

Rio Mora National Wildlife Refuge habitat suitability status for the reintroduction of the North American river otter (*Lontra canadensis*)

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INTRODUCTION

Problem

Invasive bullfrogs and crayfish have disrupted native biodiversity in the Mora River, NM by outcompeting and decimating native species populations. Reintroducing North American river otter may re-establish top-down control on these invasive species thereby allowing native biodiversity to flourish.

Question

Does the Mora River contain suitable habitat for the reintroduction of river otters?

Hypothesis/predictions

Because river otters have been successfully reintroduced in other New Mexican rivers the Mora River will also likely be a suitable ecosystem for their reintroduction. If the Mora River is suitable for river otter reintroduction, we expect mean monthly flow to be ≥ 10 cfs and for the Mora River to have sufficient shade, depth, presence of large prominent rock, beaver sign, and understory vegetation, features that prior literature has deemed important for river otter latrines in the Southwest USA.

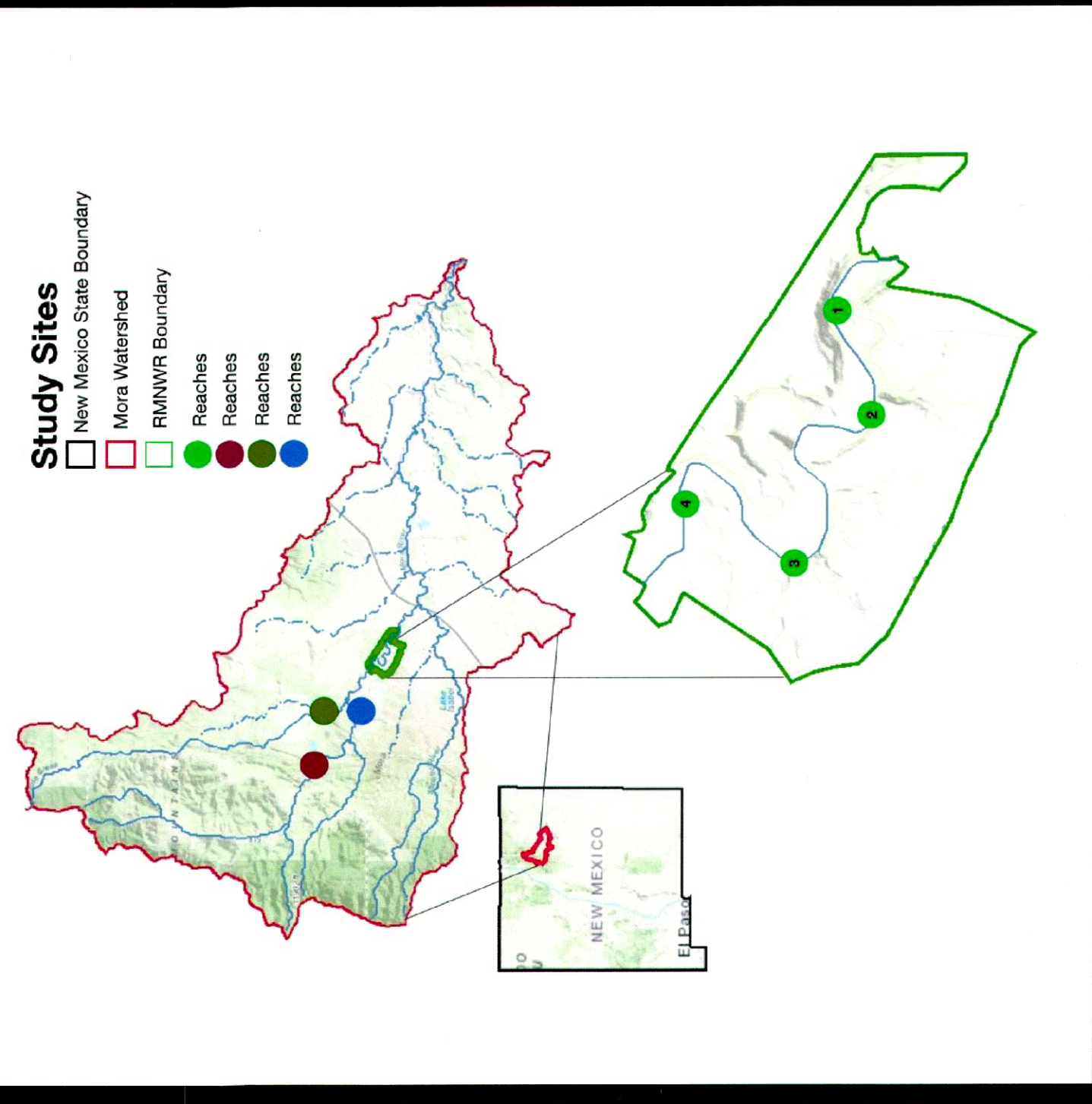
METHODS

Study Site

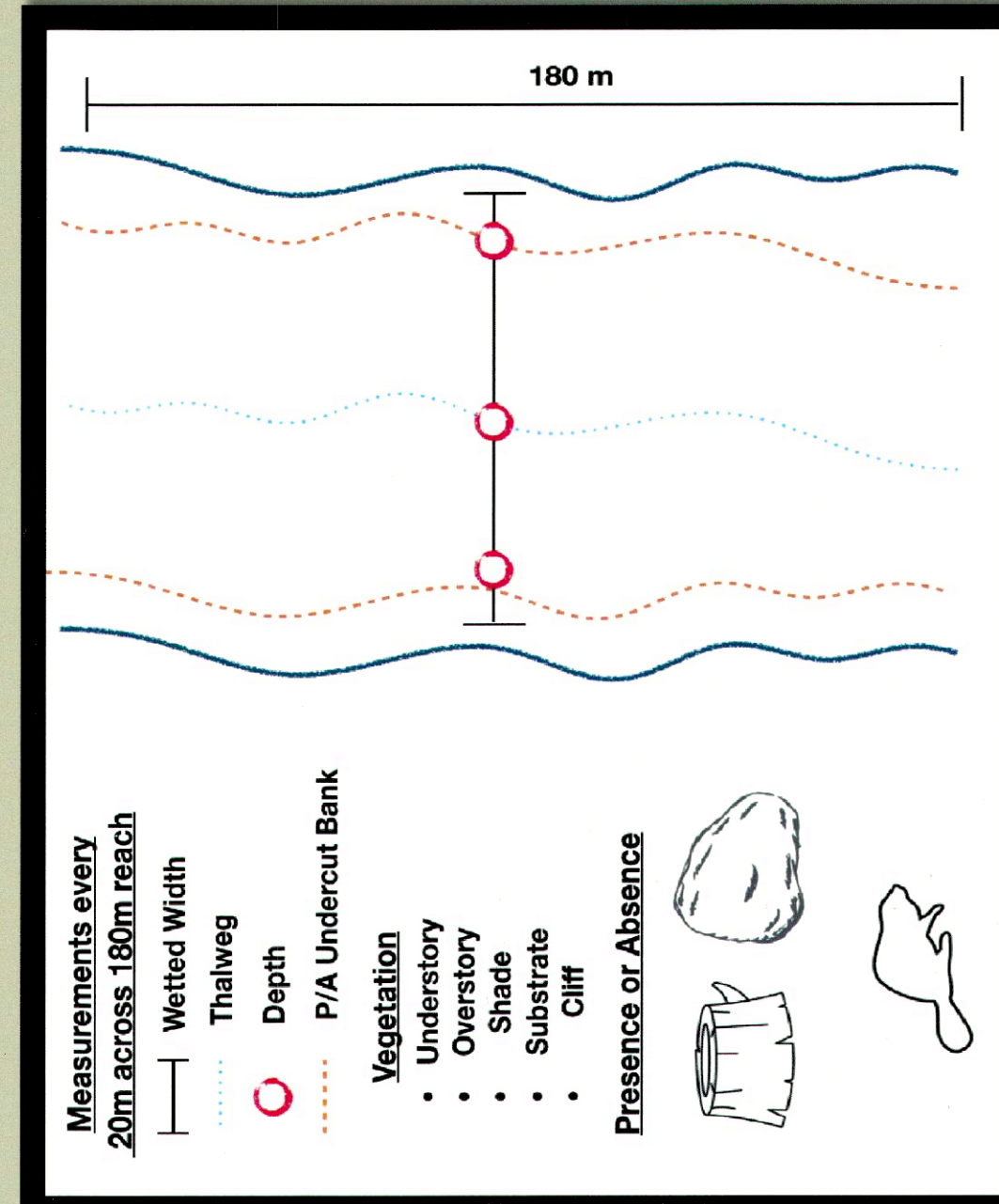
The Mora River runs through The Rio Mora National Wildlife Refuge (RMNWR), a 4,224 acre refuge between the Great Plains and the southern Rocky Mountain range.

