

Monitoring Whitebark Pine Restoration:

Lessons Learned from Southwest Crown of the Continent
Collaborative Forest Landscape Restoration Program



Cara R. Nelson
University of Montana

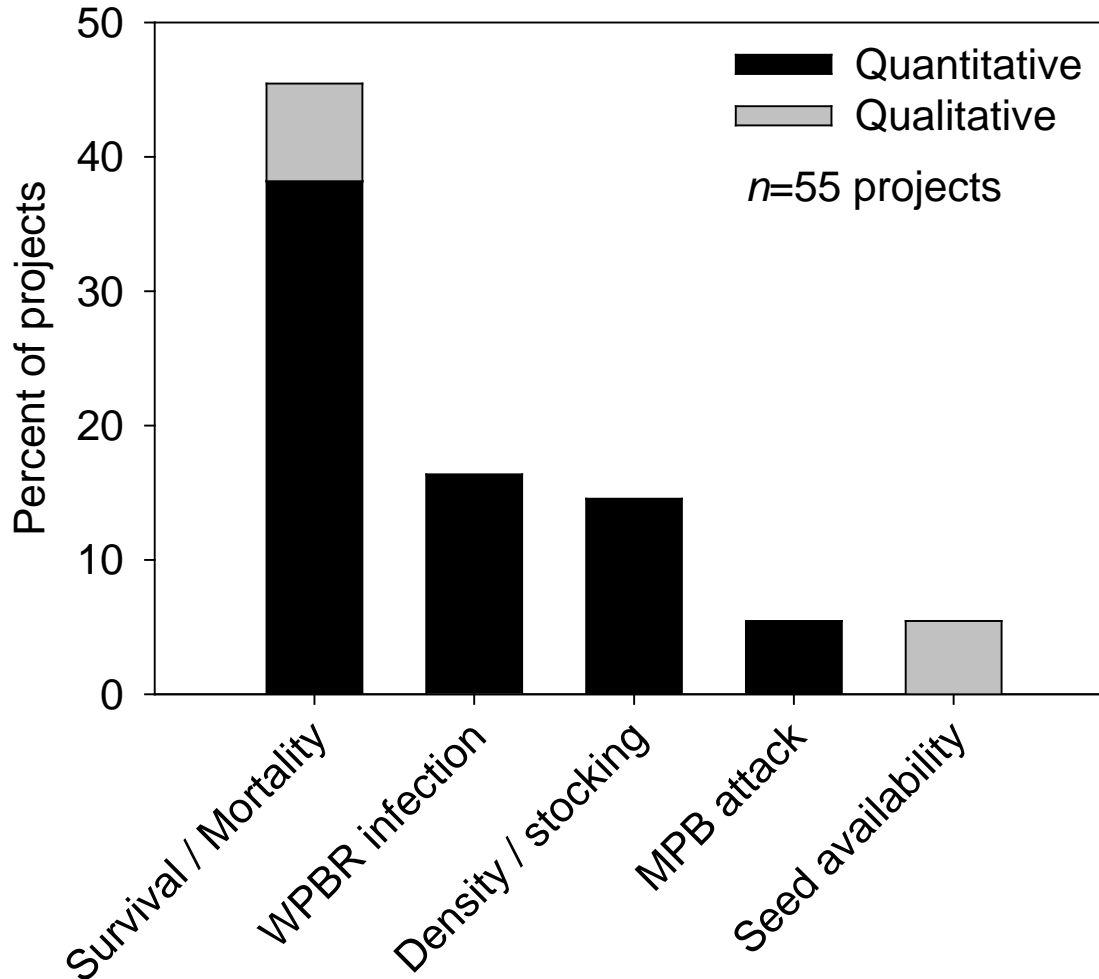


Goals of Whitebark Restoration

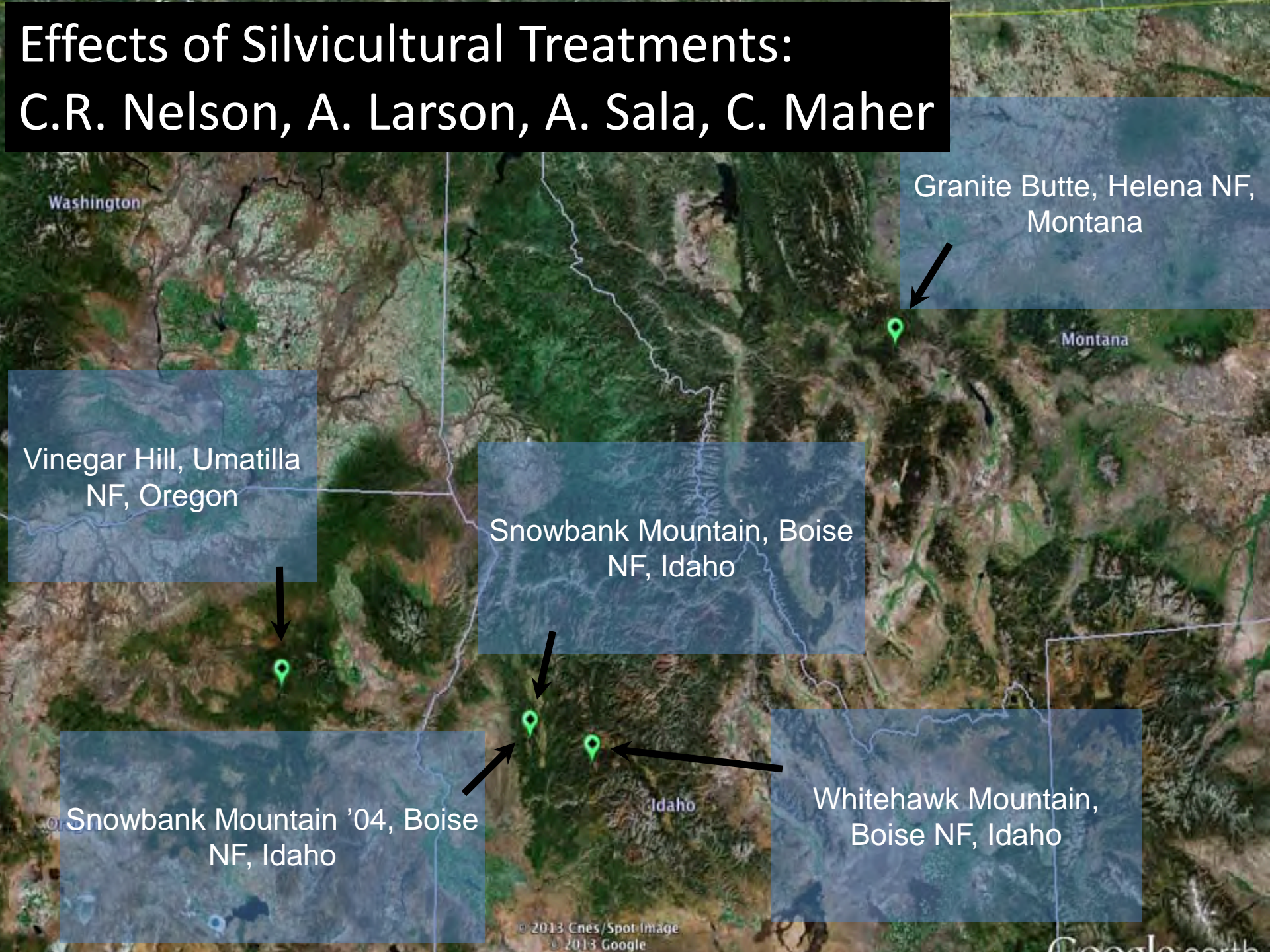
- Reduce competition from subalpine fir
- Release saplings and seedlings
- Promote nutcracker caching
- Reduce susceptibility to MPB
- Decrease risk of stand replacement fire



