

Elk Brucellosis Surveillance and Research in Montana



Targeted Surveillance Program

- 2011 – 2015
- Objectives:
 1. Evaluate prevalence and spatial extent of brucellosis
 2. Evaluate extent of elk interchange between infected and adjacent elk herds
 3. Evaluate risk of seropositive elk shedding *B. abortus*
 4. Estimate transmission risk to cattle

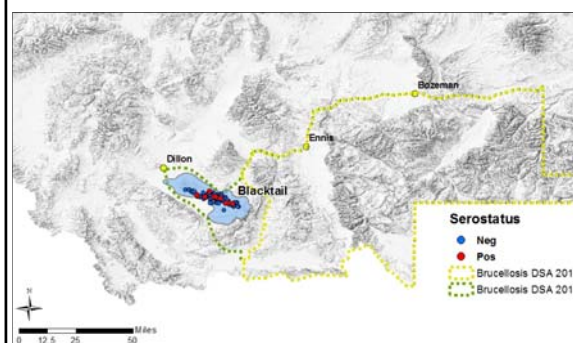


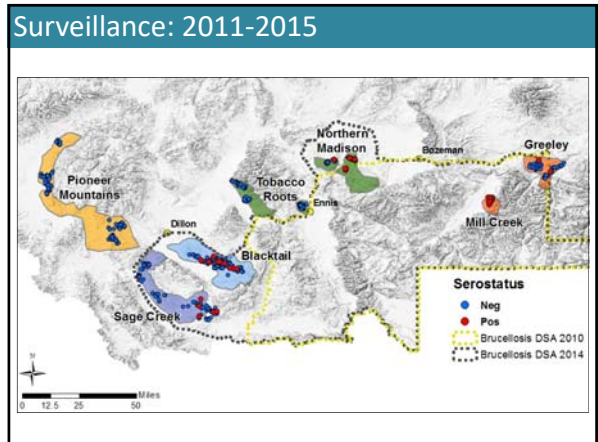
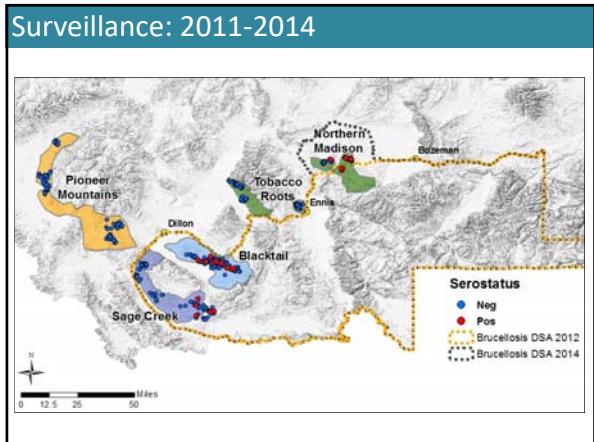
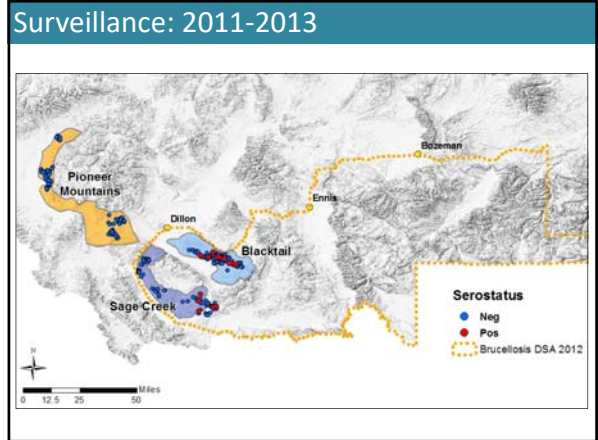
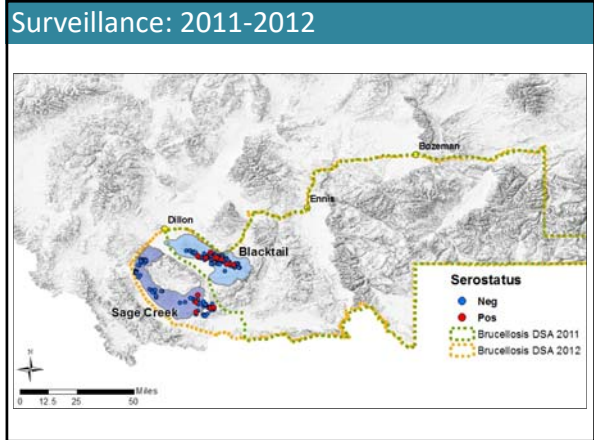
Methods

