Montana Fish, Wildlife & Parks

Region 2 Wildlife Quarterly

June 2019

Elk photographed by Rebecca Mowry in Hunting District 261 in Spring 2019.

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Region 2, 3201 Spurgin Road, Missoula MT 59804, 406-542-5500

Find the Quarterly online at fwp.mt.gov/regions/r2/WildlifeQuarterly

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The Region 2 Wildlife Quarterly is a product of Montana Fish, Wildlife & Parks; 3201 Spurgin Road; Missoula 59804. Its intent is to provide an outlet for a depth of technical information that normally cannot be accommodated by commercial media, yet we hope to retain a readable product for a wide audience. While we strive for accuracy and integrity, this is not a peer-refereed outlet for original scientific research, and results are preliminary. October 2015 was the inaugural issue.

Region 2 Elk Counts

Counting elk was like pulling teeth for FWP wildlife biologists this past winter and spring.

It began with the tale of two winters—first the open winter in December and January, and then the hard winter in February and March. And for a long while it looked like the elk might respond in secret, leaving nary a trace. Because, in large part, elk across Region 2 were not to be found in the places to which we were accustomed.

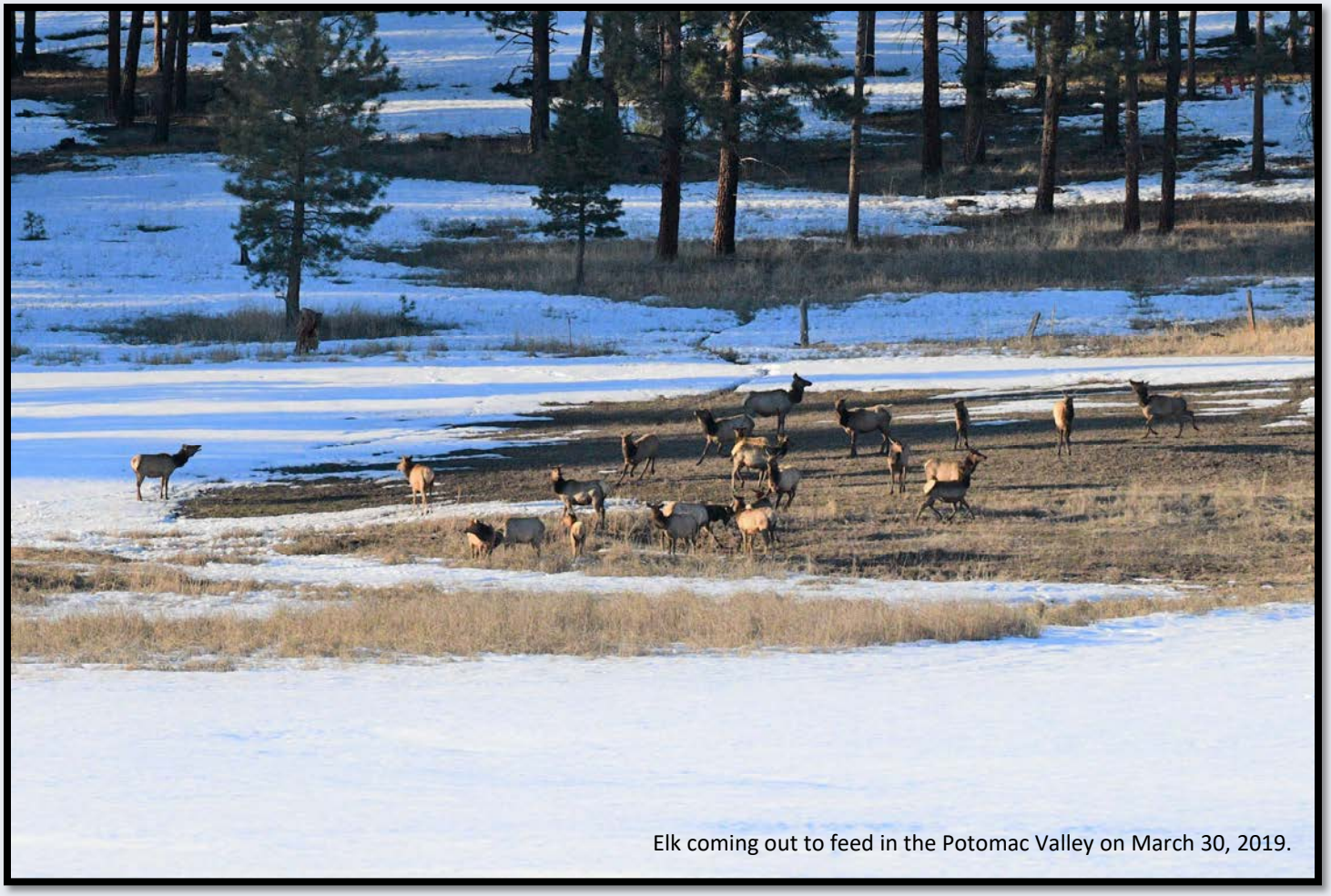
In most years, biologists know how many elk they will count and where they will count them, even before the aircraft leave the airport. This year, biologists hoped against hope that some elk might appear somewhere.

And appear, they eventually did, sometimes in the usual places and often in those less familiar to us. We are still wondering about the whereabouts of other elk groups; where and when they may or may not reappear is for time to tell.

On the following pages we've graphed and described our results, hot off the press.

Spotted Dog Wildlife Management Area photographed by Julie Golla during an elk survey on March 19, 2019.

Whether the Weather



Elk coming out to feed in the Potomac Valley on March 30, 2019.

Weather was paramount on the minds of FWP wildlife biologists this winter and spring. Whether they aimed to understand some rather unusual elk distribution patterns, forecast elk mortality, or find a weather window to accomplish aerial surveys, weather became an obsession.

Was it a hard winter, or was it an easy winter?

We searched National Weather Service data online for an objective perspective. That search and summary is a work in progress, which we've sandwiched in-between other demands on our time.

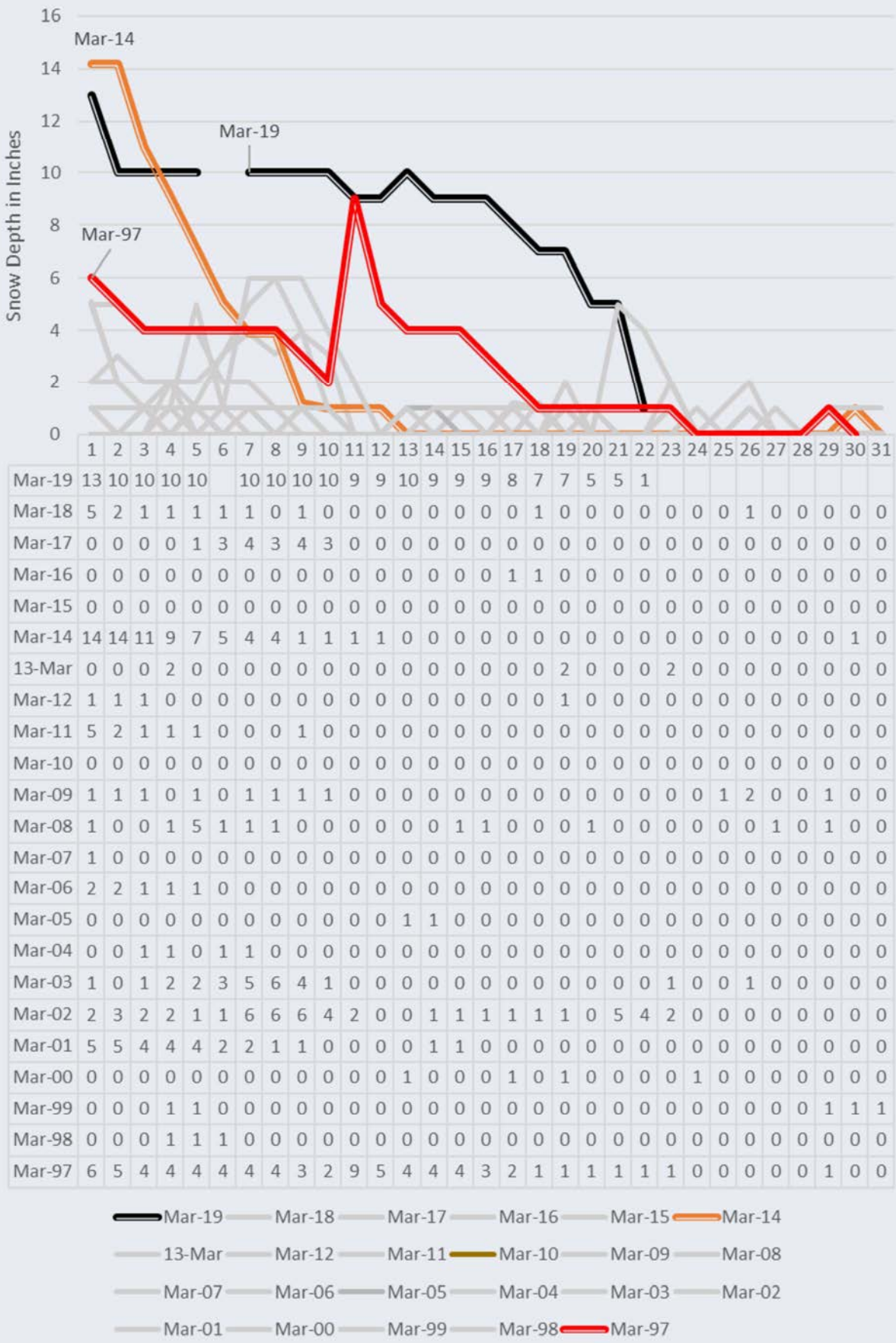
For expediency, we began by investigating weather data measured at Missoula International Airport because of its central location in Region 2 and the completeness of the data collected there. We selected snow depth as the best single metric for assessing the effects of winter weather on elk, and we decided to look at daily snow depths to assess the persistence of snow as a barrier to winter forage and spring green-up.

Little did we guess in January that we'd be comparing snow depths in March 2019 with snow depths in March 1997 (Table 1, Figure 1). March 2019 is the black line labeled "Mar-19" and March 1997 is the red line labeled Mar-97. Daily snow depths in each March between those years are represented by their own (gray) lines, but those years appear to be insignificant, compared with 2019 and 1997, except for early March 2014 (orange).

We settled on the winter of 1996-1997 as a benchmark because that winter is widely known as a hard winter for elk across much of western Montana. On the Blackfoot-Clearwater Wildlife Management Area, the winter of 1996-1997 cost about half of the 9-month-old calves and about half of the coming season's calf crop, due to the poor body condition of maternal cows.

Although the snow depths of 2019 and 1997 intersected on March 11 in Missoula (Table 1, Figure 1), March 2019 otherwise surpassed March 1997 in the depth and persistence of snow throughout the month.

Table 1. Month and year (in the left column) and day of the month (in the top row), showing March snow depths. Figure 1. Daily snow depths in March. Each line represents daily snow depths from March 1-31 in a given year; e.g., Mar-14 is the abbreviation for March 2014.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Mar-19	13	10	10	10	10		10	10	10	10	9	9	10	9	9	9	8	7	7	5	5	1									
Mar-18	5	2	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
Mar-17	0	0	0	0	1	3	4	3	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar-16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar-15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar-14	14	14	11	9	7	5	4	4	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13-Mar	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0
Mar-12	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Mar-11	5	2	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar-10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar-09	1	1	1	0	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	1	0	0
Mar-08	1	0	0	1	5	1	1	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0
Mar-07	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar-06	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar-05	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar-04	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar-03	1	0	1	2	2	3	5	6	4	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0
Mar-02	2	3	2	2	1	1	6	6	6	4	2	0	0	1	1	1	1	1	1	0	5	4	2	0	0	0	0	0	0	0	0
Mar-01	5	5	4	4	4	2	2	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar-00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0
Mar-99	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Mar-98	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar-97	6	5	4	4	4	4	4	4	3	2	9	5	4	4	4	3	2	1	1	1	1	1	1	0	0	0	0	0	1	0	0

Groundhog Day

Elk wintering in forested habitat near Greenough on March 23, 2019.

February 2019 supported snow depths in Missoula that floated near the top of all February snow depths since 1997 (Table 2, Figure 2). The black line, labeled "Feb-19" on the next page, was exceeded by February 2017 and briefly by February 2011 and 1997 in the early part of the month. February 2001 and 2014 came hard in the latter part of the month. But, 2019 arguably wins the prize for deep and persistent snow on the ground in Missoula throughout the month of February, at least since 1997.

From his post in Seeley Lake, FWP wildlife biologist Scott Eggeman rightly points out that snow depths were deeper and every bit as persistent in the Blackfoot in February 2018 than in 2019. But February 2018 ranks as moderate at most in the annals of snow depths at the Missoula Airport (Table 1). So it is that winter conditions faced in one local area often are not the same as those down the road, and weather data from one central location can't tell the whole story. It's a starting point.

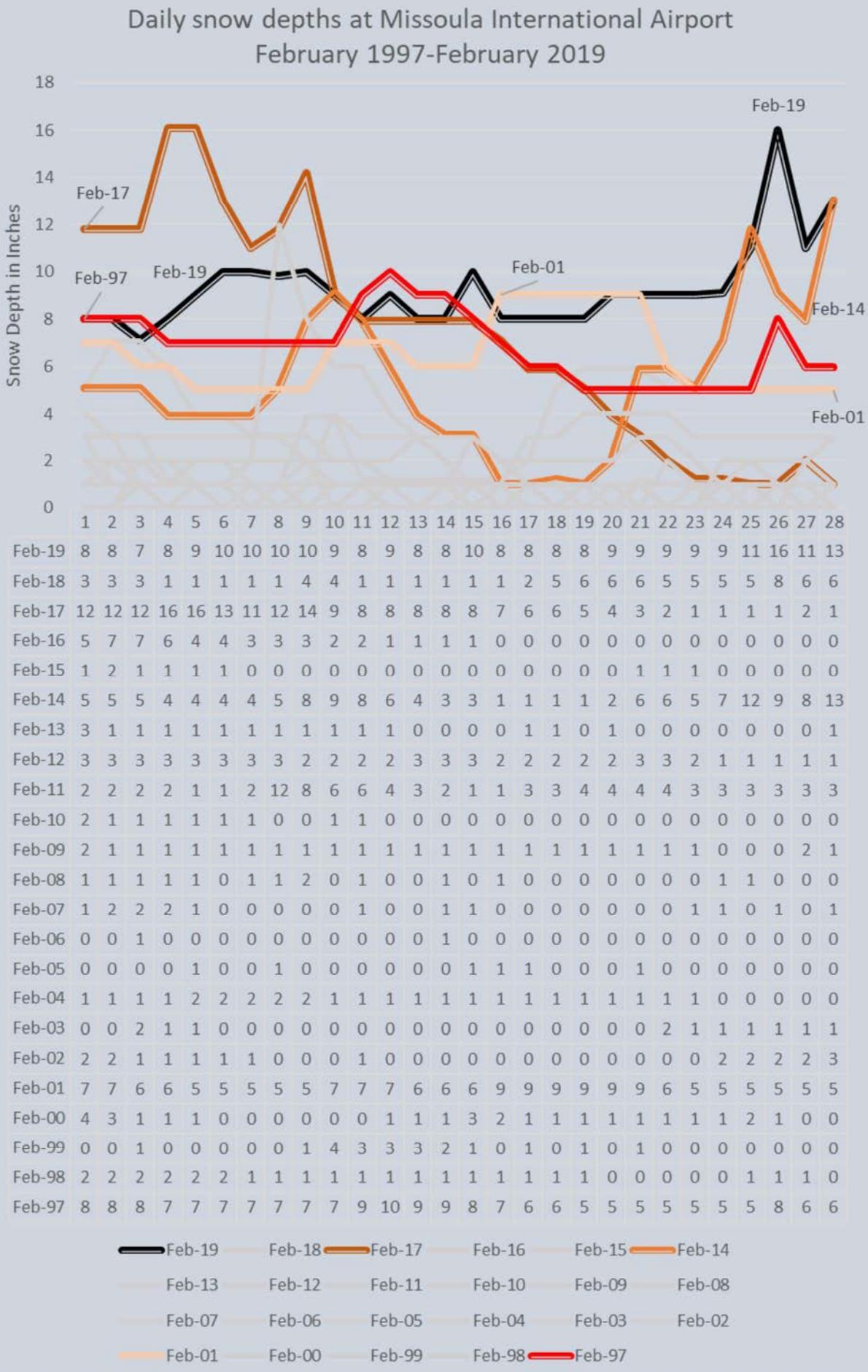
Like other parts of Region 2, elk were found scattered in small groups and in odd locations in the Blackfoot. We kept occasional tabs on a cow and last year's calf that hung in thick Douglas-fir, close to a little creek above Potomac. Locomotion through crusted snow was labored when they moved from leafless bush to tree, gleaning lichen with the needles from twigs above the snow line.

January: Elk would have faced greater hardship in 2019 if winter had arrived on time in January, but it did not (Table 3, Figure 3). In Missoula, January 2017 exceeded even 1997 in persistent snow depth, and 2019 did not "chart" until about January 21 (Table 3). Prior to that date, 2019 was essentially an open winter across most of Region 2.

With our elk counts for the winter and spring of 2019 "in the books," and with the benefit of anecdotal observations as well, we conclude that the effect of Winter 2018-2019 took a toll on overwinter survival of elk calves in places around Region 2, but did not have the severe effects on elk that we saw during and after the winter of 1996-1997. It would seem that a winter coming hard and early exerts a greater strain than a hard winter that comes late—all things being equal.

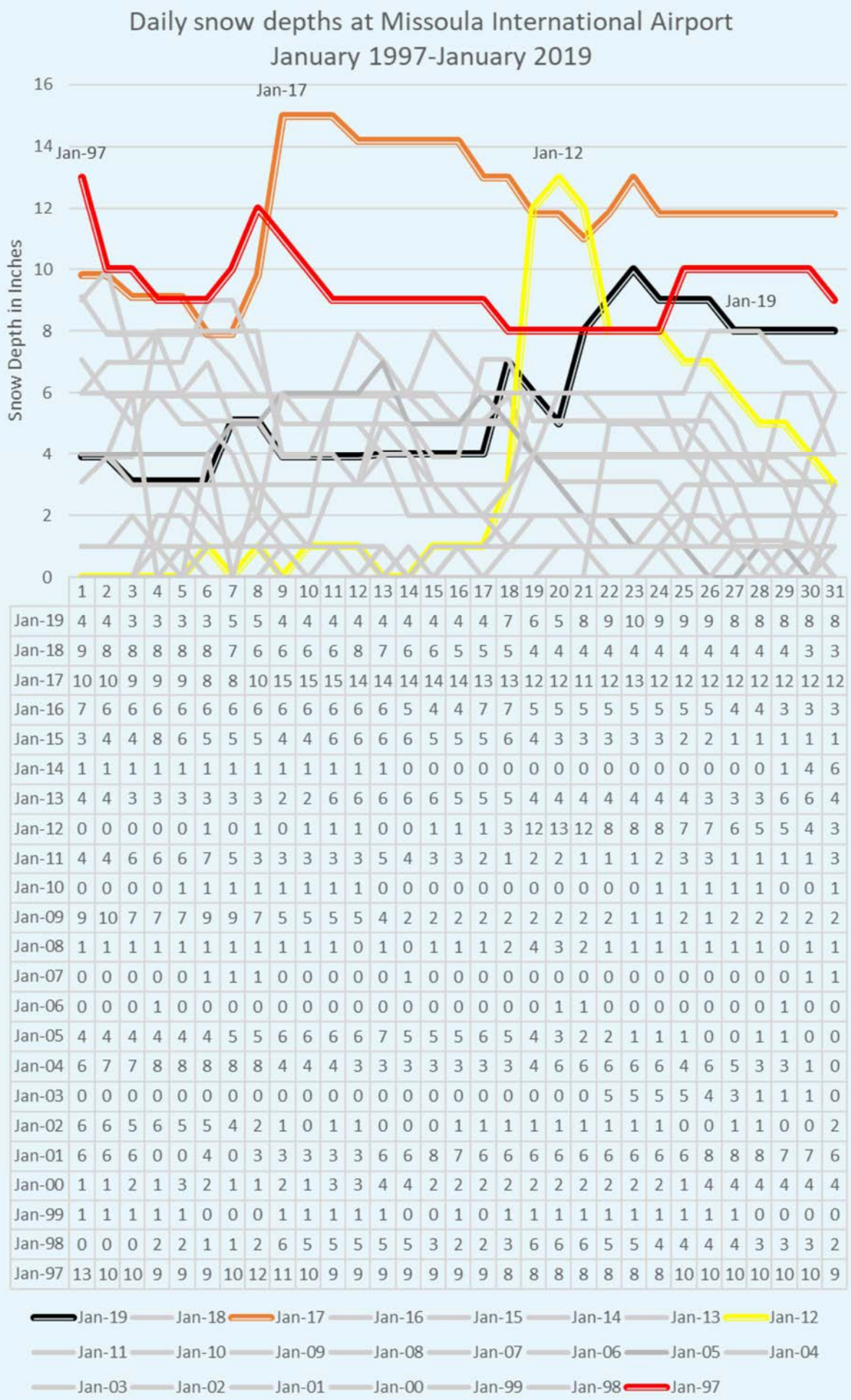
And all things are never equal.

