Hunter and Elk Response to Beetle Kill Management

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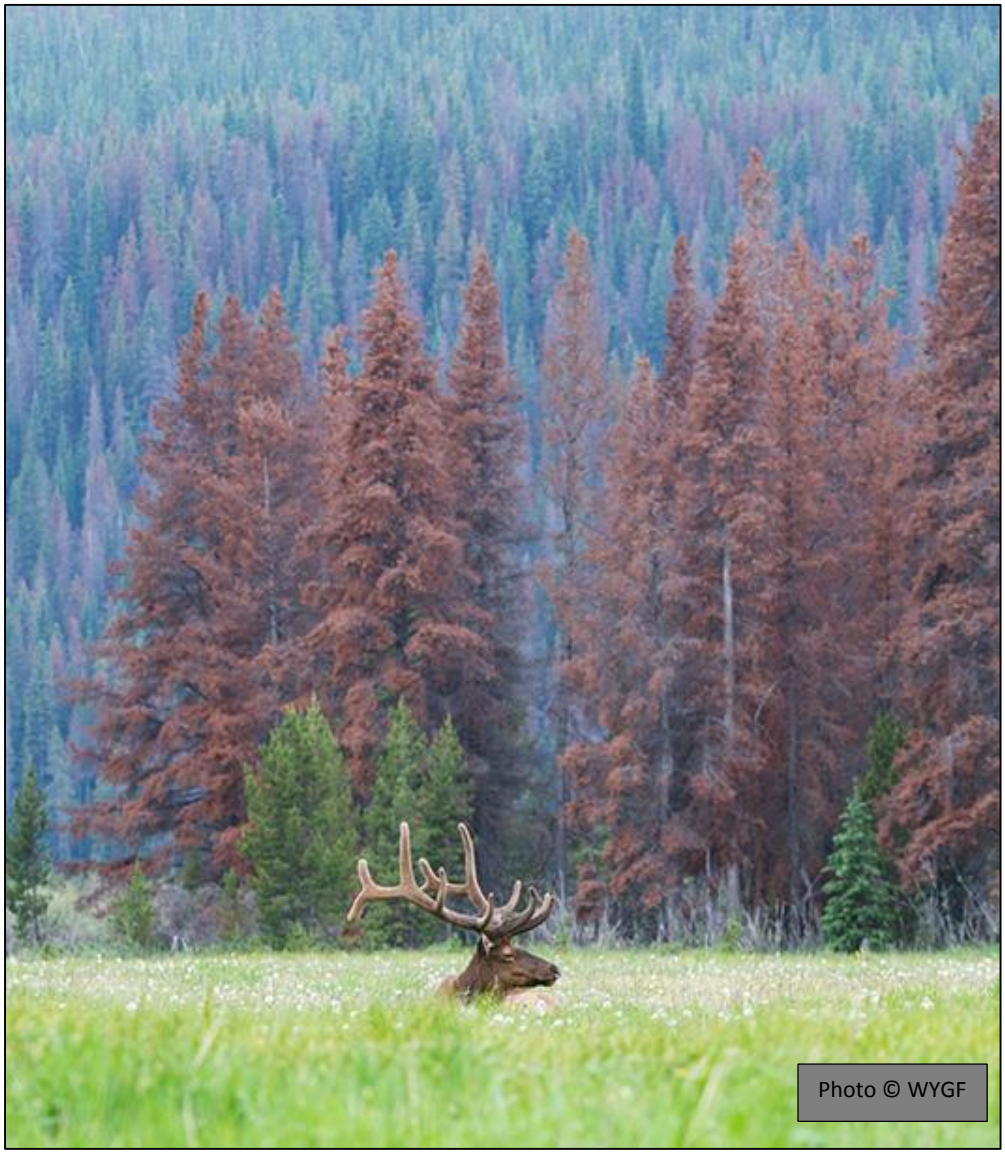