- Capture up to 100 elk per study area/recapture seropositives/remove after 5 years
- Field test for *B. abortus*
 - VIT for pregnant seropositive cows
 - Radiocollar field positive elk plus a random sample of seronegative elk
 - Serologic testing conducted at Montana Department of Livestock Diagnostic Laboratory.



Surveillance: 2011



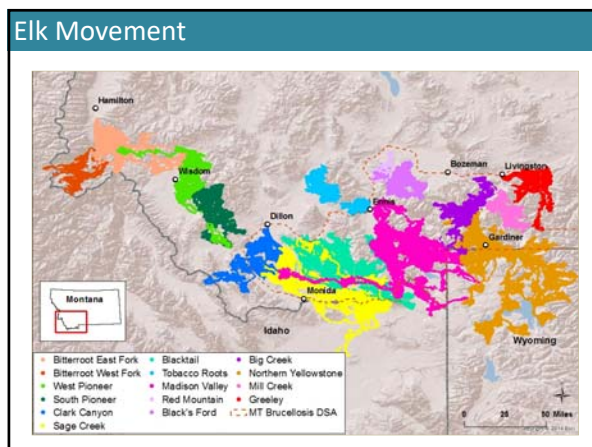
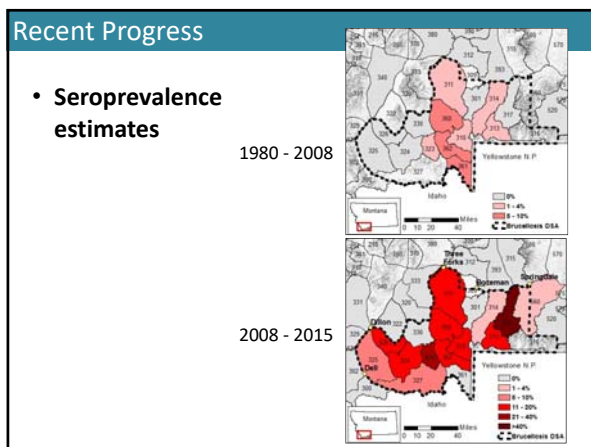


Herd	Total Pregnancies Monitored*	Confirmed Abortions	Suspected Abortions	Confirmed Live Birth	Suspected Live Birth*	Unknown
Blacktail	19	1	0	9	7	2
Sage Creek	14	1	0	7	6	0
Pioneer Mtns	0	0	0	0	0	0
Tabacco Root	0	0	0	0	0	0
North Madison	8	0	1	3	4	0
Mill Creek	9	0	0	4	4	1
Greeley	2	0	0	0	1	4
Total	52	2	1	23	22	4

Total number of seropositive elk pregnancies monitored in each study area during 2011-2015, the number of confirmed or suspected abortions, the number of confirmed or suspected live births, and the number of unknown events.


Herd	Confirmed or Suspected Abortions	Brucella detections	Confirmed or Suspected Live Births	Brucella detections
Blacktail	1	1	16	0
Sage Creek	1	1	13	0
North Madison	1	1	7	0
Mill Creek	0	0	8	1
Greeley	0	0	1	0
Total	3	3	45	1

Total number of abortion and live birth events and the number of cases per birth event category from which Brucella was detected in each study area during 2011-2015



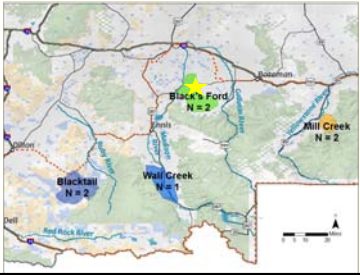
Winter 2015-2016

- First year for removal of seropositive animals
- Continue recapture and birth site monitoring of seropositive animals captured 2011-2015
- Continue surveillance east of the DSA (Silver Run, Deer Creeks, Grey Cliff and Work Creeks, Border elk). No longer doing field testing, VIT placement, and birth site monitoring.




