



Montana Fish, Wildlife & Parks

Targeted Elk Brucellosis Surveillance Project March 2016 Update

Elk capture and sampling efforts for the Targeted Elk Brucellosis Surveillance project occurred January 17th through February 23rd, 2016. Elk from 4 populations along the eastern portion of the Absaroka Mountain range between Big Timber and Red Lodge were screened for exposure to brucellosis. Additionally, elk captured in previous years of this project were recaptured for continued monitoring and/or collar removal (Figure 1).

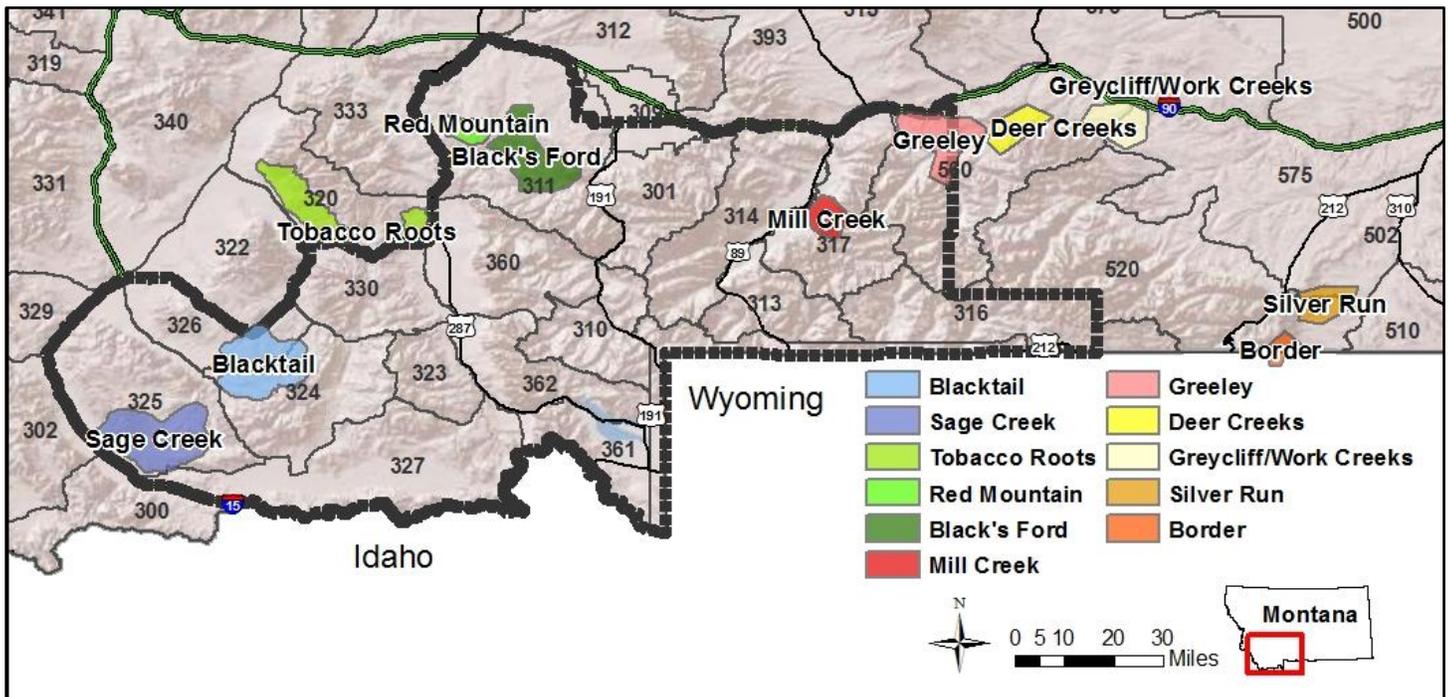


Figure 1. Elk populations that have been screened for exposure to brucellosis as part of the Targeted Elk Brucellosis Surveillance Project during 2011 - 2016.

