

**Maintaining and Restoring Riparian Areas in Grazed Ecosystems**  
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<http://rangelandwatersheds.ucdavis.edu>

**From coastal to Sierra riparian systems – there is significant effort to restore riparian areas in grazed watersheds**

**I can be good!**  
***I Promise!***

We can prescribe grazing to support riparian restoration objectives

These sites are on the same stream, both grazed by cattle. Sites are separated by about a mile, and by a gulf in management .

**Managing grazing in functional systems to enhance/maintain ecosystem services.**

Services Provided

If grazing is the primary stressor – success is relatively simple with prescribed grazing management

Degradation Pathway

**Managing grazing in non-functional systems to restore ecosystem function and services.**

Services Provided

Once a threshold is passed – success is difficult with prescribed grazing management alone

Degradation Pathway

**The Tool Box**

- **Prescribed Grazing** Management of the intensity, season, frequency of grazing *and* rest from grazing.
- **Grazing Facilities** The drinking water, supplemental feed, and fencing infrastructure needed to implement prescribed grazing.

## CEAP Literature Review


CHAPTER 1

**A Scientific Assessment of the Effectiveness of Riparian Management Practices**

W. S. George, K. E. Johnson, C. S. Boyd, and R. W. Day


“Control of grazing intensity by both livestock and native ungulates promotes recovery of riparian plant communities.”

“...supports the effectiveness of water developments, supplement placement and herding for reducing riparian vegetation utilization, or time spent in riparian areas.”




## Case Studies

- Grazed riparian areas across CA can be found with excellent to poor health.
- What management is associated with excellent and poor health?



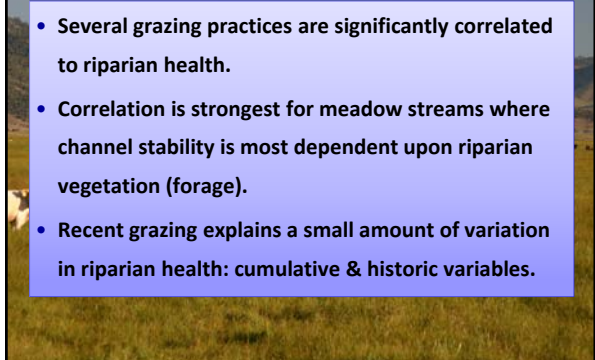
## Survey of Rangeland Riparian Sites

- 128 sites, public and private
- Major rangeland ecosystems
- Snap shot of the population of CA rangeland riparian areas.
- Representative of the population (the good, the bad, the ugly)




## Key Findings

- Several grazing practices are significantly correlated to riparian health.
- Correlation is strongest for meadow streams where channel stability is most dependent upon riparian vegetation (forage).
- Recent grazing explains a small amount of variation in riparian health: cumulative & historic variables.



