

USFS Cattle Grazing, Yosemite Toad, & Water Quality Research



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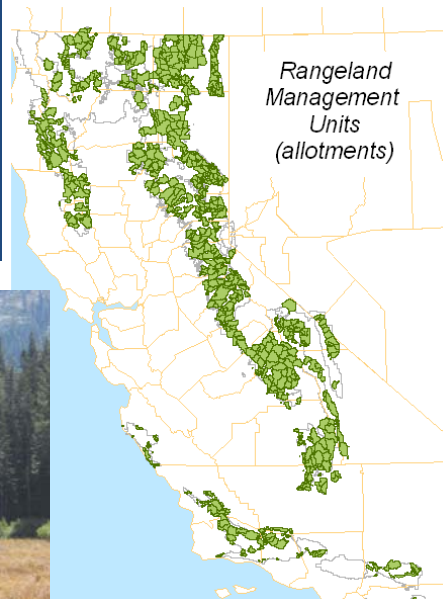


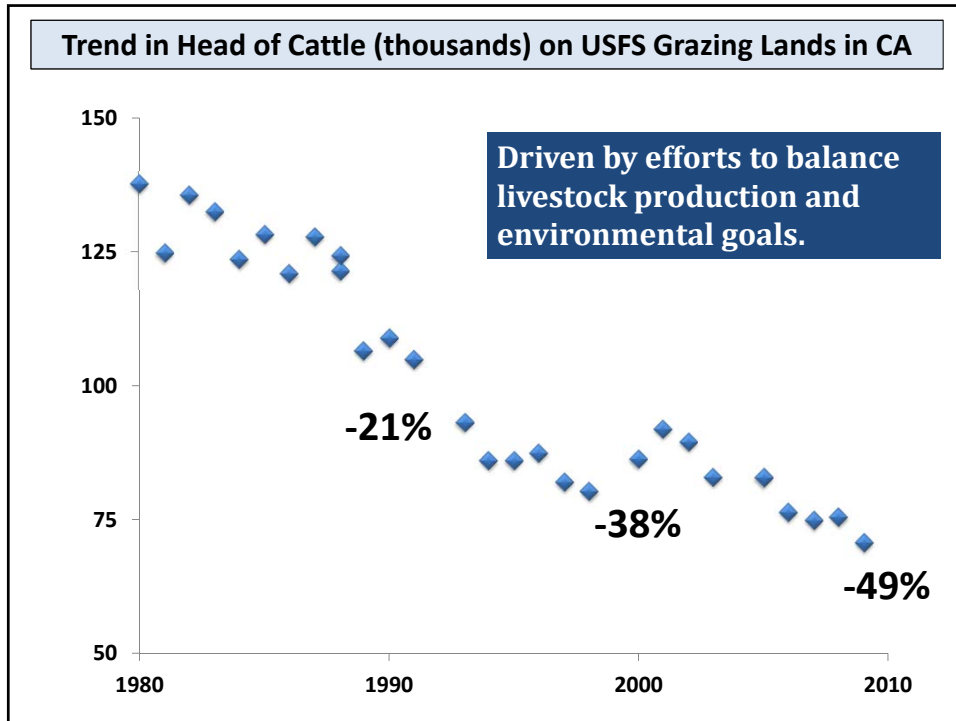
12/3/2013

Presented to Mariposa County BOS

USFS Public Grazing Allotments in CA

500 grazed allotments
8,000,000 acres
430,000 Animal Unit Months
~70,000 head of cattle

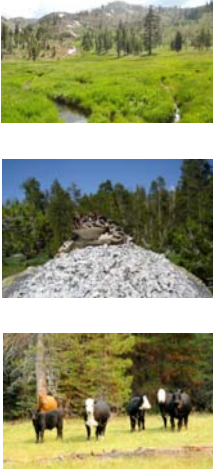




Public Lands Grazing & Yosemite Toad

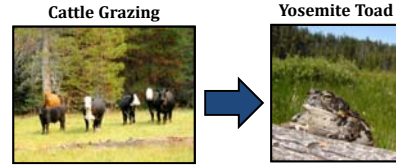
SIERRA AND STANISLAUS NATIONAL FORESTS

- Yosemite Toad - Proposed for listing under ESA
 - Mountain Meadows – Key breeding and rearing habitat
 - Livestock a driver of decline?
- 2005-2010 Yosemite Toad Adaptive Management Project
- Examine management alternatives – grazed, partial and complete exclusion.
- USFS, UC Davis, UC Berkeley, and range stakeholders.