Monitoring is Infrequently Done



Effects of Silvicultural Treatments: C.R. Nelson, A. Larson, A. Sala, C. Maher



Granite Butte, Helena NF,
Montana

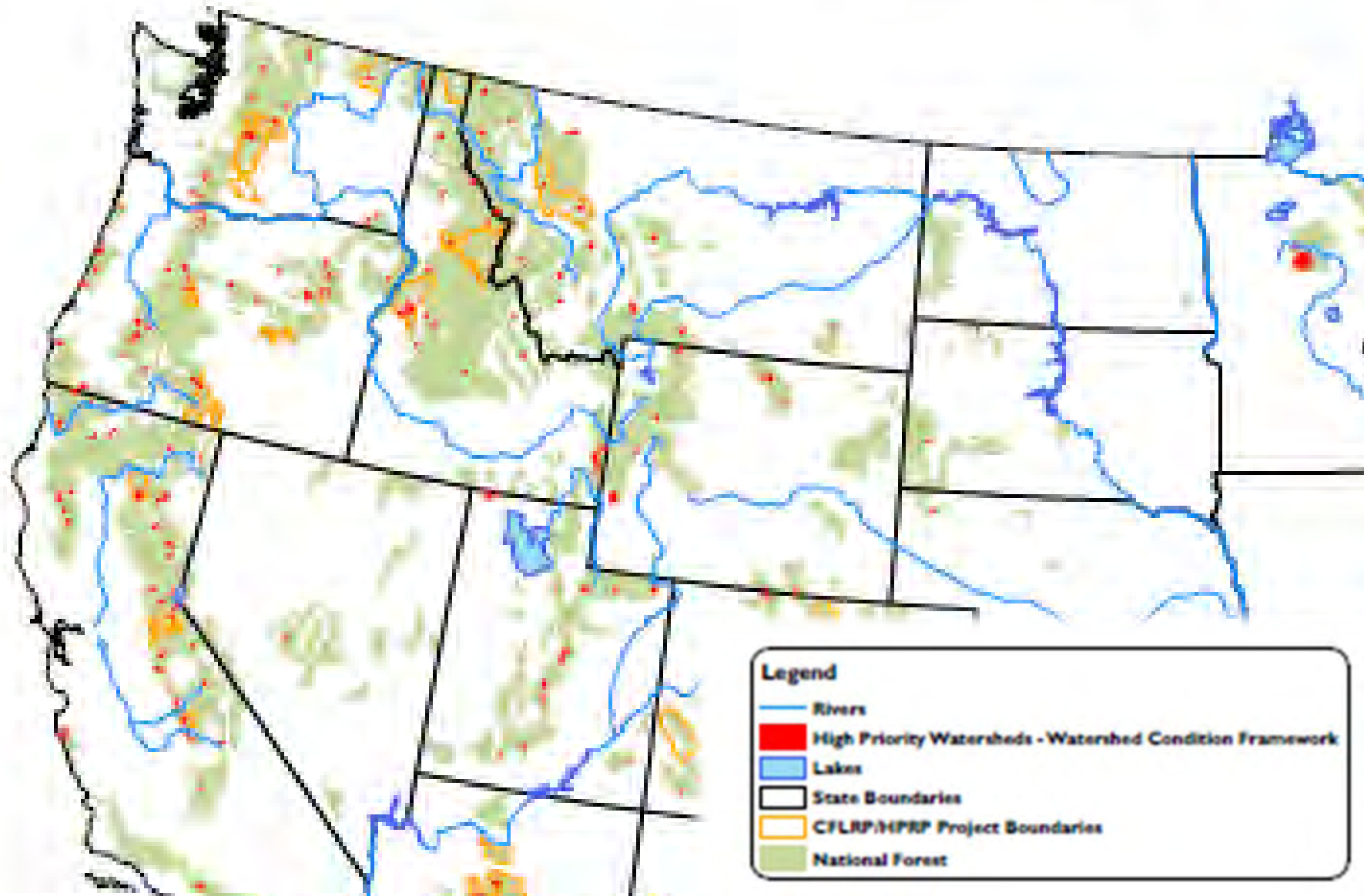
Vinegar Hill, Umatilla
NF, Oregon

Snowbank Mountain, Boise
NF, Idaho

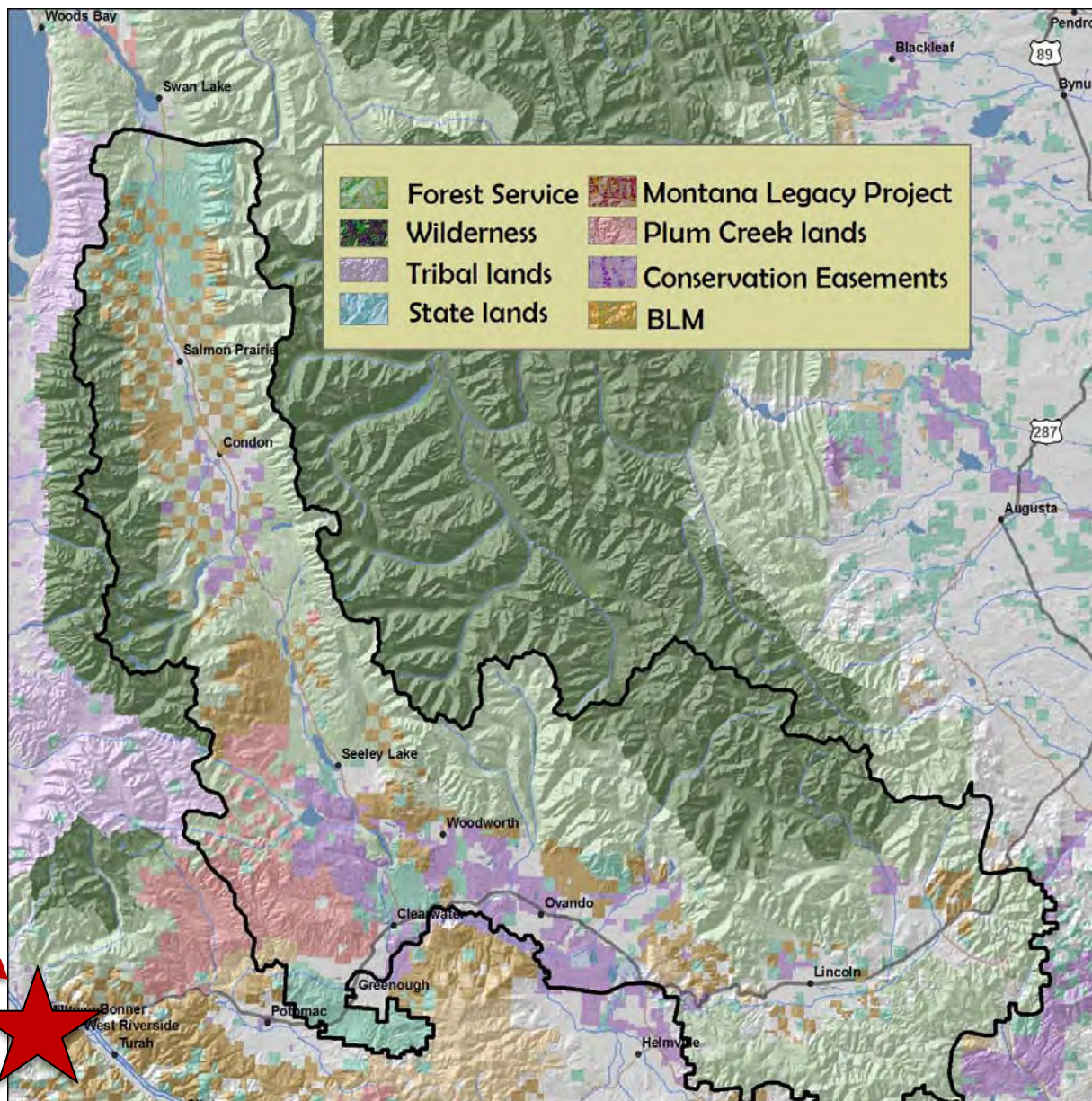
Snowbank Mountain '04, Boise
NF, Idaho

Whitehawk Mountain,
Boise NF, Idaho

Collaborative Forest Landscape Restoration Program (CFLRP)



Southwest Crown of the Continent Collaborative Forest Landscape Restoration Program



Missoula



Objectives for Today

- Provide an overview of whitebark pine monitoring in the SWCC CFLRP
- Provide general observations about what is limiting effectiveness of multiparty monitoring
- Network with those of you interested in collaborating on monitoring

Omnibus Public Land Management Act of 2009

TITLE IV--FOREST LANDSCAPE RESTORATION

SEC. 4001. PURPOSE.

The purpose of this title is to encourage the collaborative, science-based ecosystem restoration of priority forest landscapes through a process that--

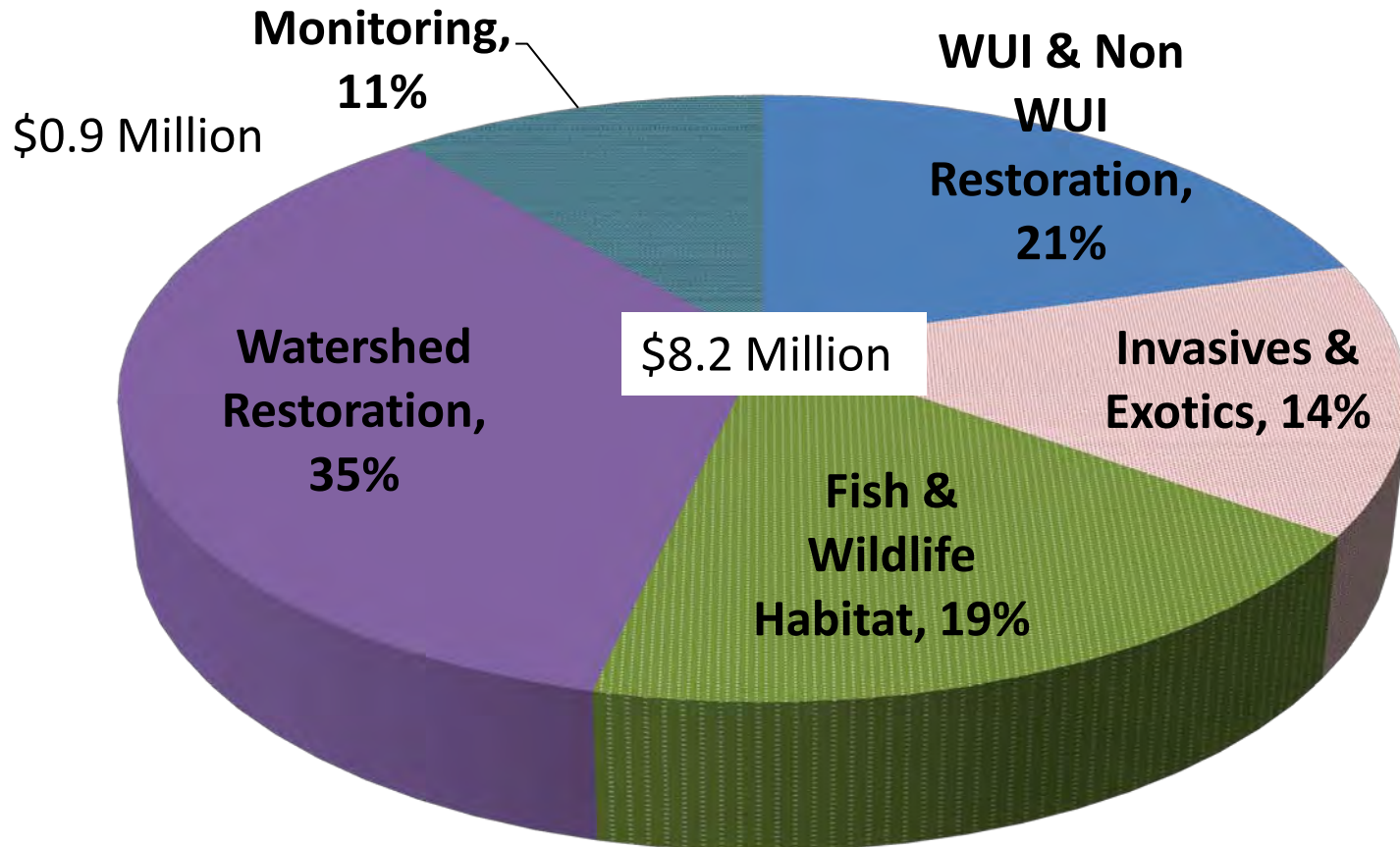
- (1) encourages ecological, economic, and social sustainability;
- (2) leverages local resources with national and private resources;
- (3) facilitates the reduction of wildfire management costs, including through reestablishing natural fire regimes and reducing the risk of uncharacteristic wildfire; and
- (4) demonstrates the degree to which--
 - (A) various ecological restoration techniques--
 - (i) achieve ecological and watershed health objectives; and
 - (ii) affect wildfire activity and management costs; and
 - (B) the use of forest restoration byproducts can offset treatment costs while benefitting local rural economies

CFLR Objectives and Whitebark Pine

Maintain biodiversity of native/desirable terrestrial plants and wildlife



SWCC CFLR Funding 2010-2012



SWCC CFLRP Monitoring Questions

- What are the effects of treatments on **species composition and size structure** of whitebark pine stands?

SWCC CFLRP Monitoring Questions

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- What are the effects of treatments on **rates of growth and seed production** in whitebark pine? Do responses vary by tree competitive environment?