Table 2. Month and year (in the left column) and day of the month (in the top row), showing February snow depths. Figure 2. Daily snow depths in February. Each line represents daily snow depths from February 1-28 in a given year; e.g., Feb-14 is the abbreviation for February 2014.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Feb-19	8	8	7	8	9	10	10	10	10	9	8	9	8	8	10	8	8	8	8	9	9	9	9	9	11	16	11	13
Feb-18	3	3	3	1	1	1	1	1	4	4	1	1	1	1	1	1	2	5	6	6	6	5	5	5	5	8	6	6
Feb-17	12	12	12	16	16	13	11	12	14	9	8	8	8	8	8	7	6	6	5	4	3	2	1	1	1	1	2	1
Feb-16	5	7	7	6	4	4	3	3	3	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Feb-15	1	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0
Feb-14	5	5	5	4	4	4	4	5	8	9	8	6	4	3	3	1	1	1	1	2	6	6	5	7	12	9	8	13
Feb-13	3	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	1
Feb-12	3	3	3	3	3	3	3	3	2	2	2	2	3	3	3	2	2	2	2	2	3	3	2	1	1	1	1	1
Feb-11	2	2	2	2	1	1	2	12	8	6	6	4	3	2	1	1	3	3	4	4	4	4	3	3	3	3	3	3
Feb-10	2	1	1	1	1	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feb-09	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	2	1
Feb-08	1	1	1	1	1	0	1	1	2	0	1	0	0	1	0	1	0	0	0	0	0	0	0	1	1	0	0	0
Feb-07	1	2	2	2	1	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	1	1	0	1	0	1
Feb-06	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Feb-05	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0
Feb-04	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0
Feb-03	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	1	1	1	1	1
Feb-02	2	2	1	1	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	2	2	2	3
Feb-01	7	7	6	6	5	5	5	5	5	7	7	7	6	6	6	9	9	9	9	9	9	6	5	5	5	5	5	5
Feb-00	4	3	1	1	1	0	0	0	0	0	0	1	1	1	3	2	1	1	1	1	1	1	1	1	2	1	0	0
Feb-99	0	0	1	0	0	0	0	0	1	4	3	3	3	2	1	0	1	0	1	0	1	0	0	0	0	0	0	0
Feb-98	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	0
Feb-97	8	8	8	7	7	7	7	7	7	7	9	10	9	9	8	7	6	6	5	5	5	5	5	5	5	8	6	6

Table 3. Month and year (in the left column) and day of the month (in the top row), showing January snow depths. Figure 3. Daily snow depths in January. Each line represents daily snow depths from January 1-31 in a given year; e.g., Jan-14 is the abbreviation for January 2014.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Jan-19	4	4	3	3	3	3	5	5	4	4	4	4	4	4	4	4	4	7	6	5	8	9	10	9	9	9	8	8	8	8	8
Jan-18	9	8	8	8	8	8	7	6	6	6	6	8	7	6	6	5	5	5	4	4	4	4	4	4	4	4	4	4	4	3	3
Jan-17	10	10	9	9	9	8	8	10	15	15	15	14	14	14	14	14	13	13	12	12	11	12	13	12	12	12	12	12	12	12	12
Jan-16	7	6	6	6	6	6	6	6	6	6	6	6	6	5	4	4	7	7	5	5	5	5	5	5	5	5	4	4	3	3	3
Jan-15	3	4	4	8	6	5	5	5	4	4	6	6	6	6	5	5	5	6	4	3	3	3	3	3	2	2	1	1	1	1	1
Jan-14	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4	6
Jan-13	4	4	3	3	3	3	3	3	2	2	6	6	6	6	6	5	5	5	4	4	4	4	4	4	4	3	3	3	6	6	4
Jan-12	0	0	0	0	0	1	0	1	0	1	1	1	0	0	1	1	1	3	12	13	12	8	8	8	7	7	6	5	5	4	3
Jan-11	4	4	6	6	6	7	5	3	3	3	3	3	5	4	3	3	2	1	2	2	1	1	1	2	3	3	1	1	1	1	3
Jan-10	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0	1
Jan-09	9	10	7	7	7	9	9	7	5	5	5	5	4	2	2	2	2	2	2	2	2	2	1	1	2	1	2	2	2	2	2
Jan-08	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	2	4	3	2	1	1	1	1	1	1	1	0	1	1
Jan-07	0	0	0	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Jan-06	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0
Jan-05	4	4	4	4	4	4	5	5	6	6	6	6	7	5	5	5	6	5	4	3	2	2	1	1	1	0	0	1	1	0	0
Jan-04	6	7	7	8	8	8	8	8	4	4	4	3	3	3	3	3	3	3	4	6	6	6	6	6	4	6	5	3	3	1	0
Jan-03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	5	5	4	3	1	1	1	0
Jan-02	6	6	5	6	5	5	4	2	1	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	0	0	1	1	0	0	2
Jan-01	6	6	6	0	0	4	0	3	3	3	3	3	6	6	8	7	6	6	6	6	6	6	6	6	6	8	8	8	7	7	6
Jan-00	1	1	2	1	3	2	1	1	2	1	3	3	4	4	2	2	2	2	2	2	2	2	2	2	1	4	4	4	4	4	4
Jan-99	1	1	1	1	1	0	0	0	1	1	1	1	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0
Jan-98	0	0	0	2	2	1	1	2	6	5	5	5	5	5	3	2	2	3	6	6	6	5	5	4	4	4	4	3	3	3	2
Jan-97	13	10	10	9	9	9	10	12	11	10	9	9	9	9	9	9	9	8	8	8	8	8	8	8	10	10	10	10	10	10	9

2019 Elk Counts

Elk photographed by Rebecca Mowry during aerial surveys in 2019.

Since the 1960s, FWP wildlife biologists in Region 2 and their pilots have been conducting aerial surveys to count elk. FWP uses these data for recommending hunting seasons, following guidance provided in the Montana Statewide Elk Management Plan and subsequent amendments to the Plan, as well as in the body of public comment and Fish and Wildlife Commission direction that we gather throughout the year.

We don't expect to find every elk, but we do count most of the elk in our Region. Based on observations of collared elk in various corners of Region 2 over many years, we can expect to count 60-90 percent of the elk in any given survey unit, depending on the amount of cover available for elk to use.

To compensate for the imperfections in the counts, we've developed protocols for homogenizing our surveys so that biologists find pretty-much-the-same elk in pretty-much-the-same places, year after year. We use the same aircraft, pilots and observers for an extended period of years; we fly in winter or early spring when elk are out in the open; we fly at dawn or dusk, also when the elk are out.

Such protocols produce reliable trends in elk numbers over a several-year period. These trends best reflect cows and 9- to 11-month-old calves; they provide variable and less reliable data on bulls. When we see bulls in the aerial surveys, we know they're there, but when we don't see bulls, we can't draw reliable conclusions until we've gone several years without catching more bulls out in the open.

We were a little nervous about whether we would find elk in the same places during our aerial surveys this year because the elk seemed to have shifted their patterns during the winter. In the end, biologists mostly breathed a sigh of relief when the surveys were completed, having seen, for the most part, what they set out see. But, the data leave room for interpretation and further testing in some of our hunting districts, and that process is now underway.

What is Recruitment?

DEFINITION OF RECRUITMENT

Recruitment is defined as the survival of a juvenile cohort to breeding age. For ease of conversation, a juvenile ungulate is said to have recruited into the breeding population on or approaching its first birthday. In the period from birth to recruitment, ungulates face the highest death rates that they will face in their lives and most juveniles born in some years and some places will die before reaching 1-year of age. Recruitment, then, is a graduation of sorts, from the juvenile period of high physiological stress, vulnerability to weather extremes and predation pressure to the adult stage of lessened death risk. Recruitment must balance the deaths or other losses of adult animals for a population to remain steady.

NOT recruitment, not yet. *At this point in early March 2019 the jury was out as to whether this 9-month-old calf (right) would survive the winter to recruit into the adult population. Although the calf is laboring in deep, crusted snow, its physical conformation looks okay for March.*

MEASURES OF RECRUITMENT

The recruitment rate in elk is estimated by observing the number of calves (as pictured) per hundred cows. Biologists sample recruitment as late in the spring and as close to the 1-year birthday (~June 1) of juvenile animals as is practical. They are hampered, however, by the ever-increasing difficulty of distinguishing juvenile animals from adults as the juveniles approach their full size. Compromises must be made with the awareness and understanding that approximations of recruitment have their limitations.

For example, biologists in the western half of Region 2 sample elk recruitment by counting cows, bulls and 9-11 month old calves from aircraft in March, April and May, when elk are aggregated and visible on green-up. In the eastern half of Region 2, elk are more visible to count on their open winter ranges than on spring ranges; so, calf: cow ratios obtained in December-March must take winter severity into account when assessing recruitment. We have to hope that the biases in recruitment estimates are relatively consistent from year to year.

RECRUITMENT STANDARDS

Recruitment happens every year. Each year offers a new opportunity for recruitment to boost the population or dampen its growth. Recruitment can vary widely from year to year and place to place. Recruitment tends to vary in waves, trending generally upward or downward over a period of several years. Elk recruitment was at a low ebb in 2009 in much of Region 2, and gradually rebounded to an average-or-better level by 2015.

Recruitment extremes exert long-range effects on populations. In late-winter 2009, FWP documented a record-low 9 calf elk-per-hundred-cows in Hunting District 250, the West Fork of the Bitterroot. So, fewer of the adult elk killed by hunters, cougars, black bears, wolves, accidents and old age were replaced by young animals in that year. A healthy elk

population can withstand the occasional year of poor recruitment—even severely low recruitment. However, multiple consecutive years of poor recruitment can deplete the breeding stock in an elk population and create cascading effects. Fewer elk in the breeding population produce fewer calves, which enter an environment that is stacked against calf survival when recruitment is poor.

An adequate calf: cow ratio for sustaining elk populations and hunter harvest in Region 2 is 25 calves-per-hundred-cows or higher.

Below: *A group of 35 (?) elk, 9 (?) calves and 1 spike bull. That's how biologists count them from the air, which yields 25 cows and a good ratio of 36 calves-per-hundred-cows on April 22, 2013. Photo of Bitterroot elk by Craig Jourdonnais.*

CALCULATIONS

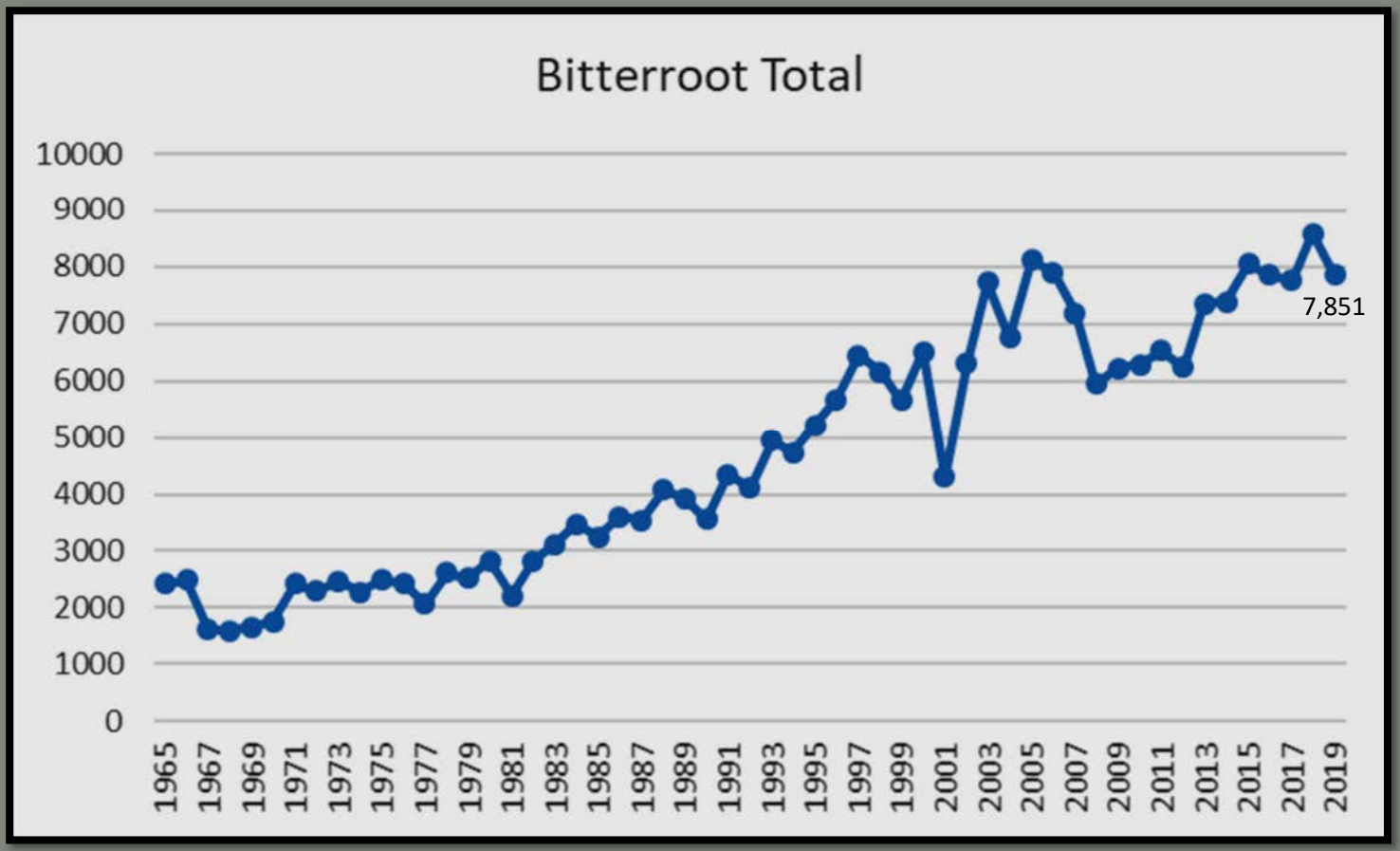
The calf :cow ratio in elk is calculated by dividing the number of calves (less than 1-year-old) by the number of adult females in the sample. For example, FWP Region 2 biologist, Rebecca Mowry, counted 5,637 adult-female (cow) elk, 1,074 adult bulls and 1,011 calves in the Bitterroot hunting districts in Spring 2019. Therefore, her calf: cow ratio is 1,011 calves divided by 5,637 cows, which equals 0.18—a suppressed ratio for elk, by the way. This ratio is normally multiplied by 100 to remove the decimal, so it would be expressed as 18 calves-per-hundred cows.

Note that this is not the same thing as the percentage of calves in the population. The percentage of calves would be calculated by dividing the number of calves by the total number of elk counted. In the Bitterroot example, Rebecca counted a total of 7,851 elk on her flights. Her totals of 1,011 calves divided by 7,851 total elk (including calves, cows and bulls) gives a result of 13 percent, compared with 18 calves-per-hundred-cows. Percentages introduce more variation and bias to recruitment estimates because bull counts tend to vary considerably, but can be useful to biologists for visualizing concepts and making off-the-cuff assessments.

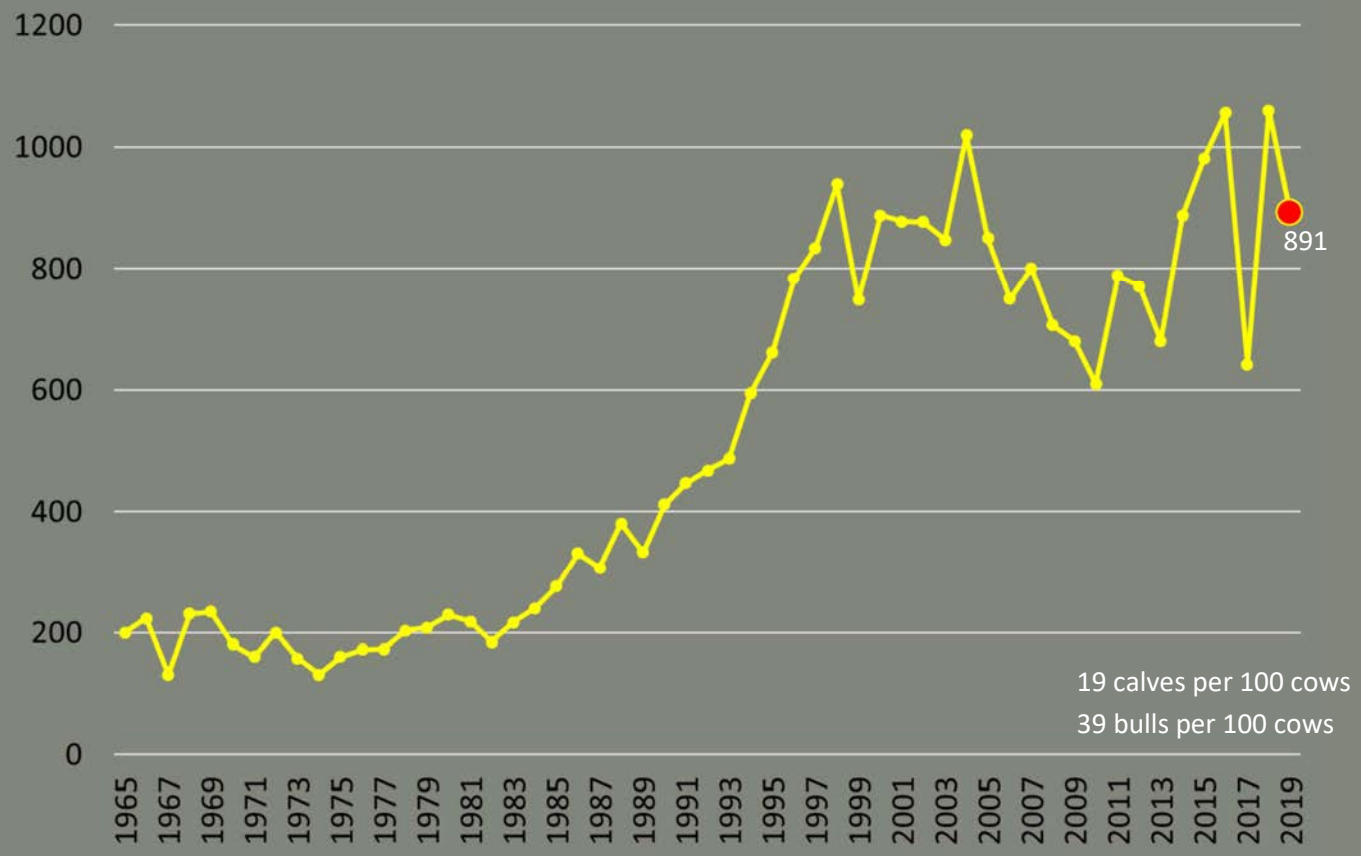
The bull: cow ratio is calculated similarly. In the Bitterroot example, we would divide 1,074 adult bullls by 5,637 cows, then multiply by 100, for a result of 19 bulls per hundred cows—a good ratio.