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CATTLE GRAZE V. EXCLUSION



RESULTS

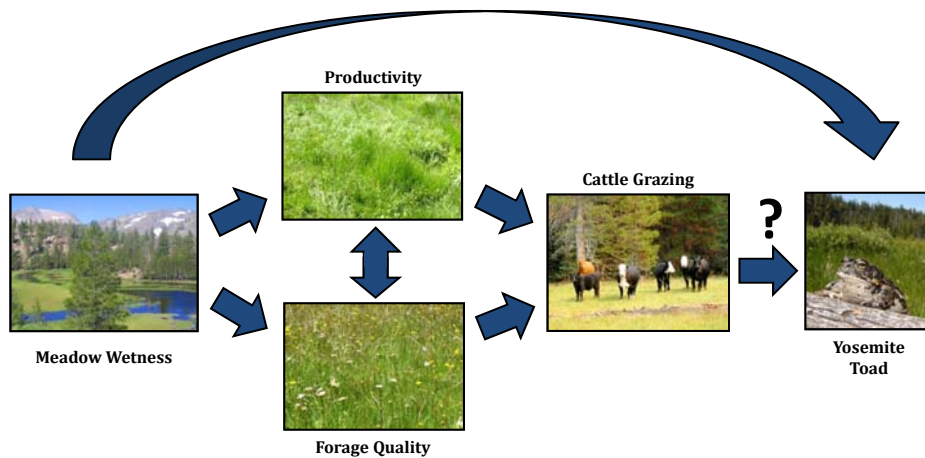
- Nutrients in all pools ~ 1 order of magnitude below levels of ecological concern.
- Pool turbidity, temperature, depth, and cover not different among grazed and non-grazed treatments.
- Breeding pool occupancy and toad early life stage densities not different among grazed and non-grazed treatments.
 - No grazing treatment-induced trends.

Roche *et al.* 2012. *Rangeland Ecology & Management*.
McIlroy *et al.* 2013. *PLOS ONE*.

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SURVEY OF MEADOW HABITAT USE BY CATTLE AND TOADS

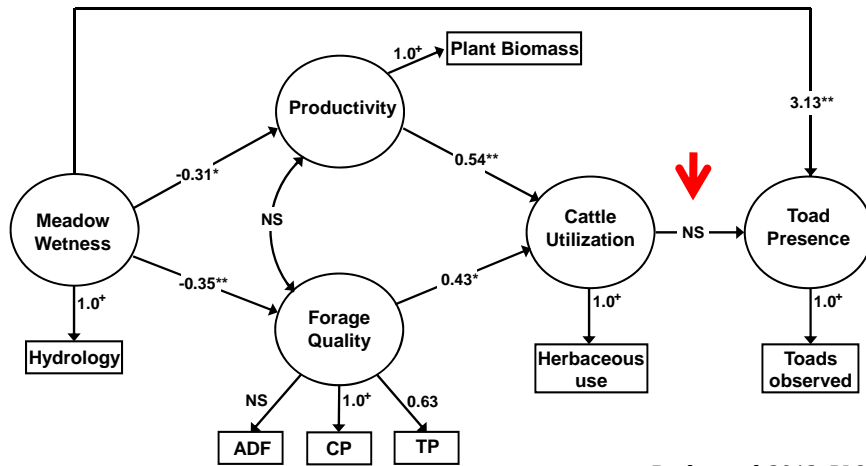
- 2006-2008
- 3 Sierra National Forest Grazing Allotments, 24 Meadows



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RESULTS

- Cattle select for higher forage quality diets (drier meadows)
- Toads more prevalent in wetter meadows.