Brucellosis sampling along the eastern Absaroka Mountain Range

During January 19 - 25, a total of 94 adult (i.e., ≥ 1.5 years old) elk from 4 elk populations were captured and sampled for exposure to brucellosis. Blood was collected in the field and later screened for exposure to brucellosis at the Department of Livestock (DOL) Diagnostic Laboratory. In addition, we received and screened 3 blood samples from hunter-harvested female elk within the area. We found a total of 6 elk from the WY-MT Border elk population south of Red Lodge that tested positive for brucellosis (Table 1, Figure 2). All other elk tested negative for exposure to brucellosis (Figures 2 & 3).

Table 1. The total number of elk sampled and the number of seropositive elk in wintering populations along the eastern portion of the Absaroka Mountain range in January 2016. The numbers in parentheses represent the lower and upper bounds of the 95% confidence interval on the seroprevalence estimate.

Population	Total Elk	Seropositive	Seroprevalence	GPS Collars
Border	16	6	0.38 (0.18, 0.61)	13
Silver Run	19*	0	0 (0, 0.17)	11
Deer Creeks	30	0	0 (0, 0.11)	4
Greycliff /Work Creeks	32	0	0 (0, 0.11)	3

*Includes 3 hunter-harvest samples.

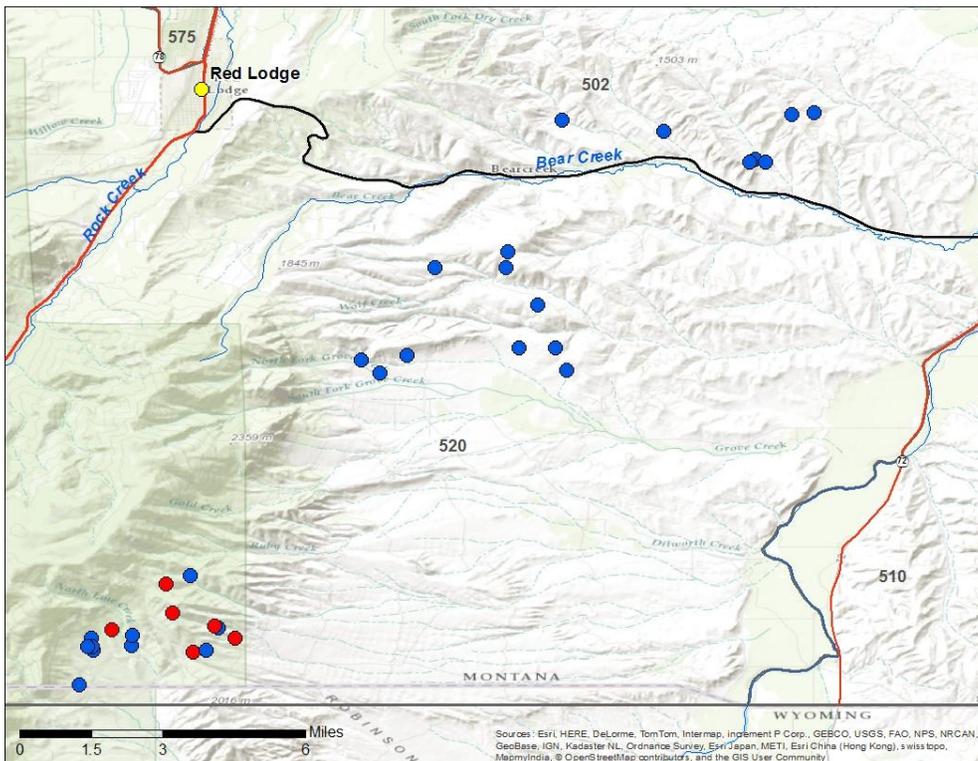


Figure 2. Capture locations of 6 seropositive (red) and 26 seronegative (blue) elk in the Border and Silver Run elk populations near Red Lodge, MT.