Bitterroot Elk Counts

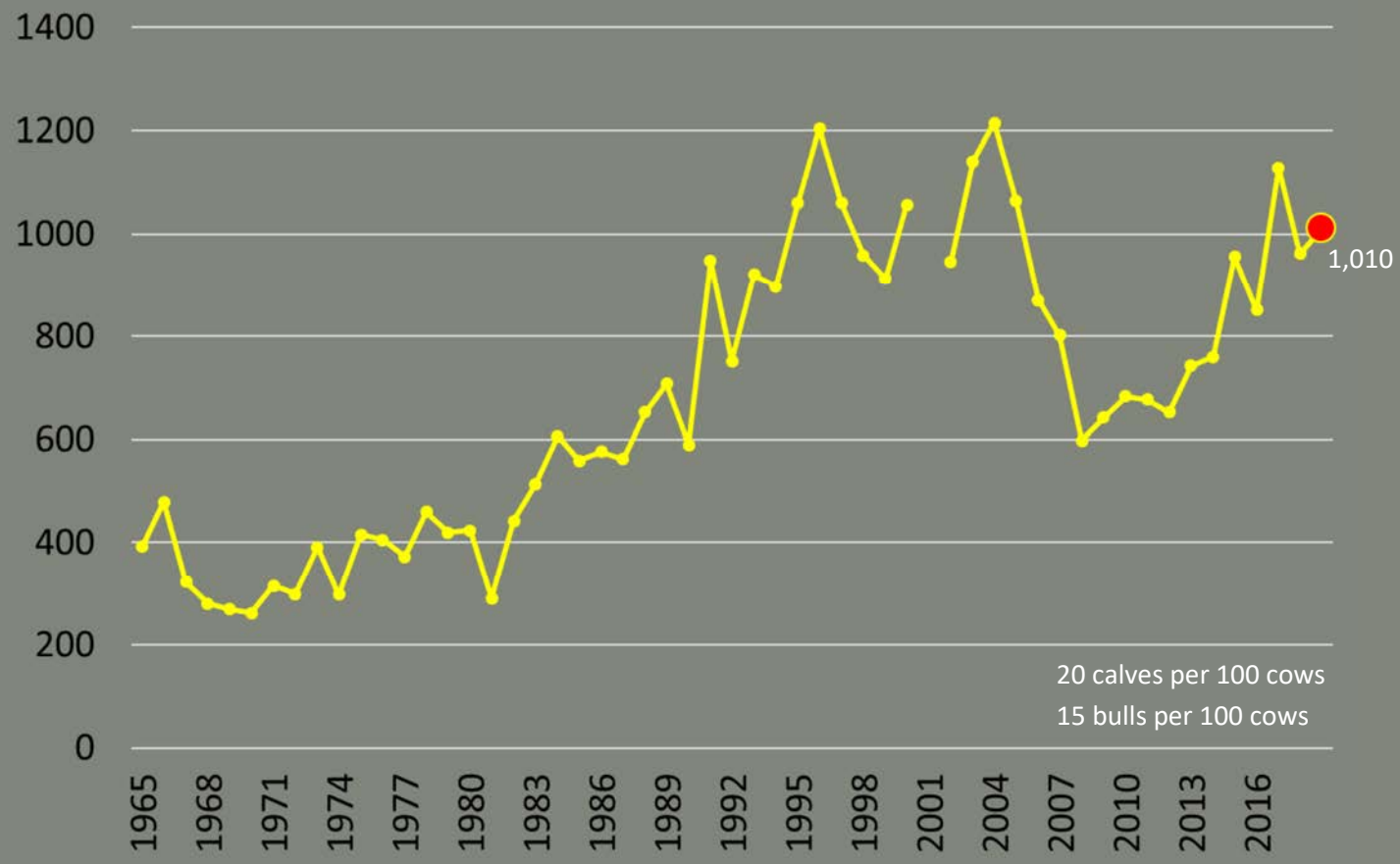
Elk in Hunting District 270 photographed by Rebecca Mowry during aerial surveys in 2019.



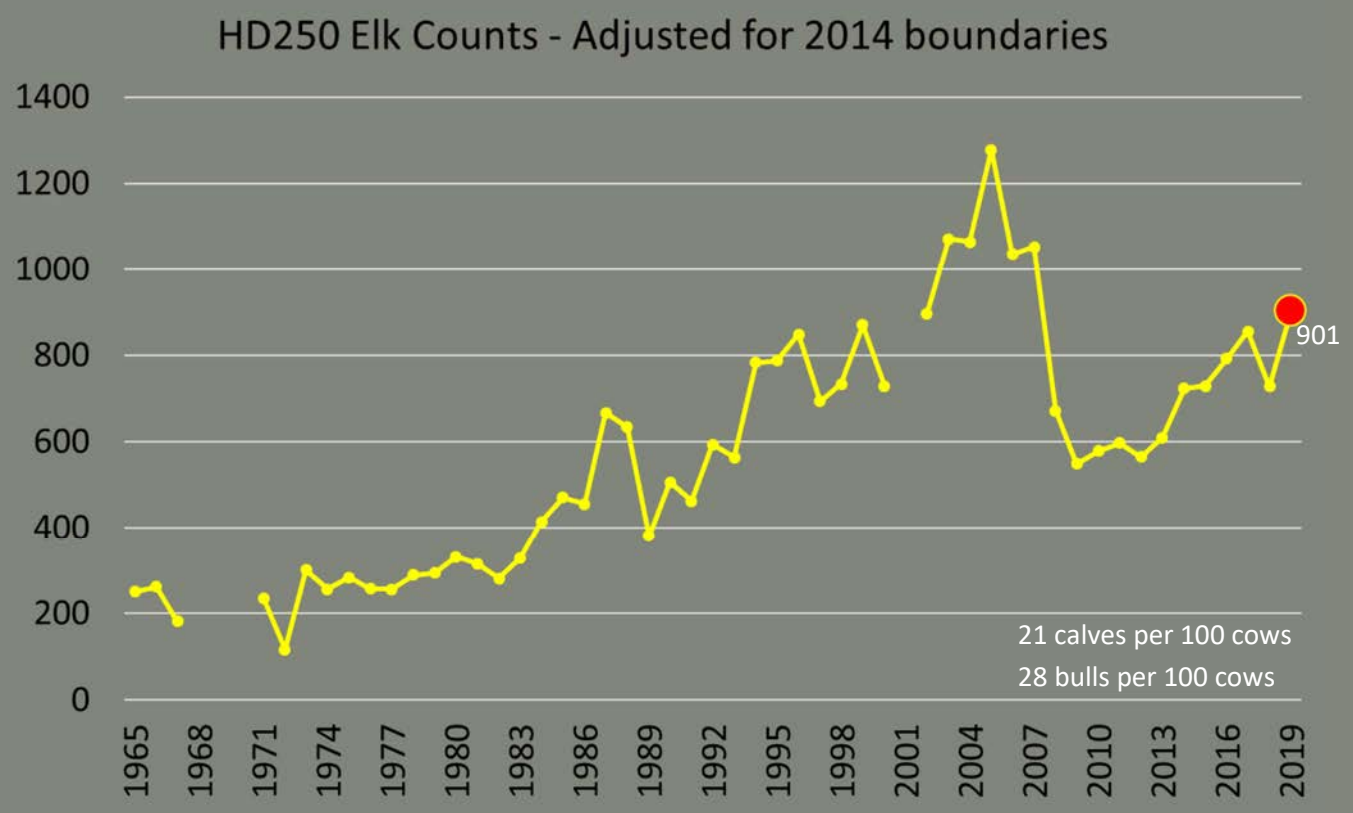
Hunting District 204



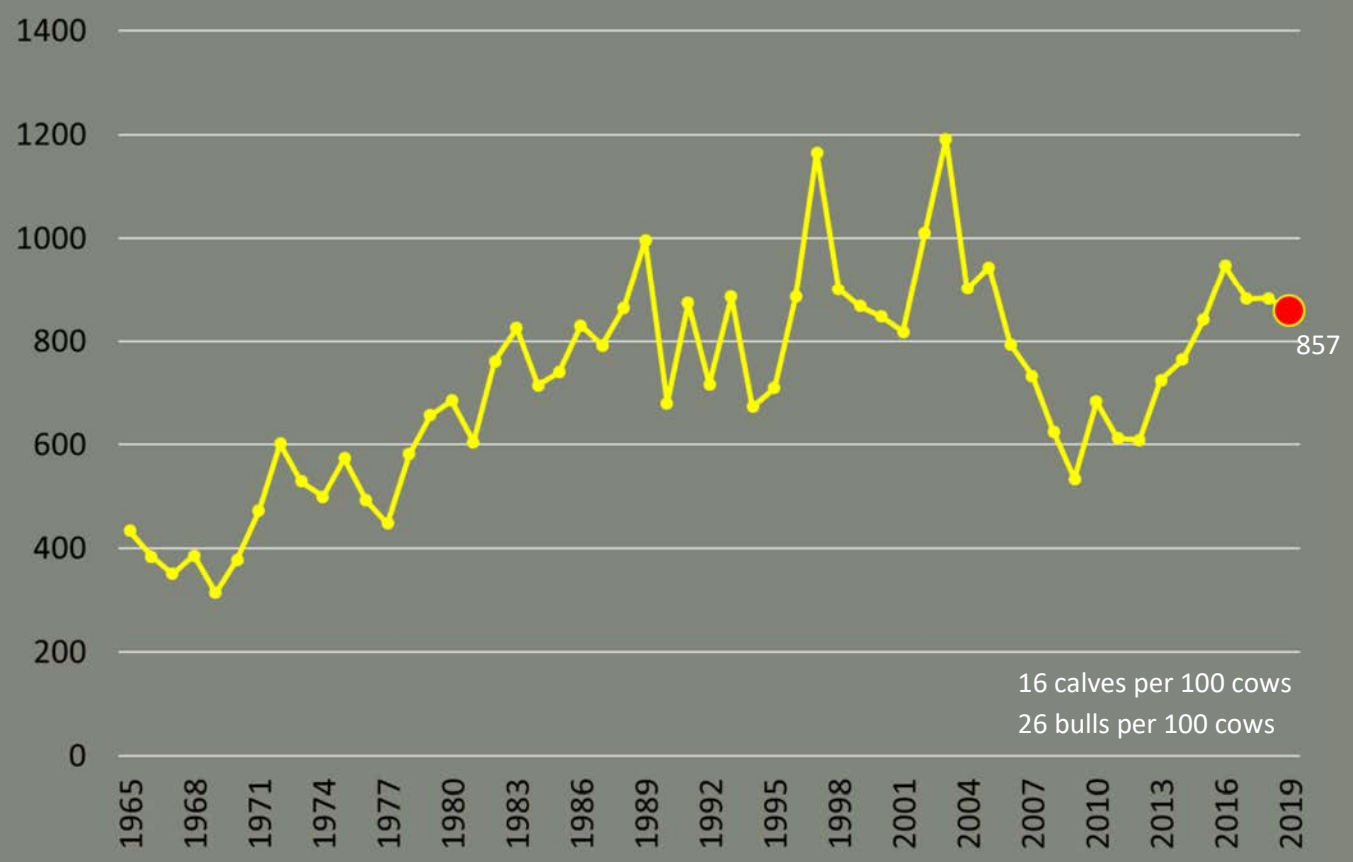
Hunting District 240



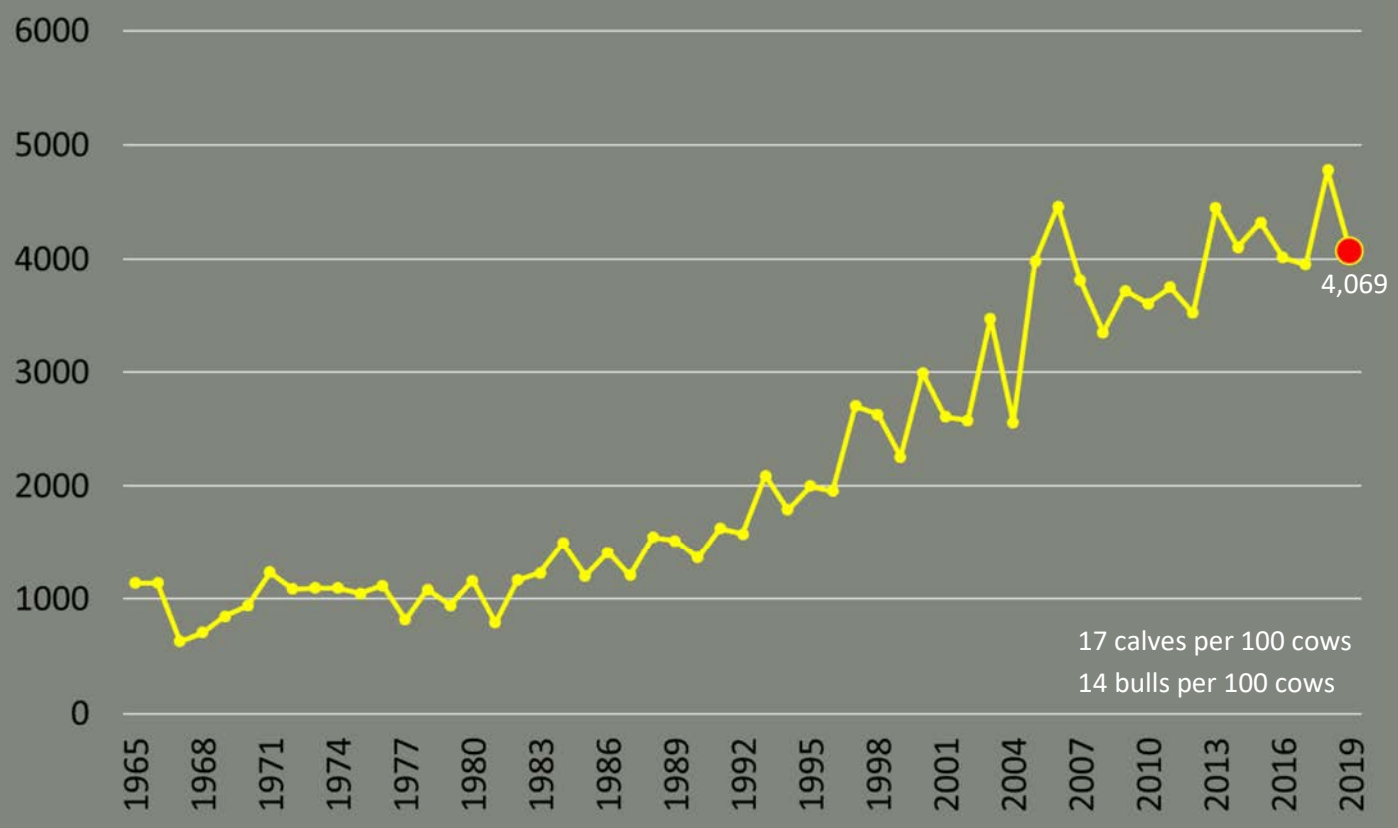
Hunting District 250



Hunting District 261



Hunting District 270



Bitterroot Summary

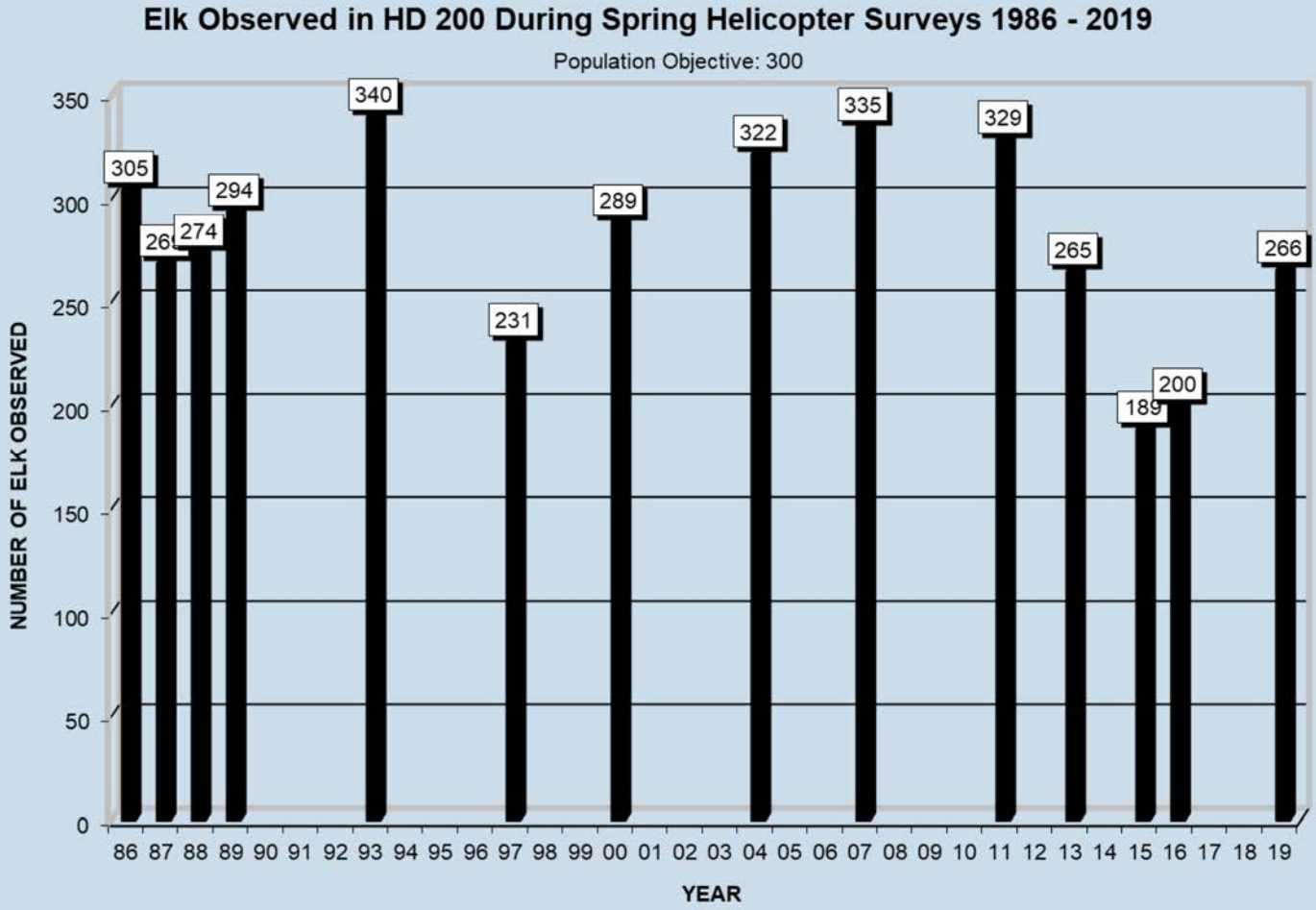
2019 Aerial Elk Survey Results

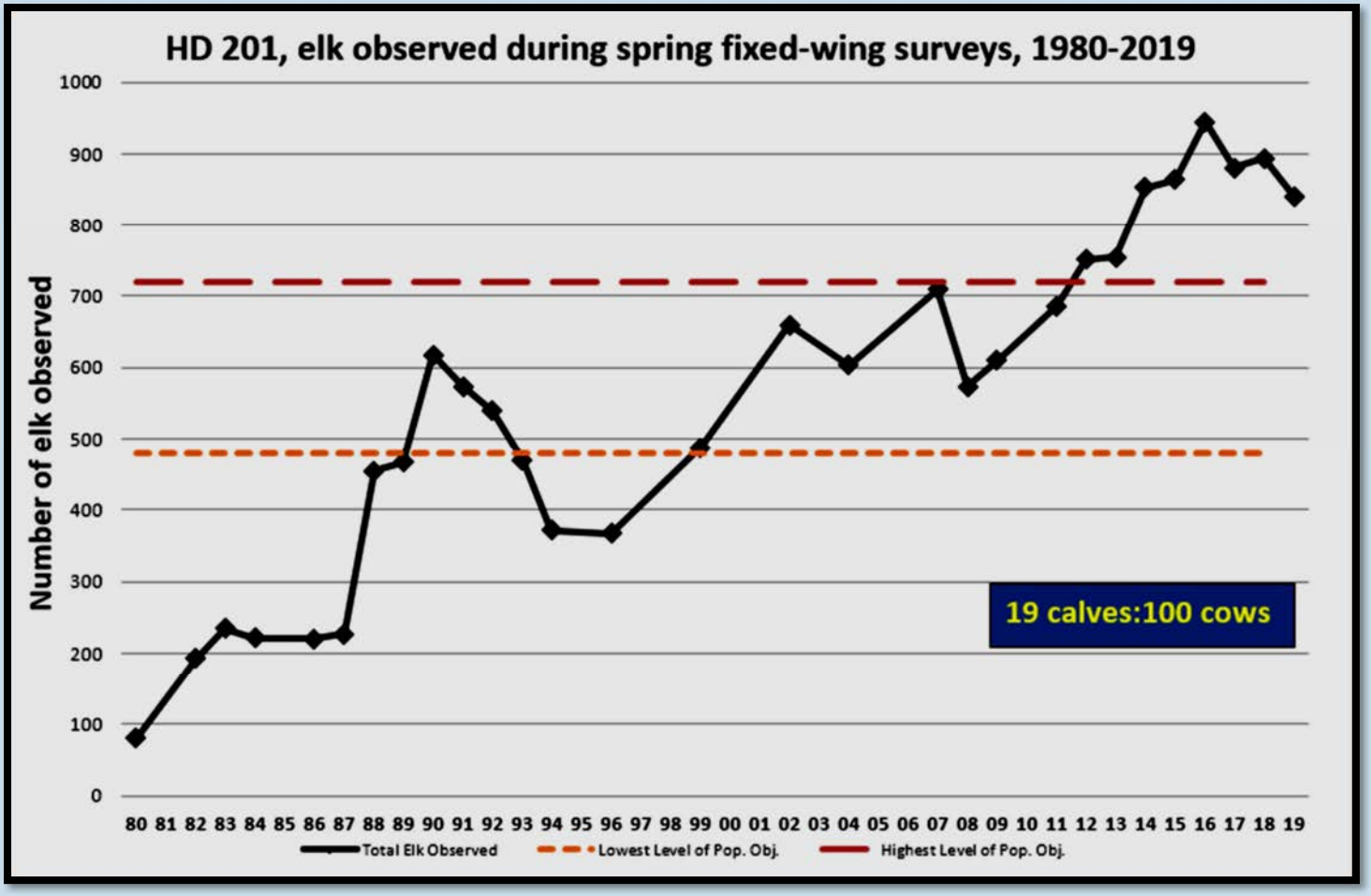
Summary:

