

Rancher-to-Rancher

July 2013; revised March 2014

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Chapter 1

About Rancher-to-Rancher

Central Coast and California ranchers:

Can productivity and profitability be improved, using tools and resources you already have? You are invited to set up a learning site on your ranch.

Our California Rancher-to-Rancher project can help you set up a small, no-risk learning site trial on your ranch, say a few acres or less, where you could concentrate your livestock for a few hours or a day, and give it a substantial recovery period from grazing. Our support could be help in planning the trial to work with your needs, simple monitoring of the soil surface, and an optional soil carbon baseline plot.

Contact us

Please contact us if you are interested. Rancher to Rancher coordinating committee:

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Developing trial areas

Using grazing **management** to produce massive biodiversity increase and regeneration of pastures and native grasslands requires a systematic process. This process is described in different ways but tends to include the following steps, which can and should form a repeated loop:

- Goal or holistic context:
 1. What is needed for you and your ranch to flourish? What do you value?
 2. What must you produce to sustain those values?
 3. What must your future resource base be to sustain what you value? (Description of landscape including biodiversity and function being managed towards.)
- Monitoring/ evidence of current grassland biodiversity and function
- Plan / trials to move the grassland towards goal



Demonstration of small learning site near Hollister, April 2013.

“I appreciate being able to SEE things in front of me. I didn’t understand trampling vs grazing until today.”

“Water quality and retention of water is our biggest challenge. This is accomplishing multiple tasks. The hard part is thinking about it, using a planning tool. A wonderful day.”

- Monitoring of progress
- Feedback and re-planning

Some potential benefits

You may improve grassland health and productivity by using nature to:

- Unleash perennial grasses and perennial forbs, as well as quality annuals
- Keep plant vigor high
- Shift the composition to a buffet of high quality forages
- Leave better soil cover 365 days a year
- Reduce the severity of drought
- Reduce invasive species problems
- Reduce wildfire risk

- Reduce hay costs
- Reduce fertilizer needs
- Reduce stream bank and gully erosion
- Improve livestock health, performance, and stocking rate
- Build topsoil
- Build profit potential
- Benefit more wildlife
- Have more fun and peace of mind

Trial area design

An area to enclose animals enables you to trial different stock densities and recoveries that will suit your ranch.

- Low cost and simple
- Can use current infrastructure or can be fenced off corners of paddock
- Small areas so only tempted to graze as planned
- Secure so as to contain “corral” densities for short periods of time
- Can be done any time of year, depending on your goals
- Usually do not require stock water as animals only present for short periods of time (several hours)
- Easy to monitor

Two new tools

1. Use high density and/or herd effect to effectively trample and fertilize the learning site.
 - **High stock density:** more than 200 cattle per acre, or more than 1,000 sheep/goats per acre. Animal behavior can be calm, or
 - **Herd effect:** must be excited animal behavior where animals are bunched, raising dust, not paying attention to where they place their hooves. Can occur in a field with low stock density if the herd is bunched and is stirred up by stock dogs or people scaring them as if their predators were present. They need to be there long enough to effectively trample the learning site—not breaking thru fence and heading for the back forty.
 - Or a combination of both can be used—whatever effectively tramples and adds fertilizer to the learning site while still controlling the herd.
2. Provide long recovery period after plants are trampled or grazed to keep plants and soils healthy. This may not be easy to do if your learning site is not fenced separately to ensure the stock cannot return. Electric fencing works great if animals are accustomed to respecting it—even in the dry season. You want to graze/trample the learning site only once or twice a year if you want to really test these new ideas against the potential benefits listed above.

Soil carbon baseline plots

In addition to soil surface monitoring, the Rancher to Rancher project also supports monitoring of soil carbon beginning with a baseline plot, for those interested in monitoring changes in soil organic matter. This is not a carbon credit scheme, but is also feedback to management, and a search for what's possible. More information can be found at soilcarboncoalition.org/challenge

What Joe Morris learned so far (June 2013)

That there is no sure thing that will work.

We are working primarily with beliefs (paradigms), and these are mostly or completely unconscious to those who hold them and operate within them.

Like possibility thinking, these beliefs are only possibilities and not inevitable, so it seems helpful to draw attention to that fact.

It also seems helpful to offer evidence that there are not only other beliefs, but that operating as if these were reality can produce economic, ecological and social benefits. (E.g. if you manage as if there were perennials, you will find them appearing.)