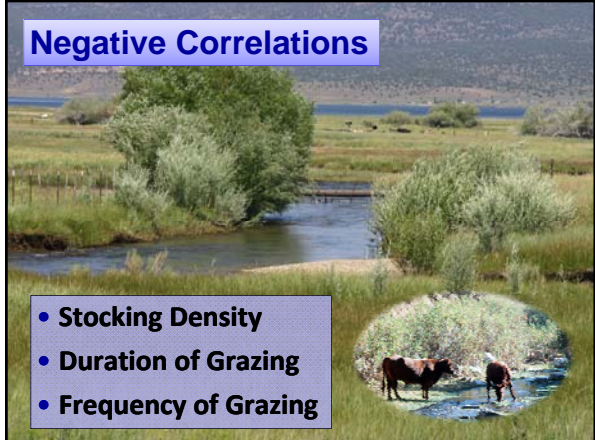
## Correlated to Riparian Health

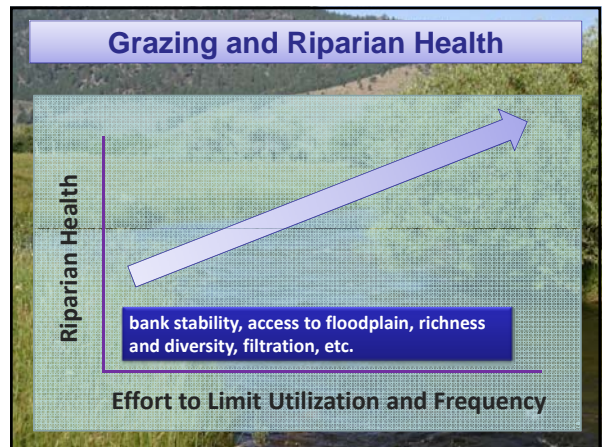
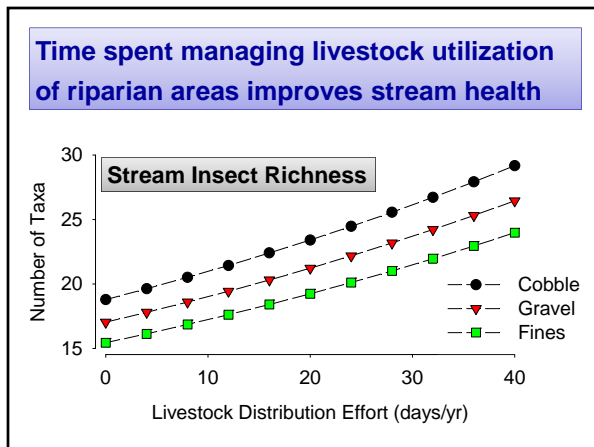
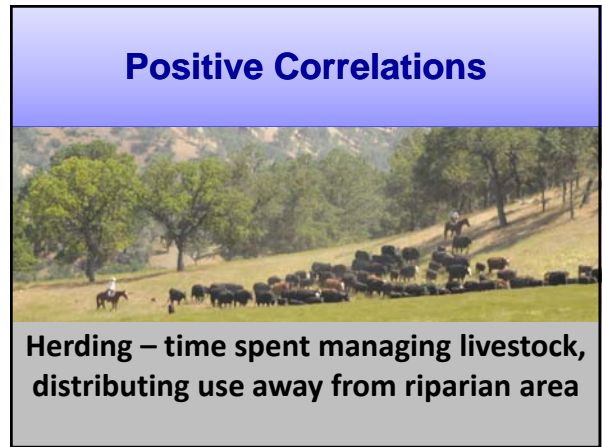
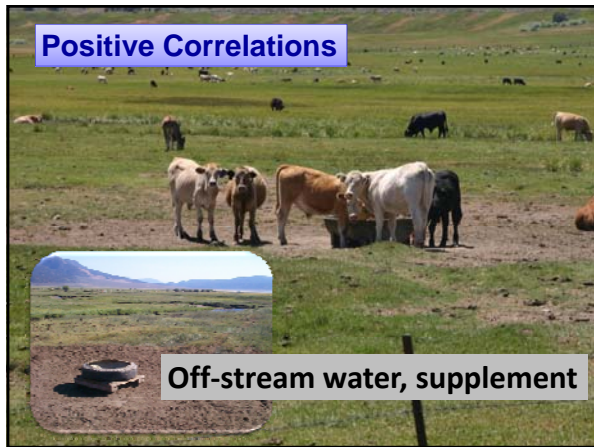
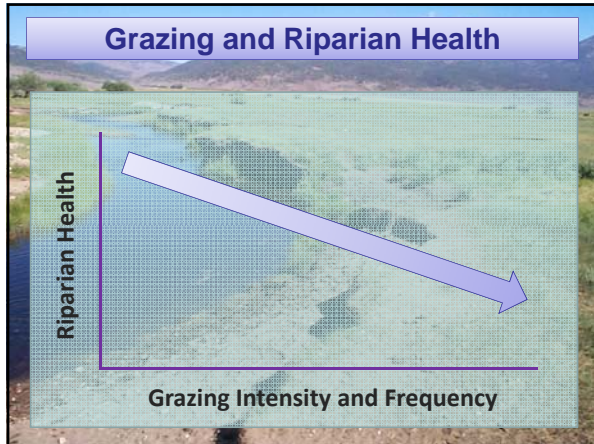
- Off-stream attractants such as water tanks and supplement.
- Herding to control utilization and time spent in riparian area.
- Rest period duration.
- Cattle density (cows/ac) during grazing bouts.
- Frequency of grazing bouts per year.



