

Lesson Plan 2.

What are Nonpoint Source (NPS) Water Quality Regulations?

Goals/Overview

Explain the background of California grazing systems and water quality regulations on rangelands, and explain how nonpoint source pollution policies compare to point sources regarding historical priorities.

Learning Objectives:

1. Understand the different grazing systems in California.
2. Understand the historical timeline of water quality regulations in the United States since 1970.
3. Contrast point sources of pollution to nonpoint sources regarding timeline of watershed management.
4. Learn about potential rangeland pollutants found in some California waterways.
5. Learn general concepts of the rainfall-runoff process regarding the way in which potential pollution sources on ranches move downstream.
6. Classify four common types of erosion—sheet, rill, gully, and streambank.
7. Understand the impact of common rangeland pollutants in local watershed(s) on water quality and aquatic fauna. Discuss other sources in the watershed briefly.
8. Explain the preliminary plan for conservation partner agencies to provide ranch maps (soil, topographic, and aerial versions) of grazing land and properties to interested attendees.

Introduction/Hook:

- Discuss general land use changes over previous century and impacts of specific large storm events on agricultural production of a region or county, and possible land use impacts on water quality. Describe changes in human population densities and multiple or cumulative uses of surface water.

Materials/Speakers:

- Historical aerial photos of watershed, region, and/or ranch comparing circa 1970s to present. Google Earth often has comparable imagery from the 1990s.
- Educational video: “[California Grazing Systems](#)” (8 minutes).
- Speaker and facilitator of discussions—possibly UCCE Livestock Range Advisor or other range manager and/or UCCE Watershed Management Advisor.
- Educational video: “[Water Quality Policy Overview](#)” (17 minutes).
- Invite Water Board staff to be available to further explain regulations.
- Provide example of binder with RWQP from Tomales Bay or Napa/Sonoma watersheds.
- Food and beverages—snacks and coffee/tea will suffice; however, consider resources or donations available to provide local food examples.

Time Allocated:

Allow 1 to 1.5 hours (25 minutes for presentations and 20 to 40 minutes for questions and reviewing waiver regulations). Times are flexible to allow participants space to get to know each other better, engage in some “small talk,” and build relationships with resource agency staff.

Procedures/Activities/Strategies/Questions:

- Welcome; attendees introduce themselves.
- Give attendees an opportunity to ask questions on previously covered topics.
- Present video: “[California Grazing Systems](#).”
- Describe the grazing system(s) in the local area, season of use, and water quality implications.
- Present video: “[Water Quality Policy Overview](#).”

- Compare and contrast sources of sediment, nutrients, pathogens, or other water quality concerns from specific or generalized ranches (20 minutes).
- Ask for examples of historic point and nonpoint sources of pollution from the watershed.
- Cover activity reviewing historical maps and aerial photos of watershed (20 minutes).
- Discuss large changes in watershed over time and contemplate if types of erosion or other pollution sources have changed.
- Discuss observations of attendees around their ranches following large rainfall events.
- Allow sufficient time to review and answer all questions regarding water quality regulations (20 to 30 minutes).
- Complete the Session Evaluation Form (appendix A).

Conclusion/Self-assessment:

- Have participants reflect upon the rainfall-runoff process with anecdotal stories of large storm events.
- Participants should consider ranch locations that may be potential sources of pollution.

Resources:

Barry, S., W. King, S. Larson, and M. Lennox. Opportunities to sustain “greener” farming: Comparing impacts of water quality regulations in two catchments: Lake Taupo (NZ) and Tomales Bay, California (USA). 2010. Proceedings of the New Zealand Grassland Association 72:17–22. https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/tomalespathogens/TomalesNewZealandBarry.pdf

George, M. R. 1995. Nonpoint sources of pollution on rangeland. Fact sheet no. 3. Rangeland Watershed Program, UCCE and Natural Resources Conservation Service. https://ucanr.edu/sites/UCCE_LR/files/180590.pdf

Gerstein, J. M., D. J. Lewis, K. Rodrigues, J. M. Harper, and J. Kabashima. 2006. State and Federal Approaches to Control of Nonpoint Sources of Pollution. Oakland: UC Agriculture and Natural Resources Publication 8203. <https://anrcatalog.ucanr.edu/pdf/8203.pdf>

State Water Resources Control Board. n.d. Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program. https://www.waterboards.ca.gov/water_issues/programs/nps/docs/plans_policies/nps_iefs.pdf

Next Steps/Future Lessons

- Ask participants to think about sites on their ranches and if and when pollution sources may potentially connect to water bodies (that is, after how much rainfall do ditches and streams lose clarity and become turbid?).
- Have participants think about historical pasture productivity changes that may have resulted from the three types of erosion.
- Suggest participants view previews for videos 6 and 7 prior to Lesson Plan 3.