2016 Seropositive Removals

- ▣ 3 seropositive Blacktail elk
 - Euthanized in field
 - Necropsy & tissue sampling at DOL Diagnostic Lab
- ▣ 4 seropositive mortalities



2016 Seropositive Removals: Serology

Serology 2011-2016							
ElkID	Age	2011	2012	2013	2014	2015	2016
BT55	4	Pos	Pos	Pos	Pos	Pos	Pos
BT68	8	Pos	Pos	Pos	Pos	Pos	Neg
BT83	8	Pos	Pos	Pos	Neg	Neg	Pos
BF02	5	---	---	---	Pos	Pos	Pos
BF39*	7	---	---	---	Pos	Pos	Pos
MC03	8	---	---	---	---	Pos	Pos
MC07	4	---	---	---	---	Pos	Pos

2016 Seropositive Removals: Reproduction



Pregnancy and Birth Events 2011-2016						
ElkID	2011	2012	2013	2014	2015	2016
BT55	Open	Open	Open	Open	Open	Open
BT68	Live Birth	Live Birth	Live Birth	Live Birth	Live Birth	Open
BT83	Live Birth	Live Birth	Live Birth	Live Birth	Live Birth	Open
BF02	---	---	---	Open	Live Birth	Preg
BF39*	---	---	---	Live Birth	Live Birth	Open
MC03	---	---	---	---	Live Birth	Preg
MC07	---	---	---	---	Live Birth	Preg



2016 Birth Event Monitoring




Herd	Abortion	Live Birth	Brucella
Mill Creek*	0	6	Not Detected
N. Madison	0	2	Not Detected

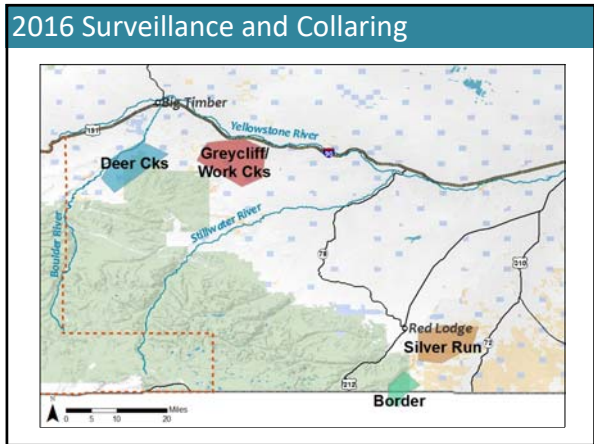
*1 elk retained her VIT

Seropositive Birth Site Sampling: 2011-2016

Pregnancy Fate	Brucella NOT Detected	Brucella Detected
Live Birth (95%)	52	1
Abortion (5%)	0	3