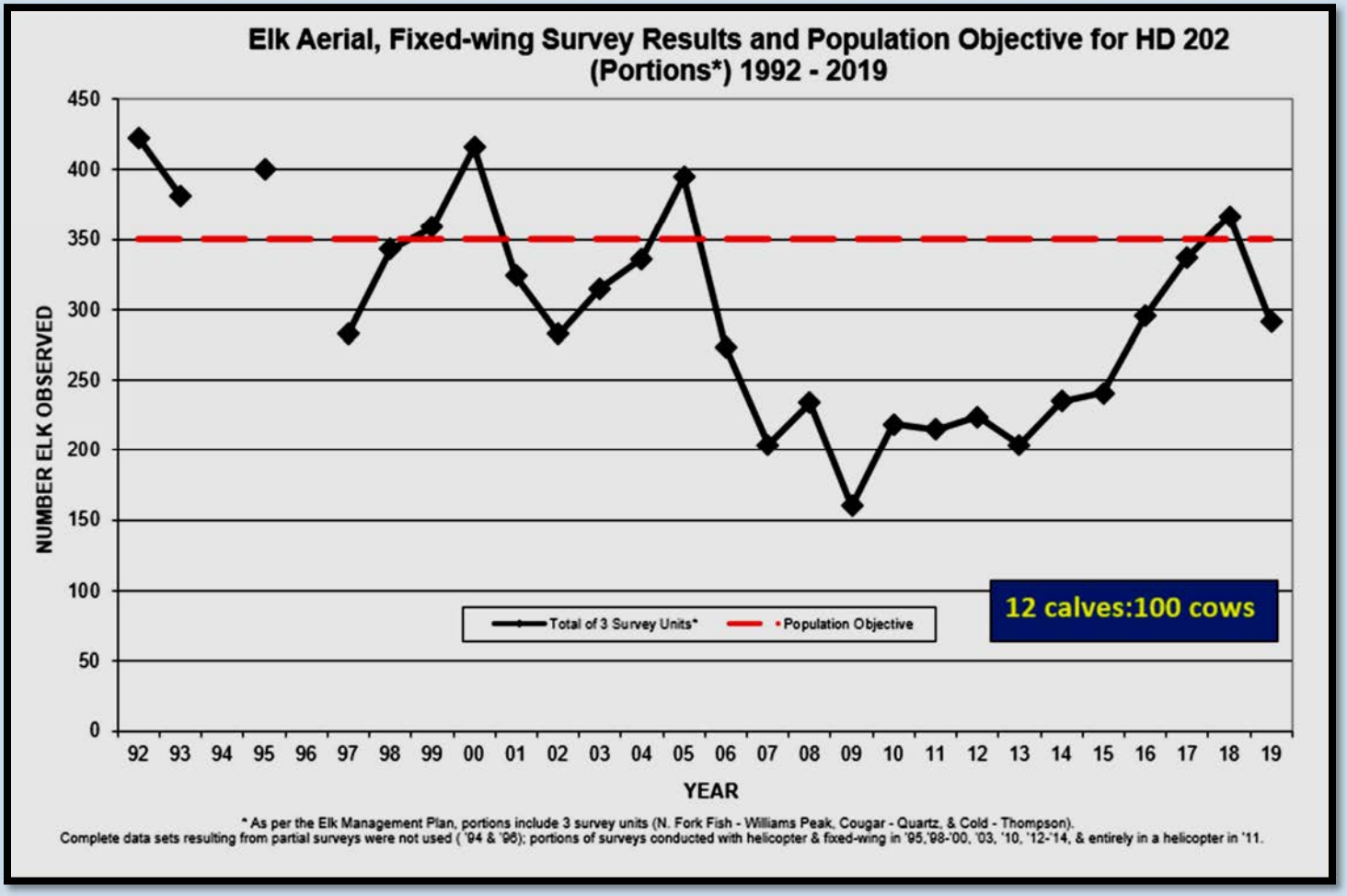
HD	Total	Cows	Calves	Bulls	Calf:cow	Bull:cow	2018 count	Objective	Above or Below
204	891	520	99	205	0.19	0.39	1060	600	Above
240	1010	704	139	107	0.20	0.15	962**	1000	Within
250	901	603	128	170	0.21	0.28	728**	1400	Below
261	857	603	95	159	0.16	0.26	883	700	Above
270	4069	3114	530	423	0.17	0.14	4779	3800	Within
River	123	93	20	10	0.22	0.11	173	NA	NA
TOTAL	**7851**	**5637**	**1011**	**1074**	**0.18**	**0.19**	**8585**	**7500**	

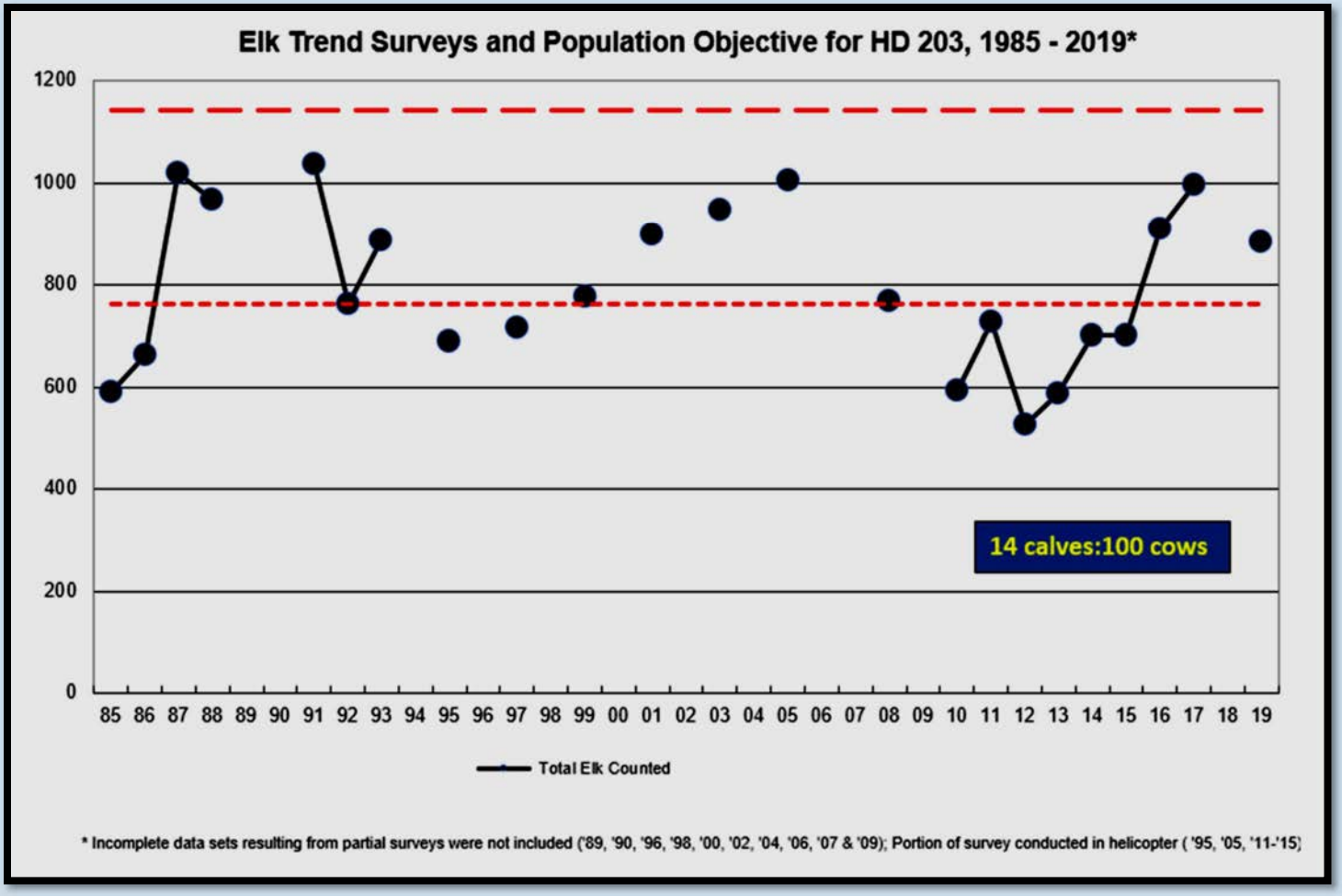
**Several 2018 counts were low due to sections not surveyed.

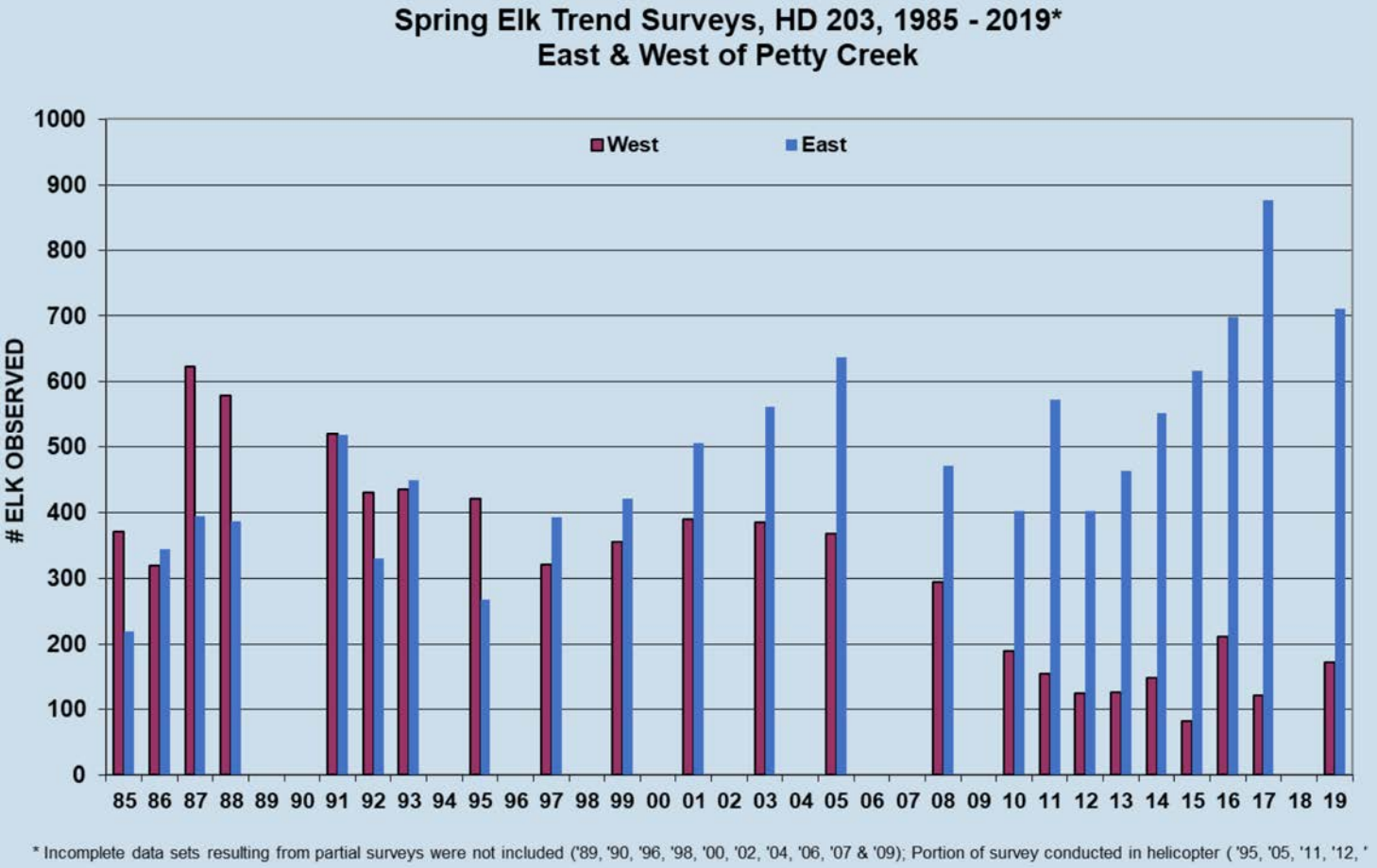
Lower Clark Fork Elk Counts

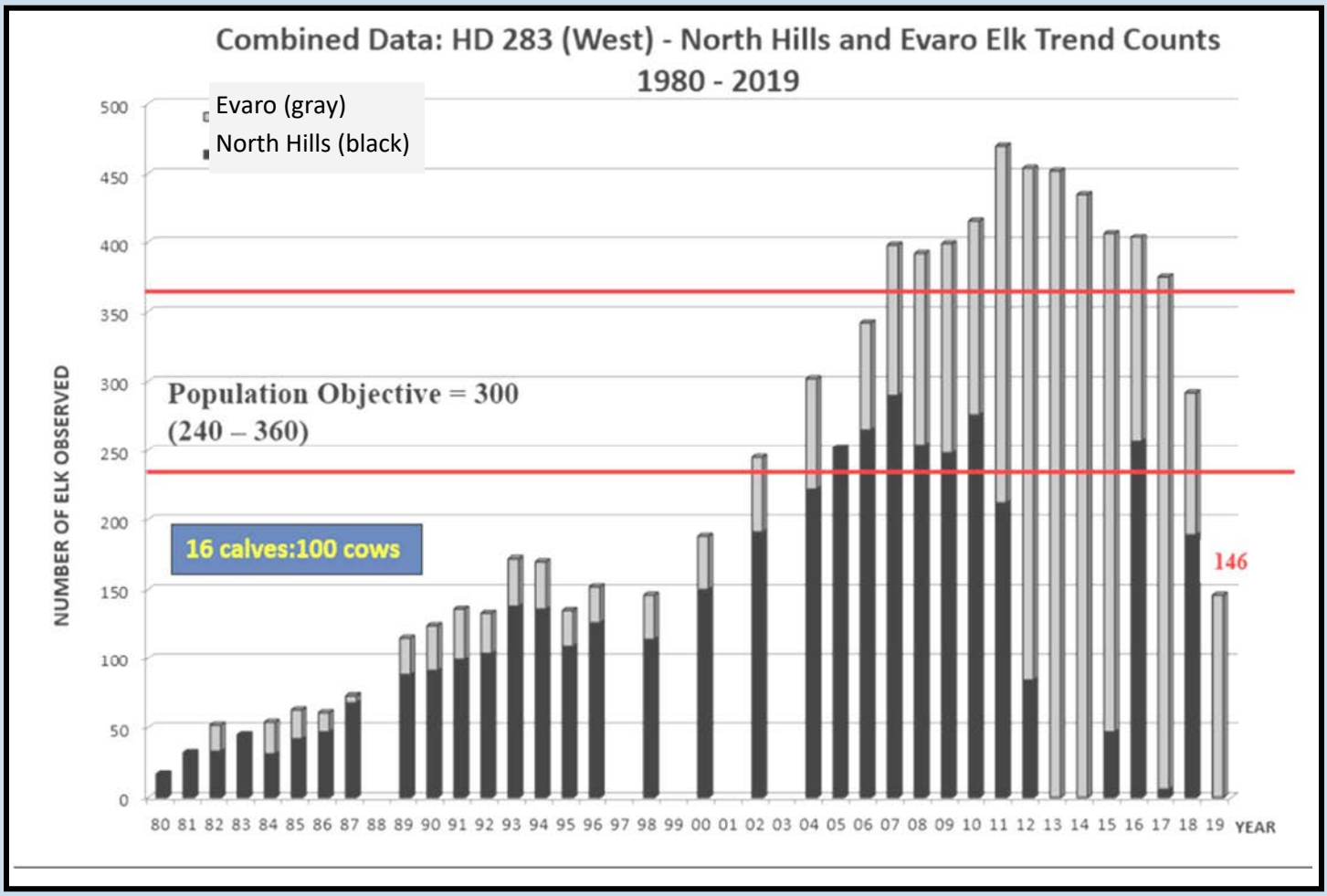


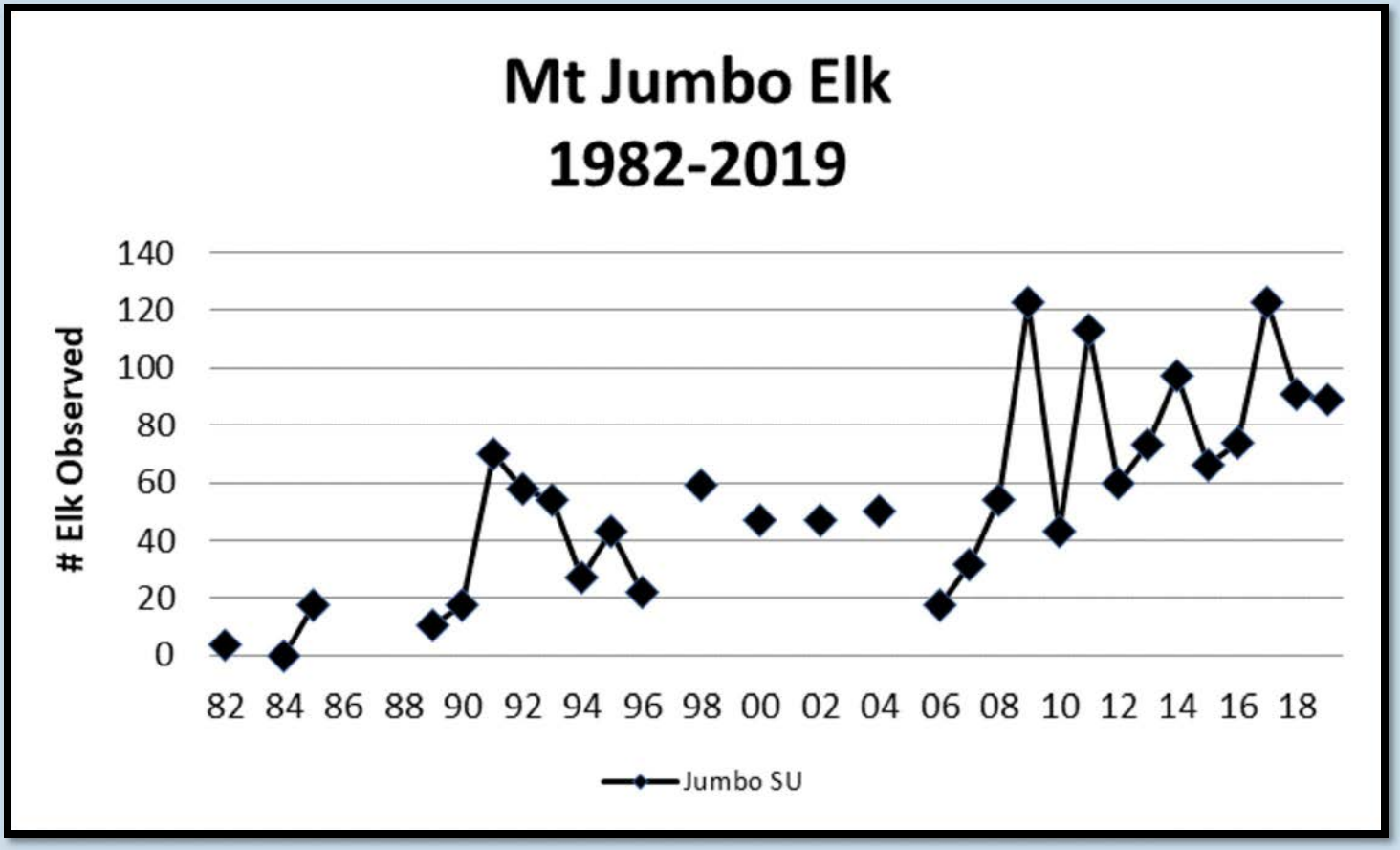

HD 201, elk observed during spring fixed-wing surveys, 1980-2019
Number of elk observed
1000
900
800
700
600
500
400
300
200
100
0
80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19
19 calves:100 cows
Total Elk Observed
Lowest Level of Pop. Obj.
Highest Level of Pop. Obj.


