FORTIFICATION CREEK PLANNING AREA
ANNUAL MONITORING REPORT
2013

INTRODUCTION

The Decision Record (DR) for the Fortification Creek Planning Area (FCPA) Resource Management Plan Amendment (RMPA) was signed on August 5, 2011. The RMPA established a performance based approach for oil and gas development within the FCPA. Performance standards were identified to conserve the Fortification elk herd and ensure successful reclamation leading to ecosite restoration. The RMPA goal for elk is to maintain a viable elk herd across the FCPA utilizing their seasonal ranges during the appropriate seasons. Reclamation goals include a short-term goal to immediately stabilize disturbed areas and provide conditions necessary to achieve the long term goals; which are (1) facilitate eventual ecosystem reconstruction to maintain a safe and stable landscape and meet the desired outcomes of the land use plan; and (2) vegetative communities within development mirror those of healthy communities as described in the Ecological Site Description (ESD).

The DR establishes a monitoring team consisting of the State of Wyoming and the BLM. The team will review monitoring data and make recommendations to the BLM authorizing officer. BLM will review performance standards prior to issuing drilling permits. All performance standards must be achieved to BLM satisfaction in order to remain within compliance. If a performance standard is not met and BLM determines it is necessary, then additional permitting will be stopped until the standard is met. This report is the monitoring team's summary of the monitoring data and their recommendations to the BLM authorizing officer.

BASE LINE

The specific elk performance standards established by the RMPA and their status at the signing of the DR (August 2011) are as follows:

1. The population is maintained at 80% (120) or greater as measured from the Wyoming Game and Fish Department (WGFD) population objective (currently 150). The WGFD 2010 Job Completion Report provides a 2009 post-season population estimate for the Fortification elk herd of 232.
2. Calf production is maintained at least 80% (100:37) of current cow:calf ratio (100:45.5). The initial ratio is based on a 9 year average (2003-2011 WGFD 2010 JCR Table 7 subadults/100 females).
3. Winter calf survival is at least 80% (100:33.6) of current cow:calf ratio (100:42.0). The initial ratio is based on a 9 year average (2003-2011 WGFD 2010 JCR Table 8 subadults/100 females). **Note**: The RMPA DR reported a value of 100:30.9, that value was the adult:calf ratio and not the cow:calf ratio, column 1 was used from table 8 instead of column 2.
4. Next-summer calf survival (calf to yearling) is at least 80% (100:26) of current cow:Yrlng ratio (100:32.4). The initial ratio is based on a 9 year average (2003-2011 WGFD 2010 JCR Table 7 Yrlng. Males (x2)/100 females).
5. Fidelity to the seasonal ranges (yearlong, calving, and crucial winter) remains greater than 80% of current levels. The seasonal crucial range fidelity will evaluate the collared elk use within the seasonal ranges (calving and crucial winter) during the crucial seasons.
6. Security habitat is maintained at 80% or greater than baseline levels within the crucial ranges and the yearlong range for each geographic phase. Acres of security habitat within the FCPA in August 2011 included 29,759 acres within the calving range, 20,435 acres within crucial winter range, and 45,354 acres within the full yearlong range (including calving and crucial winter).

7. Habitat effectiveness (local – Plan of Development [POD]) is maintained at 80% or greater of current levels within the crucial ranges and the yearlong range.

2013 DEVELOPMENT

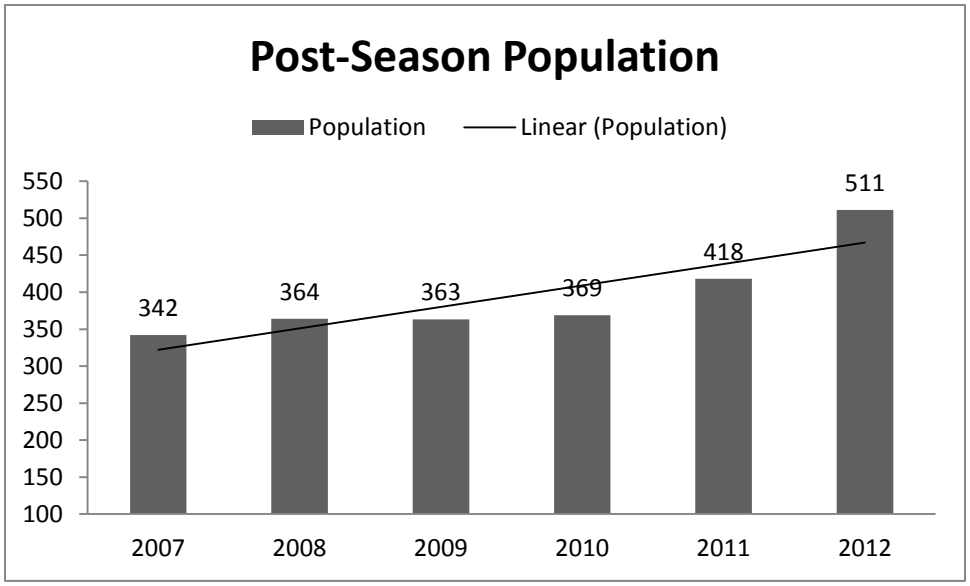
BLM authorized Anadarko's Camp John SMA Phase 1 Year 2 POD on March 13, 2014. The DR approved 25 APDs and deferred 18 pending a decision on a lease stipulation modification request.