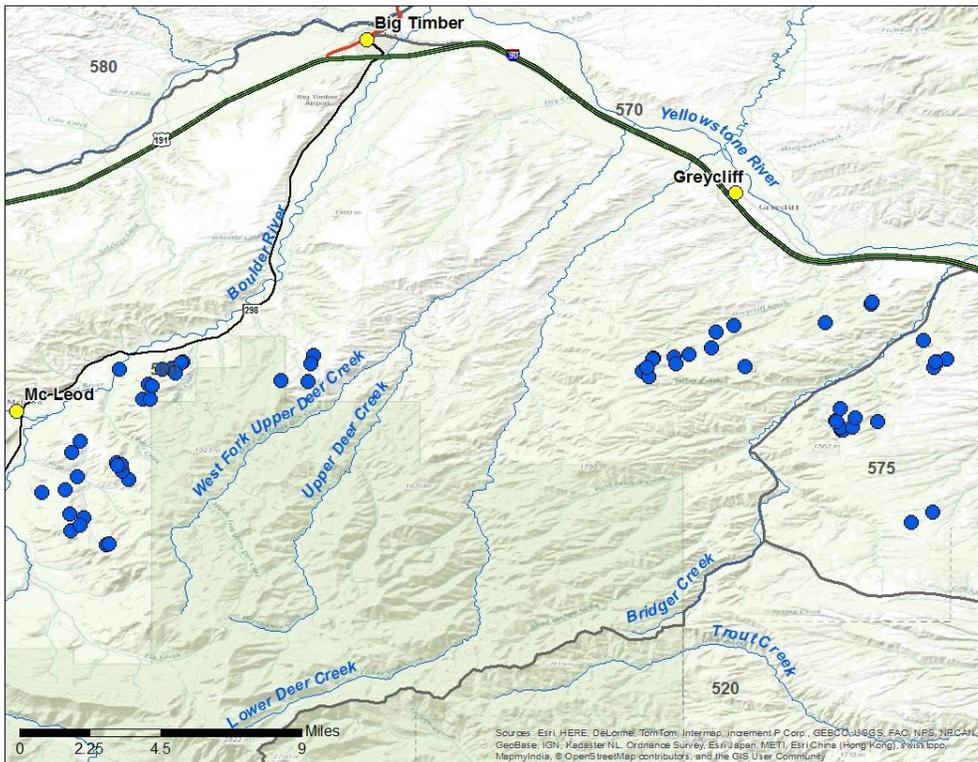


Figure 3. Capture locations of 62 seronegative elk in the Deer Creeks and Greycliff /Work Creeks elk populations near Big Timber, MT.

To better understand the potential for elk to elk and elk to livestock brucellosis transmission risk, we deployed GPS collars on a sample of elk to document fine-scale elk movement patterns during the risk period and elk interchange between populations (Table 1). All collars will record the elk’s location every 30 minutes and store the GPS data onboard. These collars are equipped with automatic release mechanisms that will allow the collar to drop off in March 2017.

Recaptures of Seropositive Elk

Seropositive elk captured and collared during the first 5-years of the Targeted Elk Brucellosis Surveillance Project are recaptured and sampled annually for five years in order to monitor their brucellosis serology (i.e., seropositive, seronegative), reproductive status (e.g., pregnancy, abortion, live birth), and evaluate their ability to shed *Brucella* on the landscape. During each capture, a blood sample is collected and screened for exposure to brucellosis. Pregnancy status is determined via rectal palpation and all pregnant elk receive a Vaginal Implant Transmitter (VIT) that is used to monitor the fate of the pregnancy. VITs are expelled during the birthing process. Elk with VITs are tracked at least twice per week until the VIT is expelled. Monitoring VITs will allow biologists to determine the timing and location of birthing events, and determine the potential for seropositive elk to shed *Brucella abortus* on the landscape. Following 5 years of monitoring, elk are removed



from the population, necropsied, and tissues are sampled to determine if they are actively infected with brucellosis. Active infection is determined by culturing (i.e., growing) *Brucella abortus* bacteria from tissue samples, as opposed to serology which only detects antibodies to the bacteria in the blood.



