

# Argenta 2015 Year End Monitoring Summary

---

Field Data Collected October 19-23, 2015

Mount Lewis Field Office, BLM

March 14, 2016



Prepared by:

National Riparian Service Team

with major support and contributions from the Mount Lewis Field  
Office, Battle Mountain District Office, Nevada State Office, and  
Argenta Permittees

-Page Left Intentionally Blank-

## EXECUTIVE SUMMARY

In June 2015, permittees of the Argenta Allotment and the Bureau of Land Management signed a Settlement Agreement to establish terms for the interim use and operation of the Argenta Allotment from 2015 to 2018. The terms include a stipulation to conduct an annual public meeting:

- To review monitoring information from the previous year,
- To review proposed changes in the annual stockmanship plans, and
- To solicit public comments.

In October 19-23, 2015, members of the Argenta Cooperative Monitoring Group (CMG) conducted monitoring of end-of-season use levels at key upland monitoring areas (KMAs) and designated riparian monitoring areas (DMAs). Upland monitoring included the collection of annual utilization of key herbaceous species using the height/weight method and of key shrubs and half shrubs using the key species method, both of which are described in the Interagency Technical Reference 1734-3 (Coulloudon et al. 1996). Riparian monitoring included the measurement of stubble height on key herbaceous species, browse levels on key woody species, and streambank alteration using the methods described in the multiple indicator monitoring (MIM) protocol, BLM Technical Reference 1737-23 (Burton et al. 2011).

In Section 3.6 of the Settlement Agreement, the end-of-season success of the grazing season would be identified on upland areas as light use levels (i.e. 30% use for key woody species and 40% use for key herbaceous species, except in the Mule Canyon use area where the end-of-season use level will be light to moderate use (i.e. 30% use of all key woody species and 50% use of all key herbaceous species.) For riparian areas, success was identified as a 4-inch stubble height on all key herbaceous species and 30% use on key woody riparian browse species. Finally, in Section 3.12, “overall allotment success” was defined as having 70% of the use areas meeting the end-of-season prescribed utilization levels for upland and riparian areas, with an aspirational goal of 100% success resulting from adaptive management and adjustments to the annual stockmanship plan.

The CMG collected end-of-season use levels at 23 KMAs (upland areas) within 19 use areas. The end-of-season use levels were successfully met at 15 of the 19 use areas for a 79% success rate, which satisfied and met the goal for overall success of at least 70% of use areas, at least for upland sites. Utilization on key shrub or half-shrub species was measured at 5 KMAs in 4 use areas. Utilization levels on woody key species ranged from 2% to 30%, which meets the end-of-season use level set in the Settlement Agreement at all KMAs or use areas.

The CMG collected end-of-season use measurements at 10 DMAs (riparian areas). Three of the 10 (30%) DMAs met the 4-inch residual stubble-height requirement. Woody species were present in adequate number for monitoring at only 4 DMAs. End-of-season browse levels at these 4 DMAs ranged from 62% to 77%, which did not meet the prescribed use levels. When stubble height and woody browse data are combined, only 2 (Fire Creek and Corral Creek) of the 10 (20%) use areas met the end-of-season prescribed use levels for both woody browse and residual stubble height.

The end-of-season monitoring data from 2015 indicate that upland use generally met the prescribed use levels set in the Settlement Agreement. In contrast, monitoring data indicate that riparian use did not meet the prescribed use levels at most riparian sites. Adjustments to the stockmanship plan will focus on a multipronged approach to limit livestock access to and use of riparian areas, including:

- Low-stress stockmanship practices to control the distribution of livestock;
- Use of low-moisture supplements, salt, and temporary water haul sites to control the distribution of livestock;
- Development of a rotational grazing system to control the time (duration), timing (seasonality), and frequency of grazing in all riparian areas, and to especially limit hot-season grazing in some riparian areas; and
- Installation of range improvements to restrict livestock access to important riparian areas to permit accelerated recovery of riparian conditions and restoration of riparian functions.

Also, the CMG will implement more frequent the within-season monitoring at the sites that did not meet the prescribed use levels or sites where the 95% confidence interval spans the prescribed use levels in 2015. In addition, as the within-season utilization levels reach predefined levels, the frequency of within-season monitoring will increase so the permittees can move livestock in a timely fashion before prescribed limits might be exceeded.

## **ACRONYMS AND ABBREVIATIONS**

**AUM** – Animal unit month

**BLM** – Bureau of Land Management

**BM** – Battle Mountain

**CMG** – Cooperative Monitoring Group

**DMA** – Designated Monitoring Area

**KMA** – Key Monitoring Area

**MIM** – Multiple Indicator Monitoring

**NRCS** – Natural Resources Conservation Services

**NRST** – National Riparian Service Team

**OHA** – Office of Hearings and Appeals

**USDA** – United States Department of Agriculture

**UTM** – Universal Transverse Mercator (coordinate system)

## **Background**

The Argenta Allotment is located southeast of Battle Mountain, Nevada and encompasses 331,518 acres, of which 141,689 acres are public land administered by the Bureau of Land Management (BLM). The primary resource values are greater sage-grouse priority habitat, emergency stabilization and rehabilitation post-fire seeding treatments, riparian and wetland habitat and isolated communities of aspen stands that provide habitat for an array of avian species and forage for big game such as mule deer. The riparian areas managed by BLM on public lands include 42 miles of perennial stream, 329 miles of intermittent/ephemeral stream, and 43 springs (*US Geological Survey's National Hydrography Dataset, Version 210* (released 5/7/2014)). However, additional riparian/wetland areas are present on intermingled private lands that are owned by several individuals and groups, as well as the permittees. No wild horse and burro herd management areas are present within the Argenta Allotment.

On August 22, 2014, the BLM Battle Mountain (BM) District issued a drought decision to temporarily close nine of the 19 grazing Use Areas on the Argenta Allotment to protect the range during drought conditions. Multiple appeals from the drought decision were filed with the Hearings Division in the Office of Hearings and Appeals (OHA), and were docketed as follows: Julian Tomera Ranches Inc., Battle Mountain Division, Chiara Ranch, Daniel E. and Eddyann U. Filippini, and Henry Filippini, Jr. v. BLM, NV-06-14-03 (Western Watersheds Project, Intervenor); John Carpenter v. BLM, NV-06-14-04; Western Watersheds Project v. BLM, NV-06-14-05; and Nevada Land Action Association and Public Lands Council v. BLM, NV-06-14-06.

