Introduction

The Clarks Fork Elk Herd Unit (CFEHU – E217) covers the area between the North Fork of the Shoshone River/Sunlight Creek Divide north to the Montana state line, and the area west of the Bighorn River and north of U.S. Highway 14-16-20 to the Yellowstone National Park (YNP) boundary. Habitat types range from alpine to sagebrush-grasslands. Land ownership is comprised mostly of United States Department of Agriculture Forest Service (USFS), Bureau of Land Management (BLM), State of Wyoming, and private lands. The CFEHU contains three elk hunt areas (HA): 51, 53, and 54 (Figure 1), all with limited quota hunting seasons. The CFEHU is managed using Special Management criteria, which establishes a postseason observed bull ratio between 30-40 bulls per 100 cows, with 62% to 75% of the bull harvest comprised of branch antlered (2+ yrs) bulls. The population objective is a mid-winter trend count of 3,300 elk (± 20%), totaled among three subunits or HA count block objectives: HA51 (n=1800), HA53 (n=600), and HA54 (n=900). Trend counts use a 3-year running average to compare to the objective. The most recent (2014) post-season trend count 3-year running average is 3,700, among HA51 (n=1789), HA53 (n=660), and HA54 (n=1260) subunits.

Elk populations increased dramatically following the wildfires of 1988, which burned and improved, elk habitat in this herd unit both inside and outside of YNP. Elk numbers peaked in the late 1990s, coinciding with (or perhaps causing) an eastward expansion and establishment of a non-migratory segment of this herd. During the early to mid 2000s, this elk population started to decline due to low calf productivity, and the population could not sustain the general season harvest levels. The Wyoming Game and Fish Department (WGFD) formed a citizen working group to help evaluate management options and the season structure was changed to limited quota licensing scheme in 2011. In 2010, the University of Wyoming completed a large-scale elk research project investigating the low productivity and movement patterns of the herd, and confirmed there were two population segments; a migratory

segment (HA 51 and 53) with poor calf productivity and a resident segment (HA 54) with good calf productivity. From these findings, we modified HA boundaries to better distribute harvest among the two herd segments when evaluating the population objective in 2013. The old Clarks Fork HAs were 50, 51, 52, 53, 54, 65, and 121, and were modified in 2013 into HAs 51, 53, and 54 based on movement data from the Absaroka Elk Ecology Study. The Heart Mountain Hunter Management Area (HMA) allowed hunters to access specific parcels of private land to increase antlerless harvest on the resident elk segment in the CFEHU near Heart Mountain. Hunter access to private lands, potential damage issues, brucellosis and large predator influences will continue to be major issues in managing this elk herd. Brucellosis seroprevalence in the CFEHU has varied since 1991 and ranged from 0% to 15.2% (Figure 2) (Table 1).