Elk Aerial, Fixed-wing Survey Results and Population Objective for HD 202 (Portions*) 1992 - 2019
NUMBER ELK OBSERVED
450
400
350
300
250
200
150
100
50
0
92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19
YEAR
12 calves:100 cows
Total of 3 Survey Units*
Population Objective
* As per the Elk Management Plan, portions include 3 survey units (N. Fork Fish - Williams Peak, Cougar - Quartz, & Cold - Thompson).
Complete data sets resulting from partial surveys were not used ('94 & '96); portions of surveys conducted with helicopter & fixed-wing in '95,'98-'00, '03, '10, '12-'14, & entirely in a helicopter in '11.

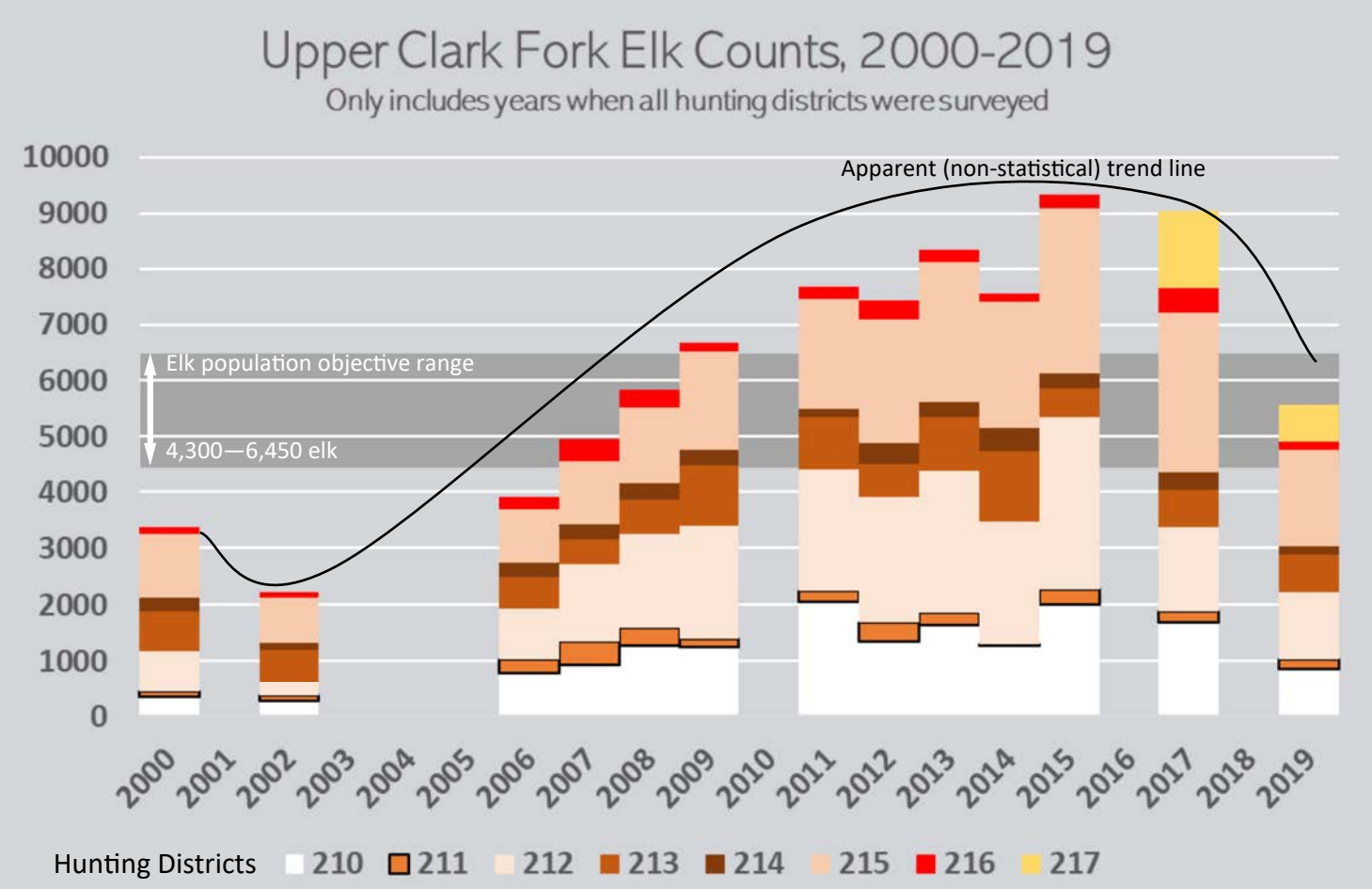

Elk Trend Surveys and Population Objective for HD 203, 1985 - 2019*
1200
1000
800
600
400
200
0
85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19
14 calves:100 cows
Total Elk Counted
* Incomplete data sets resulting from partial surveys were not included ('89, '90, '96, '98, '00, '02, '04, '06, '07 & '09); Portion of survey conducted in helicopter ('95, '05, '11-'15)

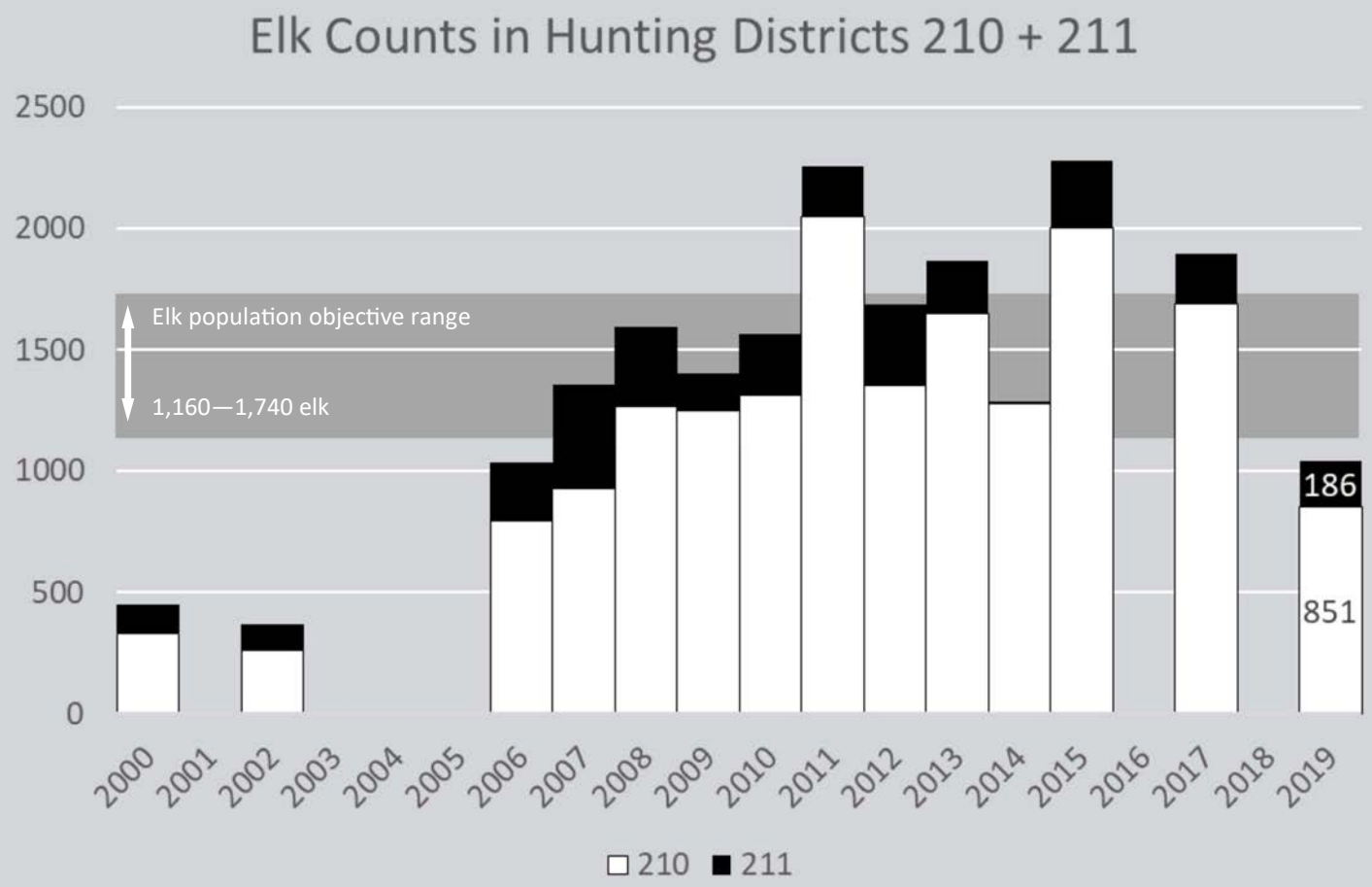

Spring Elk Trend Surveys, HD 203, 1985 - 2019*
East & West of Petty Creek
West
East
ELK OBSERVED
1000
900
800
700
600
500
400
300
200
100
0
85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19
* Incomplete data sets resulting from partial surveys were not included ('89, '90, '96, '98, '00, '02, '04, '06, '07 & '09); Portion of survey conducted in helicopter ('95, '05, '11, '12, '

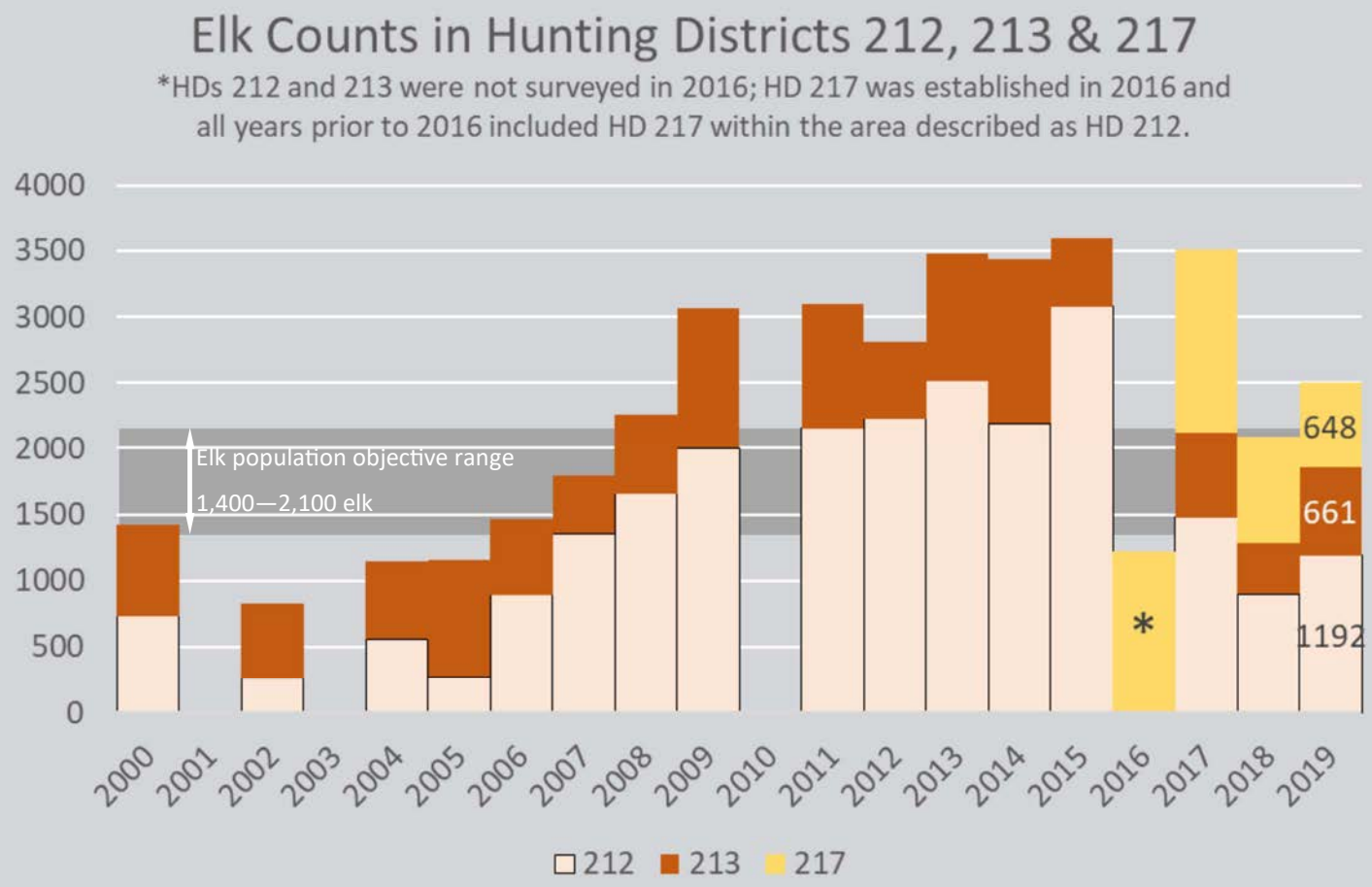

Combined Data: HD 283 (West) - North Hills and Evaro Elk Trend Counts
1980 - 2019
Evaro (gray)
North Hills (black)
Population Objective = 300
(240 – 360)
16 calves:100 cows
146
NUMBER OF ELK OBSERVED
YEAR