Ballard Petroleum horizontally drilled a non-federal oil well between January 21 and May 28, 2013 in T51N R76W S9 SE SE along Fortification Creek. Anadarko drilled a total of 10 wells (federal and non-federal) within Camp John SMA Phase 1 Year 1area within the following sections T51N R75W S18, 19, 30, 31 and T51N R76W S 24, 25. Additionally Anadarko constructed road and utility corridors for non-federal wells in T51N R75W S9. In total, Anadarko constructed 8 new road segments totaling 1.6 miles, maintained 2 road segments of approximately 3.8 miles, and installed approximately 5 miles of buried water/gas pipeline and 6.1 miles of buried electrical line. In most cases the electric and pipeline utilities were combined into a single corridor. Oil operators performed maintenance associated with older oil wells and their access roads. Yates did not conduct any operations related to Elsie or Queen B PODs.

2013 PERFORMANCE STANDARDS STATUS

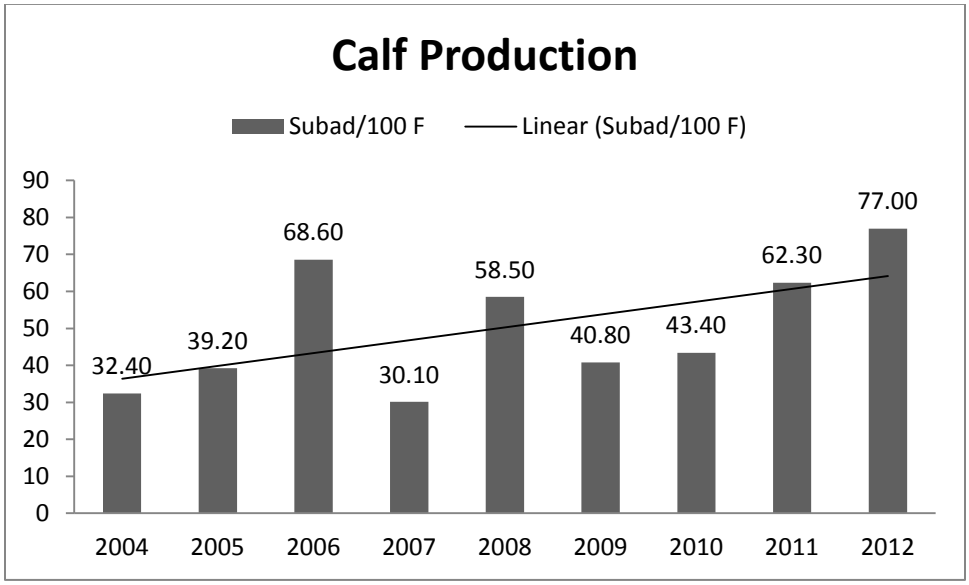
The most recent data available was analyzed to calculate the status of the elk performance standards in fall 2012; which is as follows:

1. **Population**: The 2011 post hunt population estimate, as reported in last year's Fortification Creek monitoring annual report, was 256 (POP-II estimate, WGFD 2011 Job Completion Report (JCR)). The 2012 post hunt population estimate is 511 elk. The WGFD changed population models in 2012; while the population is increasing, it is unlikely that the population doubled from the 2011 estimate. Winter flights by WGFD to count elk as well as during a January elk capture and collar operation support this. The WGFD population objective is 150. The population graph below illustrates previous population estimates using the new population model.

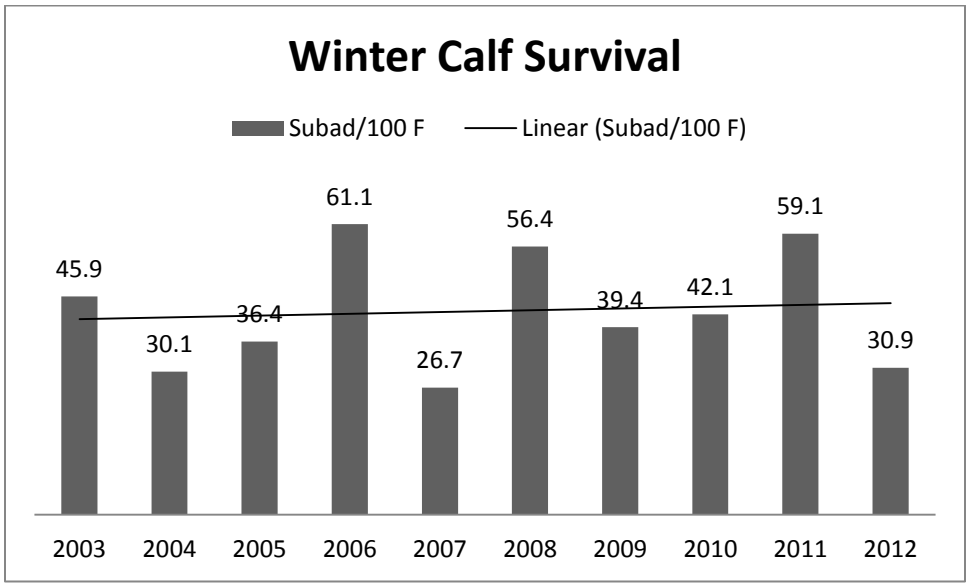


2. **Calf production**: The estimated post-season 9-year average cow:calf ratio is100:50.26 (2004-2012 WGFD 2012 JCR, subadults/100 females). The ratio indicates an increase of 4.76 calves per 100 cows from the average reported in the RMPA DR (45.5). Calf production

is highly variable from year to year, the reason for evaluating an average spread over many years. Annual calf production ranged from 30 calves (2007) to 77 calves (2012) for every 100 cows. The trend is increasing.