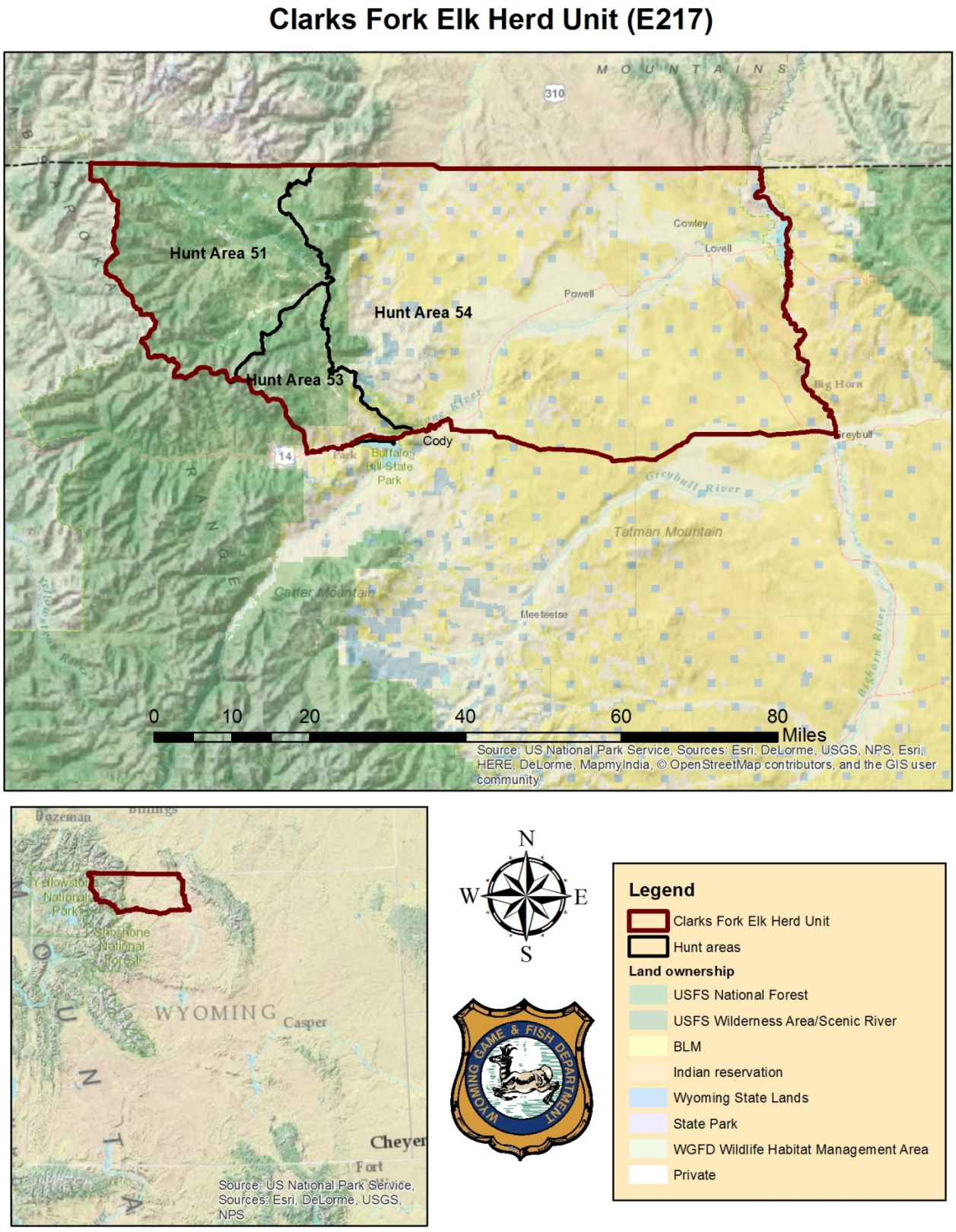

Figure 1. Clarks Fork Elk Herd Unit (E217) location, boundaries and hunt areas.