In the Black’s Ford area, we recaptured all 7 seropositive elk (Figure 4). Three out of the 7 elk were pregnant and received VITs (Table 2). One of the pregnant seropositive elk died 32 days after capture due to capture related injuries. Currently there are 2 elk in Black’s Ford with VITs being monitored. In the Greeley area, we recaptured 2 seropositive elk (Figure 5). Neither elk was pregnant. In the Mill Creek area, we recaptured 14 seropositive elk (Figure 5). Nine out of the 14 elk were pregnant and received VITs (Table 2). One of the pregnant seropositive elk died. Currently there are 8 elk in Mill Creek with VITs being monitored. In the Sage Creek area, we recaptured the 1 seropositive elk (Figure 6). This elk was not pregnant (Table 2). Three seropositive elk from Sage Creek were harvested in the fall, reducing the number of seropositive elk being monitored in Sage Creek from the previous reports.

Table 2. Seropositive elk with VITs being tracked for the 2016 parturition season.

Population	Seropositive Elk	Elk with VITs
Sage Creek	1	0
Black’s Ford	7	2*
Mill Creek	14	8*
Greeley	2	0

*1 Pregnant elk in this herd died from capture related injuries and is not included here.

Two seropositive elk from the Blacktail population and 1 seropositive elk from the Wall Creek population that had been monitored for 5-years were euthanized and transported to the DOL Diagnostic Laboratory for necropsy (Figure 6). Numerous tissues are being culture tested for *Brucella abortus*. One of the Blacktail elk seroreverted (i.e., tested seronegative) this year, but has tested seropositive the last 4 years. Two seropositive elk from the Blacktail area were harvested in the fall, reducing the number of seropositive elk being monitored in Blacktail from the previous reports.

In addition to the seropositive recaptures, 9 seronegative radiocollared elk from the Tobacco Root Mountains, Red Mountain, and Black’s Ford populations were recaptured (Figures 4 & 7). The automatic release mechanisms on these collars failed, and the radiocollars were removed in order to retrieve the GPS data.