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- What are the effects of treatments on rates of growth and seed production in whitebark pine? Do responses vary by tree competitive environment?
- What are the effects of treatments on a) **natural recruitment of whitebark seedlings** and b) cover of **understory species** thought to influence whitebark recruitment?

SWCC CFLRP Monitoring Questions

- What are the effects of treatments on species composition and size structure of whitebark pine stands?
- What are the effects of treatments on rates of growth and seed production in whitebark pine? Do responses vary by tree competitive environment?
- What are the effects of treatments on a) natural recruitment of whitebark pine seedlings and b) cover of *Vaccinium scoparium* and *Carex spp.*, both thought to influence whitebark recruitment?
- What are the effects of treatments on rates of **mortality**, frequency or severity of **beetle attacks**, and incidence of white pine **blister rust** in whitebark pine?

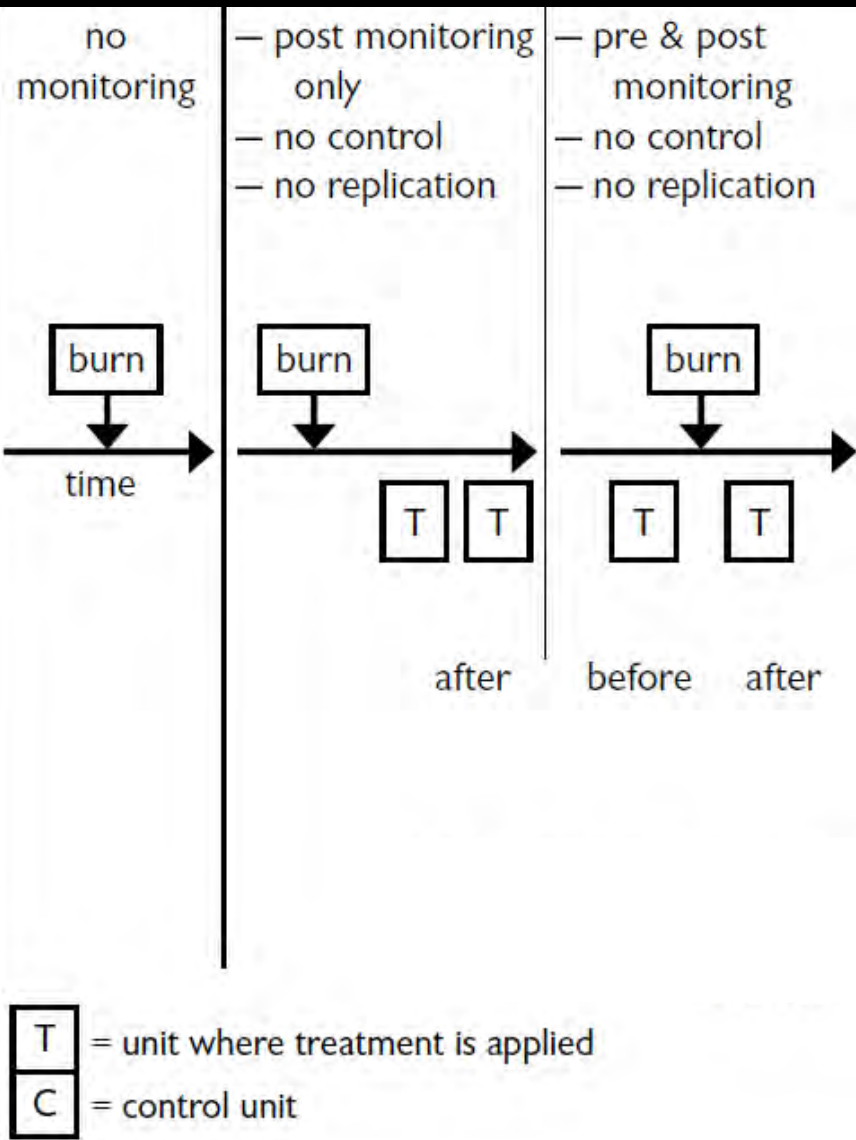
SWCC CFLRP Monitoring Questions

- What are the effects of treatments on species composition and size structure of whitebark pine stands?
- What are the effects of treatments on rates of growth and seed production in whitebark pine? Do responses vary by tree competitive environment?
- What are the effects of treatments on a) natural recruitment of whitebark pine seedlings and b) cover of *Vaccinium scoparium* and *Carex spp.*, both thought to influence whitebark recruitment?
- What are the effects of treatments on rates of mortality, frequency or severity of beetle attacks, and incidence of white pine blister rust in whitebark pine?
- How do treatments affect factors that influence **fire behavior**, including surface and canopy fuel loads?

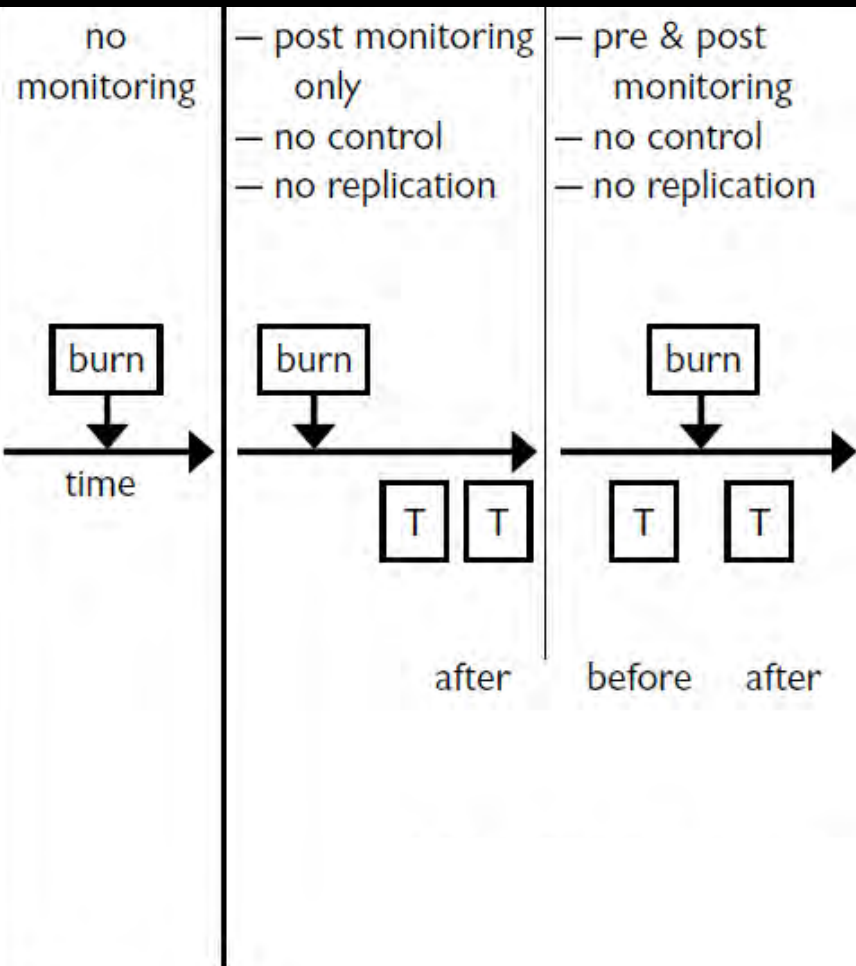
Sampling Approach

- Design: *Before-After Control-Impact* (BACI)
- Goal: Replicated over space and time