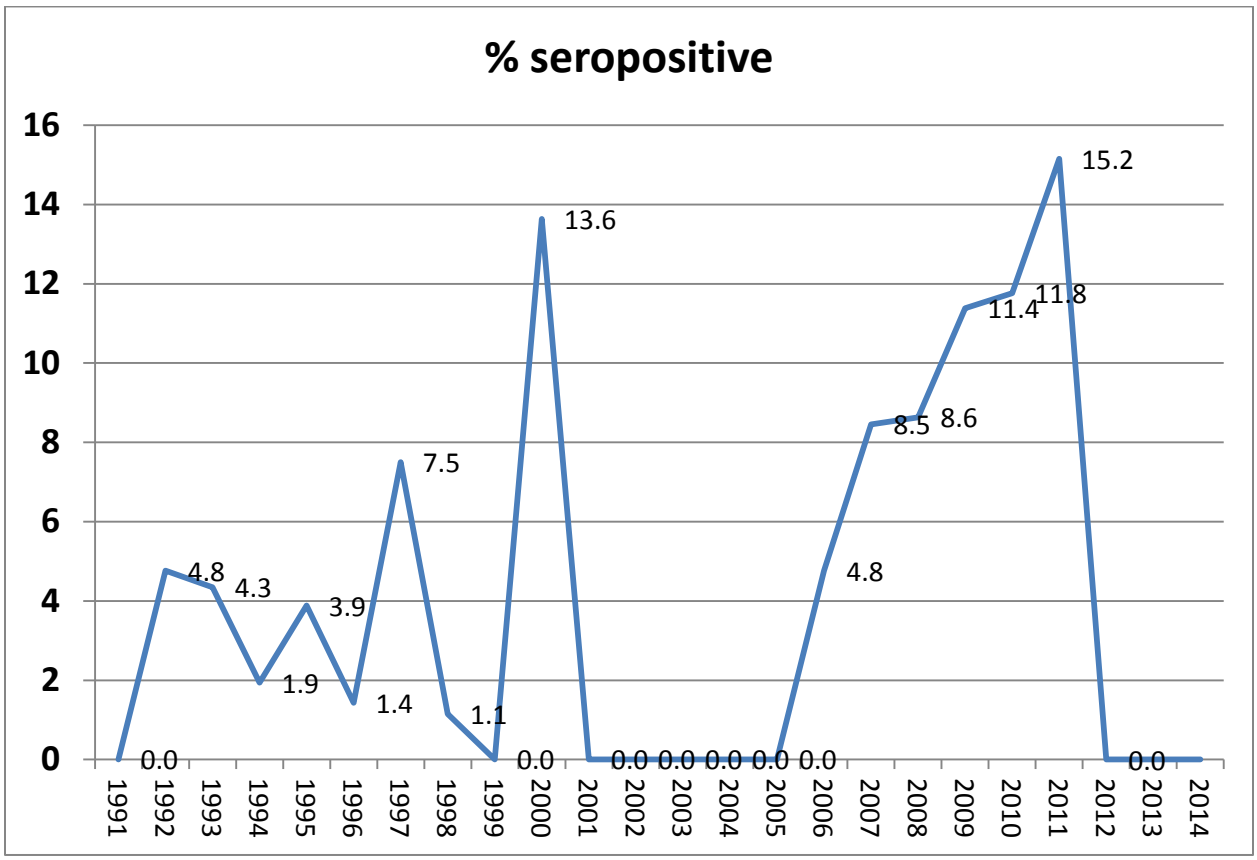

Figure 2. Brucellosis seroprevalence (males and females tested) in the CFEHU from 1991 to 2012. No blood samples were collected from 2001-2005. Only 11 samples were collected from 2012-2014 with no seropositives.

Goals & Objectives

In February 2004, Wyoming lost its brucellosis class-free status when 31 reactor cattle were detected in a Sublette County herd (Wyoming Brucellosis Coordination Team [WBCT] 2005). Infection of these cattle likely originated from elk on the nearby Muddy Creek Feedground. Following this loss of class-free status, increased surveillance of Wyoming cattle revealed a series of herds with the disease in the Greater Yellowstone Ecosystem ([GYE];WBCT 2005).

To develop management strategies regarding brucellosis in the GYE of western Wyoming and regain brucellosis class-free status, the WBCT identified the Brucellosis Management Action Plan (BMAP) process as their highest priority recommendation (WBCT 2005). BMAPs have already been finalized

for each of seven elk herds in the Jackson and Pinedale Regions containing elk feedgrounds, the Jackson Bison Herd and the Absaroka Bison Management Area. The Cody Elk Herd BMAP was completed in the early spring of 2012.

The objectives of this BMAP are to: 1) document available data regarding brucellosis in the CFEHU, 2) use data to develop management actions to reduce risk of brucellosis transmission among elk and from elk to cattle, and 3) select appropriate management actions for implementation in the CFEHU.

This BMAP, includes data and information relevant to understanding, formulating, and implementing management actions. This plan will be reviewed every five years. Our periodic review of this document will incorporate new brucellosis research results, management protocols, and governmental agency and non-governmental organization recommendations.

Public Involvement in this BMAP

Between 2005 and 2007, BMAPs were developed for each of seven elk herds associated with feedgrounds in the Jackson and Pinedale Regions. The Cody elk herd was completed spring 2012. The WGFD followed the WBCT recommendations to coordinate with cattle producers, land management agencies, and livestock disease regulatory agencies. Opportunity for public feedback on BMAPs was provided at WBCT meetings and other BMAP public meetings when each plan was finalized. We plan to hold public information and producer meetings for this BMAP as well.

Brucellosis Management Options

This section lists potential management options to reduce brucella seroprevalence; however, not all options listed in this report will be used in the CFEHU. The CFEHU differs from other elk herd units near Jackson and Pinedale because there are no elk feedgrounds. Clarks Fork, like the Cody Elk Herd, typically has milder winters with less snow, and elk winter habitat is more available when compared to habitats near Jackson or Pinedale. Strategies to help reduce transmission risks between elk and cattle require a different approach compared to elk herd units with feedgrounds. We propose to reduce comingling of elk and cattle, and to use harvest strategies to manage elk at predetermined population objectives.

