USDA Natural Resources Conservation Service
and the Central Coast Rangeland Coalition (CCRC)
Rangeland Health Indicators Project
L.D. Ford, L. Huntsinger, and S. Barry: Revised August 2, 2006

Agency Manager Meeting to Refine Indicators—Northern Region, Sunol, June 13, 2006

Summary Minutes

Attending: *Agency Managers*—David Amme (East Bay Regional Park District), William Chilson (Contra Costa Water District), Patrick Congdon (Santa Clara County Open Space Autority), Nancy Dollard (City of Walnut Creek), Tim Koopman (San Francisco Public Utility Commission), Cyndy Shafer (California State Parks), Rod Tripp (East Bay Municipal Utilities District), and Pete Van Hoorn (Alameda County RCD); *CCRC*--Sheila Barry (UCCE); *Facilitating Consultants*--Larry Ford and Lynn Huntsinger

Handouts--meeting agenda, discussion questions, roles of consultants, process to define the indicators, next steps, CCRC candidate indicators, needs, audiences and applications, criteria and approach, and references

Introductions of Attendees

CCRC History and Project Purposes

Sheila Barry initiated this discussion. The CCRC started meeting about three years ago, basically as a chapter of the Grazing Lands Coalition. It includes ranchers, educators, scientists, and agency representatives. Discussions included issues and obstacles about defining and demonstrating sustainable rangeland and grazing management. The group found it difficult to narrow down and prioritize an exhaustive list of indicators that were considered. After working to summarize potential indicators and identify healthy rangeland landscapes, the NRCS funded a cooperative agreement to hire a consultant to help define the indicator system.

Priority Concerns and Indicator Concepts: The following sections summarize the priority concerns about rangeland health and sustainability, and concepts for indicators to measure them as expressed by the agency managers of this area.

1. Non-Native Invasive Plants or Noxious Weeds

Invasive pest plants are the biggest issue in the area, particularly where economic impacts occur. Any new infestation becomes a problem. Listed noxious weeds are high priority. Pest plant populations have fluctuated over the years. Several thistles have expanded this year (2006), including Italian thistle and yellow starthistle. Grazing can be used to control some weeds. A unified effort is needed because some neighbors don't control their pest populations, and become sources for infestation. Control is expensive. External funding assistance would help convince more landowners to cooperate in pest plant control. Education of the public to recognize pest

plants, and understand the negative consequences of infestations would reduce resistance to pest plant control programs, and reduce perceptions that pest plants contribute color to wildflower displays, and to landscape aesthetics. Education about the value of livestock grazing in control of pest plants would also help to reduce the conflict of public preferences for pastoral views versus colorful weed views.

In general, the seeds of both invasive pest and desirable plants are present in the litter and soil seedbank, and are available for germination and growth depending upon ecological conditions and management. Koopman noted that seasonal grazing systems with stockers seem to promote yellow starthistle infestations. The flexibility to control herbaceous height and cover that is afforded by rotational year-long grazing systems is preferable for the control of this pest. Tripp noted that year-long rest from grazing except during a short window of YST vulnerability is optimal.[1] The traditional practice of grazing hayfields after hay cutting has often been replaced by haying without follow-up grazing. Yellow starthistle has become a problem at such sites.

2. Diversity of Desirable and Native Species

A primary indicator of rangeland health is diversity of native animals and woody and herbaceous plants. Species richness and presence of listed special-status species should be included. Population status of each species should be incorporated. Some measure of compositional patches within grasslands is needed to better understand the effects of management.[2] Monitoring of control sites (without grazing management) is needed to separate responses to management from responses to site and factors other than management.

Heterogeneity versus homogeneity of species composition and structure should be measured at scales from below the community type (e.g. sub-classification of grasslands), to pastures, habitat function, the landscape, and regions. The group did not reach consensus on desirability of the alternatives or degree of this measure at each scale.

Patch configurations and edges also play an important role in habitat structure and suitability for native versus non-native species, thus affecting the population status of native species. The group did not explore the desirability of alternative configurations of patchiness.

Another measure is the functionality of plant composition and structure for animal habitat. Monocultures are not desirable. Non-native plants and animals that cannot be eliminated feasibly must be incorporated into the description of desirable composition and structure.

Since community types (and their sub-classifications) occur in a succession sere, the stability of proportions of succession stages in a dynamic landscape pattern should be used as an indicator.

---

[1] A summary of research by DiTomaso (2005) suggests that extending the grazing period past spring into early summer is key to reducing yellow starthistle growth, height, survivability, canopy size, and seed production; and leaving adequate RDM the following year adds to these effects.

[2] David Amme recommended the use of releve censuses because they are more efficient to conduct and produce more interesting results than transects; the resulting data can be used to produce diversity indices and sub-classification of grasslands.

3. Fire Hazard Reduction

The group was aware of no scientific literature available to specifically guide fuel reduction, such as through livestock grazing, for annual grasslands of the region—how low the herbaceous biomass must be during the dry seasons to sufficiently reduce wildfire risks. The fire fighting agencies usually want to see 3-4 inch herbaceous heights. Fire hazard reduction objectives usually conform to the minimum RDM standard, but that is a late autumn measurement after the summer and early autumn dry seasons. We need a standard based in science and tailored to the grazing management tool because anti-grazing advocates argue that over-grazing is required to adequately reduce fire hazards.