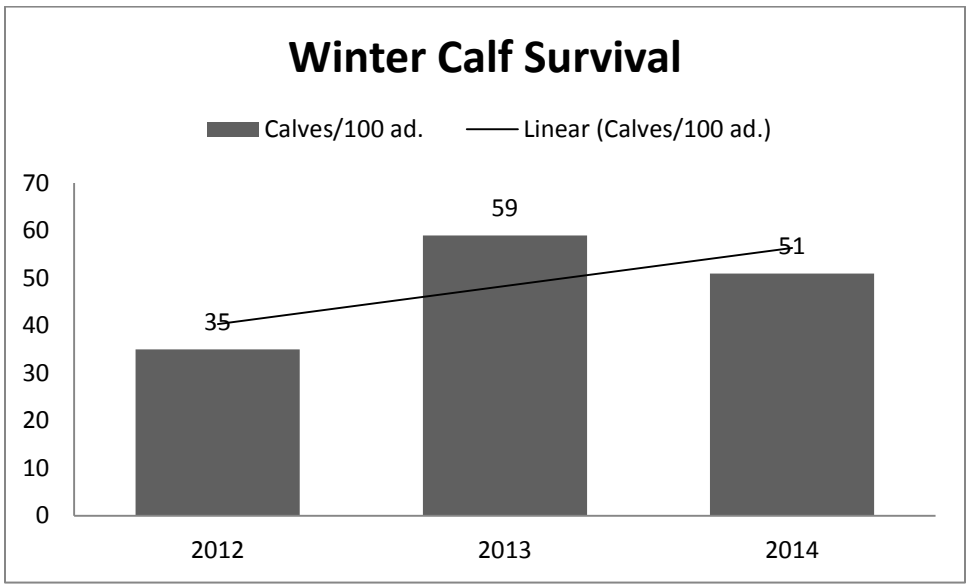


3. **Winter calf survival**: The new WGFD population model does not calculate a winter survival estimate from the post-season survey. Because the new model does not estimate winter survival and the spring surveys have only been conducted since 2012, the winter calf survival estimate from the 2011 JCR is presented. The estimated 9-year average cow:calf ratio was 100:42.5 (2004-2012 WGFD POP-II Table 8, 4/26/2012, subadults/100 females). The ratio is an increase of 0.5 calves per 100 cows from the average reported in the RMPA DR.

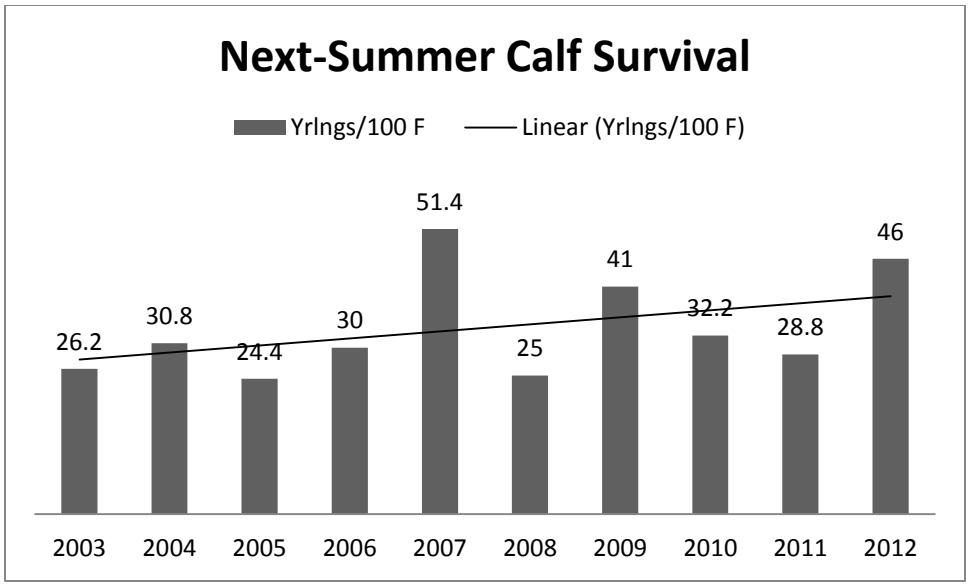


A spring helicopter survey was initiated in 2012 to produce a more reliable estimate of the winter calf survival, than basing the estimate on the end of year ratio as presented above.