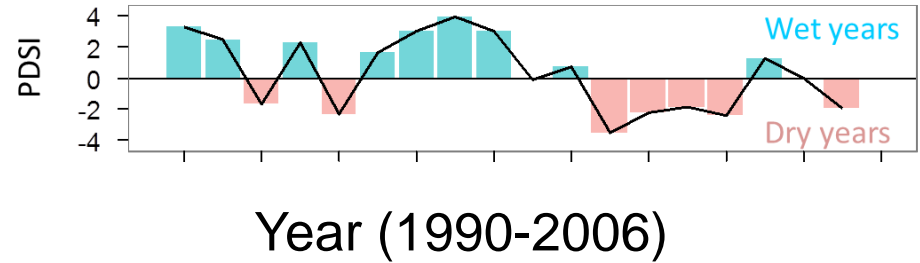
Common Monitoring Approaches



Common Monitoring Approaches

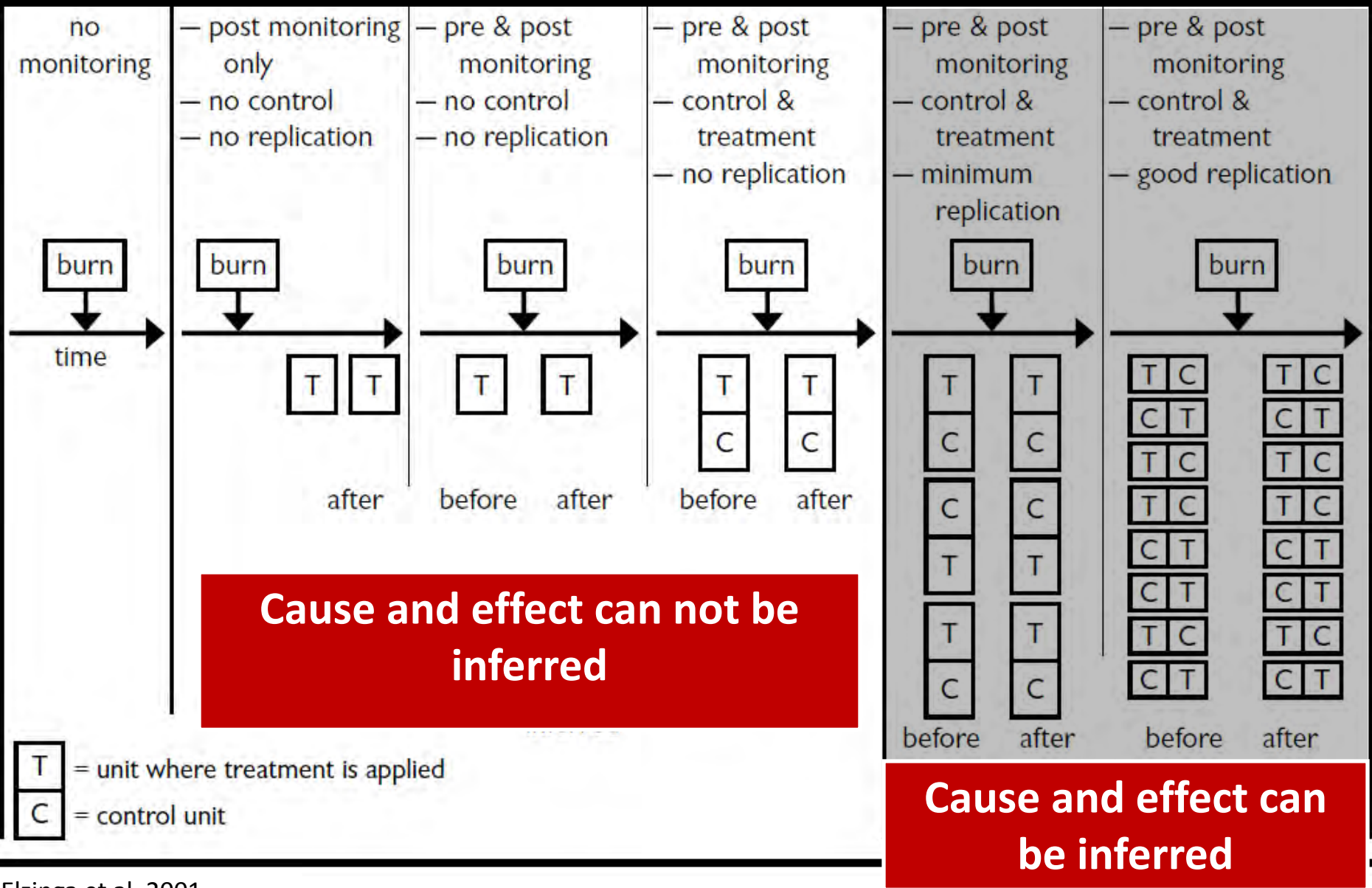


T = unit where treatment is applied
C = control unit