## Negative Correlations

- Stocking Density
- Duration of Grazing
- Frequency of Grazing






### Riparian Fencing

- **Exclusions:** vegetation management for weeds, fuels, N uptake, etc.
- **Riparian pastures:** integrate into grazing program based on timing, intensity, frequency of use.



### Summer and Fall – Annual Range

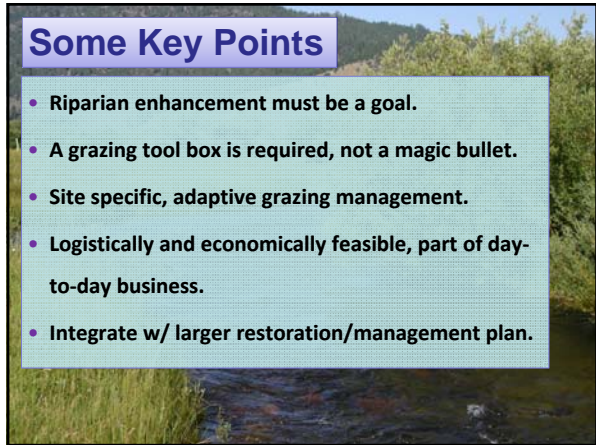


**Riparian v. upland forage quality differential**  
*protein, moisture, digestibility, phosphorus*

**Fencing riparian areas as discrete management units may be a necessity**

### Some Key Points

- Riparian enhancement must be a goal.
- A grazing tool box is required, not a magic bullet.
- Site specific, adaptive grazing management.
- Logistically and economically feasible, part of day-to-day business.
- Integrate w/ larger restoration/management plan.



### Water Quality & Cattle Grazing

*The same riparian grazing practices apply*

Factors that increase risk of water pollution with pollutants			
<b>High stocking rates</b> <ul style="list-style-type: none"> <li>• more fecal load</li> <li>• more defecation in water, near water, and runoff areas</li> <li>• more runoff and pathogen transport</li> </ul>	<b>Herd infected</b> <ul style="list-style-type: none"> <li>• calves &lt; 4 mo</li> <li>• calving during rainy season</li> <li>• long calving season</li> </ul>	<b>Distribution – space</b> <ul style="list-style-type: none"> <li>• cattle defecate in water</li> <li>• cattle defecate near water</li> <li>• cattle defecate in runoff areas</li> </ul>	<b>Distribution – time</b> <ul style="list-style-type: none"> <li>• cattle defecate near water during rainy season</li> <li>• cattle defecate in runoff areas during runoff</li> </ul>
Factors that reduce risk of water pollution with pollutants			
<b>Moderate Grazing</b> <ul style="list-style-type: none"> <li>• set cattle numbers in balance with forage production</li> <li>• enhance soil hydrologic health</li> </ul>	<b>Manage Calving</b> <ul style="list-style-type: none"> <li>• keep calves &lt; 4 mo away from water</li> <li>• offset calving from rainy season</li> <li>• shorten calving season</li> </ul>	<b>Manage Cattle Distribution</b> <ul style="list-style-type: none"> <li>• provide off-stream water</li> <li>• place supplemental feed away from water and runoff areas</li> <li>• create riparian/runoff pastures</li> <li>• create buffer strips</li> </ul>	<b>Manage Grazing Time</b> <ul style="list-style-type: none"> <li>• reduce cattle grazing near water during rainy season</li> <li>• reduce cattle grazing in runoff areas prior to and during runoff</li> </ul>

