LIVESTOCK GRAZING IN THE GOLDEN TROUT WILDERNESS: REST AND RESTORATION AND MANAGEMENT SCALE

HOW IS STREAM HEALTH AFFECTED BY GRAZING? USING STREAM INVERTEBRATES AS INDICATORS.

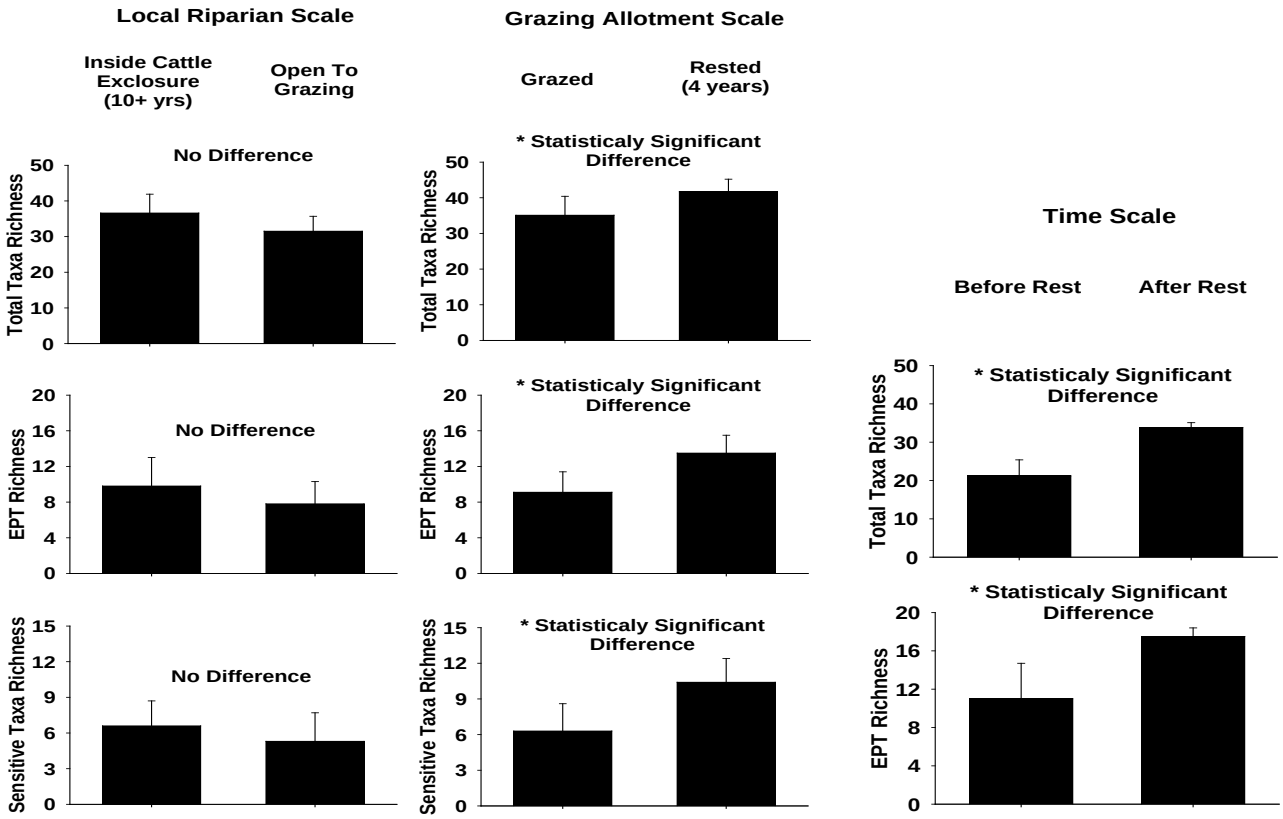
CATTLE WERE TAKEN OFF 2 OF 4 GRAZING ALOTTMENTS IN 2000. IN 2004 THE BIOLOGICAL HEALTH AND HABITAT CONDITIONS WERE ASSESSED ACROSS ALOTTMENTS TO COMPARE GRAZED AND RESTED STREAMS. WE ALSO COMPARED CONDITIONS INSIDE AND OUTSIDE LOCAL-SCALE RIPARIAN FENCE EXCLOSURES AND BEFORE AND AFTER REMOVALS ON THE RESTED ALOTTMENTS.

Study Design:

1. Contrast Grazed (16) and Ungrazed (22) stream reaches in all 4 allotments
2. Before and After the grazing rest 1999 vs 2004 in 8 paired sites Whitney-Templeton
3. Contrast Inside and Outside local-scale riparian fence exclosures (again n=8 pairs)
4. Contrast habitat and biological indicators over a gradient of grazing-related impact (bank erosion from trampling as direct indicator of grazing impact)

WAS THERE A DIFFERENCE IN HEALTH BETWEEN STREAMS WITH AND WITHOUT GRAZING, INSIDE AND OUTSIDE RIPARIAN EXCLOSURES, AND BEFORE AND AFTER REMOVALS?