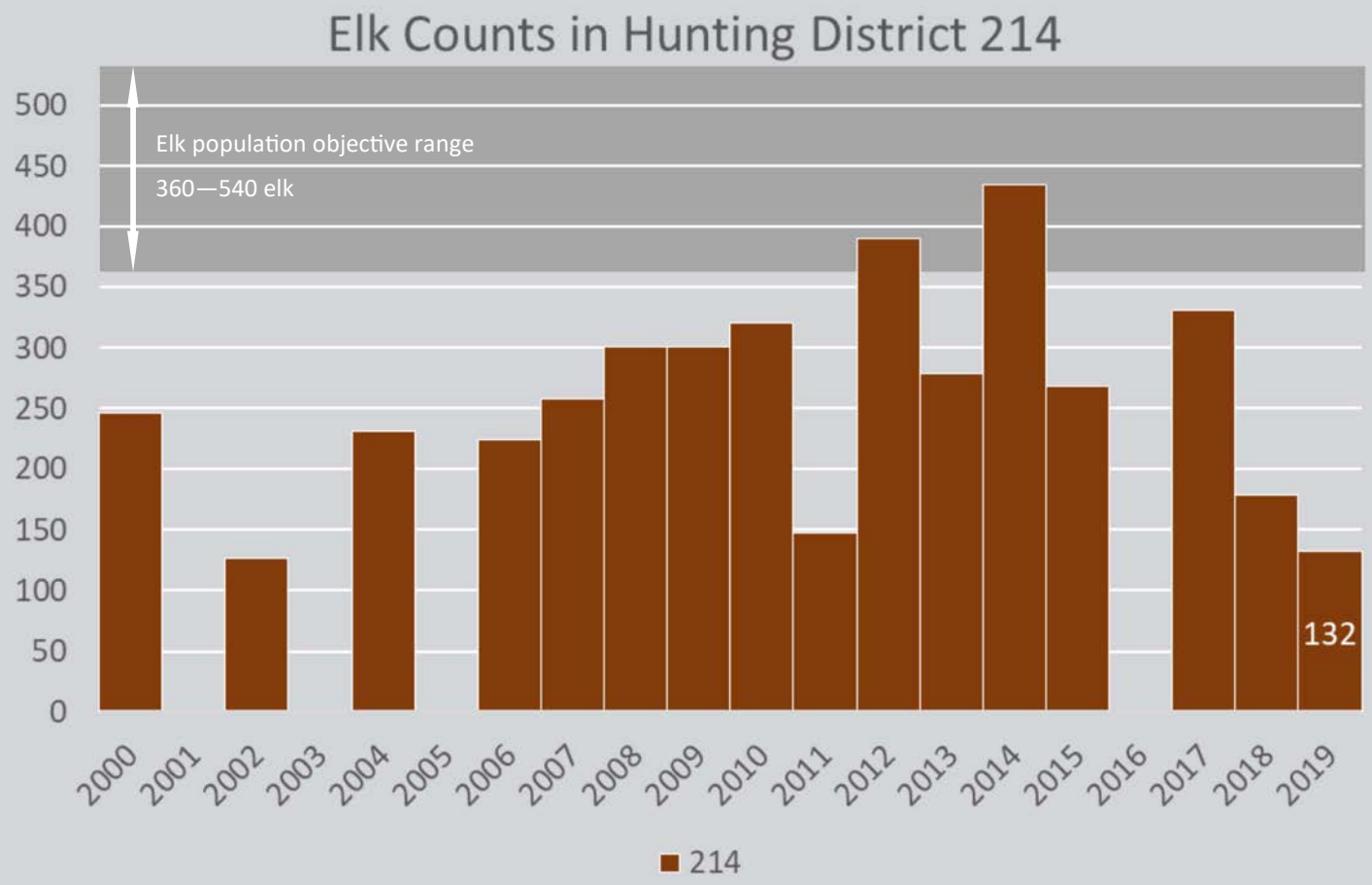

Mt Jumbo Elk
1982-2019
Elk Observed
Jumbo SU

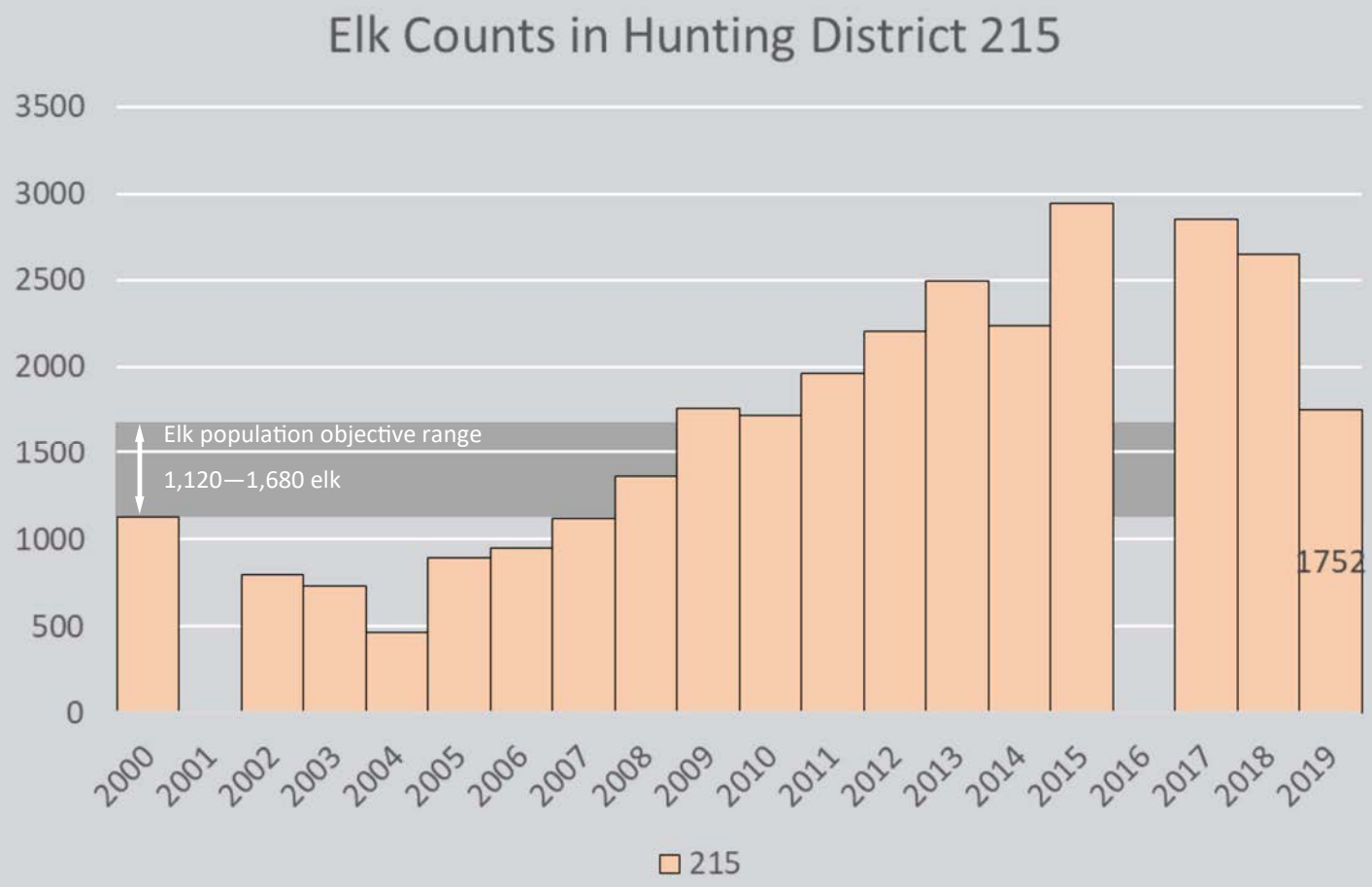
Upper Clark Fork Elk Counts

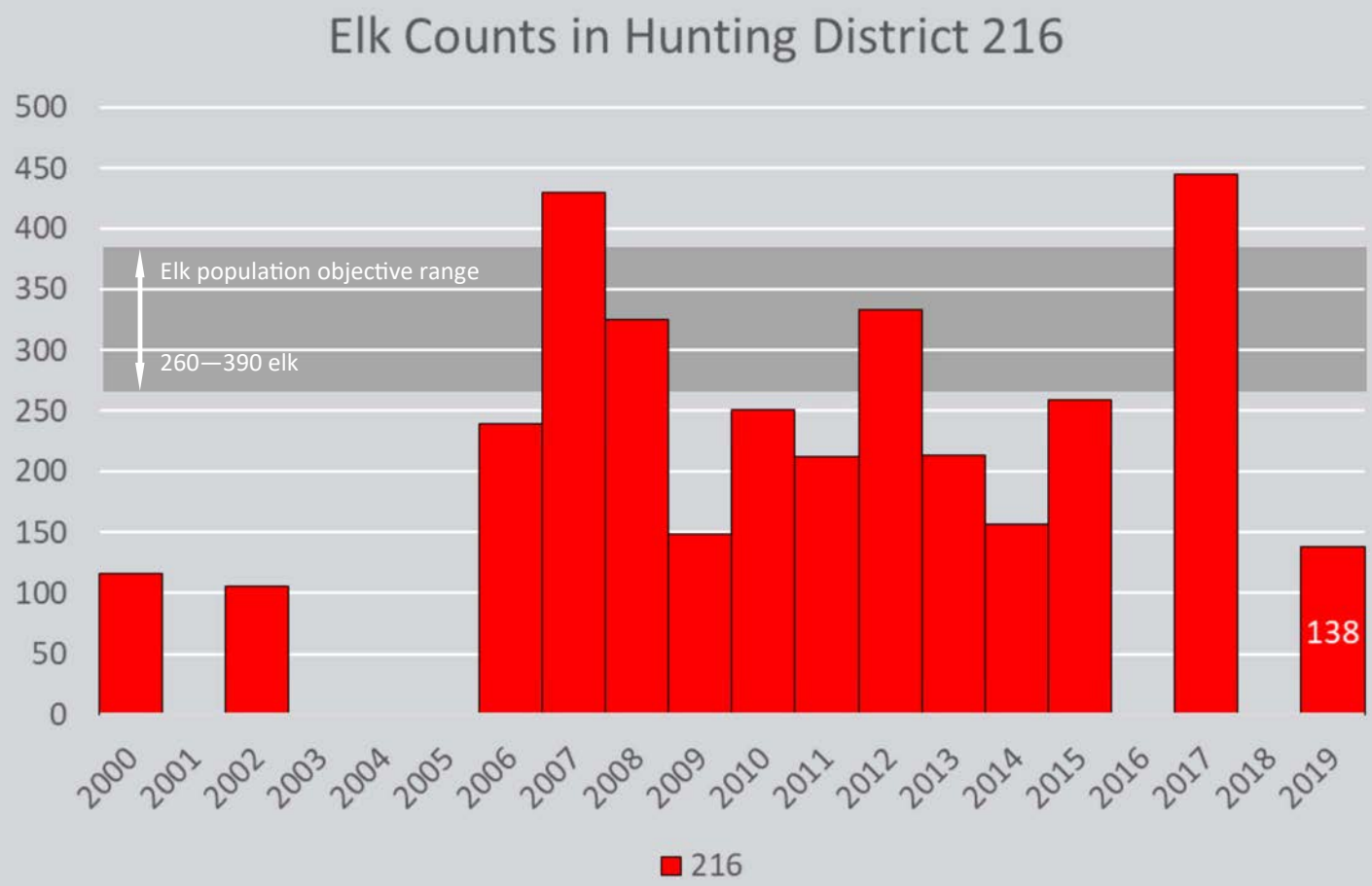


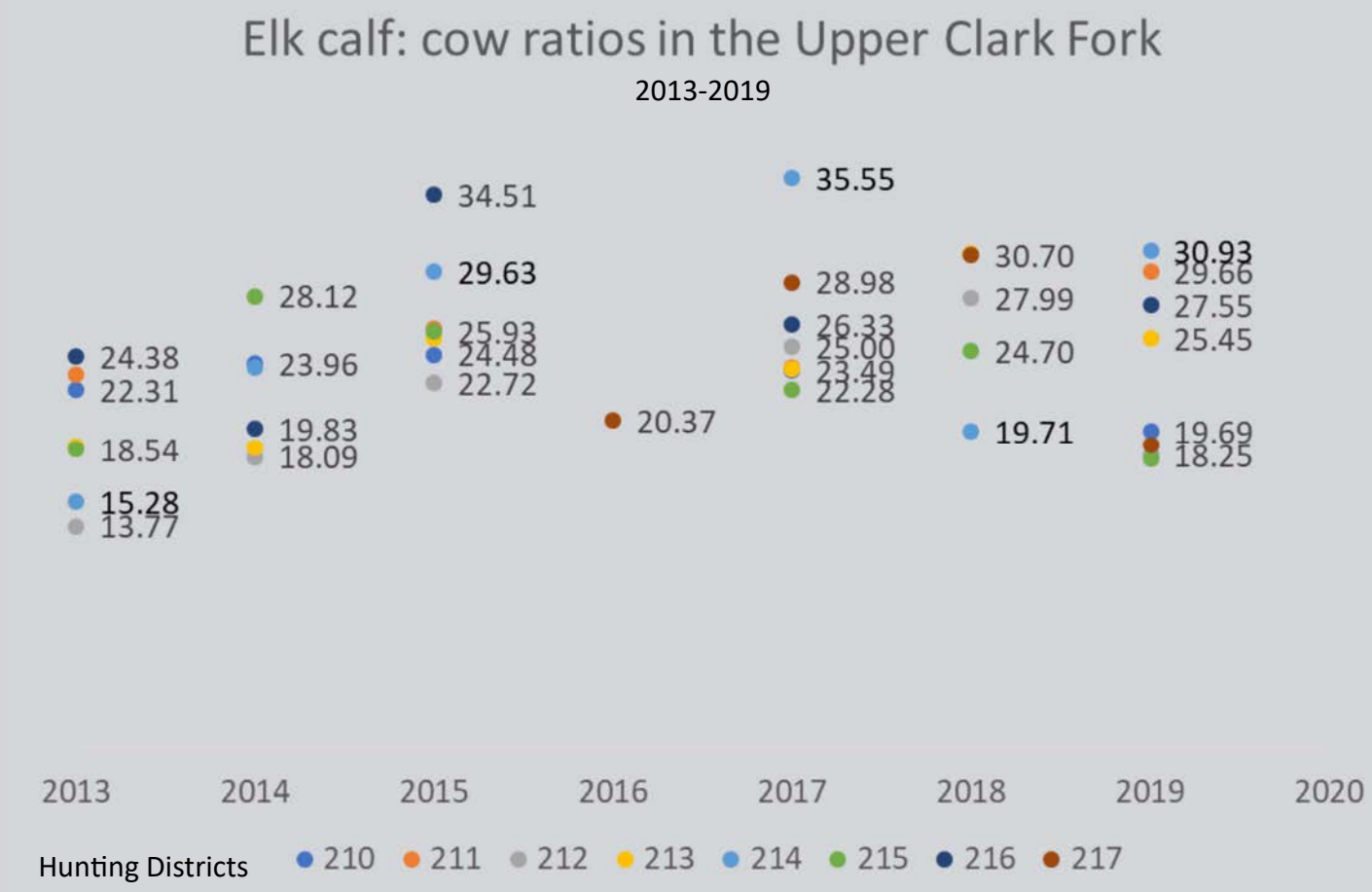

Elk Counts in Hunting Districts 210 + 211
2500
2000
1500
1000
500
0
Elk population objective range
1,160—1,740 elk
186
851
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
210
211


Elk Counts in Hunting Districts 212, 213 & 217
*HDs 212 and 213 were not surveyed in 2016; HD 217 was established in 2016 and all years prior to 2016 included HD 217 within the area described as HD 212.
4000
3500
3000
2500
2000
1500
1000
500
0
Elk population objective range
1,400—2,100 elk
648
661
1192
*
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
212
213
217

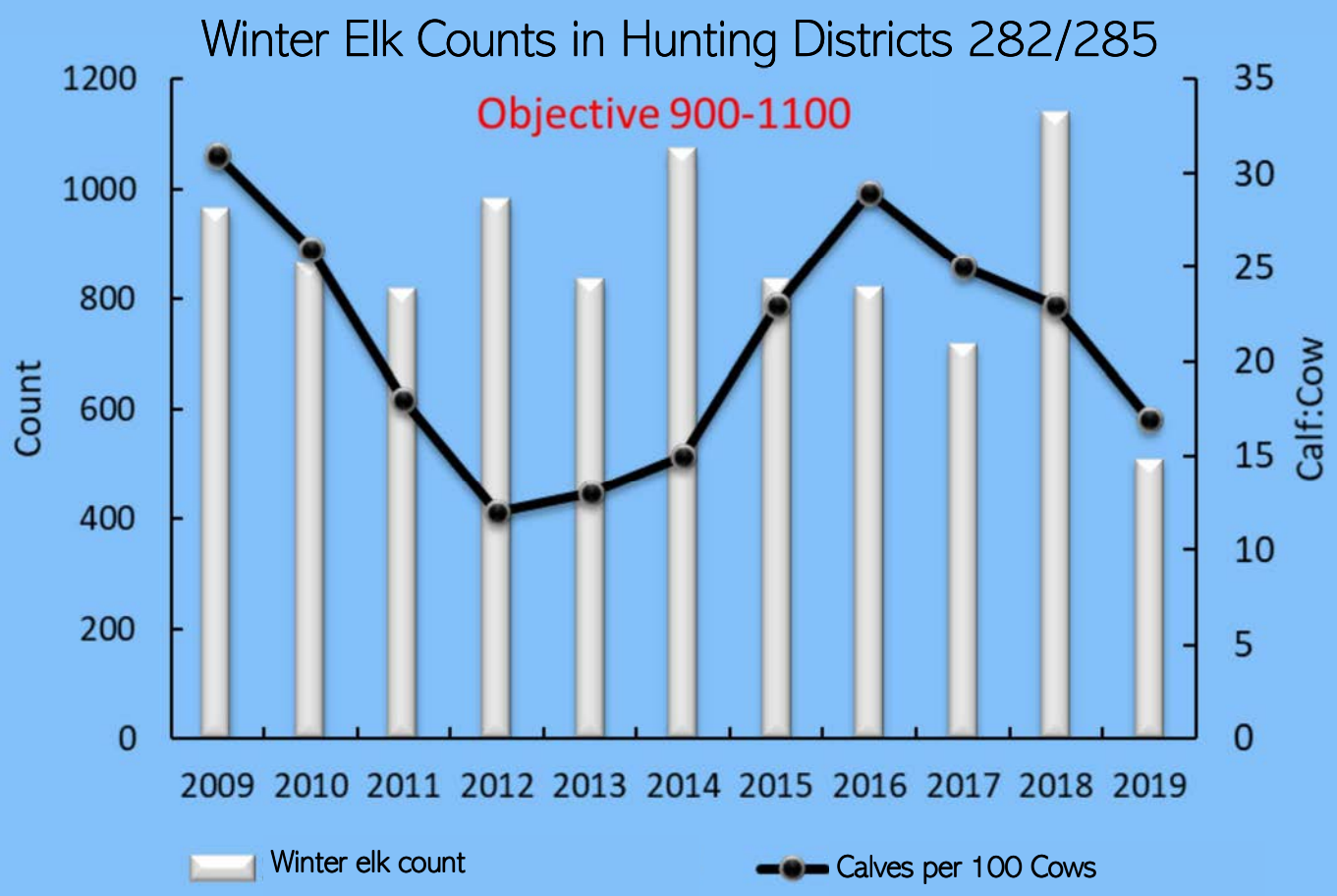

Elk Counts in Hunting District 214
Elk population objective range
360—540 elk
500
450
400
350
300
250
200
150
100
50
0
132
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
214

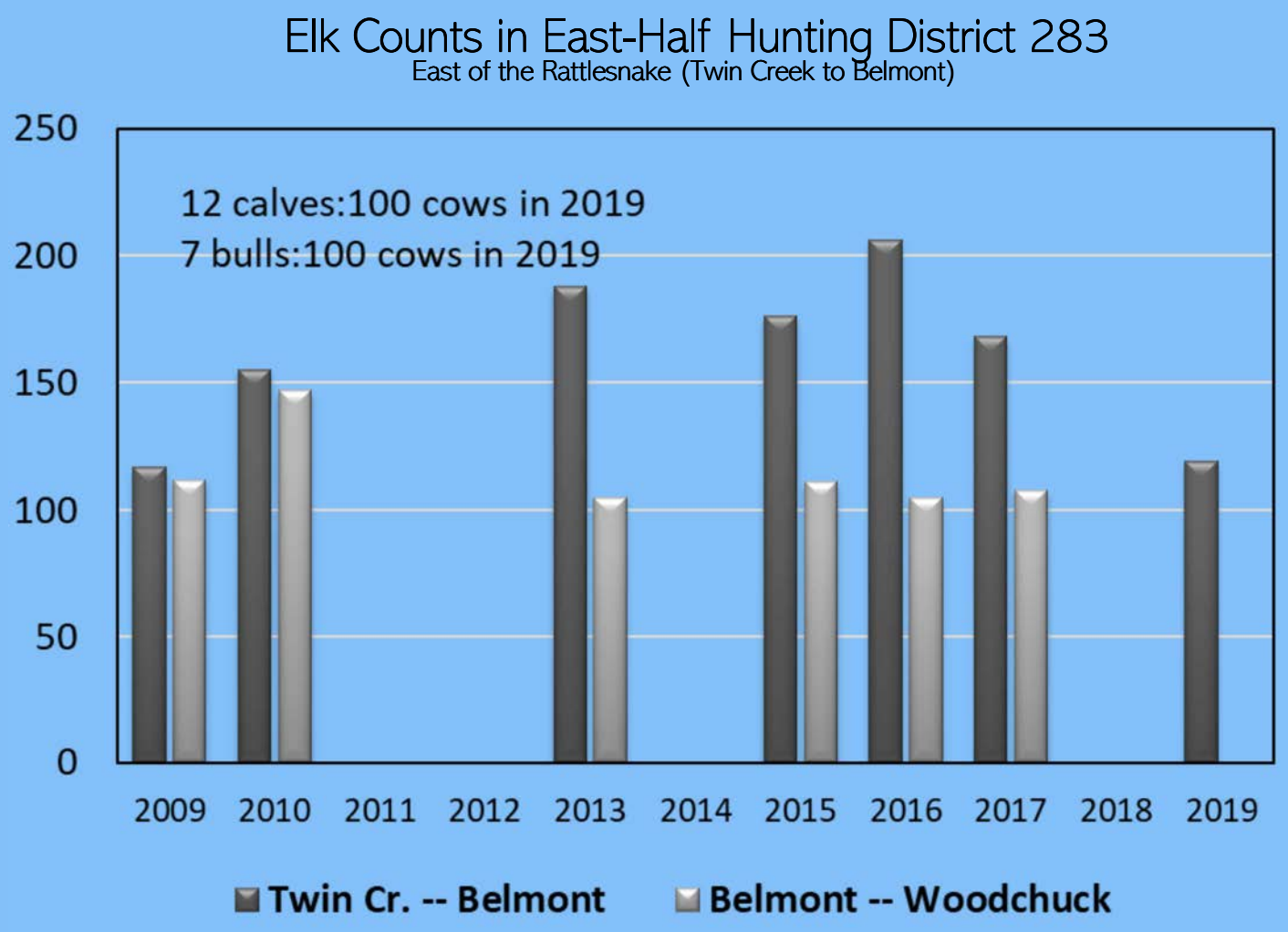

Elk Counts in Hunting District 215
Elk population objective range
1,120—1,680 elk
3500
3000
2500
2000
1500
1000
500
0
1752
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
215