Habitat Survey

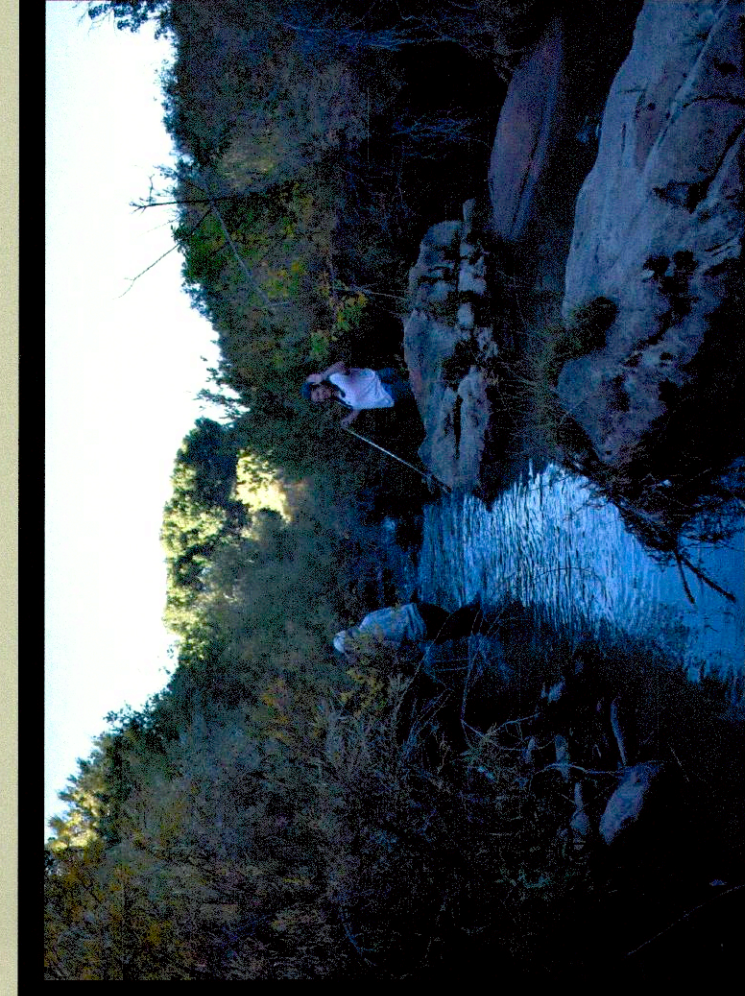
Surveys were conducted September 28 – October 1, 2018 with one reach surveyed each day.