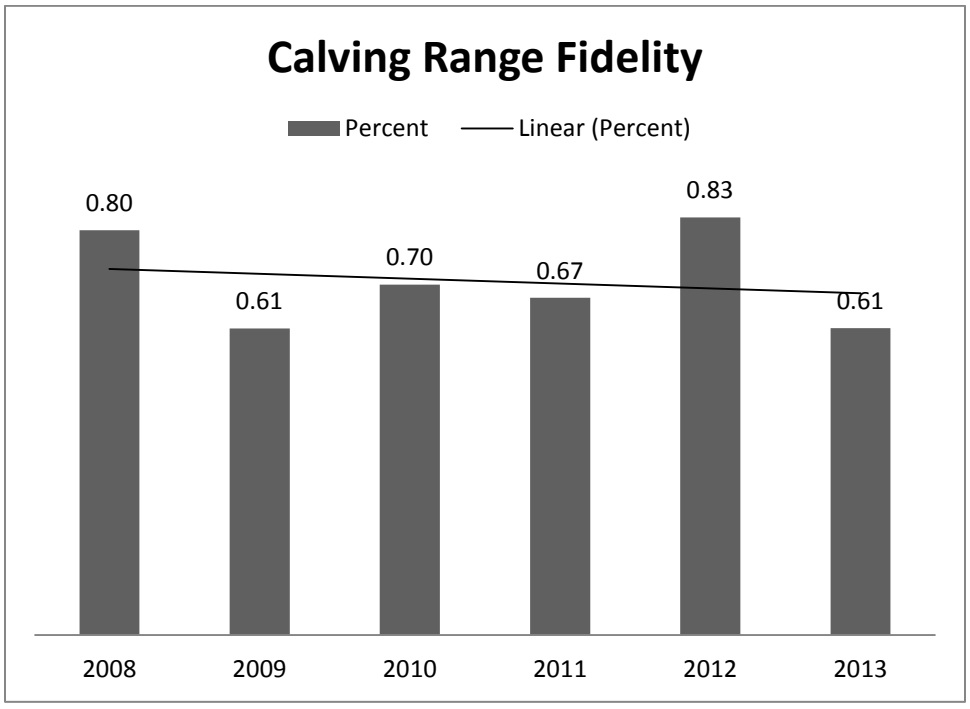
The calf:antlerless adult elk ratio ranged from 35:100 in 2012 to 59:100 in 2013, the 2014 ratio was 51:100. The ratio is presented as 'antlerless adults' versus 'cows' as it is difficult to confidently classify elk in the spring (after antler drop and before new antler growth). Last year's calves, even when near cows were difficult, although not impossible to separate out. Individuals not near others, with no size comparison available, were nearly impossible to determine if they were a calf or older so were categorized as "antlerless". It is highly likely that many bulls were also lumped into the antlerless category due to the lack of antlers at that time of year.



4. **Next-summer calf survival**: The new WGFD population model does not calculate a next-summer calf (yearling) survival estimate from the post-season survey. The following results are from the 2011 Job Completion Report and were included in the 2012 Fortification Creek Planning Area Monitoring Report. The 2012 estimated 9-year average cow:yearling ratio was 100:34.4 (2004-2012 WGFD POP-II Table 7, 4/26/2012, Yr. Males (x2)/100 females). The ratio indicates an increase of 2 yearlings per 100 cows from the 2011 9-year average. If the new population model is unable to estimate the next-summer calf survival, then this performance standard may need to be revised or eliminated.

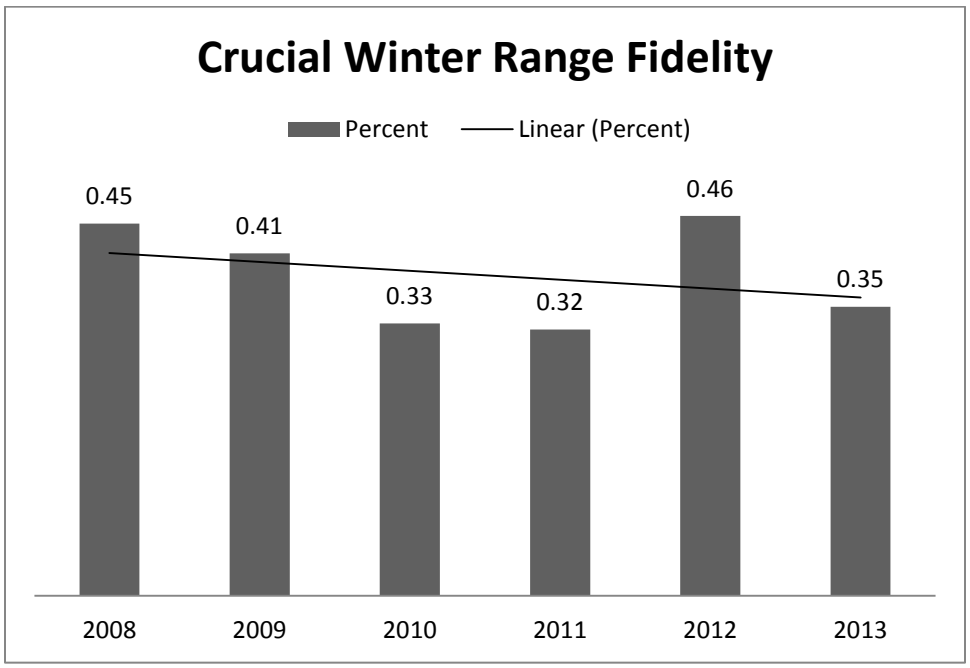


5. **Seasonal range fidelity**: Seasonal range fidelity was first evaluated within the entire herd unit, as reported in the RMPA DR. During the 2008 through 2013 calving seasons 70% of the herd unit elk locations were within the FCPA calving range (13,067 of 18,568 locations). The lowest fidelity to the calving range was in 2009 and 2013 when 61% of the herd unit locations were within the FCPA calving range; the greatest calving range fidelity was the 2012 season with 83% of the herd unit locations within the FCPA calving range.