The first livestock numbers we will try to build are not cows but microbes, namely fungi.

If we plan our grazing, there will be a return to that investment of time and money.

If we plan our grazing we will increase the amount of vegetation we have on the ranch, but it will come in many forms, some palatable to cows or sheep, some habitat and food for fungi, all reflect an increase in wealth.

This investment in our ranch is sort of like investing in a CD. If we withdraw our deposit before the CD matures we substantially decrease or eliminate our return. The CD will mature, but the term of and the amount of the return at maturity is not exactly known.

People like to see the relationship between the animals and land if it is peaceful and even artful.

People like holistic management—even if they do not use it—if it is used in an authentic way, in other words, if one uses it in at least as natural a way as one might pull out one's day planner, watch or calendar and use it to help one's decision making.

People are doing the best they can, even if they are not doing as well as they might, and they have reasons that they currently find compelling for what they are doing.

People might think holistically but not manage holistically.

We are trying to produce an effect (litter on the soil, composting litter, movement toward our desired quality of life, etc.) and there is no recipe; there are ingredients and principles and a cook—management—only.

Things will go better if people have fun.

You probably know all of these things already!

Chapter 2

How we help set up learning sites and collect data

The Rancher to Rancher project offers experienced support for site selection, design, planning, and monitoring, whether surface or soil carbon, for your learning site.

We (the committee members) invite people to participate and identify those interested.

We set up a meeting, including discussion of what we're aiming for on the ranch and with the learning site, and help identify a potential site. If a site is identified, do a monitoring transect (see form below) and leave the planning form (see below) with the land manager.

Data forms included here are:

1. A rangeland monitoring form, three pages. Use this form to collect data for each learning site, and send it to

Richard King
1675 Adobe Road
Petaluma, CA 94954

or email a scanned copy, along with the signboarded photos you take, to info@soilcarboncoalition.org

Peter Donovan will collate and present the data.

2. A planning form for a learning site trial, one page, to be left with the decision maker on the land.

Transect or site identifier:	Date, observers:
Where located and why it was chosen. Management history and direction, and why this site is representative of the ranch, its issues, and its potential.	

Sketch map of site: include solid line for transect, and show markers, distances, compass bearings and lines of sight, hoops/quadrats with positions on tape, nearby features, and lat/long of central photo point (decimal degrees).

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Key indicators to monitor the four ecological processes

TRANSECT:	HOOP OR QUADRAT				
	1	2	3	4	5
Distance along transect					
Indicate percentage of hoop cover: 0–5%, 5–33%, 33–66%, 66–95%, or 95–100%					
A. % BARE SOIL (large raindrops would detach and move it)					
B. % STABLE LICHENS/MOSS (highly resistant to sheet erosion)					
C. % HORIZONTAL LITTER COVER OVER SOIL SURFACE					
Typical thickness of horizontal litter:					
D. % DECOMPOSING LITTER COVER ON SOIL SURFACE					
Typical thickness of decomposing litter:					
E. Number of perennial grass species:					
Number of perennial forb/weed species:					
Number of perennial shrub/tree species:					
Mixed annuals present:					

List the names of the plants if you can. One or few species usually provide the majority of the live canopy or litter that reduces extreme soil temperatures and dissipates raindrop energy. Circle the names of the plants that dominate or co-dominate the plant cover over the quadrat or hoop, whether annuals or perennials. If you know, note whether the species is increasing, static, or decreasing. If there are known invasive species, draw a rectangular box around the name, and note whether increasing, static, or decreasing.

Hoop 1	Hoop 2	Hoop 3	Hoop 4	Hoop 5

Four ecological processes

Grade them A through F (highly effective to highly ineffective) in comparison to how you want them to function on this site to reduce your costs (time or money) and increase your productivity and profitability. The four interact together—never independently.	HOOP OR QUADRAT				
	1	2	3	4	5
<p>WATER CYCLE: Does the site absorb water like a sponge, concrete, or somewhere in between? A sponge has slower runoff, high infiltration and permeability, and stores more water. A highly effective water cycle needs great soil cover, very deep rooted plants, abundant soil life, good soil porosity, little compaction, and biologically active soil.</p>					
<p>MINERAL CYCLE: Evaluate the ability to use existing soil nutrients, make more nutrients available to plants from rock and air, and the rate of biological decay versus oxidation of dead plant material. A highly effective mineral cycle needs very deep rooted plants, very good soil cover, excellent biological decay, high plant diversity, and biologically active soil.</p>					
<p>ENERGY FLOW: Energy feeds all life above and below ground, including all soil microbial life, plants, and animals. Highly effective energy flow needs vegetation that is green, vigorous, dense, diverse, deep rooted, actively growing through most of the year, and large amounts of sunlight are not being wasted on bare ground, or overgrazed plants, or excessive litter not actively biologically decaying in the growing season.</p>					
<p>COMMUNITY DYNAMICS: Evaluate the diversity of species structure and functions present in comparison to what you want on that site (e.g. annuals and/or perennials, cool season and warm season plants, grasses and forbs and shrubs, soil biological activity, early succession or more complex community). Highly effective community dynamics need the components you want to be present, vigorous, and regenerating adequately.</p>					