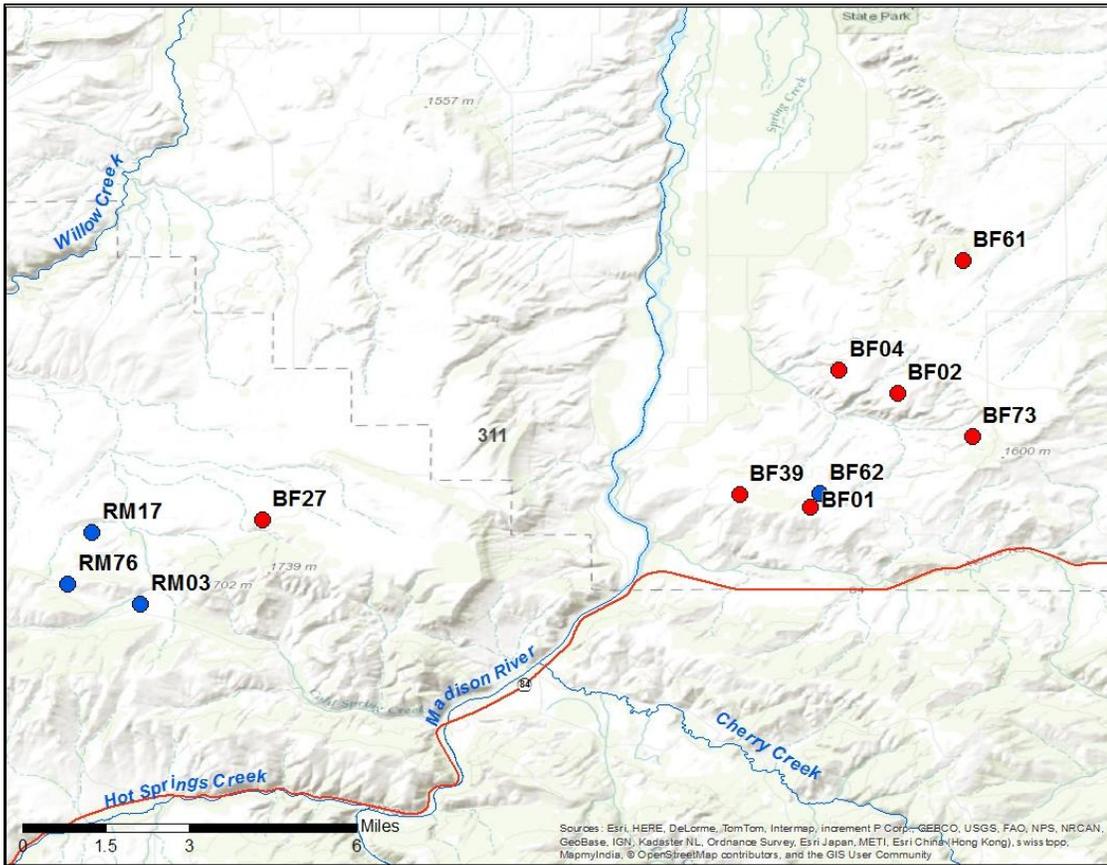


Figure 4. Capture locations of 7 seropositive (red) and 4 seronegative elk (blue) in the Black's Ford and Red Mountain populations near Bozeman, MT.

