What are pitfalls to avoid?

- Losing control! Untreated and representative control plots are crucial for assessing the impacts of management activities.
- Forgetting about it. What good is a photo point if you never revisit the location? Dedicate at least one day a year to pocket science.
- Doing it all yourself. Engage volunteers, school groups, etc.

Pocket science is more enjoyable and beneficial when people learn together.

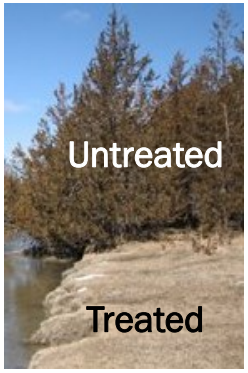
- Making it too complicated. Pocket science is about taking simple and smart observations, not about measuring everything, everywhere, all the time.

What are some real examples?

Repeat photographs demonstrate the impact of a road decommissioning project in the Sequoia and Kings Canyon National Park.

Managers ran out of funds to finish removing eastern red cedars along a riparian area on the Niobrara Valley Preserve.

They were initially disappointed at leaving the job unfinished. Now they are grateful for an untreated area that demonstrates treatment effects!



CENTER FOR COLLABORATIVE conservation

Prepared by M. Matonis and D. Binkley, fall 2013, and generously supported by the Center for Collaborative Conservation at Colorado State University.
Direct questions or comments to Megan (megan.matonis@colsotate.edu; 970-217-6473)

A Pocket Guide to Pocket Science

Who are pocket scientists?

Pocket scientists use simple and smart observations to learn from management activities. Every land manager can use pocket science—it's not expensive and complicated like rocket science! All you need are simple tools like a GPS unit and camera, and more importantly, an inquisitive mind open to surprises and new insights.

Why do pocket science?

Natural resource managers are curious about changes in wildlife habitat, trends in resource use, effectiveness of management decisions, impacts of disturbances, etc.

We ask questions like, *"Does seeding native grasses reduce the cover of invasive plants after restoration thinning?"*

Science guides us towards answers to these questions. It provides a rational approach for learning from observations.

Pocket science turns management actions into opportunities to learn!

Pocket scientists use control plots and consistent measurements to learn if management impacts meet expectations. Insights from pocket science can steer future decisions away from old mistakes with undesirable outcomes.

How can I do pocket science?

Bona fide pocket scientists use the following tips to help them

L. E. A. R. N.

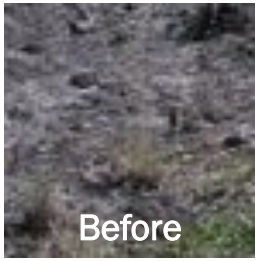
- **L**et management questions guide your methods.
- **E**ngage partners in collecting data, interpreting results, and discussing implications.
- **A**lways take photos and GPS waypoints of your plots.
- **R**epeat measurements over time using consistent methods.
- **N**ever treat an entire unit the same. Always leave a portion untreated (i.e., a control plot).

What's up with control plots?

Control plots are visual reminders of pre-treatment conditions. If no small plot is left to represent the pre-treatment condition, we will unhelpfully attribute every change to the treatment.

For example, these before and after pictures suggest that the restoration treatment resulted in substantially higher cover of grasses and forbs:

Treatment plots



However, cover of grasses and forbs also increased in untreated areas. These control plots demonstrate that factors other than the treatment (e.g., greater rainfall) likely caused the increased cover:

Control plots