Management options are listed as follows:

1. Elk Population Management

    a) Continue to work with the public and landowners to manage elk populations at the currently defined objectives.
    b) Set season structure to maximize harvest when the population is above objective.
    c) Work with landowners to improve or sustain hunter access in areas requiring increased harvest, and in areas where comingling is a risk during peak disease transmission periods (February-May).
    d) Use HMAs in some portions of the herd unit to increase and manage harvest on some private lands whenever possible. This may help prevent comingling by reducing elk densities on private land.

2. Prevent or mitigate elk-cattle comingling (see page 7-8, #2 for protocol).
3. Increase brucellosis surveillance in elk
4. Cooperatively develop elk habitat enhancement projects.
5. Prevent disturbance to elk on crucial winter ranges to prevent elk from moving to private lands and comingling.
6. Evaluate acquisitions or easements that enhance elk management in the CFEHU.

Coordination Meetings

Producer Meeting/Contacts- the WGFD scheduled a producer meeting on 24 August 2015 and a public meeting on 25 August 2015 to gather input and present this draft BMAP. We had six people attend the producer meeting and 11 attend the public meeting the following night. We received no written comments on the draft plan. The WGFD will review this plan in 5-year intervals or when new significant findings enhance disease management in elk (e.g., when research helps identify new information or techniques.)

Proposed Management Actions

1. Elk Population Management

a. Continue to work with landowners and the public to manage elk populations to objective. Through our positive landowner relationships, we anticipate we can maintain access for hunters to meet harvest objectives in most areas. Success will require positive relations with local landowners, and ensuring complaints are handled quickly and effectively. In many cases, this effort requires public understanding of the need to reduce elk densities in areas where brucellosis transmission risk is high. Coordination between field personnel and landowners to help design seasons is essential to accommodate landowner needs and meet harvest objectives.

b. By reducing or disbursing large groups of elk adjacent to and on private lands using hunting seasons, we may be able to decrease seroprevalence rates and reduce transmission risks to cattle. Elk that are hunted repeatedly often move to less accessible areas away from private land and cattle herds. This requires hunter access to private lands to prevent elk "refuges", and at the same time, maintain undisturbed elk winter ranges.

c. Modify season structure to maximize harvest. This will be a balance between number of licenses and season length. In some cases, we will provide more licenses in a HA to ensure any hunter who wants to hunt an elk has the opportunity to purchase a license, with the intent to increase harvest. While this will not make license acquisition a hindrance, it will increase the number of hunters in the field. In other cases, we may set limited quota license numbers at a lower level, but will provide longer seasons to increase success.

d. Work with landowners to improve or sustain hunter access. The WGFD's Private Land Public Wildlife (PLPW) program can facilitate access for hunters to private land. The landowner can also take advantage of the Hunter Assistance Program where the landowner's name, contact information and access stipulations are put on a website informing hunters of private land where there is access to hunt. This information also includes how many hunters are needed for each private landowner, so they are not overwhelmed with hunters.

e. Use HMAs to increase harvest in some HAs. We are currently using HMAs to help improve access on private land in portions of the CFEHU. Field personnel working on HMAs will collect biological samples (blood and tissues) for disease surveillance (brucellosis, Chronic Wasting Disease [CWD]) and help monitor harvest success during hunting seasons.

2. Prevention of elk and cattle comingling when the risk of brucellosis transmission is high (February-May).

    a. Requires communication between producers, public, and WGFD.

    b. Producer should contact WGFD of situations where elk are close to cattle during the high risk period (February-May) so WGFD can respond and move elk.

    c. The WGFD will respond and move elk away from cattle and keep in contact with producer to make sure the elk do not return.

    d. If elk return on successive days and cannot be kept away, the WGFD will initiate steps to lethally remove elk. This has worked in the other elk herds where brucellosis transmission is a risk.

    e. Elk carcasses may be donated up to 15th February; after that date, carcasses will not be donated, and will be properly disposed of due to potential brucella infection risk.

    f. Blood and tissues of lethally removed elk will be collected for brucellosis and CWD testing. Teeth will be used to determine age of harvested elk.

    g. The WGFD and the producer will communicate and monitor the area to make sure the elk do not return.