4. Oak Regeneration

Our landscapes support a lot of old oaks and little regeneration. We need to support the conditions that favor natural oak regeneration, but don't know what those conditions are. Coast live oaks appear to be abundant, perhaps associated with the exclusion of other species. Oak species diversity should be a goal.

Fire caused little damage to oaks in savanna with up to 3500 lbs/acre grassland fuel load (Tim Koopman), and up to 1500 lbs/acre grassland fuel load (Patrick Congdon). The fire hazard reduction standards should include oak tolerances.

5. Brush Encroachment

Brush encroachment is an important management issue throughout the area. Coyote brush, *Baccharis pilularis*, expands into grasslands mainly at sites with coastal influences. Other shrubs expand into grasslands at inland sites. A desired proportion of shrubland to grassland should be maintained.

6. Water Quality (and Yield)

Water quality assessments are important because they reflect management as well as non-management conditions, and livestock are known to be sources of water pollution. In addition, monitoring of TMDLs might to be required in the new water pollution management rules that are expected from the regional water quality control boards.

Measurements should be taken from streams, springs, and ponds, and include nutrients, sediments, and pathogens. A commonly used summary indicator of water quality is species and species diversity of benthic invertebrates in the water.

Water yield is less a priority than water quality, but should be considered because of the growing importance of water supplies, and some agencies need to know how it is affected by alternative management activities.

7. Soil Nutrients

Soil organic matter would be the highest priority indicator.

8. Economics

The economic dimensions of sustainability of public rangelands management is a function of operational funding. Often, livestock grazing management is less costly than other means to achieve goals, including infrastructure construction and maintenance, fire hazard reduction, optimization of habitat special-status species, and vegetation management where access by equipment is not feasible. It cost the San Francisco PUC about $300/acre to control fire hazards by means other than grazing (Tim Koopman).

Profitability of the livestock operations of lessees on agency rangelands and ranches on private lands is critical to the sustainability of rangeland management involving livestock. On private ranches, this motivation results in management to produce more and higher quality forage, and to use it for livestock weight gains. Therefore, the profit motive intersects with and must be integrated with other management goals.

Longer-term leases and lease fee credits provide incentives for the lessee to improve and maintain infrastructure.

Although rotational grazing systems might provide better flexibility of management effects, concentration of grazing in special management areas, and potentially higher forage productivity, it requires the expense of cross-fencing (plus additional infrastructure and other costs). As noted in the discussion of non-native invasive plants, the high costs of control methods and programs often limits implementation. Similarly, the high costs of installation and maintenance of cross-fencing is often prohibitive. Tim Koopman said that such expenses have been feasible for his ranch only because of the cost-sharing programs of the NRCS.

Monitoring can be expensive, and is often very limited or neglected, even though the group thinks it is relatively easy to conduct. Nevertheless, monitoring should be efficient, which is why a select group of priority indicators (surrogates) are preferable to multiple and comprehensive measures.

9. Aesthetics

The concept of aesthetics relates more to sustainability than health because it involves public perceptions and their support for the managers' activities. Views or evidence of soil erosion scars, trail pocking, bare soils around service areas or livestock infrastructure, poorly maintained infrastructure, and discarded or dilapidated equipment all can lead to negative public perceptions, and should be avoided. Proximity of trails or roads to such sights, or any infrastructure where livestock gather should be avoided because of potential conflicts with public land users.

As noted in the discussion of pest plants, education is needed to change public perceptions of pest plants from pretty wildflowers to harmful invaders that might require control, and are not a

part of the desired landscape. Pastoral views of livestock herds, open grasslands, and well-maintained infrastructure lead to positive public perceptions, and should be promoted.

The condition of infrastructure in general indicates the quality of the management operation.

10. Planning and Record-Keeping

The planning process must include the assessing and setting of management goals specific to the site. The manager should keep good written records of where and when livestock graze and other circumstances and conditions of the site. Long-term record-keeping produces a history that reveals trends and changing conditions to gauge management decisions. Unfortunately, such records are rare.

Whoever the rangeland owner, regulations on resource uses and protections must be incorporated into the planning. In many cases, feedback from the regulatory agencies is needed before planning can proceed.

11. Recommendations About Design and Use of the Indicator System

- The indicators should be widely agreed upon, including by scientists, and explainable and understandable to all involved.
- The indicator system should be user-friendly, and define the specific methods required.
- The indicator system should be adaptable to different settings.
- An important value of the indicators system will be educational—helping managers to do a better job of describing how a healthy rangeland should look and function. The indicators should be designed for use by rangeland managers in educational settings.
- There should be equal emphasis on grazed and ungrazed rangelands; the indicators should apply to rangelands regardless of current grazing or non-grazing management.
- RDM as an indicator is limited, and should not be used as the sole or “cure-all” indicator of rangeland health; acceptable RDM levels might be inappropriate for some goals; methods of measurement differ widely, and so are often not comparable or yield different answers; rested sites sometimes exceed RDM standards, which can be misleading; excess thatch accumulation is not accounted for in a minimum RDM standard.
- A checklist could be the basis of an effective indicator monitoring system because it is easier to use than a system requiring more quantitative measures.

Closing

All the agency managers present at the meeting agreed to participate in the ongoing refinement of the CCRC indicators, including subsequent test-monitoring at their properties.

Ford collected email addresses, and said he would distribute these minutes with instructions to access the project’s website.