Effects of Grazing Management and Climate Change on Extent of Semiarid Riparian Meadows[1]

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Abstract: Field sampling and remote sensing techniques were used to assess effects of long-term uncontrolled livestock grazing and recent management improvements on riparian meadows in the upper Sweetwater River Basin in Fremont County, Wyoming. Over a century of uncontrolled grazing has led to the formation of hummocks causing severe degradation to the riparian meadows. To study the effects of grazing on the wetlands, the Bureau of Land Management constructed livestock exclosures on six different riparian meadows ranging from 8 to 30 years old. This work builds upon field research that quantified changes in soil carbon storage and the width of the wetlands by quantifying the change in wetland extent over the past 30 years using high-resolution (WorldView-2) satellite data and moderate resolution (Landsat) satellite data with a longer temporal series. Training data from the field was used to predict the current wetland extent for the high spatial resolution scenes using the randomForests R package. To quantify the change in wetland extent over the past 30 years, the high-resolution data was used to train the moderate resolution data allowing for the comparison of areas with long-term heavy and light grazing pressure to predict effects of improved grazing management on recovery of the degraded wet meadows. Results of this work will inform management and restoration of riparian wet meadows that provide important water, wildlife, and forage resources.[3]

Additional Key Words: Remote Sensing, WorldView-2, Landsat, hummocks.

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3. Work reported here was conducted near 42°27'47"N, 108°30'58"W.