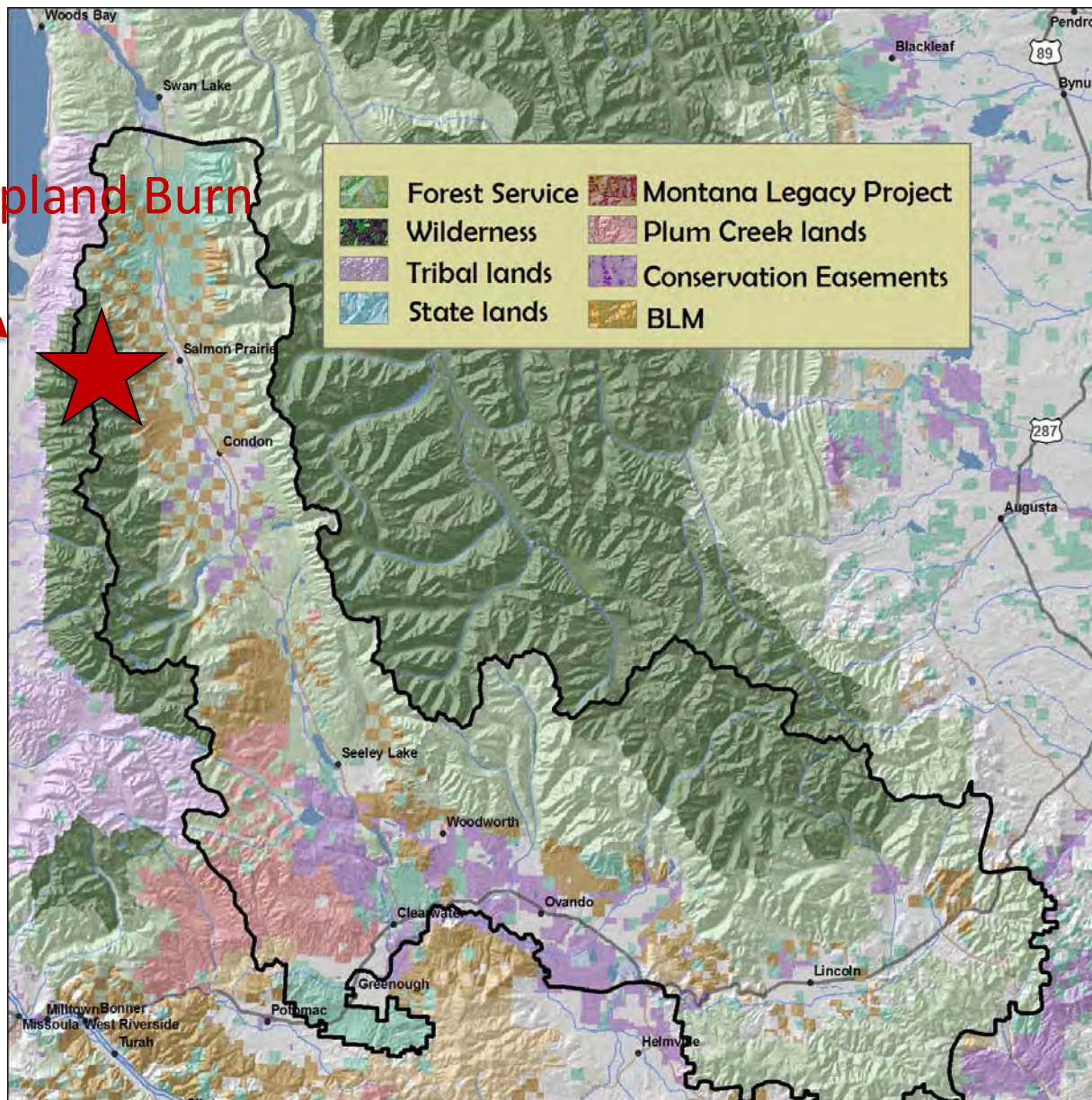
Cause and effect can not be inferred

Common Monitoring Approaches

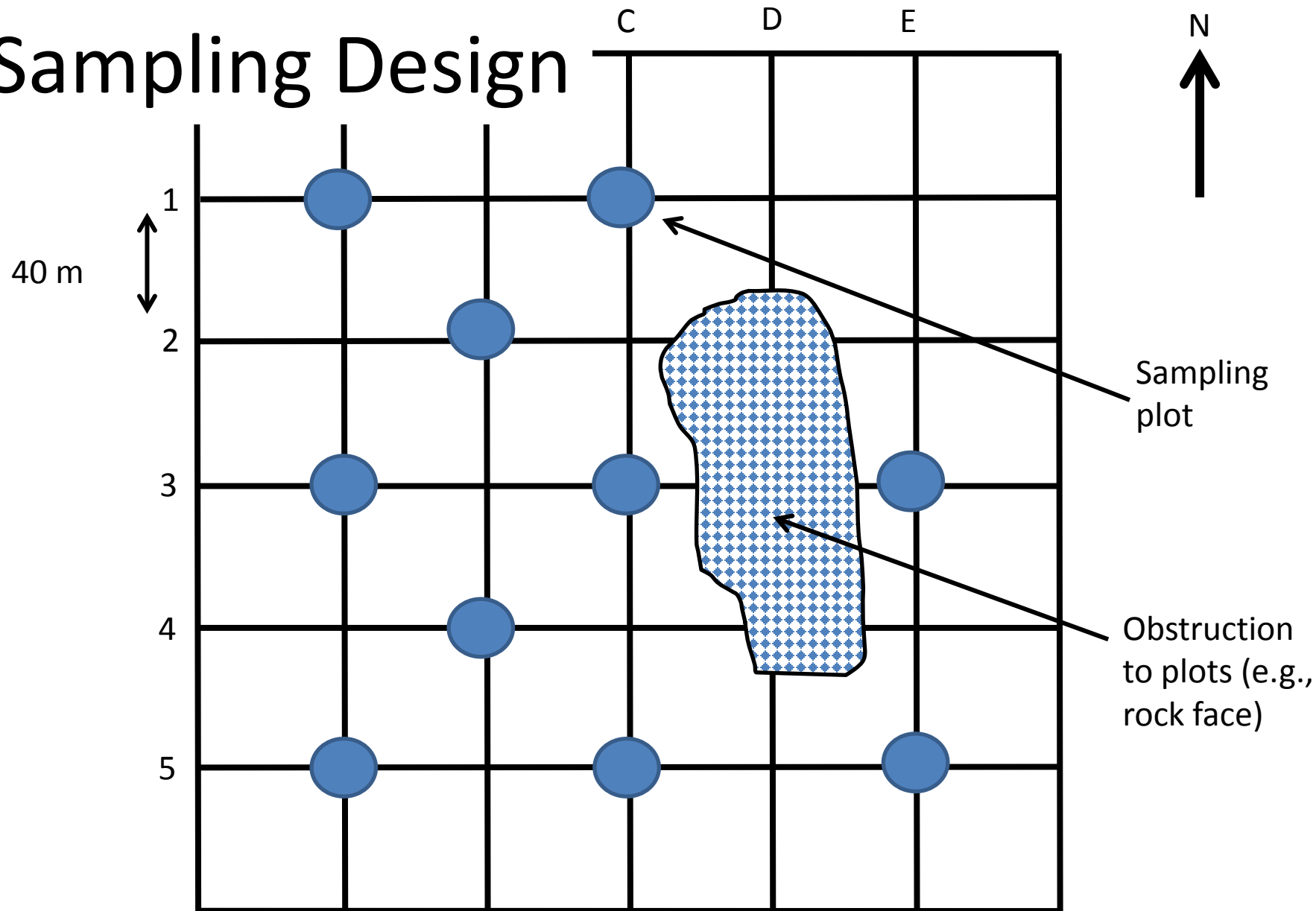


Southwest Crown of the Continent Collaborative Forest Landscape Restoration Program

