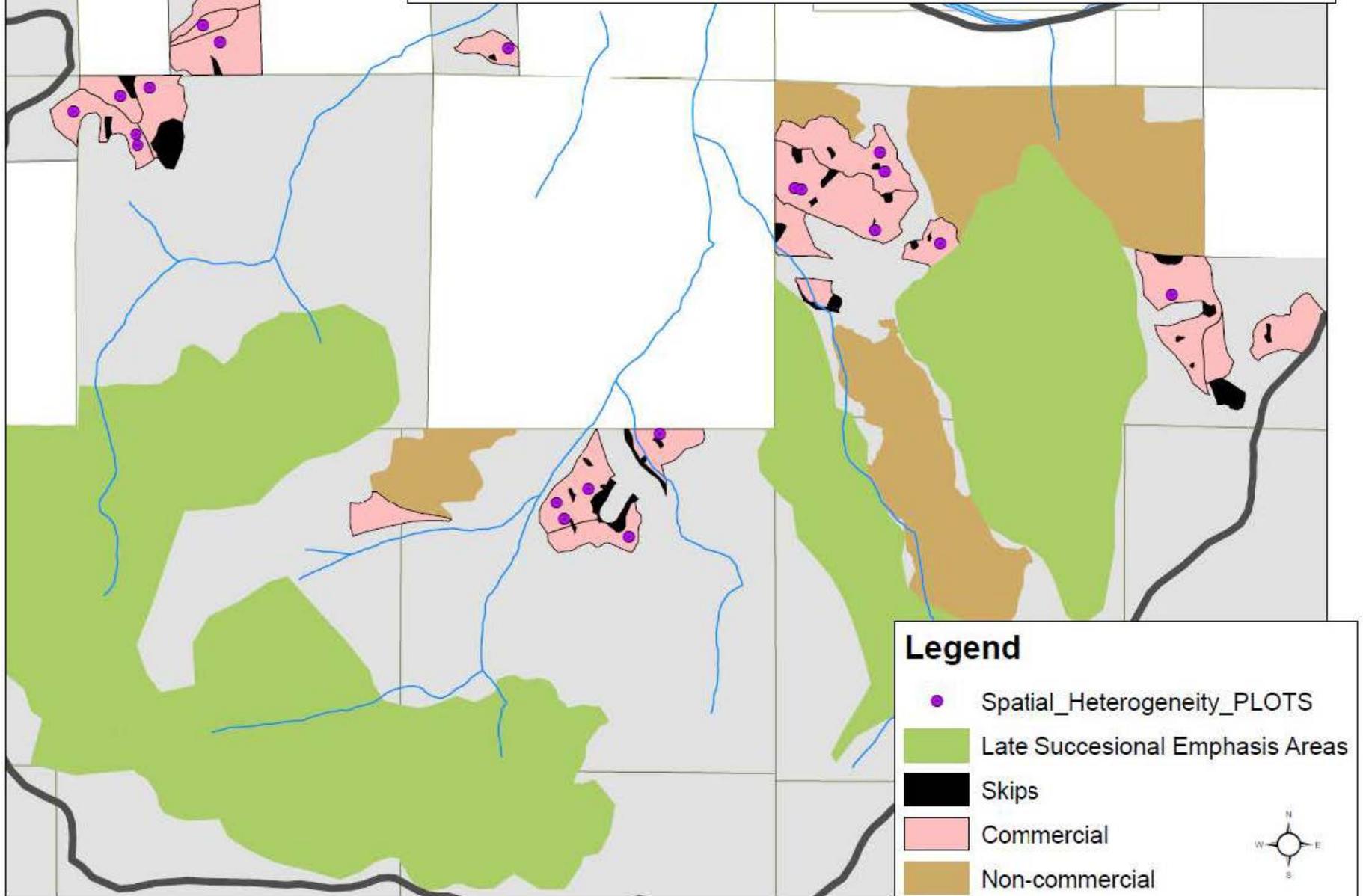


| 100' Transect GAP Inventory | Pre-Treatment | Post-Treatment |
|--------------------------------|---------------|----------------|
| Total Transect Lineal Feet | 7,200 | 1,600 |
| # GAPS encountered | 15 (20%) | 15 (70%) |
| Avg. length (ft) | 62 | 57 |

Skips



Landscape Heterogeneity



0 0.75 1.5 Miles



Date: 10/16/2012
Datum: NAD83

Tentative conclusions

- Only 4 post-tmt plots! So take it with a grain of salt!
- Pre-tmt data suggests stand was dense, trees randomly distributed
- Post tmt less dense, but more heterogeneous?
- Metrics (canopy cl variability, Winkelmass, neighbors) consistently show increase in fine-scale (within plot) spatial heterogeneity
- At within-stand level, spatial heterogeneity is contrast between treated areas and skips
- At between stand level, heterogeneity is contrast between treated and untreated areas

Key questions

- How does heterogeneity at different scales influence:
 - NSO, birds, herps, etc.
 - Understory plant development, tree regeneration
 - Fire behavior
- We don't know!

Acknowledgements

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