At the beginning of the 2015 grazing season, the Permittees and BLM initiated discussions to determine whether it would be possible to replace the temporary drought closure with a short-term grazing management strategy that prevents overgrazing, particularly in riparian areas. The BLM-NV State Director, BM District Manager, and Permittees requested National Riparian Service Team (NRST) assistance in working with the various stakeholders to explore development of an alternative short-term grazing management plan that protects range resources while allowing for replacement of the temporary closures with management. This Agreement outlines the parameters for re-opening the temporarily closed Use Areas to grazing and for interim grazing management on the currently open Use Areas in the Argenta Allotment, using management techniques that are effective, feasible, and designed to achieve resource objectives. The Agreement is designed as a three-year interim management initiative that will include ongoing assistance and oversight by the NRST.

The agreement was submitted to the Office of Hearings and Appeals by a joint motion requesting dismissal of the pending appeals on June 16, 2014. It was accepted and approved through an Order issued from the OHA on June 24, 2015.

The settlement agreement establishes several provisions that are pertinent to this monitoring report:

1. Requires within-season and end-of-season monitoring.
2. Establishes utilization levels for upland and riparian areas and sets goal for success.
3. Requires an adaptive management framework when goals are not met.
4. Requires public involvement at the end of each grazing season.

### **Within-Season and End-of-Year Monitoring.**

Permittees monitored utilization levels during the grazing period to inform livestock movements. The permittees, BLM and/or other members of the Cooperative Monitoring Group (CMG) collected utilization, stubble height, and woody browse information at the end of the grazing season to determine end-of-season use levels in each use area.

### **Establishes use levels and sets goal for success.**

The agreement states that if either the riparian or upland within-season trigger is met for part of a Use Area, the affected Permittees will promptly move the livestock to another part of the Use Area if feasible, or from the Use Area if rotation within the Use Area is not feasible. If either the riparian or upland Use Levels is met in an entire Use Area, the affected Permittee will promptly move livestock to another Use Area that has not yet been grazed. If there is no other rotational unit available within the Use Area, then the Permittee will remove the livestock from the entire Use Area. If the within-season trigger is met for all Use Areas within the allotment, all livestock must be removed from the allotment within 7-10 days.

Within Season triggers area as follows:

- The Within-Season triggers for upland areas in the nine Use Areas that were temporarily closed to grazing under the August 22, 2014, Decision will be light use, i.e. 30% use of all key woody species and 30% use of all key herbaceous species, respectively (not a combined average use of the two), as measured at Key Areas.
- The Within-Season triggers for upland areas in the Use Areas that remain open to grazing under the August 22, 2014, Decision (except for Mule Canyon Use Area) will be light use, i.e., 30% use of all key woody species and 35% use of all key herbaceous species, respectively (not a combined average use of the two), as measured at Key Areas.
- The Within-Season triggers for upland areas in Mule Canyon Use Area will be light use, i.e., 30% use of all key woody species and 40% use of all key herbaceous species, respectively (not a combined average use of the two), as measured at Key Areas.
- The Within-Season triggers for riparian areas will be 4” stubble height on all key herbaceous species and 30% use of key woody riparian browse species, as measured at DMAs.

End-of-season use levels are as follows:

- The end-of-season use levels for upland areas (except for the Mule Canyon Use Area) will be light use, i.e. 30% use for key woody species and 40% use for key herbaceous species, respectively (not a combined average use of the two), as measured at key areas.
- The end-of-season use levels in the Mule Canyon Use Area will be light to moderate use, i.e., 30% use of all key woody species and 50% use of all key herbaceous species, respectively (not a combined average of the two), as measured at key areas.
- In all Use Areas, the end-of-season use levels for riparian areas will be 4” stubble height on all key herbaceous species and 30% use of key woody riparian browse species, as measured at DMAs [designated monitoring areas].

“Overall Allotment Success” for the purpose of this Interim Management Plan is defined as having 70% of Use Areas (based on grazing use measurements at key areas and DMAs) meeting the end-of-season prescribed utilization levels for upland and riparian areas. This will allow for a learning curve and any necessary adjustments that would be identified during the new intensive Stockmanship program to be implemented under the Interim Management Period so as to achieve demonstrable improvement in success in achieving the end-of-season use levels from year to year, toward an aspirational goal of 100% success. A “demonstrable improvement in success” is a steady increase in the number of monitoring sites meeting end-of-year use levels over the course of this Agreement.

### **Analysis and interpretation of utilization data.**

Both Coulloudon et al. (1996) and Elzinga et al. (1998) discuss the process of data analysis and interpretation of utilization data or data used to determine if prescribed thresholds are met. For example, Coulloudon et al. (1996, p. 13) emphasize the need to calculate and use confidence intervals to interpret rangeland monitoring data:

“**Confidence Interval** – In rangeland monitoring, the true population total (or any other true population parameter) can never be determined. ***The best way to judge how well a sample estimates the true population total is by calculating a confidence interval.*** [Emphasis added.] The confidence interval is a range of values that is expected to include the true population size (or

any other parameter of interest, often an average) a given percentage of the time (Krebs 1989). **Confidence intervals are the principal means of analyzing utilization data.** [Emphasis added.] For instructions in calculating confidence intervals, see the [BLM] Technical Reference, *Measuring & Monitoring Plant Populations* [Elzinga et al. 1998.]”

In the BLM Technical Reference, *Measuring & Monitoring Plant Populations*, Elzinga et al. (1998) illustrate how the statistical relations of four possible monitoring results are interpreted (Fig. 1). For example, in example (A), the parameter estimate along with the entire range of the confidence interval is below the threshold (in this case the end-of-season prescribed use level). In this case, the grazing use is clearly lighter than the prescribed use level, or threshold, and use at the monitoring site “meets” the prescribed use level. In example (D), the parameter estimate along with the entire range of the confidence interval is above the threshold (in this case the end-of-season prescribed use level). In this case, the grazing use is clearly greater than the prescribed use level, and the use at the monitoring site “does not meet” the prescribed use level. In the examples (B) and (C), the confidence intervals span the threshold, or the prescribed use level. In both cases the end-of-season use “meets” the prescribed use level as determined by the confidence interval of the sampling data.