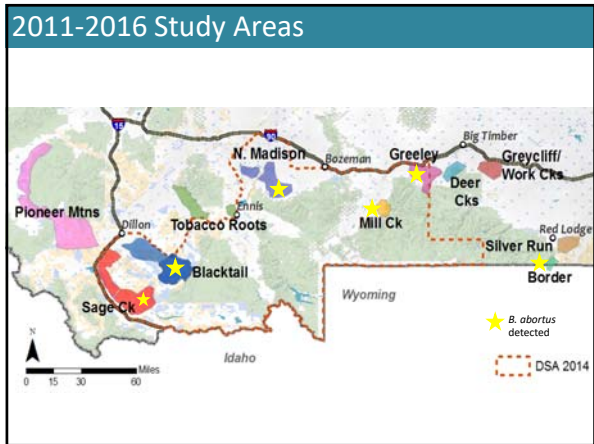






2016 Serology Testing

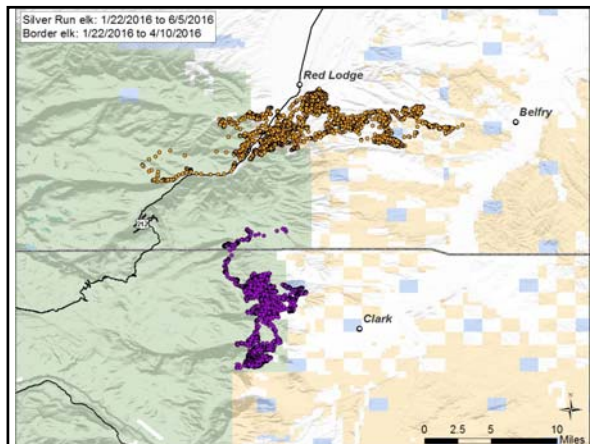
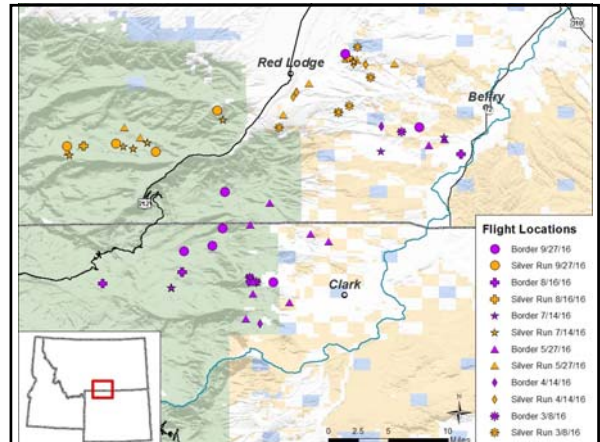
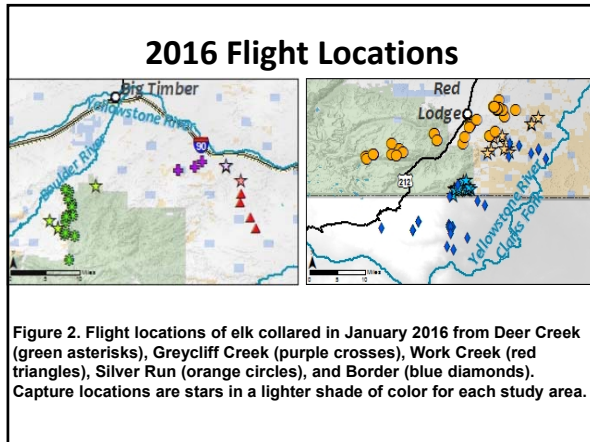
Population	Total Samples	Seropositive	Seroprevalence	GPS Collars
Border	16	6	0.38 (0.18, 0.61)	13
Silver Run	19*	0	0 (0, 0.17)	11
Greycliff/Work Creeks	32	0	0 (0, 0.11)	4
Deer Creeks	30	0	0 (0, 0.11)	3

*Includes 3 hunter-harvest samples.



Surveillance: 2011-2016

Year	Population	Total Tested	Seroprevalence
2011	Blacktail	100	12% (7 - 20%)
2012	Sage Creek	93	5% (2 - 12%)
2013	Pioneer Mtns	100	0% (0 - 4%)
2014	Tobacco Roots	70	0% (0 - 5%)
2014	N. Madison	60	17% (9 - 28%)
2015	Mill Creek	30	53% (36 - 70%)
2015	Greeley	63	3% (1 - 11%)
2016	Border Area	16	38% (18 - 61%)
2016	Silver Run	19	0% (0 - 17%)
2016	Deer Creeks	30	0% (0 - 11%)
2016	Greycliff & Work Creeks	32	0% (0 - 11%)



Future Work

- Finish 5-year monitoring of seropositive elk pregnancies
- Continue removal and testing of seropositive elk after 5 years
- Evaluate effectiveness of management actions
 - 40 radiocollars, likely in Paradise Valley and Dillon area
 - Alter elk distribution to reduce risk
- Estimate transmission risk
- More targeted surveillance in Silver Run



Funding

- APHIS through MDOL
- MFWP
- RMEF

Support

- MT Department of Livestock
- MFWP Biologists, Wardens & Pilots
- Landowners
- Sportsmen and women
- Brucellosis Working Group
- Project Technicians