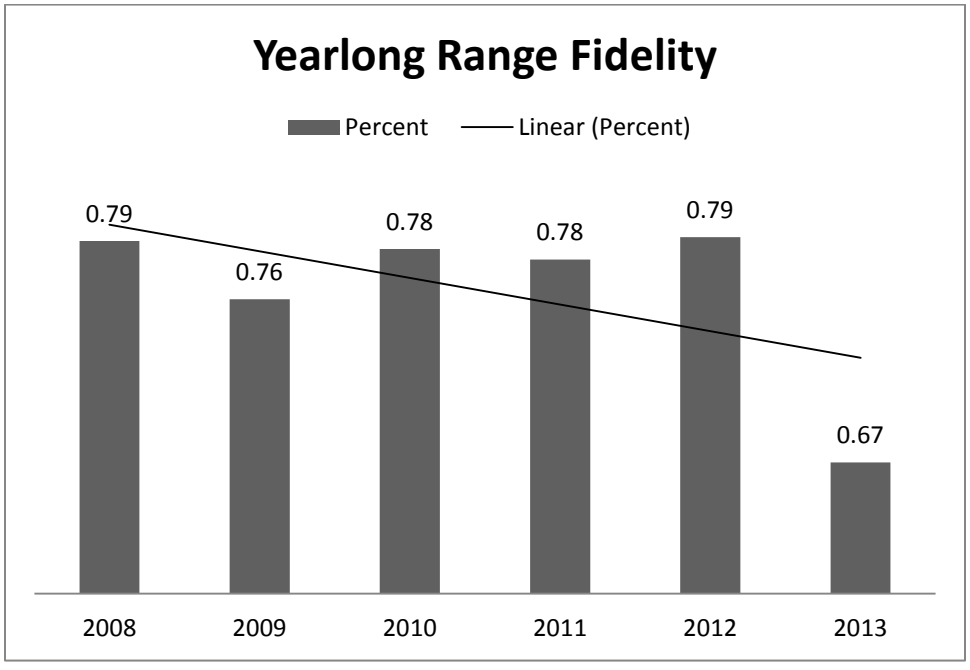


During the 2008 through 2013 winter seasons, December 1 – April 30, 39% of the herd unit elk locations were within the FCPA crucial winter range (33,291 of 84,945 locations). The lowest fidelity to the crucial winter range was 2011-2012 when 32% of the herd unit locations were within the FCPA crucial winter range; the greatest crucial winter range fidelity was the

2012-2013 winter with 46% of the herd unit locations within the FCPA crucial winter range. While fidelity to crucial winter range was greater during the winter of 2012-2013 than the previous two winters, overall there is a slight decreasing trend over the six winters evaluated.



During the biological years, May 15 – May 14, 2008 through 2012, yearlong fidelity was very similar, ranging from 76% to 79%. Biological year 2013 showed less fidelity to the yearlong range with 67% of the herd range locations being within the FCPA yearlong range.



Seasonal range fidelity was also analyzed using elk location data within the FCPA. The FCPA calving range contained 93% and 96% of the elk locations within the FCPA during the

2012 and 2013 calving seasons respectively. The FCPA crucial winter range contained 65% of the elk locations within the FCPA during the 2012 winter period. The yearlong range fidelity was looked at across the full yearlong range, not limited to the FCPA, and contained 94% of the elk locations within the entire herd unit during biological year 2012.

Season	Period	# of Elk	# Locations within FCPA	# Locations within Range	Fidelity (%)	90% Confidence Intervals (%)		Performance Standard (±/- %)
						Lower	Upper	
Yearlong	05-15-12 to 05-14-13	33	17,249*	16,194	94%	90%	98%	+37%
Winter	12-01-12 to 04-30-13	21	3,779	2,475	65%	55%	76%	+23%
Parturition	05-15-12 to 06-15-12	26	2,131	1,992	93%	86%	101%	+23%
Parturition	05-15-13 to 06-15-13	12	770	743	96%	93%	100%	+26%

*Includes all locations from GPS-collared elk (e.g., not restricted to the FCPA).