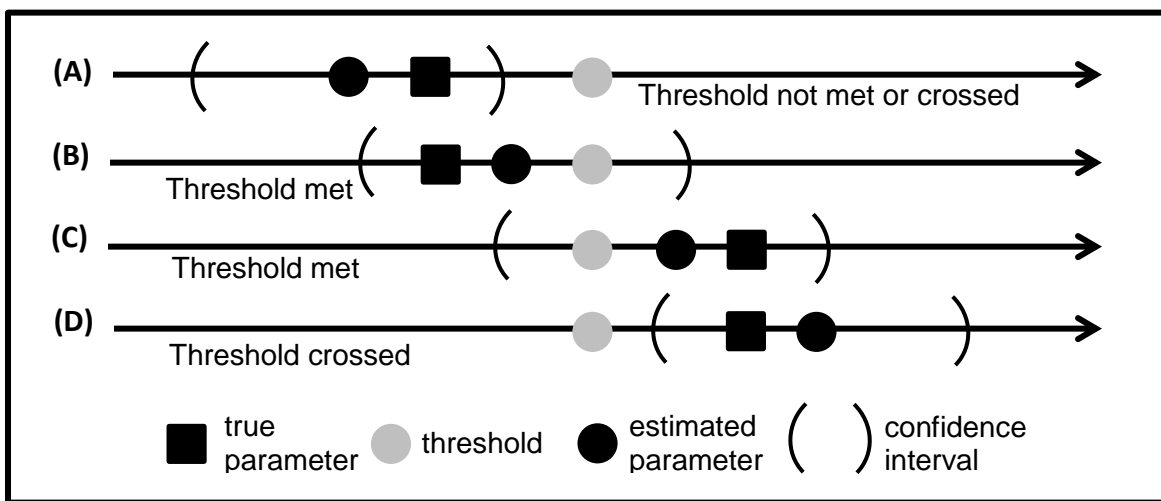


Figure 1. Illustration of how four possible monitoring results are interpreted. Examples (A), (B), and (C) meet the prescribed use levels because the parameter estimate plus the confidence intervals either do not cross the threshold or span the threshold. Example (D) does not meet the prescribed use level because the parameter threshold and the entire span of the confidence interval exceed the defined threshold (adopted from Elzinga et al. 1998).

The confidence interval is dependent on the:

- Sample size (typically 20-30 for upland utilization and 20-150 for stubble height);
- Measurement precision (1/4 inch for upland utilization; 1 inch for stubble height; and as much as +/- 10% for the key species and the woody browse methods (e.g., a measurement of 4” represents a stubble height of any measured plant that falls within a range from 3.5” to 4.5”); likewise a woody browse measurement of 30% represents browse on a plant that ranges from a low of 21% to a high of 40%);
- Variability of measurements (higher variability within the sample population leads to a larger confidence interval);
- Observer errors or bias (which the CMG has tried is minimized by writing a detailed protocol of monitoring methods and providing field review and training of methods);
- Natural or environmental site variability (which is minimized by good site stratification),
- Level of statistical significance used;
- Statistical power, and

- Degree of confidence desired (MacDonald et al. 1991.) In multiple-indicator monitoring (MIM – BLM Technical Reference 1737-23), the default confidence interval is 95% (Burton et al., 2011, p. 23).

#### **Requirement for public involvement at the end of each year.**

The agreement states “To involve the public during the interim management period, the public will be invited to a public meeting at least annually between January and February so that CMG and NRST can review the previous year’s monitoring information, review proposed changes in the annual stockmanship plans, and solicit public comments.” This deadline was not met in 2016 as the Battle Mountain District Office required more time to analyze the monitoring data, leading to a postponement of the public meeting originally scheduled for January 11, 2016, and eventually to a cancellation of the meeting scheduled for February 18, 2016.

However, after exploring the most effective ways in which to involve the general public, many of whom have expressed interest in the process over the last year, and while complying with the intent of the settlement agreement based upon the opinion of our solicitor, the BLM has decided to forgo the public meeting that was tentatively scheduled in Battle Mountain NV, and instead to prepare a comprehensive written report that will be made available to the general public. A 15-day public comment period will be provided. The CMG will review and consider any public comments before finalizing 2016 stockmanship plans.

#### **Requires adaptive management when goals are not met.**

Before March 1<sup>st</sup> (i.e., the start of the next grazing season), an end of year review will assess all of the monitoring information and develop new stockmanship plans designed to meet Overall Allotment Success. The Use Area end-of-season Assessment Process Flow Chart (Appendix 1 of the Settlement Agreement) will be used to guide the assessment. Where change in grazing management is needed, changes may be made to the timing, duration, and/or intensity of grazing (e.g., stock density/livestock numbers, season of use, length of use, range improvements, and/or rest). Because the public-involvement meeting that had originally been scheduled for January 11 was postponed, the CMG had to postpone the end-of-year review, originally scheduled for the week of February 8. This date had been preselected so public input from the January meeting could be included in the end-of-year review. Although the CMG did meet on March 9-10, 2016 to review draft 2016 stockmanship plans, written comments from a public report will still be reviewed before the CMG finalizes 2016 stockmanship plans.