- RESTED STREAMS SHOW HIGHER LEVELS OF DIVERSITY OF MAYFLIES, STONEFLIES AND CADDISFLIES (EPT), ALL SPECIES COMBINED, AND SENSITIVE SPECIES, THAN GRAZED STREAMS AFTER JUST 4 YEARS
- THERE IS NO DIFFERENCE IN DIVERSITY INSIDE vs OUTSIDE RIPARIAN EXCLOSURES (BUT THERE IS MORE GRASS GROWING INSIDE SO THEY "LOOK" BETTER)
- THERE WAS A SIGNIFICANT INCREASE IN DIVERSITY ON RESTED STREAMS COMPARING BEFORE TO AFTER AT THE SAME LOCATIONS
- CONCLUSION: ALOTTMENT REST IMPROVES HABITAT AND INSTREAM HEALTH AFTER JUST 4 YEARS BUT FENCES ARE INEFFECTIVE; MANAGEMENT OPTIONS FOR IMPROVED HABITAT INCLUDE FURTHER LIVESTOCK REMOVALS AND/OR REST-ROTATION GRAZING



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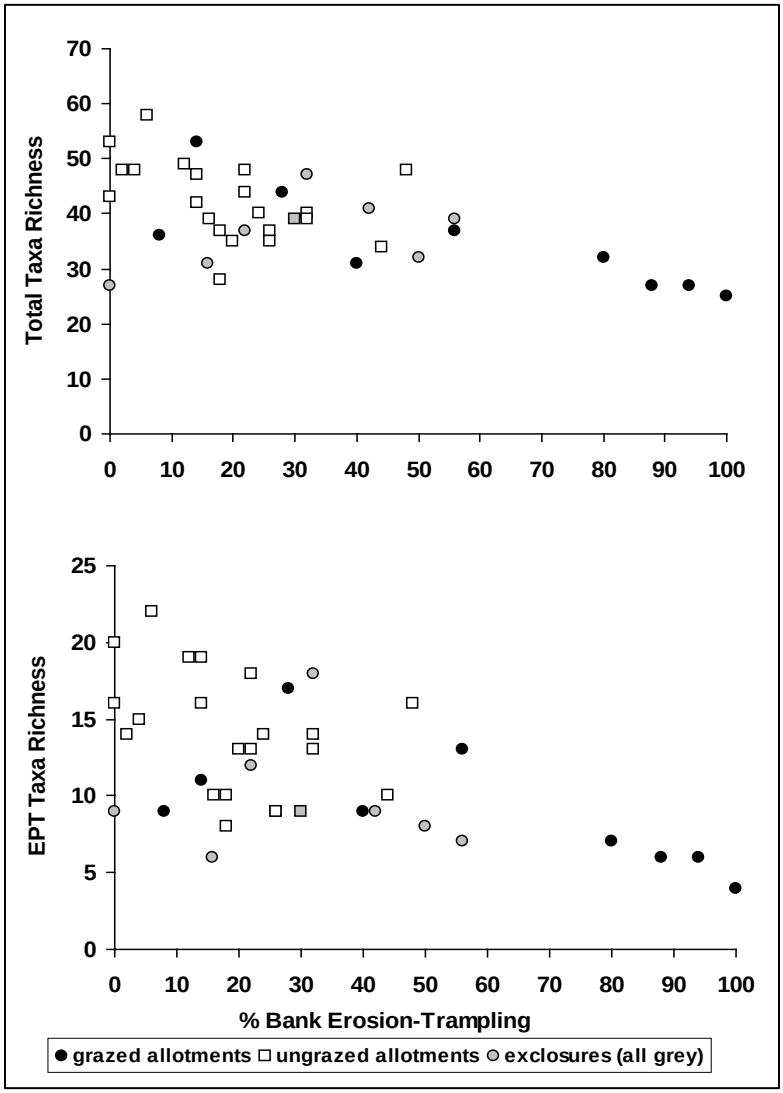
Rested Stream Reach Templeton Meadow

Grazed Stream Reach Mulkey Meadow

USING BANK TRAMPLING EROSION TO AS A MEASURE OF GRAZING INTENSITY, HOW DOES THIS AFFECT DIVERSITY OF AQUATIC LIFE?

- AS GRAZING INTENSITY INCREASES THE BEST ATTAINABLE CONDITIONS FOR DIVERSITY DECLINE
- SOME STREAMS MAY BE IS SUCH A DEGRADED STATE THAT RECOVERY IS NOT POSSIBLE WITHOUT ACTIVE ENGINEERING TO IMPROVE CHANNEL STRUCTURE AND REMOVE SEDIMENTS



Conclusions:

Short-term removal of livestock at the larger, allotment meadow spatial scale is more effective than long-term, but small-scale, local riparian area fencing, and yields promising results in achieving stream channel, riparian and aquatic biological recovery.

So, the rest was a success and could be continued and expanded to Monache/Mulkey. Grazing using rest-rotation could be tested so that exposure is not prolonged enough to degrade health and that rest intervals permit recovery.

Herbst, D.B., M.T. Bogan, S.K. Roll and H.D. Safford. 2012. Effects of livestock exclusion on in-stream habitat and benthic invertebrate assemblages in montane streams. Freshwater Biology 57:204-217.

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