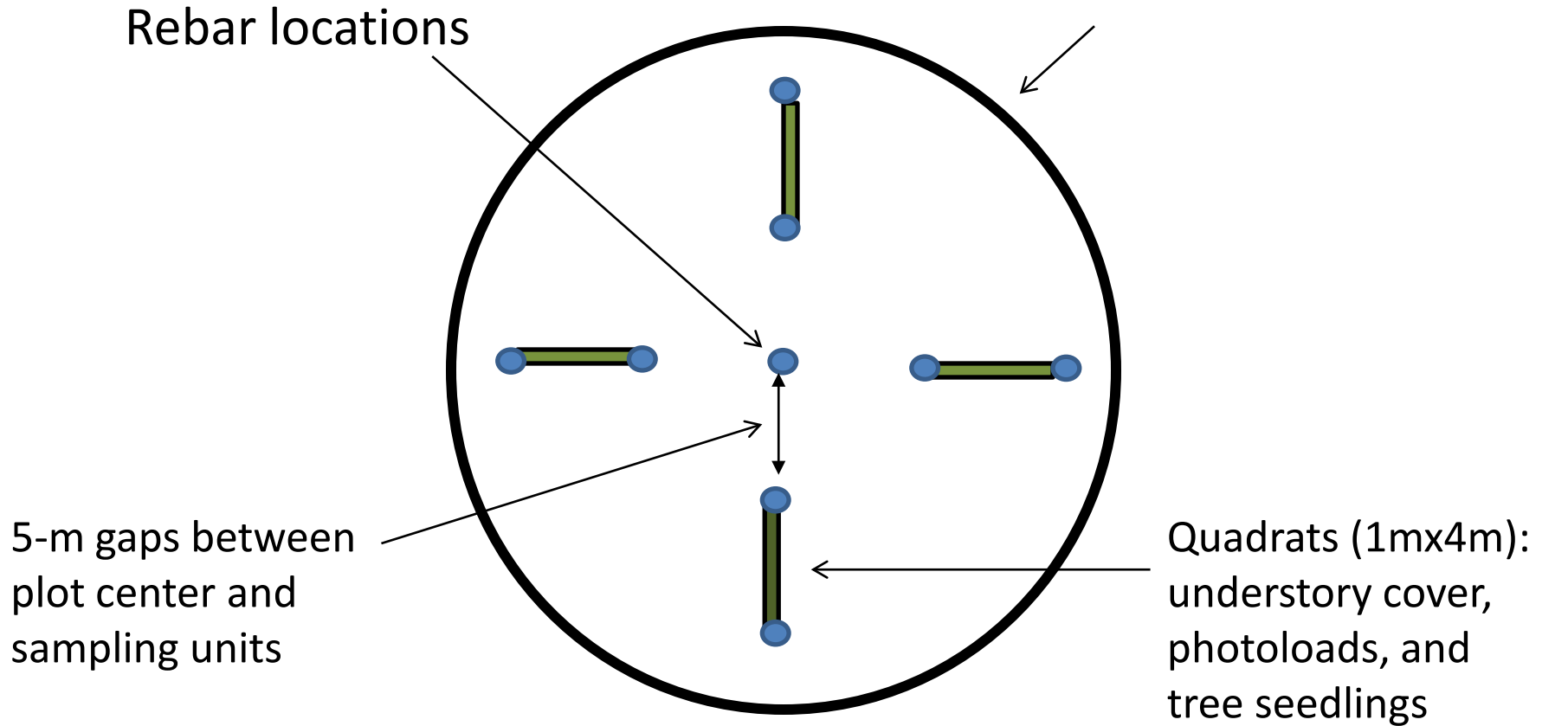
Mission Upland Burn



Sampling Design



Sampling Design



Observations about SWCC CFLRP Monitoring Plan Development



Observation #1

Confusion over the need for statistically valid monitoring designs



Multiparty Monitoring

*“The primary goal of all multiparty monitoring is to **help project participants and other interested parties better understand each other’s viewpoints** and build trust in each other and in specific management activities”*

(USFS Multiparty Monitoring Guidebook)

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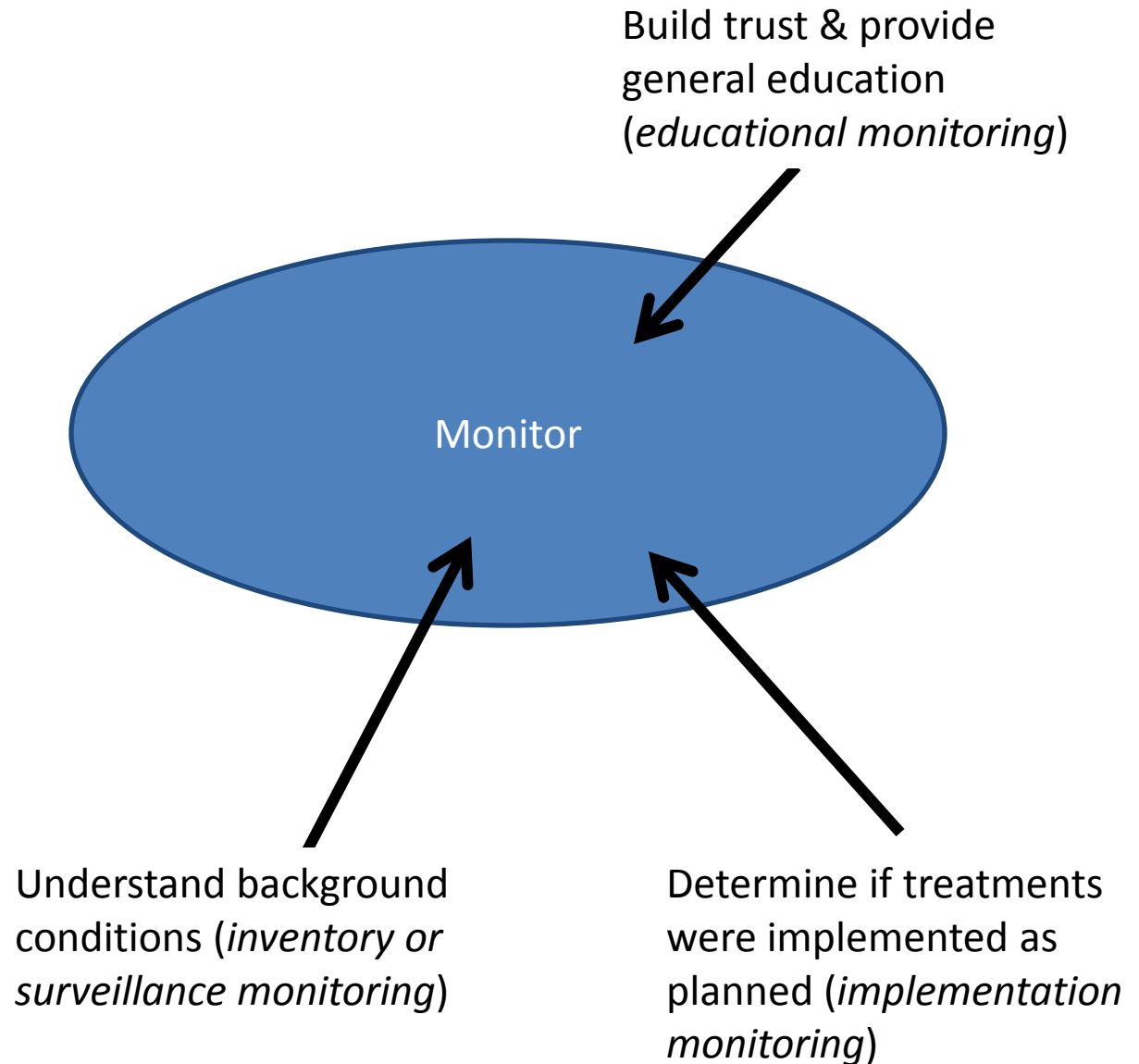
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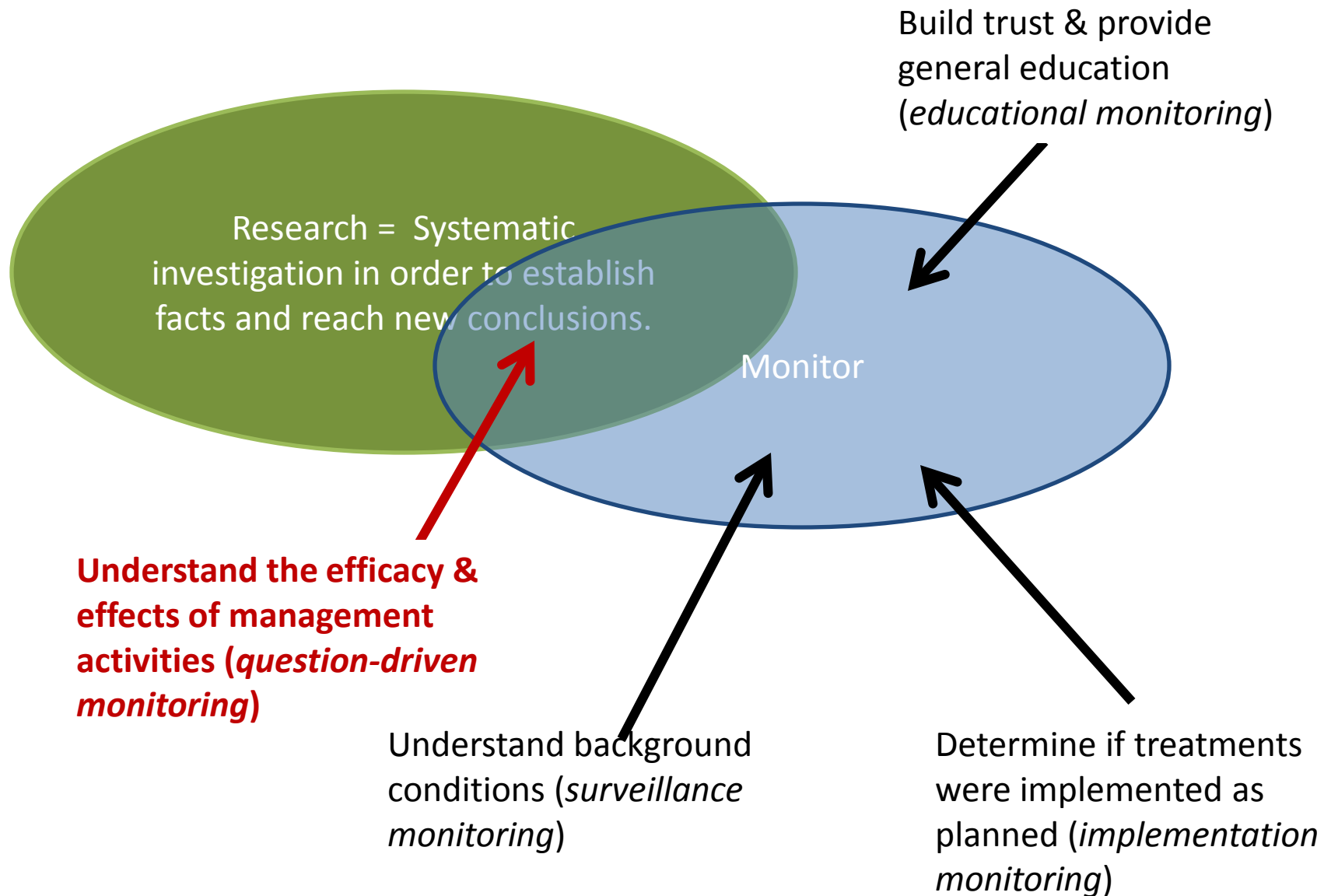
Goal of Monitoring