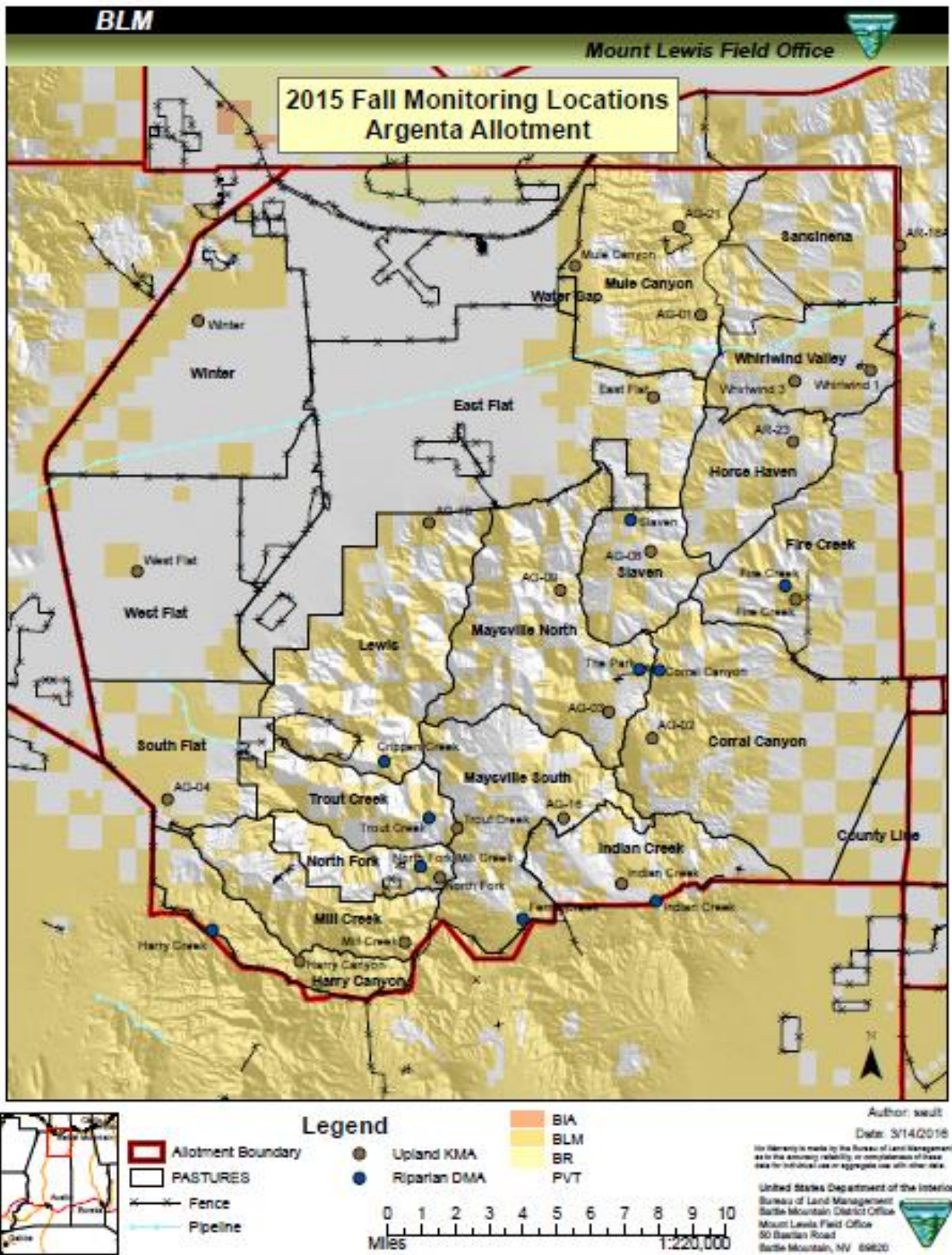
### **Methods**

Under terms of the Settlement Agreement, monitoring methods and analysis of the monitoring data will follow BLM protocols. Upland monitoring included the collection of annual utilization of key herbaceous species using the height/weight method and of key shrubs and half shrubs using the key species method, both of which are described in the Interagency Technical Reference 1734-3 (Coulloudon et al. 1999). Riparian monitoring included the measurement of stubble height on key herbaceous species and browse levels on key woody species using the methods described in the multiple indicator monitoring (MIM) protocol, BLM Technical Reference 1737-23 (Burton et al. 2011). Analysis and interpretation of monitoring data followed the protocols of BLM Technical Reference 1730-1 (Elzinga et al. 1998). When possible, repeat photos were collected to show changes in resource condition prior to and over the course of the settlement agreement. Sites were monitored by dividing CMG members into 2 teams of 5-8 individuals. One team visited riparian Designated Monitoring Areas (DMAs) over the course of 4 days and one team visited the upland Key Areas over 5 days.

Members of the CMG conducted monitoring from October 19-23, 2015 on upland and riparian sites throughout the Argenta Allotment. The purpose of this round of monitoring was to collect end-of-season use data at monitoring sites as specified in the Settlement Agreement. Monitoring sites were vetted through an extensive review process with the CMG in 2015, which is still on-going. A number of new



sites were monitored for the first time in October 2015 along with numerous previously existing monitoring locations. Some potential limitations of some preexisting and new sites were discovered during the October 2015 monitoring work. Consequently, the CMG will reevaluate several monitoring sites to ensure they are suitable for both long-term and end-of-season monitoring purposes.



# UPLAND MONITORING RESULTS

## Corral Canyon Use Area

**Monitoring site:** AG-02

**Location** (UTM Coordinates): Zone 11T 522693m E 4471785m N

**Field Observations and Results:** Thurber’s needlegrass and bluebunch wheatgrass were observed at the Corral Canyon upland monitoring site. Bluebunch wheatgrass was not common enough to use as a key species. The average utilization for Thurber’s needlegrass at this key area was 10%.

Table 1. Utilization data for Corral Canyon Use Area (\*insufficient sample size for indicated species)

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Thurber’s needlegrass	21	17.5	6.8	13.7	10%	6%
Bluebunch wheatgrass	2*	14.5	N/A	14.5	-----	-----
Average utilization	21	-----	-----	-----	10%	6%

**Summary:** Use on key species (Thurber’s needlegrass) at the monitoring site was slight and met the prescribed utilization level set in the Settlement Agreement.



Figure 2. Overview of the AG-02 key monitoring areas (KMA), Corral Canyon Use Area.



