

APPENDIX C

Drift Fence Specifications

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Summary:

The following is a set of specifications for demonstration drift fences in two locations – Moncrief Ranch, Kezar Basin and West Flat Top at Henkel Road, within the Upper Gunnison Basin, Colorado. The drift fences are as part of a larger restoration project to enhance resilience of riparian areas and wet meadows, important brood-rearing habitat for the Gunnison Sage-grouse. The drift fence design is intended to showcase a new method/technique of altering big game and cattle movements to help restore wet meadows within the sagebrush ecosystem. This is a project of the Gunnison Climate Working Group, a public - private partnership working to reduce the adverse impacts of climate change in the Gunnison Basin. The project team is interested in testing several different designs so we can evaluate construction costs, maintenance costs, effectiveness, and longevity over time, in addition to evaluating the effectiveness of this type of drift fence in restoring wet meadows/riparian areas.

Objectives:

The objectives of the demonstration drift fences are to:

1. Reduce wildlife and livestock trailing and the resultant soil compaction in wet meadows and riparian areas that serve as important brood-rearing habitat for the Gunnison Sage-grouse.
2. Alter livestock trailing and movement patterns, yet not contain them, withstand elk traffic and minimize threats/hazards to Gunnison Sage-grouse (mature birds and chicks).
3. Reduce further erosion in wet meadows and riparian areas.
4. Enlarge the wet meadow/riparian area and thus enhance the brood-rearing habitat

Minimum Standards for Proposed Drift Fences:

General and specific standards for the proposed drift fencing project are listed below. The Contractor shall follow general guidelines outlined in Hanophy (2009; Attachment B) and USFS specifications noted below for posts, driving depths, hole depths, etc. Our assumption is that one of the primary concerns is visibility of the new fences to the grouse, and to lesser degree cattle and elk.

Fences will meet the following general criteria:

- Be of the proper standard, location, orientation and alignment (follow flagged stakes marked by Bill Zeedyk) to change cattle movement patterns across the meadow, while serving as obstructions to movement.
- Be highly visible to Gunnison Sage-grouse so as not to impair grouse movements and to minimize risk of collision during flight.
- Not significantly increase the risk of predation by avian predators.
- Be highly visible to elk and resistant to damage by elk movements.

Specific standards include the following:

1. The fences should consist of three-strands of smooth wire (barbless barb wire), with 5.5' steel T-posts set on 12-foot centers.
 - a. Use 1.33 pound/ft. (heavy duty) steel posts (standard of USFS).

- b. The bottom wire shall be 20 inches above the ground surface, the middle wire 30 inches and the top wire 42 inches above the ground surface. Spec-heavy duty smooth wire (weighs 65+lbs per standard 1320 ft. spool). Lighter wires such as “gaucho” wire are not allowed.
 - c. The wires would be separated by two wooden stays at equal distances between posts, providing high visibility and enable grouse to fly over and other small animals to easily pass underneath.
 - d. On one fence at each location, use 5/8 inch aircraft cable or double the top wire by twisting two full strands together to strengthen the top strand, increase visibility and make it more resistant to elk damage.
2. Two wooden stays secured by minimum #11 wires to horizontal wires between T-posts keep the wire tight and increase visibility.
 - a. Stays should be round 3-4 “ diameter, 46” in height, consisting of lodgepole with the bark on, on four foot centers equally spaced between adjacent steel T-posts.
3. End posts to be wooden “H” braces installed according to US Forest Service standards.
 - a. Posts will be modified to prevent or minimize their use as raptor perches at the USFS site to address potential site conditions that might be encountered, i.e., extremely rocky ground, use pressure-treated wooden H-braces modified to discourage raptor use.
 - b. H-brace wood posts must be a minimum 6” diameter, 8 ft. tall, sunk to a minimum of 3 ft. Install one fence at each site with the ends being the “Amazing Brace” (with pre-fabricated metal frames) so that we can evaluate their cost effectiveness and lifespan.
4. Five foot 5 inch steel T-posts set on 12-foot centers, with posts set to a depth equal to depth of the flange top. Forest Service specifications regarding post depths:
 - a. Metal posts (T-posts) shall be driven to a depth that the ground is even with or above the top of the blade (flange).
 - b. Wood corner posts and brace posts shall be set a minimum of 36" into the ground. In locations where it is not reasonable to set corner posts due to extreme rocky conditions, 4'x4' rock boxes will be constructed on a leveled ground surface.
 - c. All soil around posts shall be compacted to the same density as the surrounding soil.
5. For the West Flat Top drift fences, install anti-perch devices, i.e., nixalite anti-perch material to dissuade raptor perching on all posts. This site has few to no perches for raptors and thus we need to minimize perching opportunities. The Moncrief Ranch site has multiple existing perches for raptors so this is not an issue.
6. To improve fence visibility to elk at one fence at each site, use at least one of the following marking techniques at each site, i.e., fence marking flags; aircraft cable; square stays; round stays, to allow assessment of comparing cost and effectiveness. See below for details.
7. West Flat Top: Two drift fences with lengths of approximately 92 ft. and 96 ft. (add 10% for estimate). Total length of drift fences is 188 ft. West Flat Top USFS drift fence specifications are:
 - a. The 92 ft. fence will be constructed with:
 - 6" diameter wooden H-braces at both ends
 - 3 strands of smooth wire
 - The top wire doubled/twisted.
 - b. The 96 ft. fence will be constructed with:

- Prefabricated Amazing braces at both ends of the fence
 - Consist of 3 strands of smooth wire
 - Single top wire with 1" diameter PVC pipe, etc. as described earlier in the SOW.
8. Moncrief Ranch, Kezar Basin: Three drift fences with lengths of approximately 105 ft., 151 ft., and 108 ft. (add 10% for estimate). Total length of the three drift fences is 366 ft.
- a. The 105 ft. fence will be constructed with:
 - Sawn square stays
 - b. The 151 ft. fence will be constructed with:
 - Round stays
 - c. The 108 ft. fence will be constructed with:
 - One Amazing Brace

Project Locations and Fence Lengths

Two locations on the USFS site and three locations were selected for the construction of drift fences angled across the valley bottom and linking with existing livestock trails situated on upslope locations paralleling the valley bottom. Sites were selected to be representative of valley conditions, but modest in length in order to test the validity of the method at reasonable cost. Additional locations for future expansion were identified if the method proves effective. Selected locations will alter trailing patterns without preventing access for grazing.

Specific locations are:

1. West Flat Top at Henkel Road (Section 36), northwest of the town of Gunnison: This site is managed by the US Forest Service.
2. Moncrief Ranch, Kezar Basin, south of Blue Mesa Reservoir: This site is privately owned.

Terms and Conditions

1. Contractor will visit the site and work closely with USFS staff (Matt Vazquez) on the West Flat Top at Henkel Road sites and the Ranch Manager (Ted Harter) for the Moncrief Ranch regarding agency specifications, materials needed (USFS may have some fencing materials available, e.g., steel posts, pressure treated wood posts), and access to the sites.
2. Contractor will construct the fence according to the specifications outlined above. If technical questions arise regarding the specifications, contact Betsy Neely (TNC) who will work with the Project Team that includes: CPW (Nathan Seward), Gunnison County (Jim Cochran), the Moncrief Ranch Manager (Ted Harter), and the USFS (Matt Vasquez) at the West Flat Top at Henkel Road site.
3. Project Team and land owner/manager will visit the completed work to ensure terms of this Scope of Work are met.

Citation

Hanophy, W. 2009. *Fencing with Wildlife in Mind*. Colorado Division of Wildlife, Denver, CO. 36 pp.