

LOWER RED ROCK LAKE AND ADJACENT WETLANDS: PRELIMINARY UNDERSTANDING OF THEIR GEOHYDROLOGY

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We have been studying the wetland systems at Red Rock Lakes National Wildlife Refuge in the Centennial Valley of Southwest Montana for several years. Our charge was to provide recommendations about water levels for optimum long term management of waterbirds. To do so, we recognized that we first needed to gain an understanding of the interacting role of water sources and soils in determining submergent and emergent plant communities. The Centennial Valley is tectonically active. That ultimately drives the location of wetlands and is responsible for the generally sloping elevation of wetland bottoms from North (highest) to South. Additionally, the area's geomorphology is dominated by glacial and related alluvial processes that drive soil development and shallow groundwater movement. Using standard hydrologic techniques, particularly shallow wells and piezometers, we have begun to gain an understanding of the prevalence of groundwater discharge in Lower Red Rock Lake and the adjacent semipermanent emergent sedge wetlands. We describe some of the initial patterns that have been uncovered using clustering and classification and regression tree statistical methods. Our next efforts will focus on multivariate analyses and modeling of soil parameters, near surface stratigraphy, hydrologic factors, and aquatic plant communities.
