

## Fence Marking to Reduce Greater Sage-grouse (*Centrocercus urophasianus*) Collisions and Mortality near Farson, Wyoming – Summary of Interim Results

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**Background:** Fence collisions have been anecdotally reported to cause sage-grouse injury and mortality but few efforts have been made to quantify this concern and publish results. Our study was initiated after two falconers independently reported numerous sage-grouse mortalities on range fences in Sublette and Sweetwater Counties in Wyoming. One of these falconers subsequently began marking such fences with aluminum beverage cans in a volunteer effort to reduce these mortalities. Our study seeks to quantify the level of sage-grouse fence strikes and mortalities and test whether marking devices can effectively reduce collisions in a cost effective manner that is not visually intrusive. Our interim results are summarized below.

**Study Area:** Approximately 12 miles northeast of Farson, WY adjacent to Little Sandy Creek on the Sweetwater-Sublette County Line. Greater sage-grouse use the area in large numbers year-round. Two large leks (100+ males) are located within 2 miles of the fence. The creek and associated riparian area serve as late brood-rearing habitat and the fence bisects winter habitat for, at least, several hundred grouse.

**Study Dates:** These results are for the April 15, 2005 – May 14, 2009 period. The study is ongoing.

**Study Fence:** 3-wire BLM range fence that is approximately 7.6 km (4.7 mi) long. The fence generally runs from southwest to northeast but does so in a zigzag manner.

**Pretreatment data:** From April 15, 2005 through Nov. 16, 2007 pretreatment data were collected during 9 surveys where 1-3 observers documented evidence of wildlife fence strikes and mortality while driving 2-3 mph immediately adjacent to the fence. These surveys resulted in evidence of 170 bird strikes/mortalities and 2 pronghorn mortalities. Confirmed greater sage-grouse accounted for 146 (86%) of the 170 strikes/mortalities documented. The other 22 observations were of waterfowl (n=4; 2%), raptors (n=5; 3%), passerines (n=2; 1%), shorebirds (n=1; <1%), and unknown birds (n=12; 7%).

**Treatment/Control data:** From Nov. 16, 2007 through May 14, 2009 approximately 1.54 miles (2.5 km) of the fence was marked in approximately .26 mi (416 m) sections with either FireFly™ bird diverters (donated by FireFly Diverters LLC for this study) or homemade markers patterned after those developed and used by the University of Oklahoma's Sutton Avian Research Center [http://www.suttoncenter.org/fence\\_marking.html](http://www.suttoncenter.org/fence_marking.html) to reduce lesser prairie-chicken fence mortality. The later were modified with reflective tape to increase visibility in snow cover conditions. The fence was unmarked (control) for 3.2 miles (5 km). Marked sections were bounded on either

side by unmarked sections. Only the top wire was marked since very few collisions were documented on the lower two wires during pretreatment monitoring.

During the Nov. 16, 2007 through May 14, 2009 period, 6 surveys were conducted in the same manner as those conducted in the pretreatment phase of the study. Results suggest markers (all types combined) reduced bird fence collisions by 70% over unmarked sections. Seven (7) bird strikes, all sage-grouse, were documented in marked sections (4.55 strikes/mile) while 47 bird strikes (15.31 strikes/mile) were recorded in the unmarked sections. Thirty-six (36) of these were confirmed sage-grouse (11.73 strikes/mile). If only confirmed sage-grouse data are compared, the markers appear to have reduced grouse mortality by 61%.

**On-going/Future Efforts:** On May 14, 2009 the treatment sections were changed to control sections, the types of markers were changed, and more treatment sections were added. Half of the fence is now marked, alternating between sections of treatment and control. All of the markers are now based on the Sutton design. The FireFly I design has been eliminated from the study. Although it was highly effective (0 strikes), the price, maintenance and visibility of the device was not appropriate for wide scale use. With this information, the company, FireFly Diverters LLC, has applied their unique system of reflective/glow in the dark tape to the Sutton model and now markets a FireFly III Grouse Diverter (see attached) which we are currently testing along with other versions of the Sutton device to which different reflective tapes have been applied. Early indications suggest all of these markers will succeed and likely further decrease avian fence collisions beyond the 70% level suggested by our initial efforts reported above. We intend to attempt to publish our results after the next phase of the study is complete.

**Interim Management Recommendations:** Not every fence is a problem; those that tend to cause problems typically include one or more of the following characteristics: 1) constructed with steel t-posts, 2) are constructed near leks, 3) bisect winter concentration areas, and/or 4) border riparian areas. Areas of greater topographic relief (roughness) appear to have lower incidence of collisions apparently because the birds have to fly higher to avoid the ground. Avoid building fences within at least ¼ mile (preferably 0.6 mile) of leks. New and existing fences in these areas should be surveyed for evidence of grouse fence strikes before installing permanent fence markers. In brief, surveys can be conducted by walking, driving or riding slowly (2-3 mph) along the fence looking for carcasses or concentrations of feathers on the ground and individual feathers caught on top wire barbs. Evidence of fence strikes does not last long due to weather and scavengers. The discovery of fence strikes is therefore cause for mitigation. Where the decision has been made to mark a fence we currently recommend the top wire be marked with at least 2 markers of the Sutton design modified with high quality reflective tape. While we have yet to substantiate the need for reflective tape, untaped markers become essentially invisible with snow cover. Arrangements are being made to make markers available to ranchers at no cost. Contact the author for further information.

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