Integrated Lentic Riparian Grazing Management

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Introduction: Managing lentic riparian areas for functionality is a legal, policy, sustainability, sage grouse & common sense requirement. Yet this work has been neglected without an effective integrated riparian management process (IRMP) such as Dickard et al. (2015) described for lotic riparian areas.

Methods: ***Step 1- Assess Riparian Area Functioning condition (PFC)*** using Prichard et al. (2003). An interdisciplinary team reviews information and delineates and stratifies riparian areas using remote sensing. Limited budgets may require focus on the most important, the largest, or the areas with critical habitat. Stratify by logical grouping based on similarities such as geomorphology, hydrology, vegetation, size, apparent condition, or classification (e.g. Weixelman et al. 2011). Random sampling by strata occurs within pastures, watersheds, or other management units. Potential is the foundation for riparian PFC assessment. Where soils persist, they characterize the soil forming environment (Lewis et al., 2003), including the extent and seasonality of saturation and the biotic communities needed to sustain riparian functions. Additional information for describing potential can come from reference areas, historic documents, photos, species lists, hydrology of the watershed and spring, and knowledge linking present or historic species to growth and reproduction or survival requirements and limiting factors. Where soil has eroded, the interdisciplinary team will have to envision how riparian functions can spiral toward potential. Water and time for recovery allow plants to grow and reproduce or spread. Stabilizing plants capture sediment, dissipate or resist erosive energies, and accumulate organic matter to re-create the sponge for water to nourish plants that drive recovery. Twenty hydrology, vegetation, or geomorphology assessment items can be validated with measurements so the ID team can identify risks (e.g. Figure 1) to physical functioning (Prichard et al., 2003).

Figure 1. In Great Basin riparian areas, the most common "no" items putting riparian areas at risk: 3. Smaller and not enlarging; 6. Flow patterns altered; 12. Low vigor; 13. Inadequate stabilizing vegetative cover; 14. Hummocking; and 19. Out of balance erosion vs. deposition; are illustrated in these photos:

Step 2 - Identify resource values, or types of habitat. Endangered, threatened, or sensitive species at springs depend on specific aquatic habitat requirements. Sage-grouse depend on functioning riparian meadows with green forbs for late brood rearing habitat, especially in their dry-summer western range.

Step 3 - Prioritize riparian areas for management, restoration, or monitoring using steps 1 and 2. Prioritize riparian areas that function at risk. They need to improve with better management before crossing an ecological threshold. Augment these with certain areas recognized in step 2.

Step 4 - Identify issues, and establish goals, and objectives for key areas. Issues from steps 1-3 (specific riparian functions in need of recovery or restoration, desired resource attributes, and potential) focus goals

and objectives. Riparian vegetation that traps sediment and stabilizes soil to slow runoff and expand zones of wetness, or increases forage productivity usually drive recovery and objectives.

Step 5 - Design and implement management and restoration actions. Many riparian grazing management strategies and a few principles have been shown to be effective (Swanson et al., 2015).

Step 6 - Monitor and analyze the effectiveness of actions by targeting the threats to riparian functions and targeted resource values. For many strategies in Swanson et al. (2015), the most useful short-term monitoring data will be dates of recovery from grazing. Long-term monitoring, photography and species composition with bare ground should be focused along the curved, lowest elevation or thalweg greenline where the strong roots of riparian stabilizers (usually wetland obligates) are most important for preventing erosion and capturing sediment. Cross section(s) transect(s) also document distribution of wetland species and bare ground. Surveying will track topography in relation to wetness and erosion.

Step 7 - Implement adaptive actions. Riparian management must be adjusted with learning from monitoring data. Monitoring short-term conformance with the plan, annual impacts of the implemented management and unplanned events like weather and fire helps interpret changes in resource attributes such as vegetation, to determine progress toward meeting long-term resource objectives. Cooperative analysis guides adjustment of management.

Results and Discussion: In the Elko Bureau of Land Management (BLM) District, remarkable success has been observed for several streams (Swanson et al., 2015). About half of the 3,500 lentic riparian areas had been PFC assessed by 2012 (Personal Comm., 2013, Pat Coffin, Elko BLM fish biologist, retired) and ¾ of the lentic hectares were functioning properly or improving. However, ¾ of the riparian areas (mostly small, but potentially critical to local wildlife) were functioning at risk with a static or downward trend or no longer functioned.

Conclusions and Implications: Past management has focused on large riparian areas. The foundations are in place for integrated lentic riparian management. The need is great to focus on at-risk and high value areas in need of better management. Tools and strategies developed for grazing management of lotic riparian areas need to be applied with monitoring focused on the driving variables for recovery.

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