## East Flat Use Area

**Monitoring site:** East Flat 1

**Location (UTM Coordinates):** Zone 11T 522628m E 4487909m N

**Field Observations and Results:** This site was dominated by sagebrush with an understory of Sandberg’s bluegrass and cheatgrass with sparse bottlebrush squirreltail. Livestock signs were frequent and fresh at this site. Only a few Indian ricegrass plants were observed during the site visit. Sandberg’s bluegrass was the only species that was common enough to use as a key species. Utilization on Sandberg’s bluegrass was 30%.

Table 2. Utilization data for East Flat Use Area (\*insufficient sample size for indicated species)

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Sandberg’s bluegrass	20	10.7	1.1	7.8	30%	15%
Bottlebrush squirreltail	5*	10.7	3.8	7.6	-----	-----
Average Utilization	20	-----	-----	-----	30%	15%

**Summary:** Use on key species was slight to moderate and met the prescribed utilization levels set in the Settlement Agreement. However, because part of the 95% confidence intervals extends above the prescribed utilization level, this site will be prioritized to receive a higher frequency of within-season monitoring in 2016 so livestock moves can be made before prescribed utilization levels are exceeded.



Figure 3. Overview of the upland KMA, New East Flat Use Area.

## Fire Creek Use Area

**Monitoring site:** Fire Creek

**Location (UTM Coordinates):** Zone 11T 529395m E 4478311m N

**Field Observations and Results:** This site was dominated by sagebrush with an understory of Sandberg’s bluegrass and bottlebrush squirreltail, which were abundant. No utilization was observed on either key species at this site. Little sign of livestock was present, and what existed was old.

Table 3. Utilization data for Fire Creek Use Area

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Bottlebrush squirreltail	20	7.7	N/A	7.7	0%	0%
Sandberg’s bluegrass	25	8.8	N/A	8.8	0%	0%
Average utilization	45	-----	-----	-----	0%	0%

**Summary:** This monitoring site is located along a ridge line. Use on key species was not observed and met the prescribed utilization level set in the Settlement Agreement.



Figure 4. Overview of the new upland KMA, Fire Creek Use Area.

## Harry Canyon Use Area

**Monitoring site:** Harry Canyon

**Location (UTM Coordinates):** Zone 11T 505823m E 4461111m N

**Field Observations and Results:** No utilization was observed on Sandberg’s bluegrass, the only key species at this site. Little sign of livestock was present, and what existed was old. There was a nearby complex of springs where several greater sage-grouse were observed during data collection.

Table 4. Utilization data for Harry Canyon Use Area

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Sandberg’s bluegrass	20	10.8	N/A	10.8	0%	0%
Average utilization	20	-----	-----	-----	0%	0%

**Summary:** Use on the key species was not observed and met the prescribed utilization levels set in the Settlement Agreement.



Figure 5. Overview of the new upland KMA, Harry Canyon Use Area.



## Horse Haven Use Area

**Monitoring site:** AG-23

**Location** (UTM Coordinates): Zone 11T 529408m E 4485867m N

**Field Observations and Results:** This site burned and was reseeded with crested wheatgrass. The understory of the site is dominated with Sandberg’s bluegrass and includes an abundance of cheatgrass and other annuals. Livestock trailing was evident through and adjacent to the site. Utilization was determined to be 48% +/- 15% for Sandberg’s bluegrass. An insufficient number of samples of crested wheatgrass and bottlebrush squirreltail was present and prevented their use in calculating average utilization for the site.

Table 5. Utilization data for Horse Haven Use Area (\*insufficient sample size for indicated species)

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Sandberg’s bluegrass	20	6.9	1.2	4.4	48%	15%
Crested Wheatgrass	3*	16.1	1.2	7.2	-----	-----
Bottlebrush squirreltail	3*	6.7	2.6	4.6	-----	-----
Average utilization	20	-----	-----	-----	48%	15%

**Summary:** When the 95% confidence interval is used to evaluate end-of-season utilization, this site had light to heavy use on Sandberg’s bluegrass (48% +/- 15%). Elzinga et al. (1998, pp. 260-262) indicate that monitoring populations, in which the confidence interval spans a threshold, meet the prescribed utilization levels (see Fig. 1). The monitoring data indicate there is a 95% probability that the true utilization average is somewhere between 33% to 63%. Because part of this range is below the 40% prescribed utilization level, the site is interpreted as meeting the prescribed utilization level. The CMG will review the appropriateness of using this site in the future for long-term condition monitoring and for end-of-season utilization, because the site was burned, it was reseeded with crested wheatgrass, and it is affected by heavy trailing, conditions that may not be representative of the Horse Haven use area. If the site is used in 2016, it will be prioritized for high frequency of within-season monitoring because part of the 95% confidence intervals extends above the prescribed utilization level. More frequent within-season monitoring can ensure livestock moves can be made before prescribed utilization levels are exceeded.



Figure 6. Overview of upland KMA, AR-23, Horse Haven Use Area.

## Indian Creek Use Area

**Monitoring site:** Indian Creek 3

**Location (UTM Coordinates):** Zone 11T 521121m E 4464800m N

### Field Observations and Results:

Cattle were present at the site at the time of the site visit. Use of key species was slight to light. Utilization of Sandberg’s bluegrass was 13% and bottlebrush squirreltail was 6%.

Table 6. Utilization data for Indian Creek Use Area (\*insufficient sample size for indicated species)

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Indian ricegrass	1*	N/A	0.50	0.50	-----	-----
Bottlebrush squirreltail	20	6.6	3.0	5.6	6%	4%
Sandberg’s bluegrass	20	9.3	1.8	7.8	13%	10%
Average utilization	40	-----	-----	-----	10%	6%

**Summary:** The understory is dominated by Sandberg’s bluegrass. Use on the key grass species is slight and met the prescribed utilization level set in the Settlement Agreement.



Figure 7. Overview of the New upland KMA, Indian Creek Use Area.

## Lewis Use Area

**Monitoring site:** AG-10

**Location (UTM Coordinates):** Zone 11T 511970m E 4481985m N

**Field Observations and Results:** This site is dominated by Wyoming big sagebrush with an understory of Sandberg’s bluegrass and scattered bottlebrush squirreltail plants. No Indian ricegrass was observed. Frequent cattle sign and rabbit sign were observed in the area. Utilization observed on Sandberg’s bluegrass was 59%. Bottlebrush squirreltail was uncommon and did not have an adequate sample size for determination of utilization.