Roche et al. 2012. PLOS ONE.

Cattle grazing and conservation of Yosemite toad can be compatible goals

Cattle Grazing and Yosemite Toad (*Bufo canorus* Camp) Breeding Habitat in Sierra Nevada Meadows

L.M. Roche, B. Allen-Diaz, D.J. Eastburn, and K.W. Tate. 2012. Rangeland Ecology & Management 65:56-65.

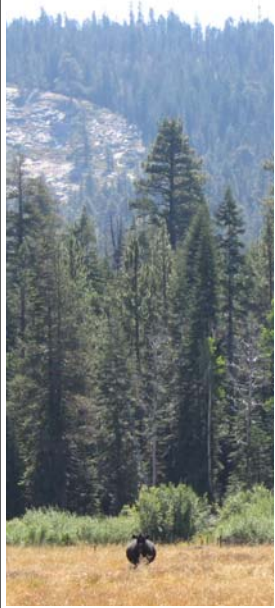
Cattle grazing and conservation of a meadow-dependent amphibian species in the Sierra Nevada

L.M. Roche, A.M. Latimer, D.J. Eastburn, and K.W. Tate. 2012. PLOS ONE.

Determining the effects of cattle grazing treatments on Yosemite toads (*Anaxyrus canorus*) in montane meadows.

S. McIlroy, A.J. Lind, B.H. Allen-Diaz, L.M. Roche, W.E. Frost, R.L. Grasso, and K.W. Tate. 2013. PLOS ONE.

Public Lands Grazing & Water Quality



“Bee Exclusive: Livestock Waste Found to Foul Sierra Waters”
Sacramento Bee 25 April 2010

- **Prompted multi-partner collaboration.**
 - U.S. Forest Service
 - UC Davis
 - UC Cooperative Extension
 - Permittees
 - Regional Water Quality Control Boards
 - Range stakeholders

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OBJECTIVES

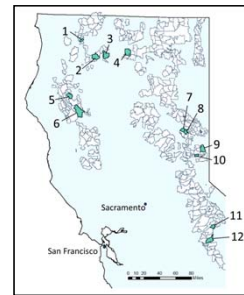
1. Quantify fecal indicator bacteria and nutrient concentrations in surface waters.
2. Compare to a) Regulatory benchmarks, b) Recommended benchmarks for eutrophication concerns, and c) Estimates of nutrient background concentrations.
3. Examine relationships between water quality, environmental conditions, cattle grazing, and recreation.



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COMPREHENSIVE WATER QUALITY SURVEY

- 12 USFS public lands grazing allotments, 5 National Forests.
 - 320,000 acres
- 155 stream collection sites, monitored monthly during grazing-rec period (Jun-Nov, 2011).
 - Key Grazing Areas
 - Recreation Areas
 - Areas with No Concentrated Use Activities
- Total of 743 water samples collected
 - Fecal Indicator Bacteria: Fecal coliform, *E. coli*
 - TN, NO₃-N, NH₄-N, TP, PO₄-P



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RESULTS

- Observed nutrient concentrations were at least one order of magnitude (90%) below levels of ecological concern, and similar to background estimates.
- Throughout the study period, US EPA recommended *E. coli* benchmarks were always met for over 90% of samples collected and over 83% of sites (no exceedances).

“Our results do not support previous concerns of widespread microbial water quality pollution across these grazed landscapes, as concluded in other surveys.”

Roche, L.M., L. Kromschroeder, E. R. Atwill, R.A. Dahlgren, and K.W. Tate. 2013. **Water Quality Conditions Associated with Cattle Grazing and Recreation on National Forest Lands.** *PLOS ONE* 8(6): e68127.

Rangeland Watershed Laboratory

<http://rangelandwatersheds.ucdavis.edu>