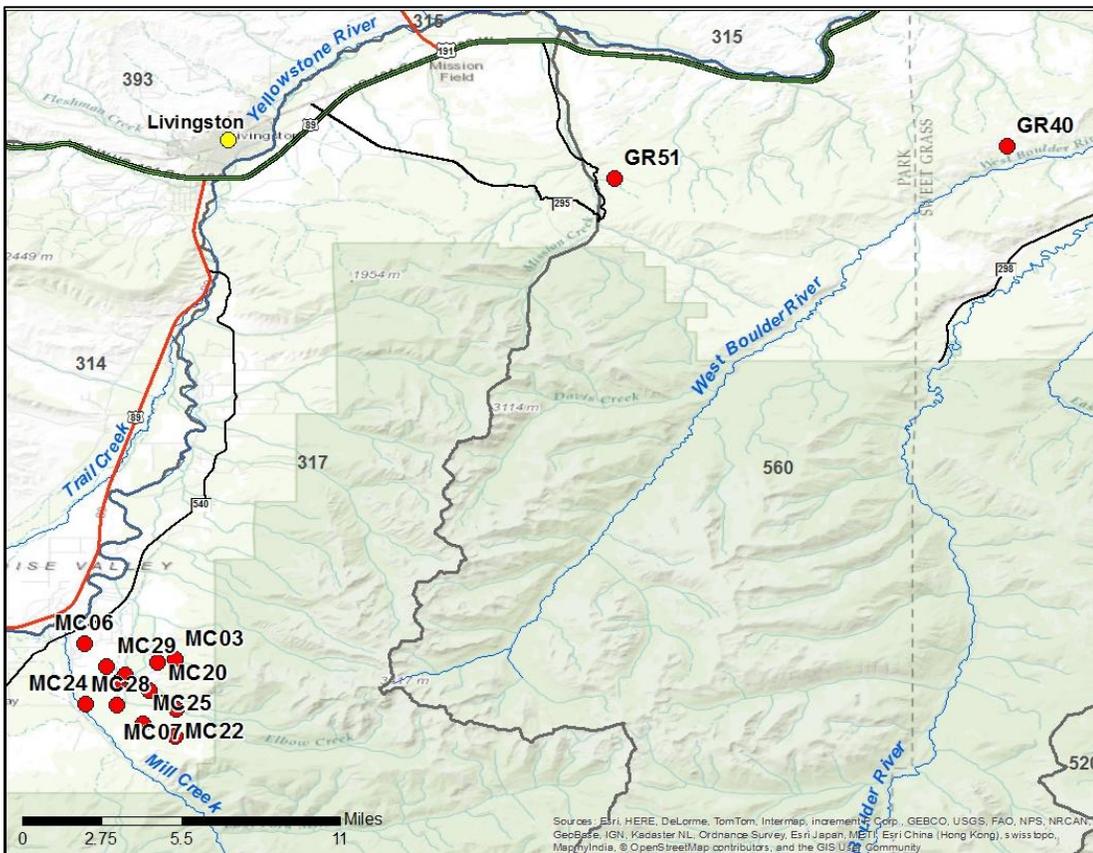


Figure 5. Capture locations of 16 seropositive (red) elk in the Mill Creek and Greeley populations near Livingston, MT.

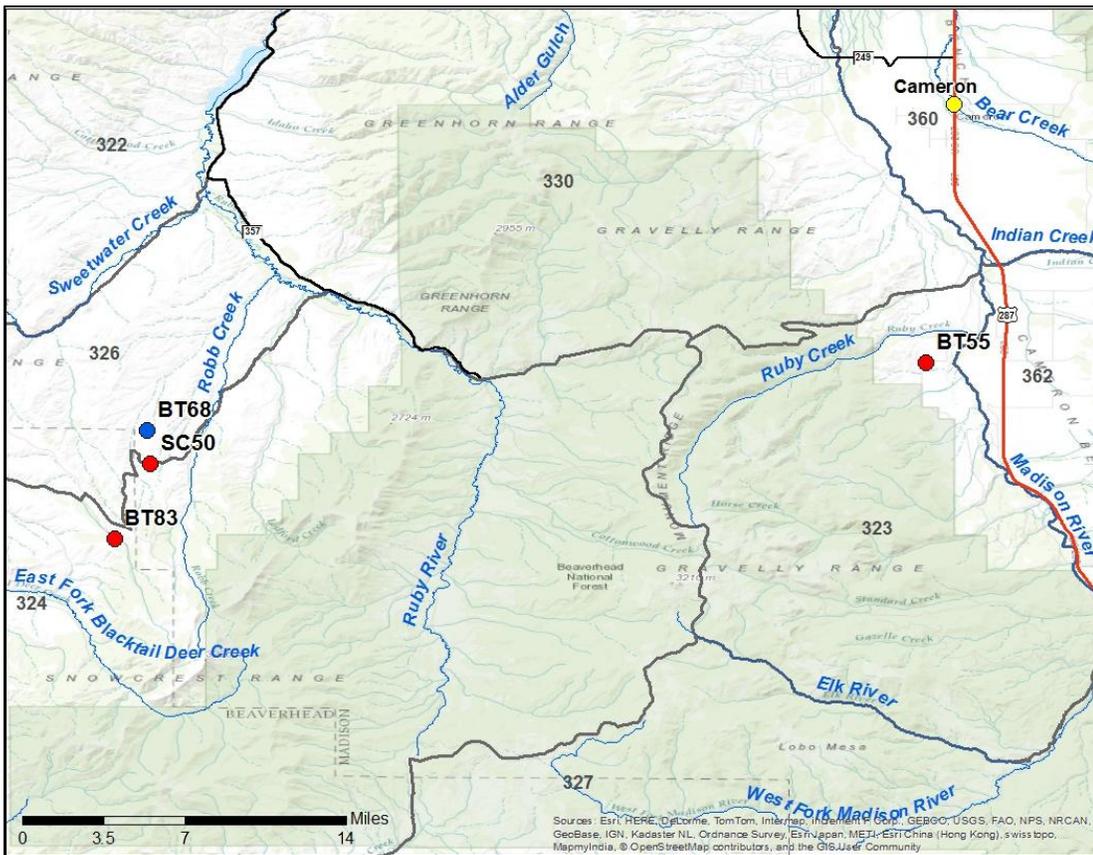


Figure 6. Capture locations of 4 seropositive elk in the Sage Creek, Blacktail and Wall Creek populations. BT68 (blue) tested seronegative this year, but has tested seropositive the past 4 years.