Monitoring = Watching,
keeping track of, or
checking usually for a
special purpose

Goal of Monitoring



Goal of Monitoring



Research or Monitoring?

Research

Monitor

Question-driven monitoring
(efficacy & effects of management activities)



Observation #2

Confusion over the difference between inventory and question-driven monitoring



NRIS FSVeg

Natural Resource Information System: Field Selected Vegetation

Common Stand Exam Field Guide Region 1

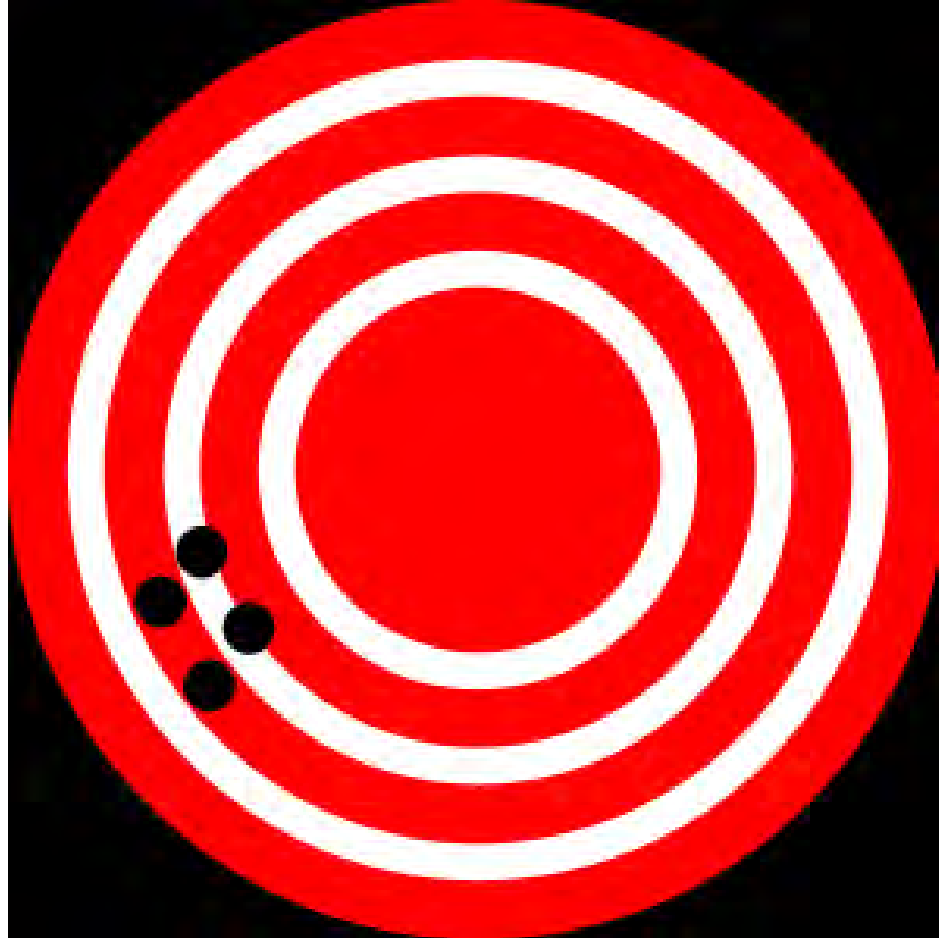


July 2013



USDA Forest Service

Precision of Estimation must be Adequate for Assessing Effects



Effective Protocols for Monitoring Treatment Effects

- Use a “before-after control-impact design”
 - *or control-impact if you have a very large number of sites*
- Only collect data on ecosystem variables for which you have an analysis plan
- Measure ecosystems variables with adequate precision for assessing treatment effects (conduct power analyses)

Interested in collaborating on upcoming or previously implemented treatments?

Cara.nelson@umontana.edu