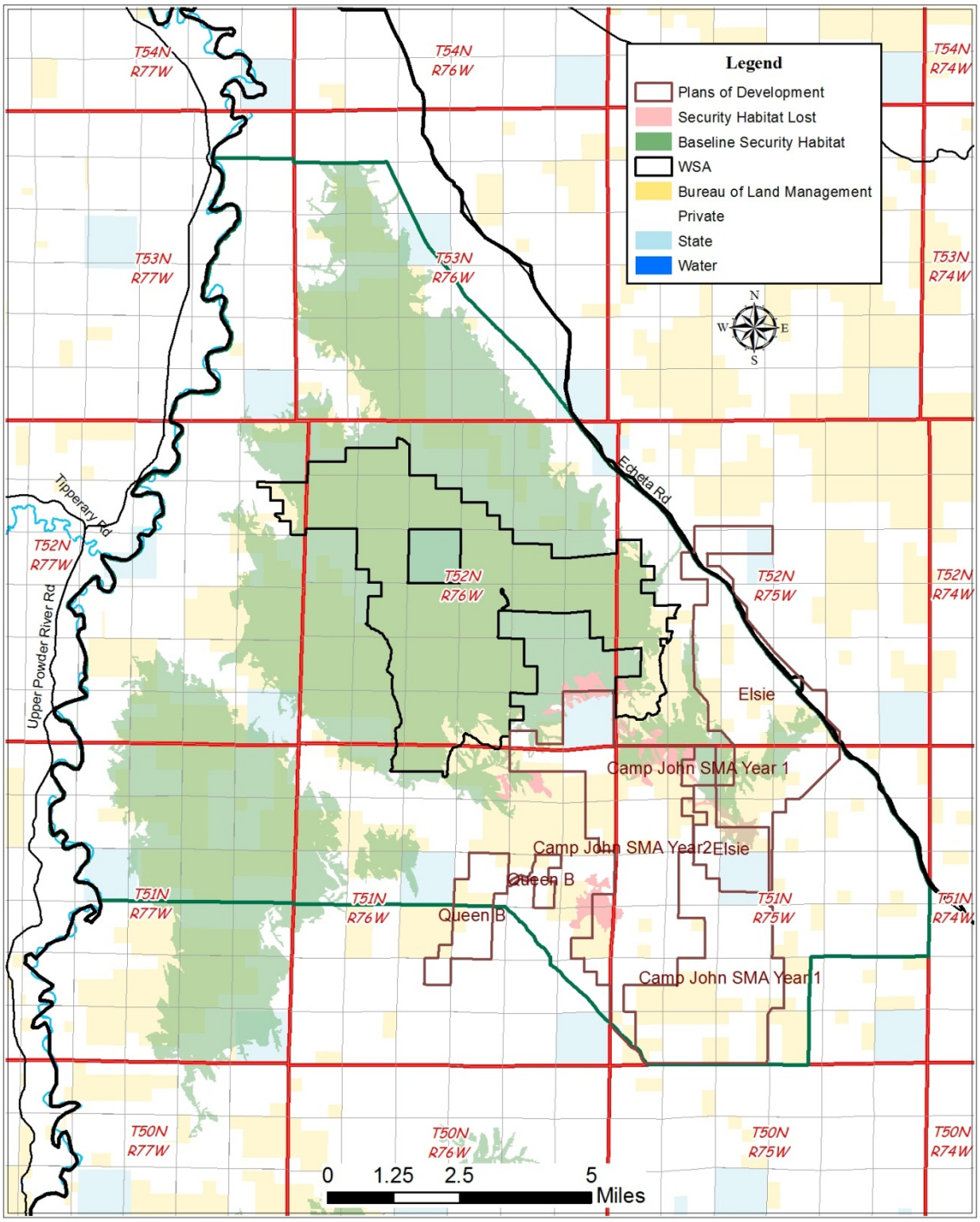
6. **Security habitat**: Since the August 5, 2011 DR four Federal CBNG projects have been authorized. Total elk security habitat loss from the four authorized federal PODs (Anadarko's CJU SMA Phase 1 Year 1 and Year2 PODs, and Yates Queen B and Elsie PODs) combined with authorized or pending WOGCC nonfederal permits is 1,101 acres (19.7%) of the baseline elk security habitat in the SE Phase (5,593 acres).

7. **Habitat effectiveness:**

Camp John SMA Phase 1 Year 1: This POD area received the most elk use in biological year 2008 (May 15, 2008 –May 14, 2009) with 300 elk locations. Camp John elk use represented 0.70% of all locations within herd unit during biological year 2008 (300/42,886). Nearly all of these data points (279) were from a single collared cow (335339). Cow elk 335339 used the Camp John area consistently from May 2008 through January 2009. October 2010 was the only other time that Camp John appeared to receive regular use. Two data points were recorded in Camp John Phase 1 Year 1 from different elk in biological year 2012. Camp John Phase 1 Year 1 elk locations represented less than 0.1% of the herd unit locations during biological years 2009 through 2012. Use increased in biological year 2013 to 0.26% of the herd unit locations (79/29,396). All but three of the biological year 2013 locations were from cow elk 91920, with her use being exclusively during May 2014.

Camp John SMA Phase 1 Year 2: This POD area has the highest density of elk relocations for the four CBNG projects analyzed within the FCPA. Elk use has increased from 2.4% (1,040/42,886) of the herd unit data points in biological year 2008 to 5.0% of the herd unit data points in biological years 2012 (893/17,927) and 2013 (1,484/29,396). The POD area is used year round. In 2009, a low of 13 collared cow elk used the POD area while in biological years 2011 and 2012, 24 collared cow elk used the Camp John SMA Phase 1 Year 2 POD area. A similar number of elk used the project area in biological year 2013 with14 of the collared cows being located more than 15 times each.

Map 1. Fortification Creek Planning Area
Security Habitat Loss Through Bio Year 2013



Twenty collared elk have used the Camp John SMA Phase 1 Year 2 POD area during the 2008 through 2012 calving seasons (May 15 through June 15). Fourteen of these elk were collared in 2008 and five in 2011. The 14 elk collared in 2008 were recorded within the project area 681 times during the 2008 through 2010 calving seasons; during this same time period there was a total of 13,720 data points recorded from all the collared elk. Less than 5% (681/13,720=4.9%) of the elk locations during the 2008 through 2010 calving seasons were within the project area. The 6 elk collared in 2011 each were located 92 times within the project area during the 2011 and 2012 calving seasons; during this same time period there was a total of 6,975 data points recorded from all the collared elk. Less than 2% (92/6,975=1.3%) of the elk locations during the 2011 through 2012 calving seasons were within the project area. Elk use within the Camp John SMA Phase 1 Year 2 POD accounted for 3.7% (45/1,224) of biological year 2013 calving season herd unit locations, with five collared elk represented.