Table 7. Utilization data for Lewis Use Area (\*insufficient sample size for indicated species)

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Sandberg’s bluegrass	20	9.1	0.8	5.3	59%	12%
Bottlebrush squirreltail	2*	6.0	2.2	4.8	-----	-----
Average utilization	20	-----	-----	-----	59%	12%

**Summary:** Use on the key species was moderate to heavy and did not meet the prescribed utilization level set in the Settlement Agreement. The CMG will use Appendix 1 of the Settlement Agreement to make adjustments to the 2016 grazing plan. In addition, this site will require a higher frequency of within-season monitoring in 2016 so livestock moves can be made before prescribed utilization levels are exceeded.



Figure 8. Overview of the upland KMA AG-10, Lewis Use Area.



## Mill Creek Use Area

**Monitoring site:** New Mill Creek

**Location** (UTM Coordinates): Zone 11T 513316m E 4467458m N

**Field Observations and Results:** This site is dominated by sagebrush with an understory of Letterman’s needlegrass (*Achnatherun lettermanii*, ACLE9) and mountain brome (*Bromus marginatus*, BRMA4). Some bluebunch wheatgrass was observed. Cheatgrass was observed throughout the site. Signs of cattle and rabbit were observed commonly in the area. Utilization was light to moderate. Utilization averaged 45% (+/- 10% on Letterman’s needlegrass and 41% (+/- 15%) on mountain brome (Table 8).

Table 8. Utilization data for Mill Creek Use Area

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Letterman’s needlegrass	41	19.3	3.8	12.8	45%	10%
Mountain brome	20	26.3	5.0	17.9	41%	15%
Average utilization	61	-----	-----	-----	44%	10%

**Summary:** Use on the key species is light to moderate with a parameter estimate of 44% (+/- 10%); however, when the 95% confidence intervals are accounted for, the use meets the prescribed level set in the Settlement Agreement (see Fig. 1; Elzinga et al. 1998, pp. 260-262). Because part of the 95% confidence intervals extends above the prescribed utilization level, this site will be prioritized to receive a higher frequency of within-season monitoring in 2016 so livestock moves can be made before prescribed utilization levels are exceeded.



Figure 9. Overview of the new upland KMA, Mill Creek Use Area.

## Mule Canyon Use Area

**Monitoring sites and Locations (UTM coordinates):** The Mule Canyon Use Area has three upland monitoring sites:

- New – Zone 11T 519822m E 4494136m N
- AG-01 – Zone 11T 524876m E 4491809m N
- AG-21 – Zone 11T 523895m E 4496141m N

**Field Observations and Results:** The “New” monitoring site was burned and was reseeded with forage kochia. A few annual weeds are present in the interspace and the site is lacking any perennial grasses. Utilization on forage kochia was 23%.

The AG-01 site was affected by the Mule Canyon Fire in 1999. Subsequent rehabilitation established forage kochia, crested wheatgrass, and a variety of native species. Use on crested wheatgrass was light to moderate. Use on forage kochia was slight to light.

The AG-21 site was also burned in 1999 and was re-seeded with crested wheatgrass, forage kochia (*Bassia prostrata*, BAPR5) and other native species. Other species within the site include bottlebrush squirreltail, Indian ricegrass and Sandberg’s bluegrass. Cheatgrass is also present. Shrubs are infrequent and include serviceberry and scattered sagebrush. Cattle sign was frequent across the site with scattered fresh hoof tracks and droppings. There was too little crested wheatgrass to use for utilization calculations. Utilization was 5% on forage kochia.

Table 9A. Utilization data on key herbaceous species for Mule Canyon Use Area  
(\*insufficient sample size for indicated species)

Monitoring Site	Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
AG-01	Crested wheatgrass	30	21.5	4.9	14.7	37%	10%
AG-21	Crested wheatgrass	5*	14.6	4.2	8.8	-----	-----
Average utilization	-----	30	-----	-----	-----	37%	10%

Table 9B. Utilization data on key shrubs for Mule Canyon Use Area

Monitoring Site	Key Species	Frequency	Average Utilization	Confidence Interval (+/-)
New	Forage kochia	30	23%	10%
AG-01	Forage kochia	25	16%	6%
AG-21	Forage kochia	20	5%	3%

**Summary:** The plant community at these sites was altered by fire and a post-fire seeding. Use on the key species was generally slight to light and met the prescribed utilization level set in the Settlement Agreement. (Note: the settlement agreement set the utilization level on key herbaceous species at 50% for the Mule Canyon Use Area; all other use areas have a utilization level of 40% on key herbaceous species).



Figure 10A. Overview of the new upland KMA, Mule Canyon Use Area.



Figure 10B. Overview of the upland KMA AG-01 Mule Canyon Use Area. (Card is mislabeled as AG-21 instead of AG-01)



Figure 10C. Overview of upland KMA AG-21 Mule Canyon Use Area. (Card is mislabeled as AG-01 instead of AG-21)



## North Fork Mill Creek Use Area

**Monitoring site:** New North Fork

**Location (UTM Coordinates):** Zone 11T 512511m E 4465109m N

**Field Observations:** This site is dominated shrub dominated and contains deep-rooted perennial grass species within the understory, including mountain brome, Idaho fescue, and bottlebrush squirreltail. Some bluebunch wheatgrass and Letterman’s needlegrass was observed. Frequent cattle sign was observed in the area. Utilization observed on bottlebrush squirreltail was 36%; mountain brome was 56%; and Idaho fescue 43%.

Table 10. Utilization data for N Fork Mill Cr. Use Area (\*insufficient sample size for indicated species)

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Bottlebrush squirreltail	20	17.3	3.0	11.4	36%	12%
Mountain brome	22	32.6	5.1	20.6	56%	15%
Idaho fescue	20	17.9	2.3	10.3	43%	9%
Letterman’s needlegrass	3*	26.0	1.8	13.9	-----	-----
Bluebunch wheatgrass	4*	25.8	N/A	25.8	-----	-----
Average utilization	62	-----	-----	-----	45%	7%

**Summary:** Use on bottlebrush squirreltail and Idaho fescue ranged from light to moderate; whereas use on mountain brome ranged from moderate to heavy. When use on the three key species is averaged, the use was moderate, 45% +/- 7%, and met the allowable utilization level set in the Settlement Agreement. However, because part of the 95% confidence intervals extends above the prescribed utilization level, this site will be prioritized to receive a higher frequency of within-season monitoring in 2016 so livestock moves can be made before prescribed utilization levels are exceeded.