Reach and USGS gauge station locations



Habitat surveys conducted at each reach



Reach 1 September 28, 2018

RESULTS



Reach 1 September 28, 2018

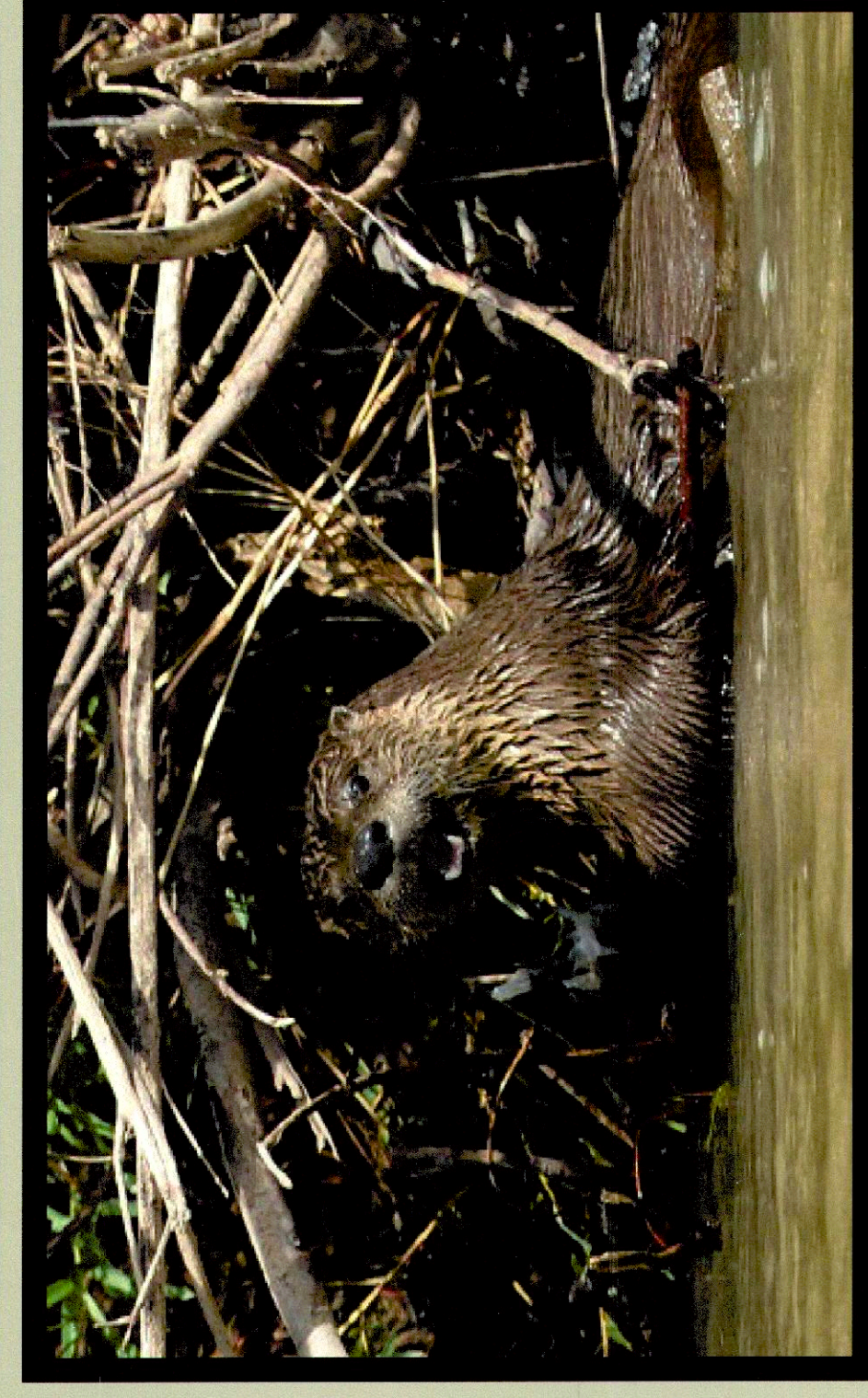
Reach Description

	Reach 1	Reach 2	Reach 3	Reach 4
Location	35.844N, 105.049W	35.839N, 105.064W	35.848N, 105.085W	35.861N, 105.077W
Mean Thalweg depth (cm)	54.17 +/- 7.78	27.06 +/- 4.01	45.98 +/- 8.36	36.28 +/- 6.82
Mean Wetted Width (m)	6.92 +/- 0.87	5.80 +/- 0.76	9.84 +/- 0.35	5.72 +/- 0.63
Percentage of understory cover	65% +/- 3%	47% +/- 3%	65% +/- 2%	43% +/- 3%

Reach description with mean thalweg, wetted width, and percentage understory cover

Depue & Ben-David (2010) vs Mora River Findings

Reaches in the Mora River had similar or higher prevalence of shade, presence of prominent rock, and beaver sign compared to other latrine sites studied by Depue & Ben-David (2010), but lower prevalence of cliff overstory and river depth.



North American river otter

Flow
Across three USGS gages in the Rio Mora watershed, adequate (i.e. ≥ 10 cfs, Fitzgerald, 1994) mean monthly flows occurred in 30-61% of months resulting in median values of 9-26 cfs.