During field visits, elk sign was observed throughout the project area with the highest use observed late fall to early spring. Individuals were observed on occasion as they fled into thick juniper cover or over ridge tops. Fresh elk sign (tracks and droppings) were observed during every field visit.

Elsie: Elsie accounted for 0.1% of herd unit elk use (22/39,509) in biological year 2009, with most use in June and August 2009. Eight elk locations were recorded in the Elsie project area in biological years 2008 and 2011; five locations were recorded in 2010. Elk use was irregular throughout these years. Elsie saw greater use in biological year 2012 with 25 data points; however, 23 were from a single collared cow (907584) using the POD area from August through October. The remaining two Elsie data points were from cow elk 909035 during two days in late August. Fourteen data points were recorded within the Elsie POD area in biological year 2013, 0.04% of the herd unit locations (14/29,396) with nine locations for cow elk 919210. During field visits conducted 2011-2012, elk and elk sign were frequently observed within the project area.

Queen B: The Queen B POD contained 0.2% of the herd unit elk locations (47/30,968) in biological year 2011, and 0.1% in biological years 2008 (37/42,886) and 2010 (31/32,079). The most consistent use was in June and August 2009, and also in October 2010. Elk use of Queen B declined in biological year 2013 to 0.04% of the herd unit locations (15/29,396). Eleven of the points were recorded by cow elk 907466 with nine of the locations being in mid-January 2014.

Biological Year 2012: Elk use within the first three authorized PODs (Camp John SMA Phase 1 Year 1, Elsie, and Queen B remained low in 2012 with no recognizable use patterns. Two data points were recorded in Camp John Phase 1 Year 1 from different elk. Elsie contained 25 data points; 23 being from a single collared cow (907584) using the POD area from August through October. The remaining two Elsie data points were from cow elk 909035 during two days in late August. Queen B was used the most of the first three PODs with 37 data points from collared cows; the majority of the use was from August through November by eight different collared elk. One cow accounted for16 (43%) of the data points.

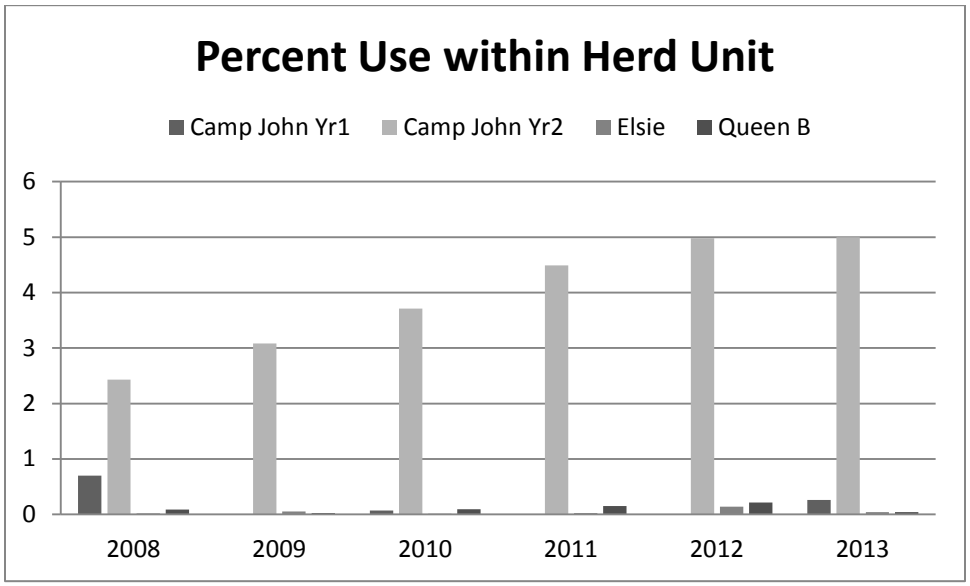
Camp John SMA Phase 1 Year 2 POD had the highest density of elk relocations, 893 of 958 data points or 93%, for the four CBNG projects analyzed within the FCPA during 2012. Elk use was greatest in the northwest portion of the POD near the WSA, with elk use decreasing further south. Only three data points were recorded in the southern half of the POD; from one cow elk (907466) on three consecutive days in early November. Fifteen collared elk

used the northwest portion of the POD. Two collared cow elk were recorded throughout the year, with cow 907437 being recorded 403 times and cow 909218 being recorded 198 times. These two collared cows represent 601 (67%) of the 893 data points during biological year 2012 within Camp John SMA Phase 1 Year 2 POD.

Biological Year 2013: Elsie and Queen B POD use remained very low with each containing 14 and 15 data points respectively. Camp John SMA Phase 1 year 1 POD exhibited 79 data points and15 collared elk represented. This represents 0.26% (79/29,396) of the biological year 2013 herd unit locations and 5.0% (79/1592) of the use within all four project areas. Camp John SMA Phase 1 Year 2 had the most use of the project areas, containing 5.0% (1,484/29,396) of the herd unit data points and 93% (1,484/1,592) of the four POD areas data points.

Elk use within the areas of Anadarko's 2013 development activities (T51N R75W S 18, 19, 30, 31 and T51N R76W S9, 24, 25) and in the vicinity of Ballard Petroleum's non-federal oil well (T51N R76W S9 SE SE) remained very low in biological years 2008 – 2011; ranging from 0.1% to 0.6% of the elk locations within the herd unit each year. Biological year 2012 activity increased to 2.4% (433 of 17,927 locations) in the 2013 work area, with nearly all the locations being in T51N R76W S9. Eight collared cow elk were represented with most of the points representing six elk. Although there was more use in biological year 2012 the pattern of use was similar in earlier years, with Section 9 used predominantly during May and from July through November. There were no elk collar locations during biological year 2012 in section 9 following November 2012.