3. Increase blood and tissue sampling efforts. With the season extension in the Cody and Gooseberry elk herds during the winter of 2010-2011, we successfully increased our sampling efforts and sample sizes to better understand brucellosis seroprevalence in both herds. We continue to target our sampling efforts for elk herds in the Bighorn Basin, specifically the Cody, Gooseberry, North Bighorn and Clarks Fork herds. Increased sampling intensity will allow the WGFD and producers to better understand the distribution of brucellosis and identify trends in prevalence. Better information will provide the WGFD and producer more management options (modify hunting seasons to target higher prevalence areas, producers may voluntarily change grazing management and area of use to avoid higher prevalence areas during high risk periods, etc.)

4. Develop and implement brucellosis research in the CFEHU. Designing, funding, and completing studies will help to better understand where and how elk use the habitats in the CFEHU and provide valuable information to affected interests. Research will also help evaluate monitoring programs like, blood and tissue collection methods, laboratory diagnostics, and test potential new methods to reduce transmission and seroprevalence.

Additional Actions

Information and Education (I&E). Brucellosis, Feedground and Habitat section (BFH) and other WGFD personnel regularly inform and educate the public about wildlife diseases, including brucellosis. Educational outreach has included group presentations, news releases, interpretive signs at feedgrounds and winter ranges, and various brochures and publications. The importance of quality wildlife habitat and the substantial role that disturbance (e.g., fire) plays in ecosystems are also stressed during information and education efforts. Brucellosis, Feedground and Habitat section and other WGFD field staff make numerous private landowner contacts regarding habitat improvement projects, wildlife-friendly management techniques, or ways to prevent commingling of elk and livestock. Additional efforts are focused on area schools, NGOs, and civic groups to inform about brucellosis. These efforts should continue to inform the public of the WGFD's role in brucellosis research and management, and relay consequences of the disease to Wyoming's economy. Additionally, should any of the aforementioned options be officially adopted, I&E efforts should focus on why the option(s) was (were) pursued and what benefits may be realized. The public should be made aware of any proactive management embarked upon by the WGFD.

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Table 1. Brucellosis seroprevalence sampling results from 1991 to 1996 in the CFEHU.

Hunt Area		1991			1992			1993			1994			1995			1996		
Herd Unit		Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev
51	All	19	0	0.00	16	0	0.00	10	0	0.00	50	0	0.00	44	0	0.00	38	1	2.63
	Cow	54	0	0.00	12	1	8.33	19	1	5.26	67	2	2.99	68	4	5.88	45	0	0.00
53	All	39	0	0.00	5	1	20.00	13	1	7.69	53	2	3.77	59	4	6.78	31	0	0.00
	Cow	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	1	0	0.00
54	All	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	1	0	0.00
	Cow	4	0	0.00	13	0	0.00	0	0	0.00	40	1	2.50	12	0	0.00	11	0	0.00
Total Clarks Frk	**All**	**58**	**0**	**0.00**	**21**	**1**	**4.76**	**23**	**1**	**4.35**	**103**	**2**	**1.94**	**103**	**4**	**3.88**	**70**	**1**	**1.43**
	Cow	**58**	**0**	**0.00**	**25**	**1**	**4.00**	**19**	**1**	**5.26**	**107**	**3**	**2.80**	**80**	**4**	**5.00**	**57**	**0**	**0.00**

Table 1 (continued). Brucellosis seroprevalence sampling results from 1997 to 2002 in the CFEHU.