CHECK: Good map, oriented correctly? Good photos? Form all filled out? Extra paper properly labeled?

Planning your learning site or trial

For your learning site, select a site that is:

- not performing to its potential relative to what you want and need for your ranch
- representative of much of your ranch and its potentials
- one you can manage conveniently, for example with high livestock density and generous recovery period from grazing
- small, such as an acre or less, for a low-risk experiment
- accessible and visible

Site location, size, and description. Why did you choose it?
Number and description of livestock used
Date and time
Planned recovery period
Planned date of next livestock use
What you observed about livestock behavior, litter cover, and what you learned

This form is for you, for your learning, but please also share your information with us, either by phone, email, or regular mail:

Richard King, 1675 Adobe Road, Petaluma, CA 94954

Peter Donovan at info@soilcarboncoalition.org, 541-263-1888

Chapter 3

Monitoring cheat sheet

Site selection takes time and exploration. Select a site that is:

1. not performing to potential relative to the goal or context of the manager
2. representative of much of the ranch, its issues, its potentials
3. accessible, visible, easily located
4. can be managed, such as with high stock density, trampling, recovery

To be effective, **monitoring must be repeatable**. To be repeatable, 1) you have to be able to relocate the site accurately and easily, and 2) the monitoring procedure must be simple enough to get it done.

Once you have selected a site and a transect location:

1. Stretch your tape. Get it straight.
2. On the form, draw a map of the location with compass bearing, GPS at photo point, lines of sight, markers.
3. Photograph up and down the transect from the photo point, with signboard (I use a D-handle shovel to support my signboard)
4. Select representative locations on the tape, at least two, for hoops or quadrats. Photograph them (see below) and record your observations on the form.
5. Note other observations about the transect area, such as plants or signs of animals seen in the circle of which the transect is the diameter, as well as nearby, slope and aspect, and management issues and opportunities.
6. Review your work for completeness, including the map. Put in end stakes if you are using them. Check for opportunities to measure and record distances from the endpoints of your transect to other permanent features.
7. Collect contact info and make sure the rancher is committed to doing the experiment. Encourage them to invite others if they want, and leave them a planning form to return to us, preferably with some photos.

Monitoring involves a mental journey or transition from the Whole (and holistic context) to small specifics at the hoop or quadrat level, back out to the Whole.

A line of sight between permanent features is a huge asset for relocating a transect. For example, a solid corner post lined up with a mountain top, or newer power pole, etc. If you have ever tried to relocate a transect you know how difficult it can be without clear markers and references. GPS helps but is simply not good enough.

Tape. The best is a 200-foot/60-meter tape, with chaining pins about 3/16" diameter to hold the tape in place. Use some kind of permanent transect marker, such as a disk blade pinned into the ground with rebar, railroad tie corner post, building foundation corner, or a T-post, preferably part of a permanent fence so livestock don't rub it over. The more permanent markers, the better. Where permanent markers are lacking, I often use 3/8-inch rebar with end in a J, driven flush into the ground, with 2 feet of soft aluminum wire attached. Bucket lids nailed down with heavy spikes are good but pigs tear them up.