BACKGROUND

The Sierra Madre elk herd (SMEH) is one of the keystone elk herds in Wyoming. In 2012, the Wyoming Game and Fish Department began research to better understand the response of hunters and elk to the mountain pine beetle epidemic in the Sierra Madre range located in southern Wyoming. The funding to initiate the project was made possible by the Routt-Medicine Bow National Forest RAC. The specific objectives of the project are to evaluate changes in how elk use their summer ranges in the Sierra Madre forest, document any changes in hunter use and effort, and to evaluate how the effects of beetle kill on habitat use by both elk and hunters will influence elk vulnerability to hunter harvest. By gaining information related to these objectives, current management approaches may be altered by land and wildlife managers to better manage this elk population. Currently, the SMEH population size is estimated to be approximately 8,000, which is considerably higher than the population objective of 5,000. Some indication of impacts to forest ecosystem health has been well documented in the Sierra Madre range by both range staff and wildlife biologists. If a decrease of elk vulnerability to harvest does occur due to the beetle kill epidemic, the concern is that forest health could further be diminished as the SMEH population increases. Through this research, management activities may be identified to reduce the potential of an

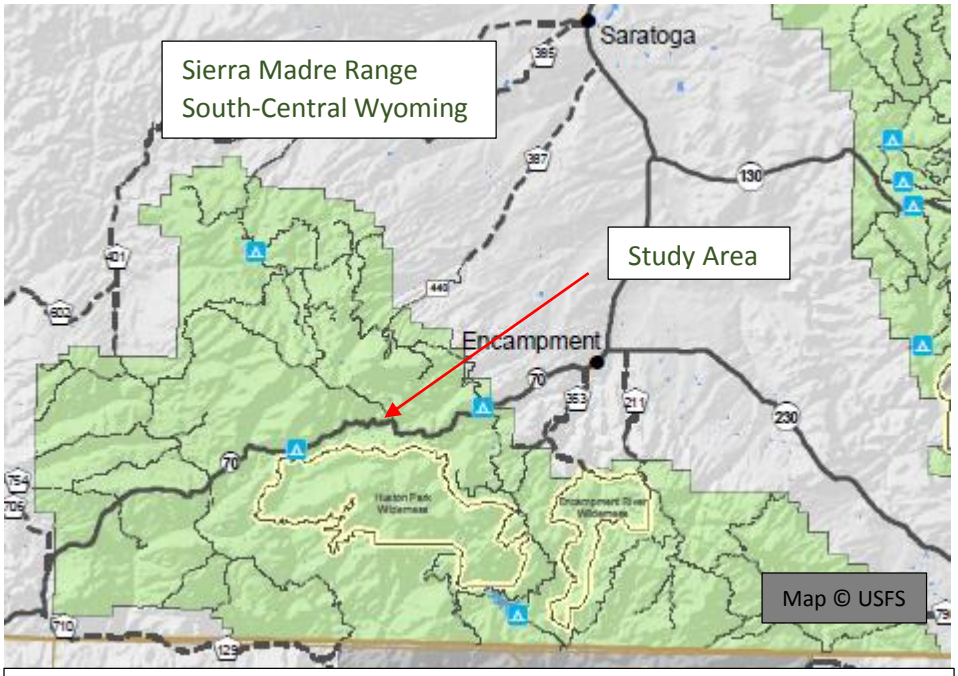

Figure 1. The research study area is located within the Routt-Medicine Bow National Forest in the Sierra Madre Range. The range is located in south-central Wyoming between the communities of Baggs and Encampment.

The beetle kill epidemic has made forests increasingly challenging for hunters to travel through. Scenes like this tangled group of conifers have become very common in the Sierra Madre Range.

increase in landscape degradation. In addition to a threat to forest health, if the way elk and hunters use the forest changes it could impact how many hunters hunt in the area. If hunters find it difficult to travel through the forest due to fallen trees from beetle kill, they may choose to hunt in other areas. This possible reduction in hunters may lead to a loss of revenue for the Wyoming Game and Fish Department, Carbon County and the local businesses located in Rawlins, Baggs, Saratoga, and Encampment.