Hunt Area		1997			1998			1999			2000			2001			2002		
Herd Unit		Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev
51	All	19	1	5.26	42	0	0.00	16	0	0.00	8	1	12.50	0	0	0.00	0	0	0.00
	Cow	24	2	8.33	59	1	1.69	33	0	0.00	17	2	11.76	0	0	0.00	0	0	0.00
53	All	21	2	9.52	44	1	2.27	26	0	0.00	12	2	16.67	0	0	0.00	0	0	0.00
	Cow	1	0	0.00	2	0	0.00	3	0	0.00	2	0	0.00	0	0	0.00	0	0	0.00
54	All	0	0	0.00	1	0	0.00	3	0	0.00	2	0	0.00	0	0	0.00	0	0	0.00
	Cow	17	1	5.88	24	0	0.00	5	0	0.00	7	0	0.00	0	0	0.00	0	0	0.00
Total Clarks Frk	**All**	**40**	**3**	**7.50**	**87**	**1**	**1.15**	**45**	**0**	**0.00**	**22**	**3**	**13.64**	**0**	**0**	**0.00**	**0**	**0**	**0.00**
	Cow	**42**	**3**	**7.14**	**85**	**1**	**1.18**	**41**	**0**	**0.00**	**26**	**2**	**7.69**	**0**	**0**	**0.00**	**0**	**0**	**0.00**

Table 1 (continued). Brucellosis seroprevalence sampling results from 2003 to 2008 in the CFEHU

Hunt Area		2003			2004			2005			2006			2007			2008		
Herd Unit		Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev
51	All	0	0	0.00	0	0	0.00	0	0	0.00	9	1	11.11	13	0	0.00	26	1	3.85
	Cow	0	0	0.00	0	0	0.00	0	0	0.00	35	1	2.86	74	8	10.81	54	5	9.26
53	All	0	0	0.00	0	0	0.00	0	0	0.00	27	1	3.70	63	8	12.70	46	4	8.70
	Cow	0	0	0.00	0	0	0.00	0	0	0.00	14	0	0.00	81	4	4.94	85	8	9.41
54	All	0	0	0.00	0	0	0.00	0	0	0.00	6	0	0.00	66	4	6.06	67	7	10.45
	Cow	0	0	0.00	5	0	0.00	0	0	0.00	9	1	11.11	3	0	0.00	8	0	0.00
Total Clarks Frk	**All**	**0**	**0**	**0.00**	**0**	**0**	**0.00**	**0**	**0**	**0.00**	**42**	**2**	**4.76**	**142**	**12**	**8.45**	**139**	**12**	**8.63**
	Cow	**0**	**0**	**0.00**	**5**	**0**	**0.00**	**0**	**0**	**0.00**	**58**	**2**	**3.45**	**158**	**12**	**7.59**	**147**	**13**	**8.84**

Table 1 (continued). Brucellosis seroprevalence sampling results from 2009 to 2014 in the CFEHU

Hunt Area		2009			2010			2011			2012			2013			2014		
Herd Unit		Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev	Tested	# Pos	prev
51	All	12	3	25.00	18	3	16.67	10	2	20.00	0	0	0.00	0	0	0.00	1	0	0.00
	Cow	35	2	5.71	54	5	9.26	24	1	4.17	8	0	0.00	1	0	0.00	1	0	0.00
53	All	32	2	6.25	43	4	9.30	18	1	5.56	6	0	0.00	1	0	0.00	0	0	0.00
	Cow	87	9	10.34	47	5	10.64	5	2	40.00	4	0	0.00	0	0	0.00	0	0	0.00
54	All	79	9	11.39	41	5	12.20	5	2	40.00	3	0	0.00	0	0	0.00	0	0	0.00
	Cow	6	1	16.67	7	0	0.00	0	0	0.00	0	0	0.00	0	0	0.00	1	0	0.00
Total Clarks Frk	**All**	**123**	**14**	**11.38**	**102**	**12**	**11.76**	**33**	**5**	**15.15**	**9**	**0**	**0.00**	**1**	**0**	**0.00**	**1**	**0**	**0.00**
	Cow	**128**	**12**	**9.38**	**108**	**10**	**9.26**	**29**	**3**	**10.34**	**12**	**0**	**0.00**	**1**	**0**	**0.00**	**2**	**0**	**0.00**

Table 1 (continued). Brucellosis seroprevalence sampling results totals from 1997 to 2014 in the CFEHU.

Hunt Area		Total		
Herd Unit		Tested	# Pos	prev
51	All	351	13	3.70
	Cow	684	35	5.12
53	All	539	33	6.12
	Cow	332	28	8.43
54	All	274	27	9.85
	Cow	172	4	2.33
Total Clarks Frk	**All**	**1164**	**73**	**6.27**
	Cow	**1188**	**67**	**5.64**