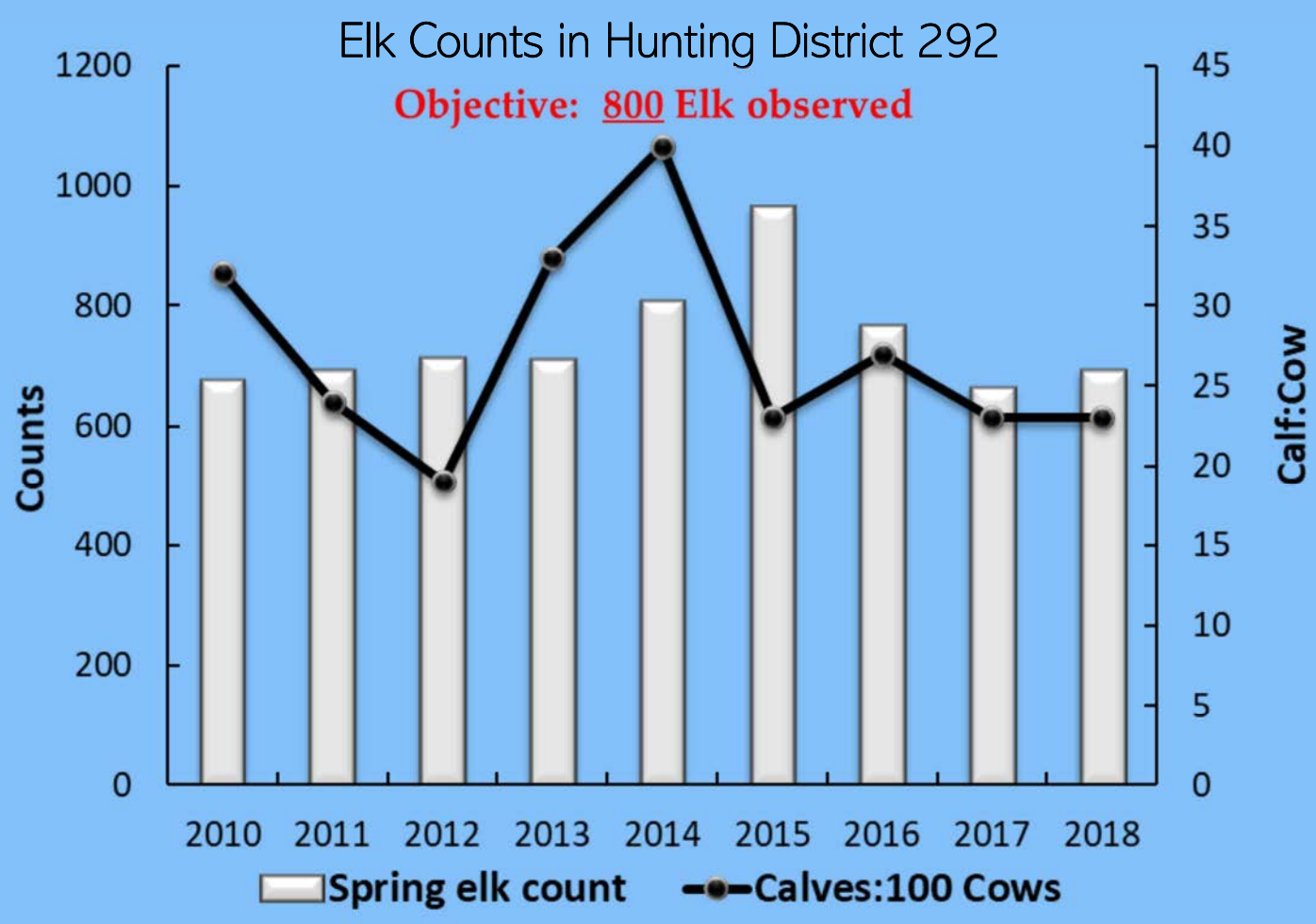

Elk Counts in Hunting District 216
500
450
400
350
300
250
200
150
100
50
0
Elk population objective range
260—390 elk
138
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
216

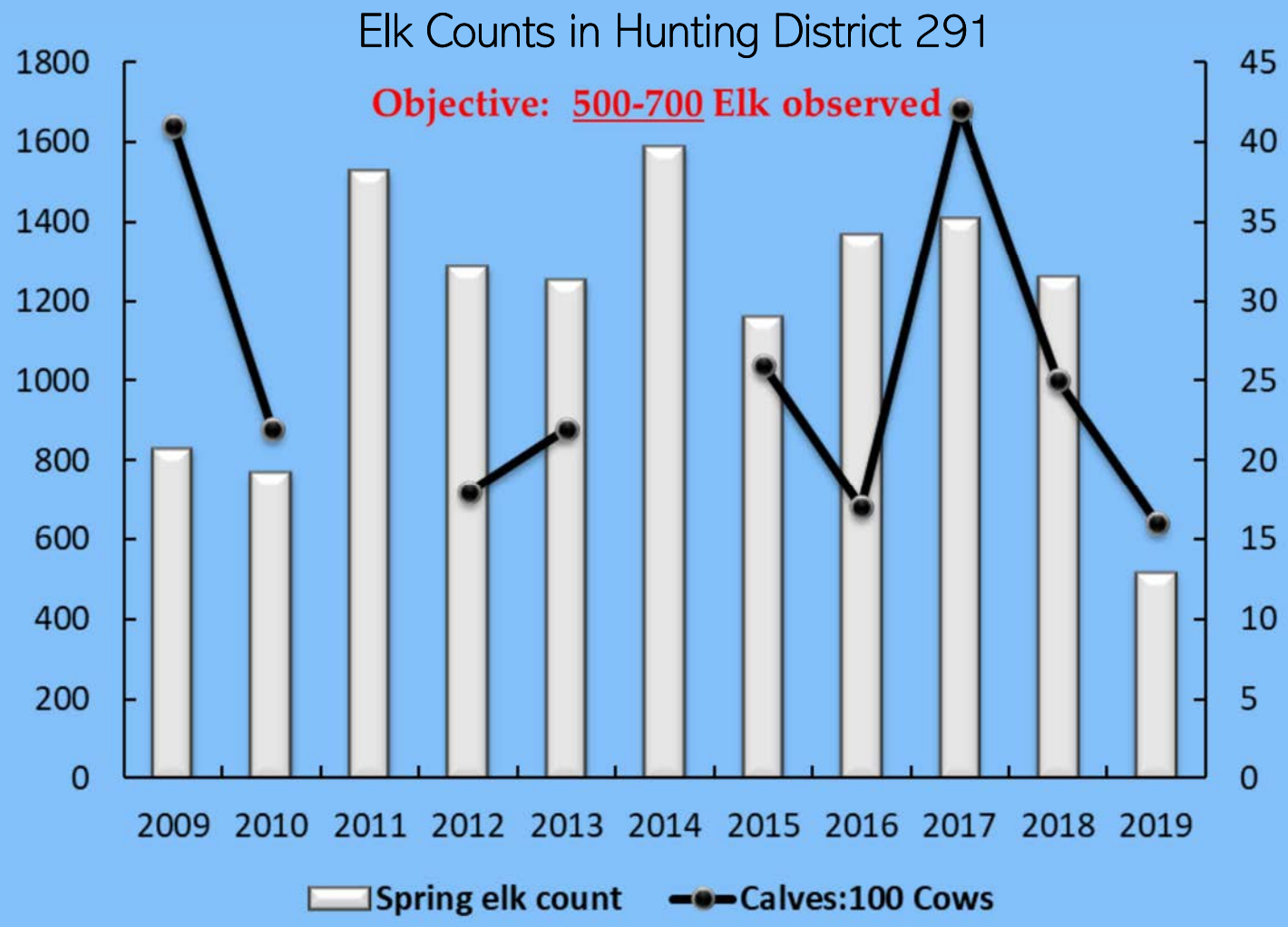

Elk calf: cow ratios in the Upper Clark Fork
2013-2019
24.38
22.31
18.54
15.28
13.77
28.12
23.96
19.83
18.09
34.51
29.63
25.93
24.48
22.72
20.37
35.55
28.98
26.33
25.00
23.49
22.28
30.70
27.99
24.70
19.71
30.93
29.66
27.55
25.45
19.69
18.25
2013
2014
2015
2016
2017
2018
2019
2020
Hunting Districts
210
211
212
213
214
215
216
217

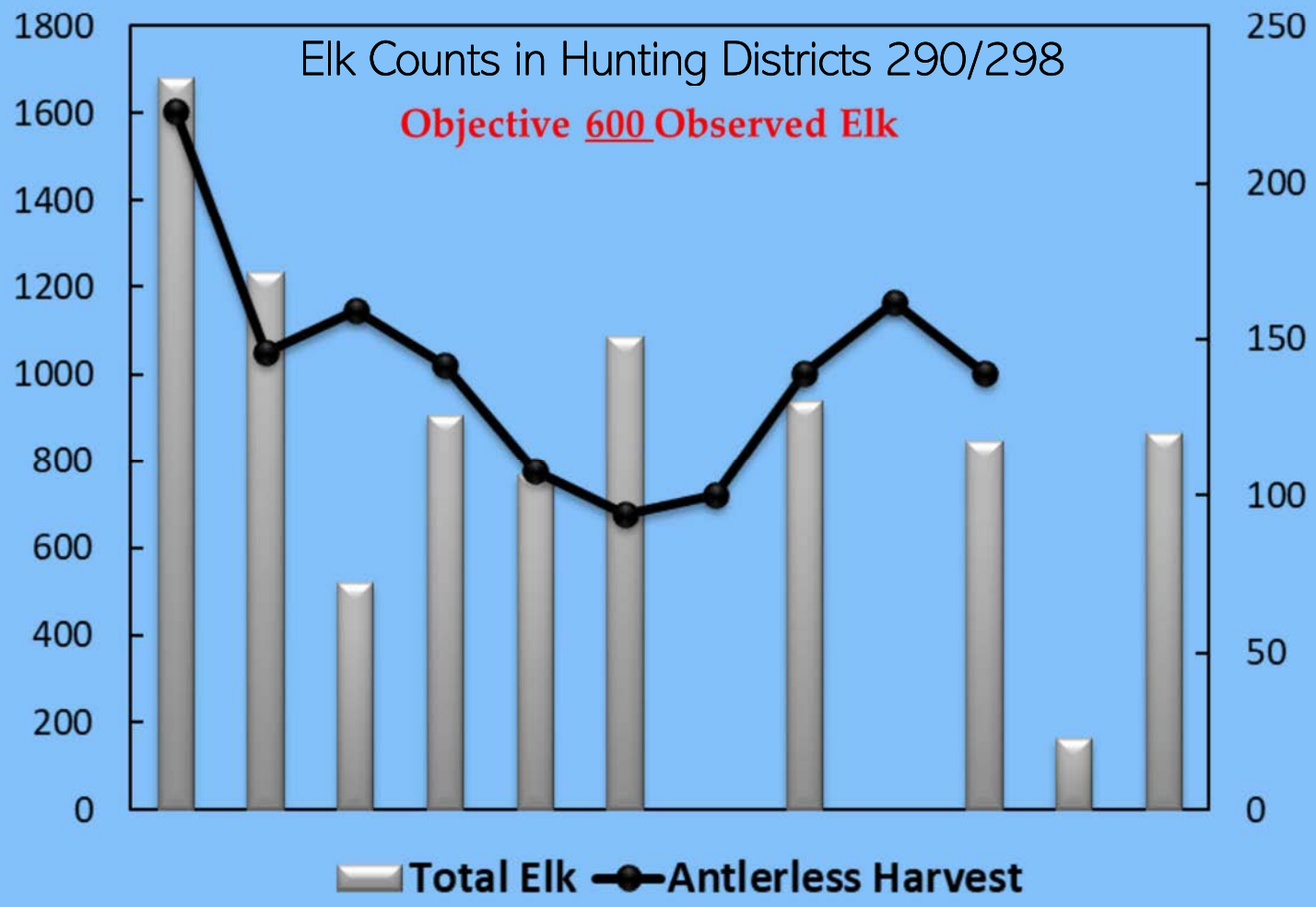
Blackfoot Elk Counts

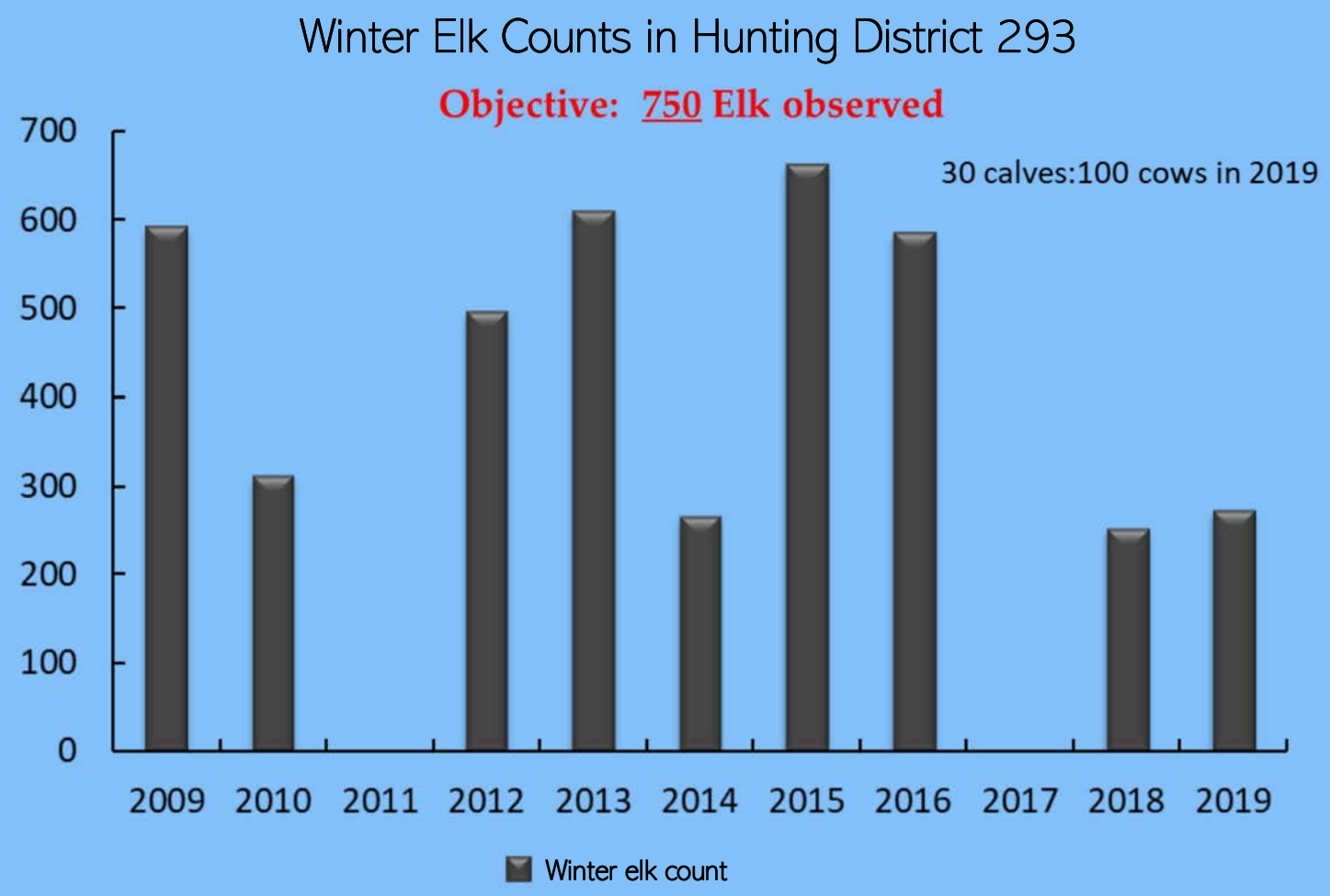


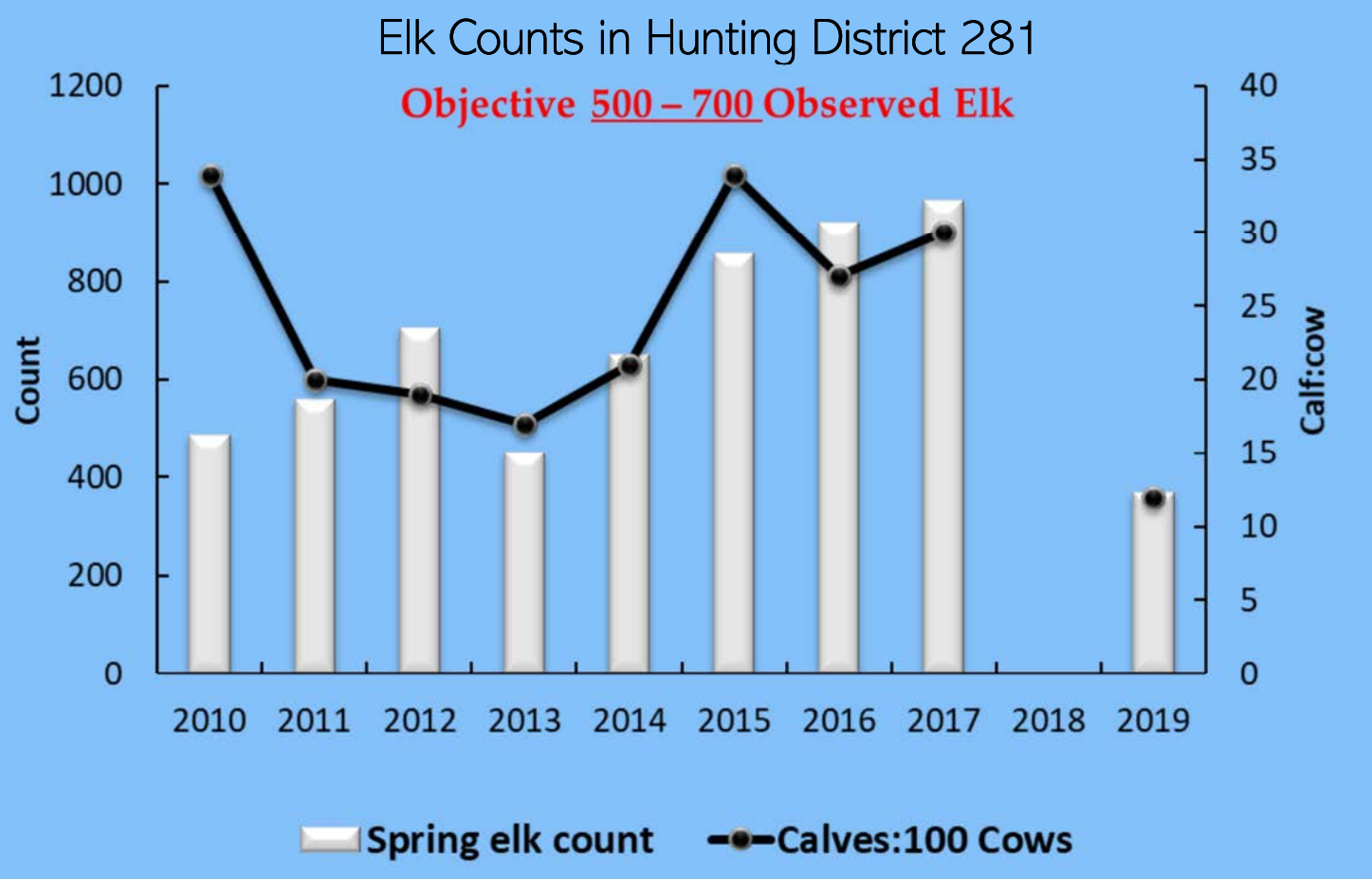

Elk Counts in East-Half Hunting District 283
East of the Rattlesnake (Twin Creek to Belmont)
12 calves:100 cows in 2019
7 bulls:100 cows in 2019
250
200
150
100
50
0
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Twin Cr. -- Belmont
Belmont -- Woodchuck


Elk Counts in Hunting District 292
Objective: 800 Elk observed
Counts
Calf:Cow
1200
1000
800
600
400
200
0
45
40
35
30
25
20
15
10
5
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
Spring elk count
Calves:100 Cows