Progress and Future Work

In 2014, Rocky Mountain Elk Foundation volunteers worked with Wyoming Game and Fish and Wyoming Cooperative Fish and Wildlife Research Unit staff to process 19 elk during a capture and collar operation.

In 2012, 26 GPS collars were placed on elk by the Wyoming Game and Fish Department (WGFD). With the help of Rocky Mountain Elk Foundation volunteers, the WGFD and the Wyoming Cooperative Fish and Wildlife Research Unit deployed 19 additional GPS collars in March 2014 over a 40-mile area of winter range for the SMEH. The data collected from the collars will help researchers better understand how the changing landscape due to beetle kill influences elk movements. This information will help direct land and wildlife management agencies when determining the best course of action to achieve forest regeneration in beetle kill areas on the Routt-Medicine Bow National Forest as well as other areas experiencing the epidemic.

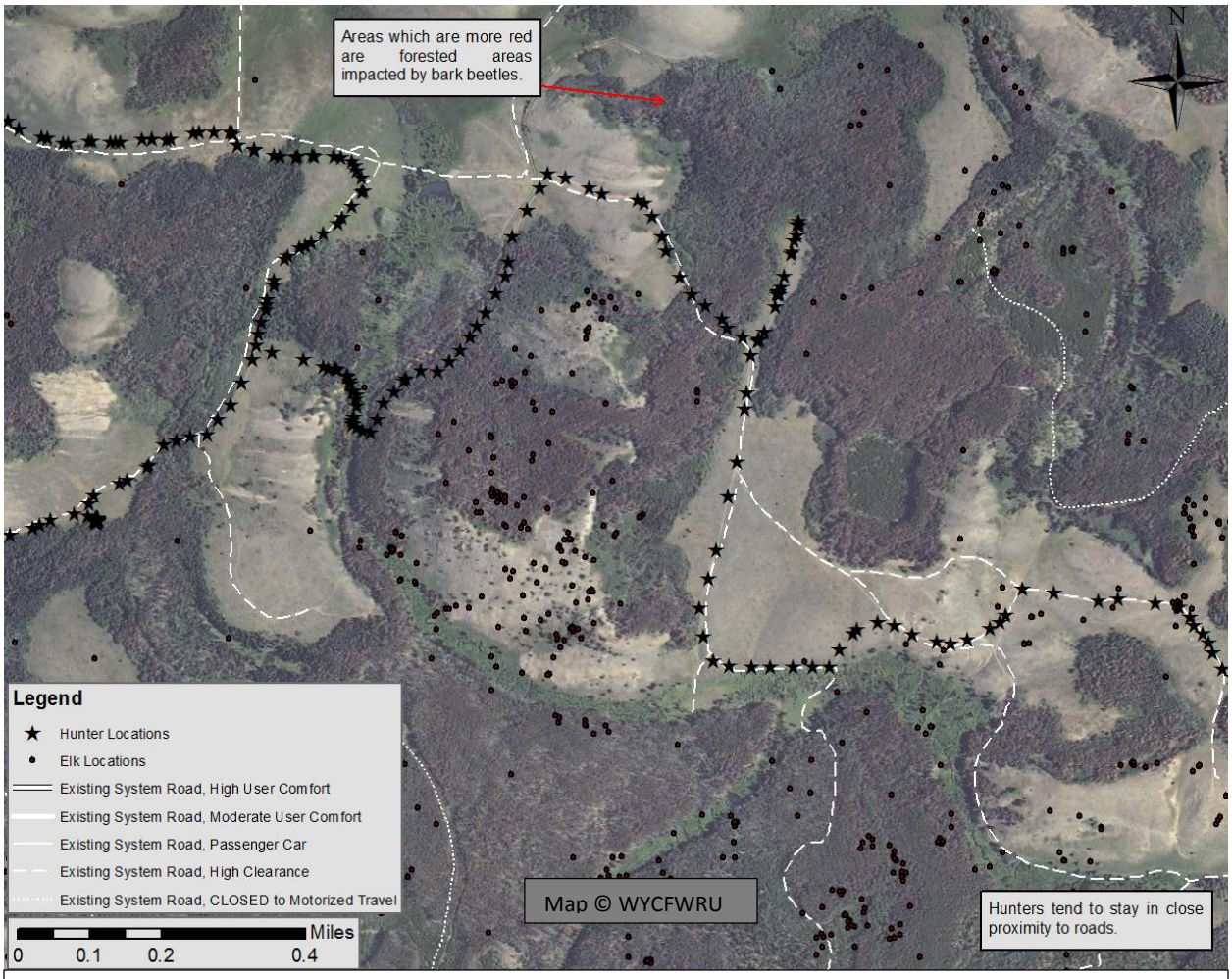

Figure 2. An initial analysis of 2012 data collected from the GPS collars of three elk, 57 hunters and vegetation classification gives a glimpse into the response of elk and hunters to the beetle kill epidemic. It can be seen that elk use both beetle kill and non-beetle kill areas. Hunters seem to stay close to roads and avoid beetle kill. This first analysis is merely an observation of a small sample of data points. Future work will incorporate a more robust sample and more sophisticated spatial and statistical analyses.

A Wyoming Cooperative Fish and Wildlife Research Unit graduate student was brought on to the project in August of 2014 and will work in collaboration with the research team to help gain a better understanding of elk and hunter response to the changing landscape as a result of the beetle kill epidemic. An analysis will be completed by the team to allow land and wildlife managers to determine appropriate management actions to be taken in the beetle kill area. Examining hunter and elk data on the Sierra Madres will allow us to determine the influence that beetle kill may have on elk and hunter distributions. On a landscape that is potentially fragmented by beetle killed stands of conifers, elk and/or hunters may shift their use of the landscape. Altered behavior of elk or elk hunters may influence elk vulnerability during the fall hunting seasons.

In December 2014, the initial 2012 GPS elk collars are scheduled to drop off allowing the research team to begin combining hunter and elk movement data. This is when the real power of the data will begin to be realized and start to allow for a better understanding of how beetle kill changes the way hunters and elk utilize the forest. Moving forward there will also be an intensive effort to incorporate a more sophisticated GIS vegetation classification analysis to gain a more detailed picture of the stage at which conifer trees are catogorized as a result of the beetle kill (Green, Red, Grey). Current available vegetation classification gives a very broad look, while this newly developed tool will allow researchers to better determine what type of habitat elk and hunters are using.