Figure 11. Overview of new upland KMA, North Fork of Mill Creek Use Area.

## North Maysville Use Area

**Monitoring site and Location** (UTM Coordinates): End-of-season use levels were measured at two upland monitoring sites within the North Maysville Use Area in 2015.

- AG-03 – Zone 11T 520488m E 4473038m N
- AG-09 – Zone 11T 518233m E 4478751m N

**Field Observations:** The AG-03 site is dominated by low sagebrush with an understory of Sandberg’s bluegrass and scattered bottlebrush squirreltail. Greater sage-grouse and rabbit sign were observed at the site. Utilization on Sandberg’s bluegrass was 6% and on bottlebrush squirreltail 2%.

The AG-09 site was burned recently and now has a mixture of shrub and grass species that are typical of disturbed sites, such as cheatgrass and rabbitbrush. The site was also reseeded with intermediate wheatgrass after the fire. Utilization was not calculated on the intermediate wheatgrass because an existing height-weight curve was not available. The CMG will explore the need to develop a height-weight curve for intermediate wheatgrass in 2016. If a height-weight curve is developed for intermediate wheatgrass, utilization in 2015 on intermediate wheatgrass can be calculated retroactively.

Table 11. Utilization data for North Maysville Use Area (\*insufficient sample size for indicated species)

Monitoring Site	Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
AG-03	Bottlebrush squirreltail	20	6.5	1.5	6.2	2%	4%
	Sandberg’s bluegrass	22	9.2	0.8	8.4	6%	9%
AG-09	Intermediate wheatgrass	20 <sup>#</sup>	22.1	6.8	15.3	0%	0%
	Basin wildrye	5*	38.0	9.4	-----	-----	-----
	Bluebunch wheatgrass	4*	24.7	8.6	-----	-----	-----
Average Utilization		42	-----	-----	-----	4%	5%

<sup>#</sup>No height-weight curve could be found for intermediate wheatgrass. The CMG will determine if a curve should be developed for this species during the 2016 growing season.

**Summary:** Use on key species at AG-03 was slight and met the prescribed utilization level set in the Settlement Agreement. Slight to light use is commonly observed at much of the high elevation areas in the Argenta allotment. Use on intermediate wheatgrass has not yet been calculated and will depend on the development of a height/weight curve specific to this species.



Figure 12A. Overview of upland KMA AG-03, North Maysville Use Area.



Figure 12B. Overview of upland KMA AG-09, North Maysville Use Area.

## Sansinena Use Area

**Monitoring site:** AG-18A

**Location (UTM Coordinates):** Zone 11T 534319m E 4495188m N

**Field Observations and Results:** This site has burned on multiple occasions and has been seeded resulting in a dominance of Sandberg’s bluegrass, crested wheatgrass and forage kochia along with invasive annual species. Cattle sign was common and ranged from in age from fresh to old. Utilization averaged 30% on forage kochia and 57% on crested wheatgrass.

Table 12A. Utilization data on key herbaceous species, Sansinena Use Area

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Crested wheatgrass	20	10.8	1.8	6.0	57%	8%
Unknown (seeded, non-native species)	22	24.4	1.8	13.1	-----	-----
Average Utilization	20	-----	-----	-----	57%	8%

Table 12B. Utilization data on key shrubs, Sansinena Use Area

Key Species	Frequency	Average Utilization	Confidence Interval (+/-)
BAPR5	24	29.9%	8.5%

**Summary:** Use on the crested wheatgrass was moderate to heavy and did not meet the prescribed level set in the Settlement Agreement. However, heavy use on crested wheatgrass is noteworthy, because many sources have shown this palatable, non-native, seeded plant is tolerant of heavy grazing pressure up to 65% annual use (USDA NRCS 1999, 2001, 2006). The CMG will need to evaluate why Sandberg’s bluegrass (described as dominant at the site) was not measured for utilization. Also, The CMG listed burned areas as one of the rejection criterion for establishment of monitoring sites. Generally, annual use monitoring sites are not established in burned areas or sites seeded with non-native, forage species if these characteristics are not representative of the use area. The CMG will use Appendix 1 of the Settlement Agreement to make adjustments to the 2016 grazing plan. In addition, this site will require a higher frequency of within-season monitoring so livestock moves can be made before prescribed utilization levels are exceeded.



Figure 13. Overview of upland KMA AG-18A, Sansinena Use Area.



## Slaven Use Area

**Monitoring site:** AG-08

**Location** (UTM Coordinates): Zone 11T 522442m E 4480591m N

**Field Observations and Results:** This site burned in 1999 and was reseeded with crested wheatgrass. The site is dominated by Sandberg’s bluegrass, crested wheatgrass and cheatgrass. Douglas rabbitbrush is the dominant shrub on the site with less frequent Wyoming big sagebrush in the area. Fresh cattle sign was common across the area. Utilization on the site was 58% on crested wheatgrass.

Table 13. Utilization data for Slaven Use Area

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Crested wheatgrass	20	16.0	3.0	9.5	58%	9%
Average Utilization	20	-----	-----	-----	58%	9%

**Summary:** This site was affected by wildfire and reseeded with crested wheatgrass and other perennial species, which has changed the species composition. Sandberg’s bluegrass is the dominant grass with crested wheatgrass scattered throughout the area. Use on the crested wheatgrass was moderate to heavy and did not meet the prescribed utilization level set in the Settlement Agreement. However, crested wheatgrass is a species that is tolerant of heavy use levels, as high as 65% (USDA NRCS 1999, 2001, 2006).