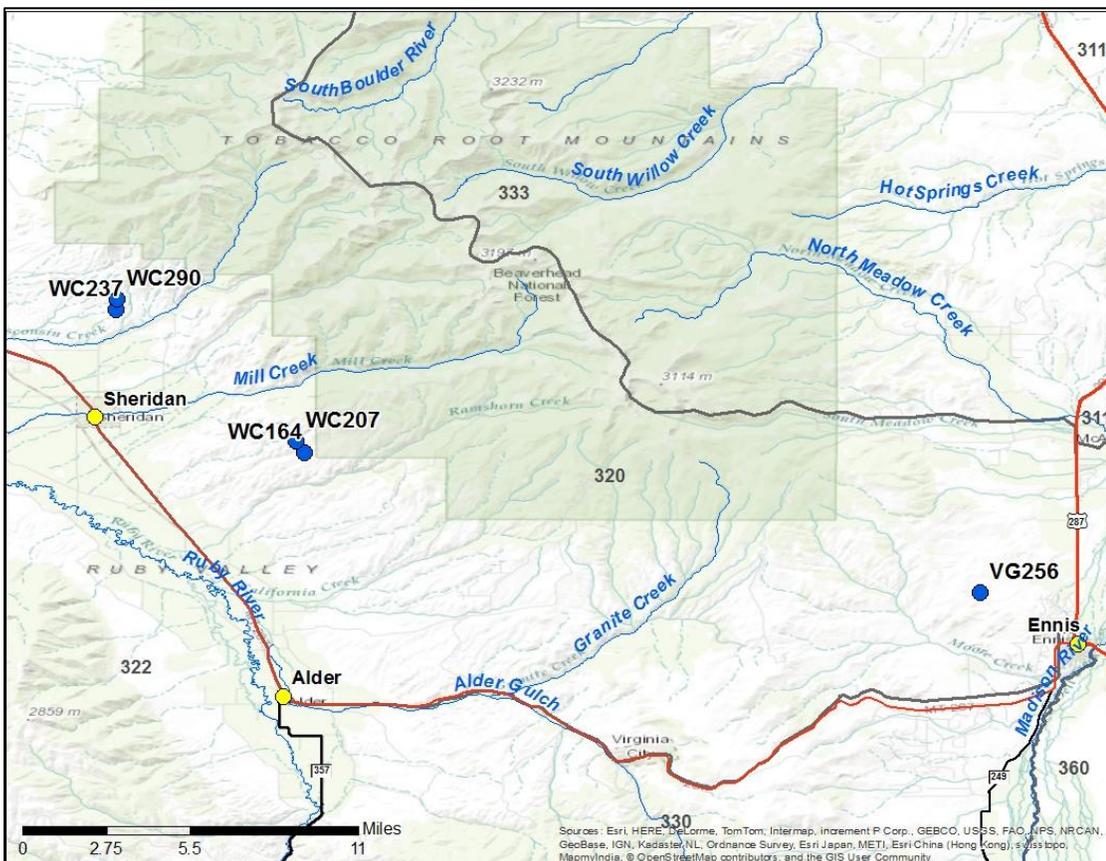


Figure 7. Capture locations of 5 seronegative (blue) elk in Tobacco Root Mountain populations.

There are currently 29 radiocollars on seronegative elk in Greeley, Mill Creek, Black's Ford, Red Mountain, and the Tobacco Roots (Figure 7). These radiocollars were deployed during the 2014 and 2015 capture seasons and their automatic release mechanisms will be dropping the collars in the next year when they will be retrieved and their GPS data downloaded.

A sincere thank you to all FWP personnel, the Quicksilver helicopter capture crew, and landowners within the study areas. This research would not be possible without your efforts and support. For additional information, please contact Jenny Jones 406-579-7128, jennyjones@mt.gov.