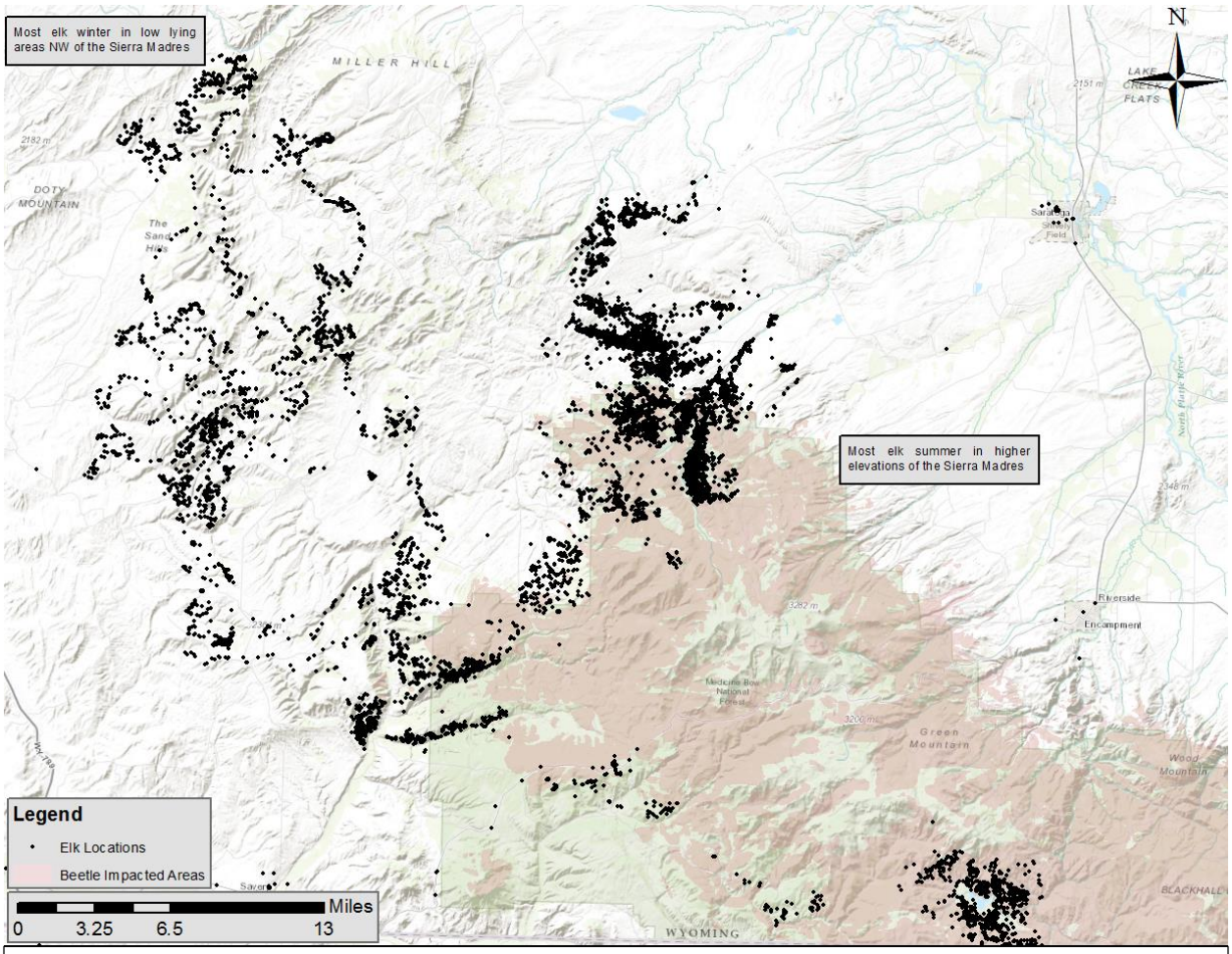

Figure 3. The above map shows locations of elk in relation to beetle kill in the SMEH study area. Wildlife managers have a strong understanding of the habitats elk inhabit throughout the year, but little is known about how a landscape-level disturbance such as the mountain pine beetle epidemic will influence elk and elk hunters into the future.

Hunters are an important part of this research. By agreeing to carry a researcher supplied GPS unit in their pack, a track of their hunting movements are captured. This information will later be analyzed along with elk movement and vegetation classification data.

During the 2012, 2013 and 2014 hunting seasons, 57, 70 and 170 hunters respectively, were randomly sampled and volunteered to participate in the study. Each hunter carried a GPS unit for one day of their hunt in the Sierra Madre elk herd study area. A track was generated by each hunter while in the field and later mapped after the GPS unit was collected. An effort will also be made in the 2015 hunting season to collect hunter data from at least 150 randomly selected participants for the year. This data will be critical in gaining a better understanding of the response of hunters to beetle kill areas in the Sierra Madre range.

Acknowledgments

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Little Snake River Conservation District