DISCUSSION / CONCLUSIONS

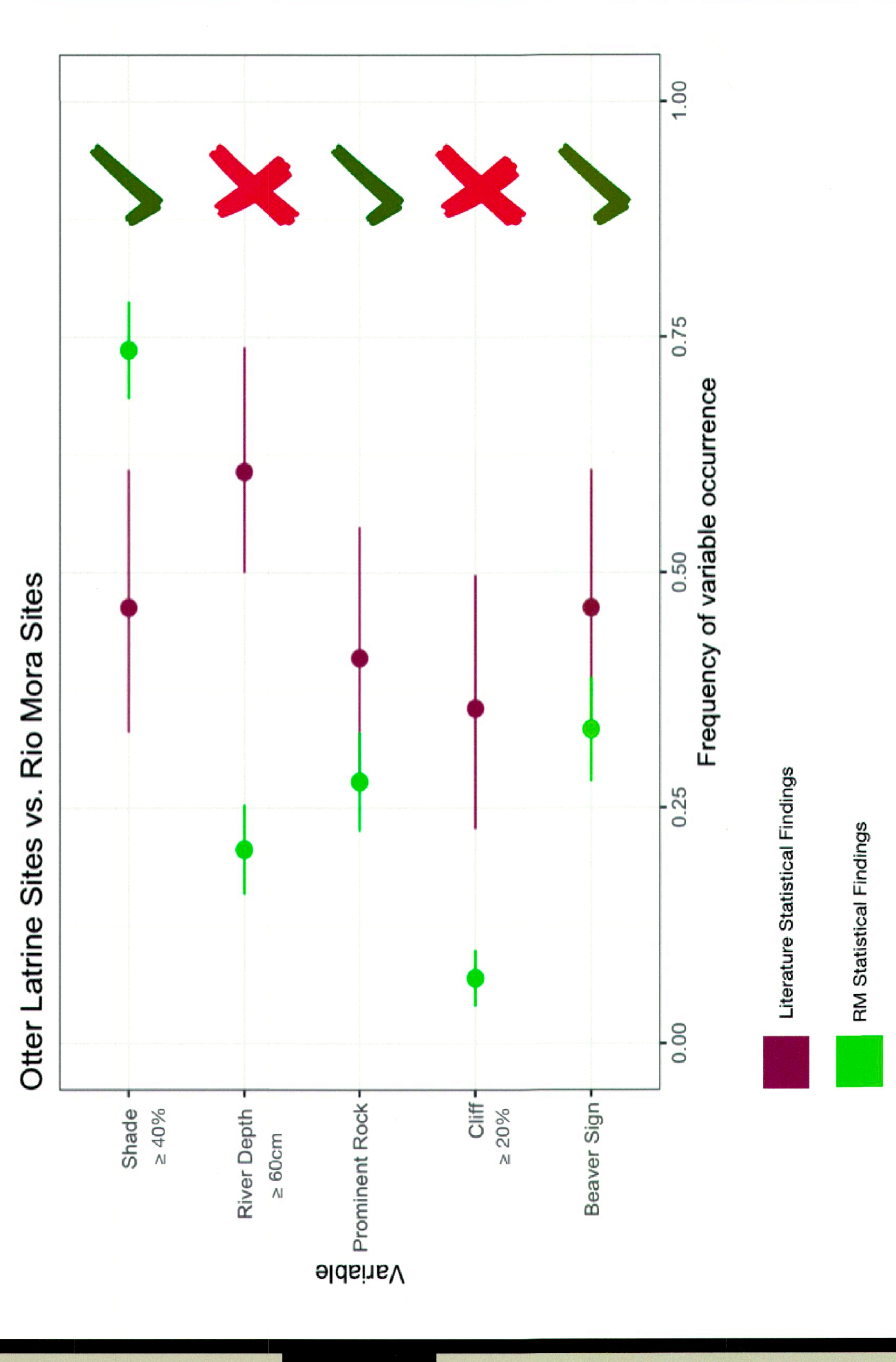
- A comparison of Mora River habitat characteristics to five key preferred otter latrine habitat characteristics identified by Depue & Ben-David (2010) indicate marginally sufficient habitat for river otters.
- Our comparison of Mora River habitat to latrine site habitat characteristics from previous literature shows that the Mora River does meet many of the requirements, except for depth and cliff overstory.
- Our examination of past flow rates show that for half of the time flow is just under the requirement of 10 cfs at one of the gauge stations.
- Some limitations to our findings are that we don't have year-round depth measurements and vegetation characteristics. Also, factors like cliff overstory may not be as important to river otters in this region.
- Others exhibit flexibility in time and degree of use when it comes to habitat and latrine site selection (Dronkert-Egnew, 1991). Our results suggest that the Mora River in RMNWR may contain suitable habitat for river otters if they are able to adapt to lower flows and depths and are flexible in latrine selection.
- Follow-up studies should focus on seasonal differences in habitat characteristics.