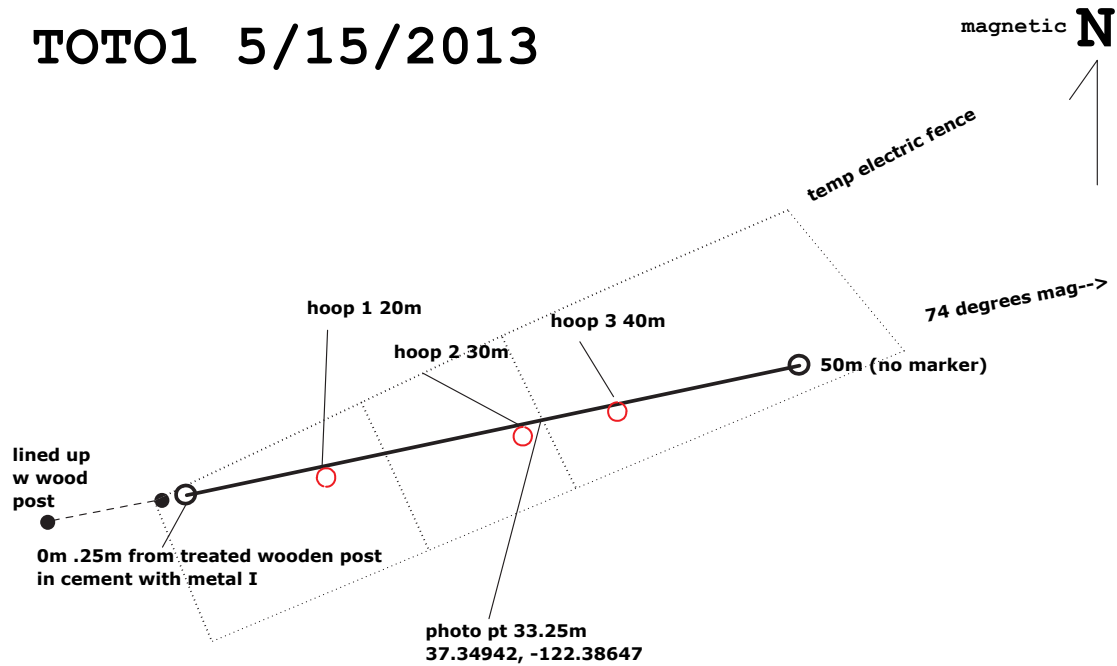
Hoop or quadrat. A standard size is 4.8 square feet. A hoop made of plastic-coated stainless steel aircraft cable that is 94 inches in circumference, or a PVC quadrat square that is 26 1/2 inches on each side, will give this area. Use your hand to measure percent cover, starting with the smallest coverage and using subtraction for the remainders. For a hoop or quadrat of this size, your hand with fingers together is 4% of the total area; fingers somewhat spread, 5%; fingers more spread, 6%. The heel of your fist is 1%; your thumb is a third of a percent. Place hoop or quadrat touching the tape (hoops should be round, and accurately tangential to the tape) in at least two representative locations, more if needed. For east-west transects, the hoop should be on the south side of the tape to avoid shadows during photography.

Signboard for photos. Signboarding every photo is a dandy idea. Write transect identifier, pasture location, date, and hoop number and position if photographing a hoop or quadrat. Make sure your signboard is readable in every photo.

White dry-erase board works but it is a problem to avoid overexposure in bright sunlight. Dark boards work better, or colored paper on a clipboard. A piece of smooth plywood painted grey with chalkboard paint (comes in a spray can) is a good alternative. You can write with chalk on a variety of surfaces, including the back of many clipboards, provided you have a damp rag to erase. Chalk has several advantages over dry-erase markers: cost, no surprises about running out of ink, and you can't lose the cap.

Photos: From the photo point near the middle of your transect tape, shoot signboarded photos up and down the tape, showing a little sky, and with the **tape bisecting the photo**. For each hoop or quadrat, shoot one photo straight down—your boot toes should show in the photo. Get the tape in the picture plus your signboard. Then, take 3–4 steps back and shoot a low-angle photo across the tape including the hoop or quadrat and some sky. For a transect with two hoops, this will give you 6 repeatable photos. Random, unidentified photos will merely confuse and complicate your monitoring!

TOTO1 5/15/2013



Sample transect sketch map, in digital form. Please aim for clarity when making your sketch map!

Basic monitoring equipment

GPS receiver (Garmin is a popular make)

sighting compass (Suunto is a popular make)

chalkboard with chalk

camera

tape (200-ft, or 60-meter is best) and chaining pins to anchor tape

quadrat or hoop pencil, clipboard, forms



Sample shot of hoop. Because the tape is slightly above the ground, it appears that the hoop is not touching it, but the edge of the hoop is directly below the 44-foot mark on the tape. The value of this photo is that it is **repeatable**, and allows you to track change.



Sample shot along transect tape. Note how this transect is aligned with center pivot axis and tip of mountain, which makes it much easier to relocate.