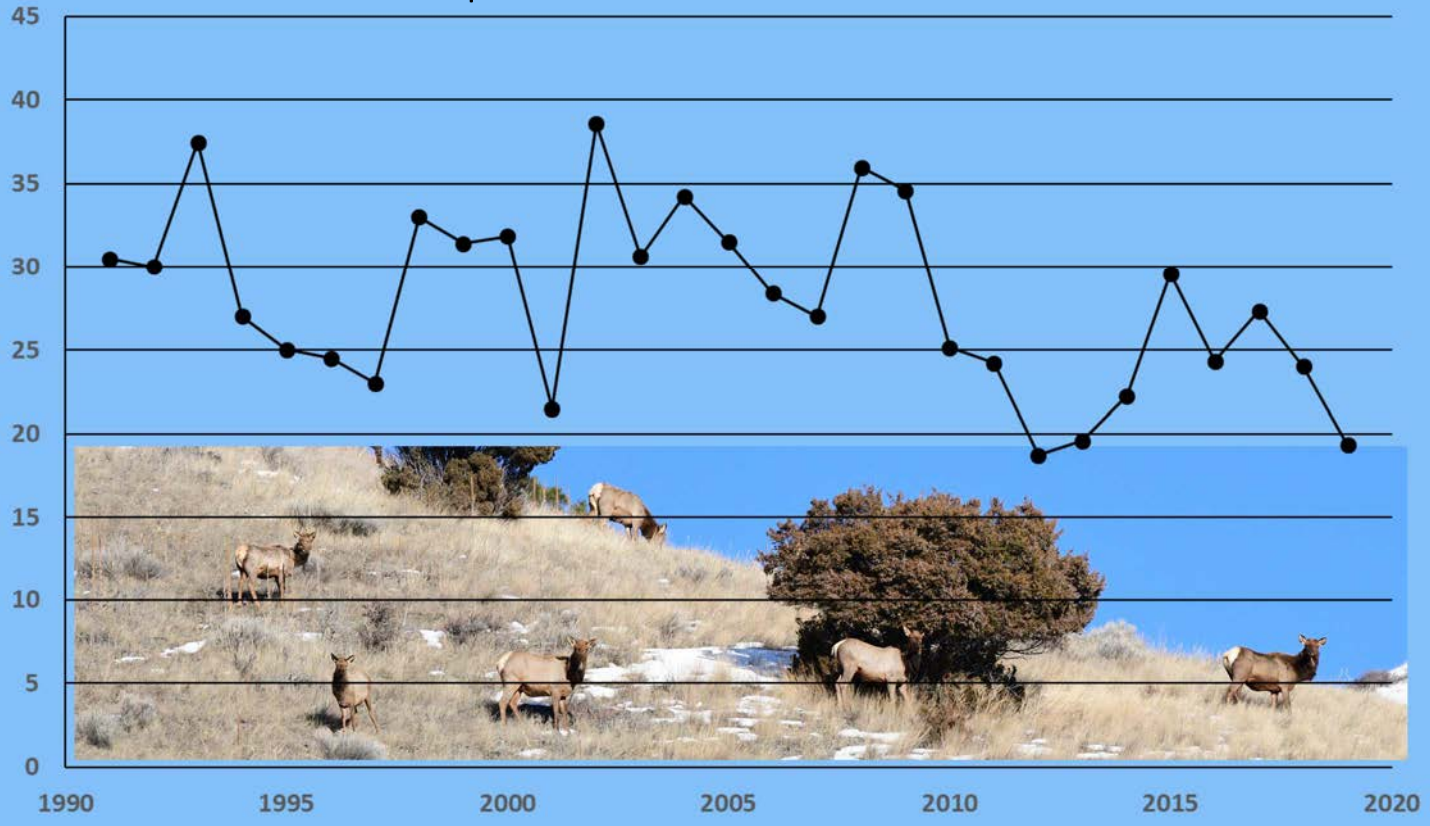

Elk Counts in Hunting District 291
Objective: 500-700 Elk observed
1800
1600
1400
1200
1000
800
600
400
200
0
45
40
35
30
25
20
15
10
5
0
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Spring elk count
Calves:100 Cows


Elk Counts in Hunting Districts 290/298
Objective 600 Observed Elk
1800
1600
1400
1200
1000
800
600
400
200
0
250
200
150
100
50
0
Total Elk
Antlerless Harvest

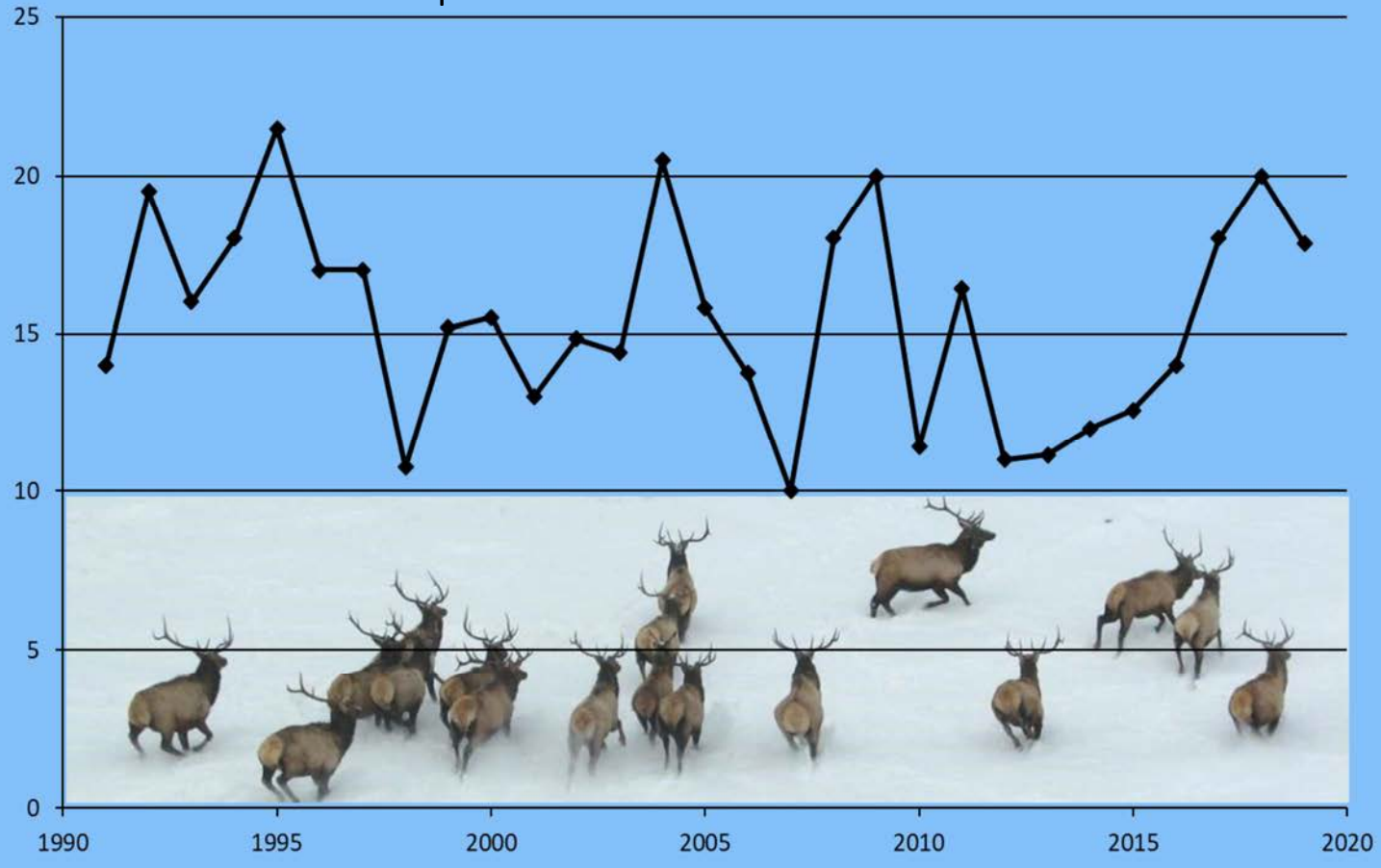

Winter Elk Counts in Hunting District 293
Objective: 750 Elk observed
30 calves:100 cows in 2019
700
600
500
400
300
200
100
0
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Winter elk count


Elk Counts in Hunting District 281
Objective 500 – 700 Observed Elk
Count
Calf:cow
1200
1000
800
600
400
200
0
40
35
30
25
20
15
10
5
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Spring elk count
Calves:100 Cows

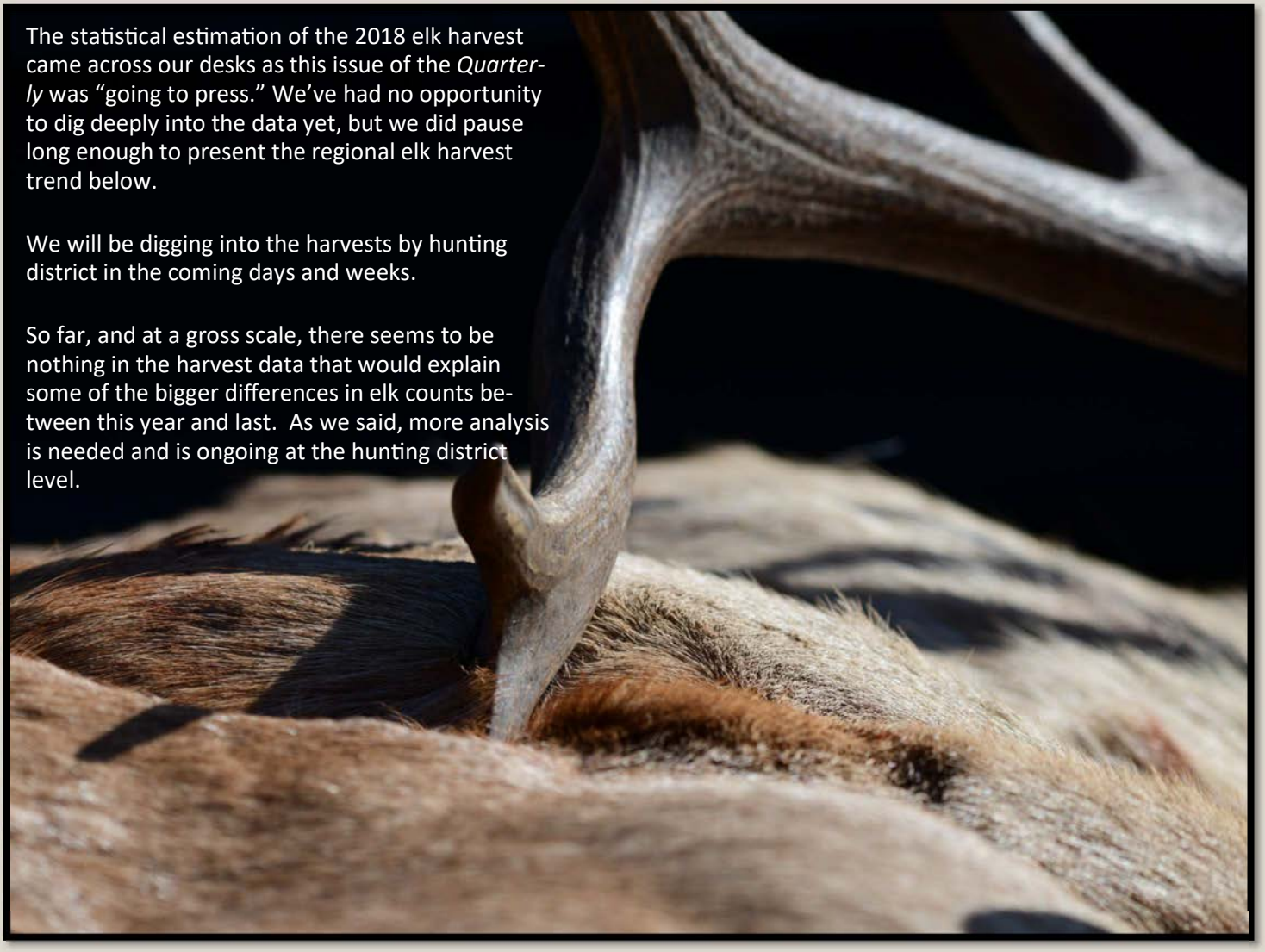
Trend in Calves per 100 Cows in the Blackfoot Watershed



Trend in Bulls per 100 Cows in the Blackfoot Watershed



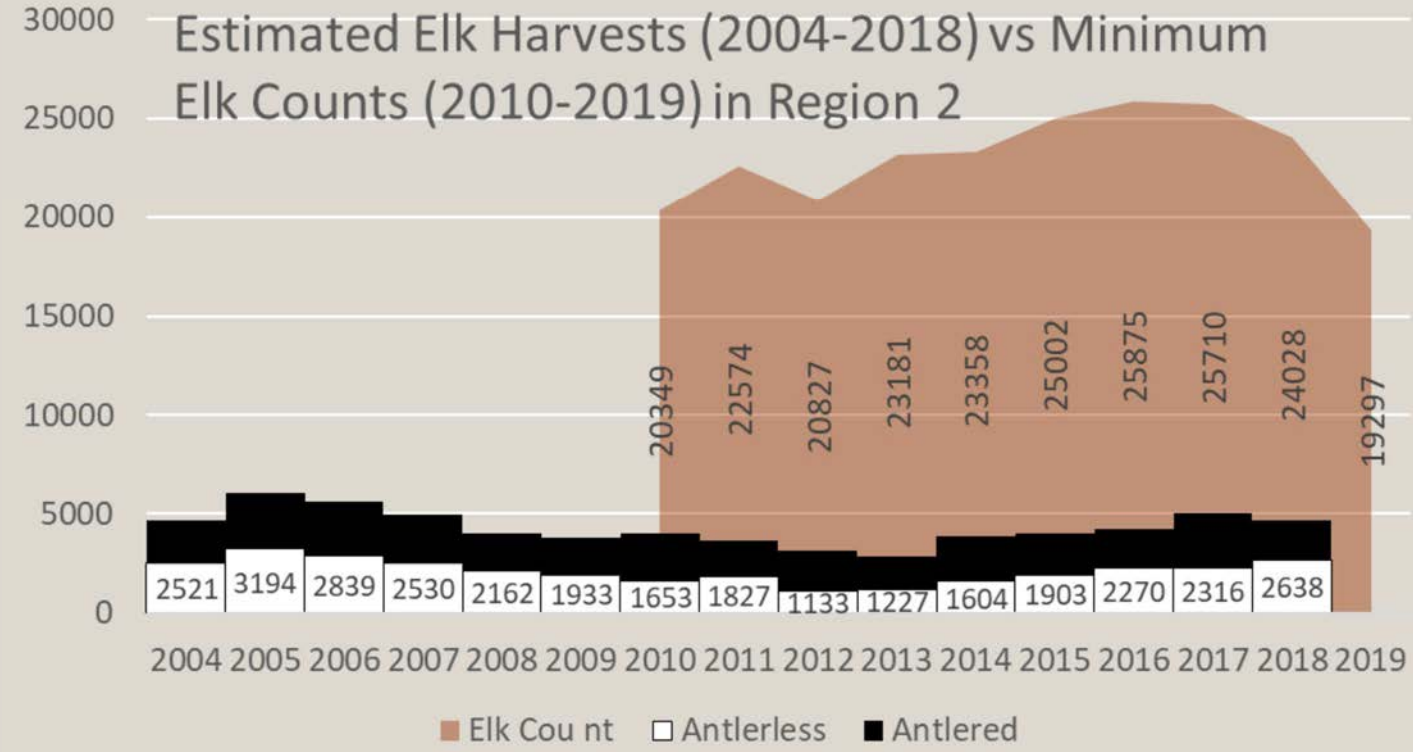
Region 2 Elk Harvest



The statistical estimation of the 2018 elk harvest came across our desks as this issue of the *Quarterly* was "going to press." We've had no opportunity to dig deeply into the data yet, but we did pause long enough to present the regional elk harvest trend below.

We will be digging into the harvests by hunting district in the coming days and weeks.

So far, and at a gross scale, there seems to be nothing in the harvest data that would explain some of the bigger differences in elk counts between this year and last. As we said, more analysis is needed and is ongoing at the hunting district level.



Elk Futures

As the next calf cohort gets its legs, like this newborn in the Blackfoot Valley on May 27, our minds drift to thoughts of what awaits them. The *Montana Climate Assessment* is a helpful forecasting tool, which resides online at *http://montanaclimate.org/chapter/executive-summary*

Some interesting and relevant quotes from the Executive Summary of the *Montana Climate Assessment* include:

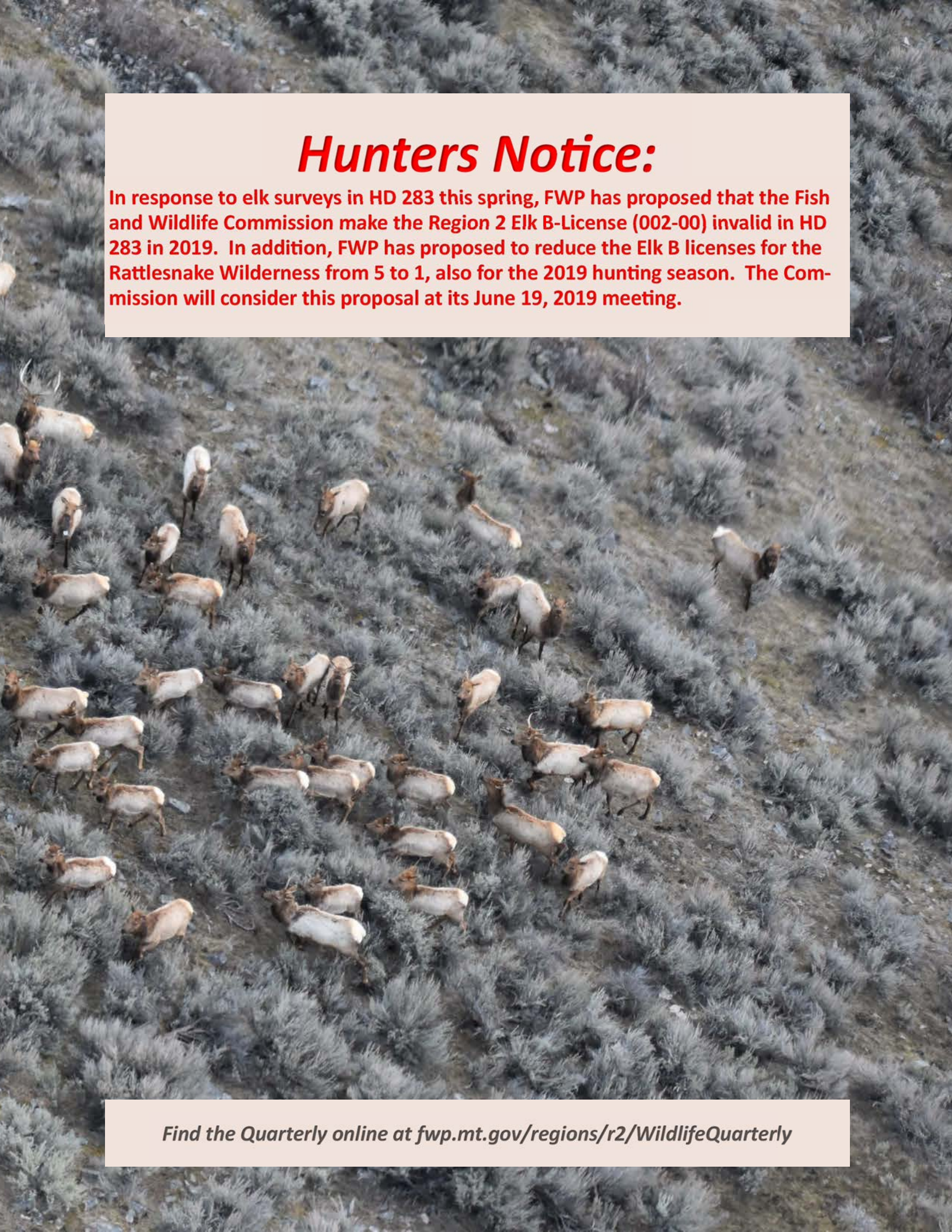
- *Since 1950, average statewide temperatures have increased by 0.5 degrees F per decade, with greatest warming in spring; projected to increase by 3-7 degrees F by mid century, with greatest warming in summer and winter and in the southeast.*
- *Maximum temperatures have increased most in the spring, and are projected to increase 3-8 degrees F by mid century, with greatest increases in August and in the southeast.*
- *Minimum temperatures have increased most in winter and spring, and are projected to increase 3-7 degrees F by mid century, with greatest increases in January and in the southeast.*
- *Precipitation is projected to increase, primarily in spring in the northwest; a slight statewide decrease in summer precipitation and increased year-to-year variability of precipitation are projected as well.*

We read these climate projections to say that elk, biologists, landowners, hunters and elk watchers can consider the elk biological year of June 2018-May 2019 as evidence of what the future holds. That is, we will continue to expect the unexpected.

And elk distribution during FWP's annual aerial surveys may not be as predictable as it was in the past.

Winter conditions in the future will be of special interest. Subtle changes in fall, winter and spring temperatures and precipitation will make the difference between a soft, fluffy snow cover through which elk can paw for food and a freezing, thawing, crusted snow cover that renders moving and foraging laborious.

If this Blackfoot calf is long-lived—and some cow elk live to be more than 20 years old—its fitness will be tested by a lot of change. Fortunately, elk are among our most adaptable wildlife.



Hunters Notice:

In response to elk surveys in HD 283 this spring, FWP has proposed that the Fish and Wildlife Commission make the Region 2 Elk B-License (002-00) invalid in HD 283 in 2019. In addition, FWP has proposed to reduce the Elk B licenses for the Rattlesnake Wilderness from 5 to 1, also for the 2019 hunting season. The Commission will consider this proposal at its June 19, 2019 meeting.

Find the Quarterly online at fwp.mt.gov/regions/r2/WildlifeQuarterly