Lesson Plan 19.
Pastures

Goals/Overview:

Explain pasture production fundamentals and water quality improvements using examples in the field. Enable participants to assess their ranches with specific tools and knowledge gained during field workshop to prioritize options for future conservation practices, using the form in the RWQP Template.

Learning Objectives:

1. Understand the importance of vegetation distribution, composition, cover, RDM, and infiltration to water quality and pasture productivity.
2. Review attendees' understanding of soil health concepts.
3. Understand the impacts of overgrazing, in addition to underutilizing forage such as brush encroachment, which causes risk of wildfire. Discuss common weeds, such as thistles and medusahead, and how weed populations change with grazing management and rainfall patterns.
4. Review residual dry matter (RDM) monitoring protocols with hands-on activities and mapping approaches that use visual estimates calibrated with clipping and weighing measurements.
5. Practice using forms in the RWQP Template in the field at sites of concern to feel comfortable applying questions in the Pasture Assessments and Future Water Quality Projects forms.
6. Gain ability to use tools discussed back home at attendees' individual ranches.

Introduction/Hook:

- Review clay-pan concept, and introduce "cow-pan" concept of compacted soil from livestock often found in soil profile near trails, feeders, and water troughs.
- Openly discuss grazing management approaches compared to site-specific treatments and how the two interact, such as in the timing and seasonality of grazing versus the number and location of water troughs available.

Materials/Speakers:

- Dig soil pits within pastures to review soil science, compaction, and rooting depth.
- Invited speaker and facilitator of discussion would be someone with knowledge in livestock and grazing management and soils from UCCE, NRCS, RCD, or other relevant organization.
- Consider inviting Water Board staff to review regulations and learn about pastures.
- Bring copies of the RWQP Template and extra copies of the Pasture Assessment—Worksheet 4, Stream Assessment—Worksheet 5, Future Water Quality Projects—Worksheet 7, and Monitoring—Worksheet 10.
- Provide attendees handouts of pertinent resources.

Time Allocated:

Allow 2 to 4 hours, including self-serve lunch (40 minutes for presentations, 30 minutes for question/answer, 10 minutes for reviewing regs, 20 minutes for traveling within ranch, 30 minutes for lunch, and 1 to 2 hours for discussing sites).

Procedures/Activities/Strategies/Questions:

- Visit the host ranch, preferably with the rancher and invited speakers, several days prior to the field tour to plan site visits, discussion points, and the tour progression/flow.
- Welcome newcomers. Introduce and thank the landowner for hosting.
- Review historical maps and aerial photos of ranch being visited. Discuss large changes at ranch over time and contemplate if types of erosion or other pollution sources have changed.
- Review soil health concepts from previous session.

- Fill-out or review Pasture Assessment—Worksheet 4, Stream Assessment—Worksheet 5, Future Water Quality Projects—Worksheet 7, Monitoring—Worksheet 10, or any other form from the RWQP Template, depending on feedback and questions from participants.
- Discuss observations of attendees around their ranches following large rainfall events.
- Review the RWQP Template and open up questions regarding overall process and adaptability of plan for individual ranches.
- Complete the Session Evaluation Form (appendix A).

Conclusion/Self-assessment:

- Consider potential grazing management practices that will improve water quality while also increasing pasture productivity, such as improving distribution to reduce bare soil from trails near streams.

Resources:

Barry, S., R. Larson, G. Nader, M. Doran, K. Guenther, and G. Hayes. 2011. Understanding Livestock Grazing Impacts: Strategies for the California Annual Grassland and Oak Woodland Vegetation Series. Oakland: UC Agriculture and Natural Resources publication 21626. https://anrcatalog.ucanr.edu/pdf/21626.pdf

Brownsey, P., J. Davy, T. Becchetti, M. L. Easley, J. J. James, and E. A. Laca. 2016. Barb Goatgrass and Medusahead: Timing of Grazing and Mowing Treatments. Davis: UC Agriculture and Natural Resources Publication 8567. https://anrcatalog.ucanr.edu/pdf/8567.pdf

DiTomaso, J. M., G. B. Kyser, and M. J. Pitcairn. 2006. Yellow starthistle management guide. California Invasive Plant Council. https://www.cal-ipc.org/docs/ip/management/pdf/YSTMgmtweb.pdf

George, M. R., N. K. McDougald, W. A. Jensen, R. E. Larsen, D. C. Cao, and N. R. Harris. 2008. Effectiveness of nutrient supplement placement for changing beef cow distribution. Journal of Soil and Water Conservation 63(1):11–17. https://doi.org/10.2489/jswc.63.1.11

Hudson, T. D. 2008. Livestock Management and Water Quality. Pullman: Washington State University Extension. http://pubs.cahnrs.wsu.edu/publications/wp-content/uploads/sites/2/publications/eb2021e.pdf

Kroeger, T., F. Casey, P. Alvarez, M. Cheatum, and L. Tavassoli. 2009. An economic analysis of the benefits of habitat conservation on California rangelands. Washington: Defenders of Wildlife. https://defenders.org/sites/default/files/publications/an_economic_analysis_of_the_benefits_of_habitat_conservation_on_california_rangelands.pdf

LeBlanc, J. W. 2001. Getting a Handle on Broom: Scotch, French, Spanish, and Portuguese Brooms in California. Oakland: UC Agriculture and Natural Resources Publication 8049. https://anrcatalog.ucanr.edu/pdf/8049.pdf

McDougald, N. K., W. E. Frost, and R. L. Phillips. 2001. Livestock Management during Drought. Oakland: UC Agriculture and Natural Resources Publication 8034. https://anrcatalog.ucanr.edu/pdf/8034.pdf

Next Steps/Future Lessons:

- Identify where large bare-soil areas frequently connect to tributaries during small storm events. Consider when ditches and drainages within each pasture become hydrologically connected with surface runoff flowing into larger tributaries.
- Consider historical changes in pasture productivity resulting from erosion and management changes.