ACKNOWLEDGEMENTS

We would like to thank RMNWR staff members Erica Garroutte, Shantini Ramakrishnan, and Luis Ramirez, and Denver Zoo, for allowing us to pursue this study on the reintroduction of river otters within the Mora River, as well as Regis University, and project members Jo Aquino, Jenna Slabe, and Armando Toral Becker for the assistance on data collection.

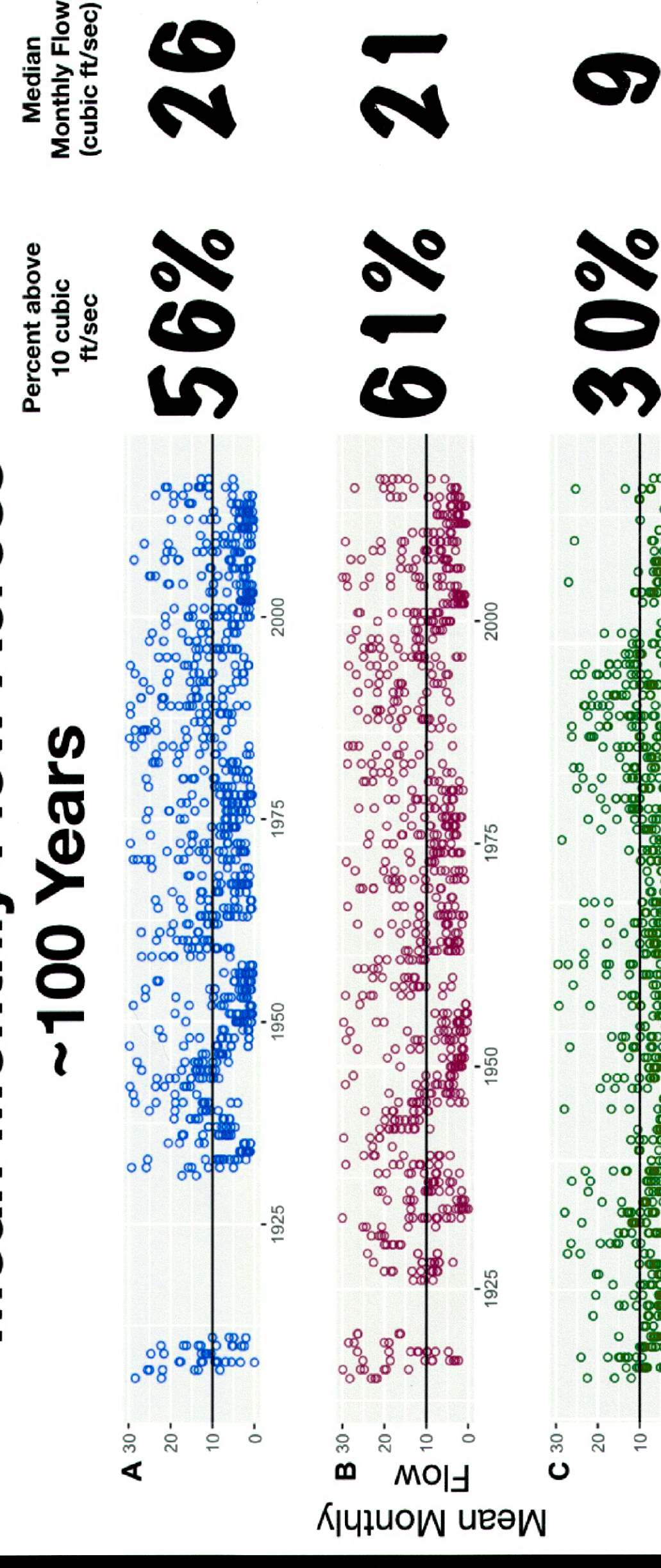
LITERATURE CITED

Ben-David, D., & Depue, A. (2010). River otter latrine site characteristics in the Rio Mora watershed, New Mexico. *Journal of Wildlife Management*, 74(2), 275-282.
 Fitzgerald, J. P., Meyer, C. A., & Ewing, S. A. (1994). Minimum of Coho Salmon of the Mora River, Colorado. *Journal of Wildlife Management*, 58(2), 275-282.
 Dronkert-Egnew, A. E. (1991). River otter population status and habitat use in riparian forests. *Conservation Biology*, 5(1), 1-12.



Previous literature vs. Mora River findings

Mean Monthly Flow Across ~100 Years



Flow data from three gauges within the Mora watershed