The first collared elk locations within section 9 following spudding of the Ballard (January 21, 2013) well were in late May 2013 when one collared elk was located on two successive days. The next recorded use was not until August. Section 9 was used regularly through October, then during late January, and again in May 2014.



Reclamation: BLM monitored reclamation compliance, in May 2014, at six Camp John unit Federal well sites (12-13-5175, 14-18-5175, 14-19-5175, 24-24-5175, 31-25-5176, 43-24-5176) that Anadarko drilled in 2013. At all sites the disturbance area had been straw mulched and seeded with 12 inch straw wattles

below cut slopes. All sites had some vegetation growing; but being so early in the growing season, it could not be determined if the vegetation resulted from the seed mix or from the straw. There were tire ruts at all well locations. Four sites exhibited subsidence, three along buried utility lines (14-18-5175, 14-19-5175, 43-24-5176) and the reserve pits at one location (CJU Fed 31-25-5176). None of the locations met the first year reclamation standard of being stabilized with the approved seed mix growing.

2014 ACTIVITY PLANS

Anadarko's Camp John SMA Phase 1 Year 2 POD was authorized on March 13, 2014. Twenty-five APDs were approved and 18 APD's were deferred pending a lease stipulation modification request decision. Anadarko (Lance) and Yates verbally stated at the RMPA monitoring team annual meeting November 6, 2013, that they have no implementation plans for 2014. Ballard is currently drilling a second horizontal oil well from the well location constructed January 2013.

DISCUSSION

Demographic parameters are highly variable from year to year, making it necessary to average them over multiple years. Unfortunately this means it may take several years for a change in trend to be identifiable. This is one of the reasons for a suite of performance standards. The range fidelity, security habitat, and habitat use standards provide for more immediate feedback.

Demographic trends are all increasing whereas range fidelity trends are decreasing. This is a change from the trends observed in 2012 which were more mixed. In 2012 the demographic trends were steady or increasing while the calving range fidelity appeared to be increasing, the crucial winter range fidelity was decreasing, and the yearlong range fidelity was steady. Although range fidelity appears to be decreasing, particularly for the yearlong range, it is still within the accepted standards. Elk use within the POD areas has not changed much over the years and is not likely a factor in the reduced yearlong range fidelity. Anadarko's 2013 development activities took place in an area of very low elk use, while the Ballard well was drilled during a time period when collared elk historically did not use that area. The decrease in fidelity to the FCPA seasonal ranges, particularly the yearlong range, is most likely a result of the decreased CBNG activities within the southern yearlong range, and therefore more elk use of the southern range. BLM employees have reported observing more elk within the southern yearlong range than in previous years during the height of CBNG development in the vicinity of the FCPA.

Range fidelity in the decision record examined the FCPA seasonal range use within the entire herd unit whereas an independent analysis reported the FCPA seasonal range use compared to the FCPA. Both of these approaches provide valuable information. Basing fidelity on the herd unit evaluates the contribution of the FCPA seasonal ranges to the entire herd helping to ensure the contribution of the FCPA to the herd is maintained. Whereas basing fidelity on the FCPA focuses the evaluation on the area to which the RMPA management actions pertain and therefore eliminates some of the variables not applicable to the RMPA. The independent contractor was asked to conduct their analyses at both the FCPA and herd unit scale for future reports.

2013 calving range and crucial winter range fidelity evaluated throughout the herd unit, 61% and 35%, was lower than fidelity evaluated within the FCPA, 96% and 65%. Seasonal range fidelity at the herd unit scale should be lower than at the FCPA scale as long as elk are effectively using the seasonal ranges outside the FCPA. While FCPA seasonal range fidelity over the herd unit decreased in 2013, when only analyzing the FCPA locations the fidelity increased in 2013; which demonstrates the continued importance of the seasonal ranges. FCPA 2012 calving and crucial winter range fidelity as compared to the full FCPA was 88% and 52% respectively.

In examining the habitat effectiveness within the POD areas there is an issue with one or two animals constituting the bulk of locations for some areas. In future reports WEST should be able to statistically weight these situations and provide a more realistic view of use.

Verbal and written work statements expressing no or limited operation plans are not legally binding. Therefore, drilling permits authorized by the BLM or WOGCC are considered reasonably foreseeable and are accounted for when evaluating security habitat loss and the other performance standards. At this time, it is uncertain what is reasonably foreseeable for conventional oil exploration within the FCPA.

RECOMMENDATIONS

Presently the authorized activity has not adversely affected the elk performance standards with the exception of security habitat. At this time there are no demographic or elk use (seasonal range fidelity and habitat effectiveness) trends suggesting that a change in FCPA management is necessary.

Seasonal range fidelity should continue to be evaluated at both the herd unit and the FCPA scales as both scales provide valuable insight into how the elk use their seasonal ranges. Biological year 2013 data indicate that the elk may be spending more time within the southern range outside the FCPA.

Report winter calf survival results in a fashion where the traditional fall survey results and the newly incorporated spring surveys are directly comparable, such as calves per 100 adults.

In examining the habitat effectiveness within the POD areas, use should be statistically evaluated for individual elk.