The CMG will use Appendix 1 of the Settlement Agreement to make adjustments to the 2016 grazing plan. In addition, the CMG will stratify the ecological sites to determine how representative the current site is of the Slave Use Area. The CMG listed burned areas as one of the rejection criterion for establishment of monitoring sites. Generally, annual use monitoring sites are not established in burned areas or sites seeded with non-native, forage species if these characteristics are not representative of the use area. This site will require a higher frequency of within-season monitoring so livestock moves can be made before prescribed utilization levels are exceeded.



Figure 14. Overview of the upland KMA AG-08, Slaven Use Area.



## South Flat Use Area

**Monitoring site:** AG-04

**Location (UTM Coordinates):** Zone 11T 499590m E 4468878m N

**Field Observations and Results:** This site is dominated by shadscale and bud sagebrush with an understory of Sandberg’s bluegrass and bottlebrush squirreltail. Cattle sign was common, and there was evidence of recent trailing and trampling. Utilization on Sandberg’s bluegrass was measured at 18%.

Table 14. Utilization data for South Flat Use Area (\*insufficient sample size for indicated species)

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Sandberg’s bluegrass	30	5.5	1.3	4.2	18%	8%
Bottlebrush squirreltail	1*	5.0	N/A	5.0	-----	-----
Average utilization	30	-----	-----	-----	18%	8%

**Summary:** Use on key grass species was slight to light and met the prescribed utilization level set in the Settlement Agreement.



Figure 15. Overview of upland KMA AG-04, South Flat Use Area.

## South Maysville Use Area

**Monitoring site:** AG-16

**Location (UTM Coordinates):** Zone 11T 518336m E 4467964m N

**Field Observations and Results:** This site is dominated with big sagebrush and an understory of Sandberg’s bluegrass and bottlebrush squirreltail. Utilization was measured at 25% on Sandberg’s bluegrass, 30% on bottlebrush squirreltail and 59% on Thurber’s needlegrass.

Table 15. Utilization data for South Maysville Use Area

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Sandberg’s bluegrass	30	8.9	1.3	6.4	25%	9%
Bottlebrush squirreltail	29	7.4	2.2	5.0	30%	6%
Thurber’s needlegrass	20	15.4	1.5	8.6	59%	9%
Average utilization	79	-----	-----	-----	35%	6%

**Summary:** The occurrence of Thurber’s needlegrass is limited at this site. Sandberg’s bluegrass and bottlebrush squirreltail dominate the understory. Use on the key species ranged from light to moderate to heavy; however the average utilization level (35% +/- 6%) met the prescribed level set in the Settlement Agreement. However, because one species (Thurber’s needlegrass) received moderate to heavy use and because a part of the 95% confidence intervals for the average utilization extends above the prescribed utilization level, this site will be prioritized to receive a higher frequency of within-season monitoring in 2016 so livestock moves can be made before prescribed utilization levels are exceeded.



Figure 16. Overview of upland KMA AG-16, South Maysville Use Area.

## Trout Creek Use Area

**Monitoring site:** New Trout Creek

**Location (UTM Coordinates):** Zone 11T 513318m E 4467461m N

**Field Observations and Results:** This site is dominated by mountain sagebrush with an understory of mountain brome, Letterman’s needlegrass, Idaho fescue, and bottlebrush squirreltail. Some bluebunch wheatgrass and was observed. Cattle signs were common in the area. Utilization was variable and ranged from light (33% on bottlebrush squirreltail), to light to moderate (46% on Idaho fescue), moderate to heavy (67% on mountain brome), to heavy (72% on Letterman’s needlegrass).

Table 16. Utilization data for Trout Creek Use Area

Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval +/-
Letterman’s needlegrass	21	20.1	2.2	11.4	72%	10%
Mountain brome	20	29.2	4.6	17.6	67%	14%
Bottlebrush squirreltail	21	16.1	3.0	10.8	33%	12%
Idaho fescue	20	17.7	2.1	10.5	46%	13%
Average utilization	82	-----	-----	-----	54%	7%

**Summary:** This site is shrub dominated and has abundant, deep-rooted, perennial grass species within the understory. Use on the key species was moderate to heavy and did not meet the prescribed utilization level set in the Settlement Agreement. The CMG will use Appendix 1 of the Settlement Agreement to make adjustments to the 2016 grazing plan. In addition, this site will require a higher frequency of within-season monitoring so livestock moves can be made before prescribed utilization levels are exceeded.



Figure 17. Overview of the new upland KMA, Trout Creek Use Area.



## West Flat Use Area

**Monitoring site:** New West Flat

**Location (UTM Coordinates):** Zone 11T 498127m E 4479641m N

**Field Observations and Results:** This site was dominated by shadscale, fourwing saltbush (*Atriplex canescens*) and greasewood. There was no sign of use or presence of livestock. Use on shadscale was slight. Fourwing saltbush was not found in sufficient quantity for monitoring utilization.

Table 17. Utilization data for West Flat Use Area (\*insufficient sample size for indicated species)

Key Species	Frequency	Average Utilization	Confidence Interval (+/-)
Shadscale	20	2%	2%
Fourwing saltbush	4*	-----	-----
Average utilization	20	2%	2%

**Summary:** Use on the key shrub species was slight and met the prescribed utilization level set in the Settlement Agreement.



Figure 18. Overview of the new upland KMA, West Flat Use Area.

## Whirlwind Use Area

**Monitoring Sites and Locations:** End-of-season use levels were measured at two upland monitoring sites in the Whirlwind Use Area in 2015.

- New Whirlwind 1 – UTM 11T 532947m E 4489173m N
- New Whirlwind 3 – UTM 11T 529348m E 4488671m N

**Field Observations and Results:**

This site was dominated by shadscale and had Sandberg’s bluegrass and bottlebrush squirreltail in the interspaces. No Indian ricegrass was observed. Livestock were near the site during the site visit. Use on Sandberg’s bluegrass was 26% and on bottlebrush squirreltail 39%.

Table 18. Utilization data for Whirlwind Use Area (\*insufficient sample size for indicated species)

Monitoring Site	Key Species	Frequency	Average Ungrazed Height (inches)	Average Grazed Height (inches)	Average Measured Height (inches)	Average Utilization	Confidence Interval (+/-)
Whirlwind 1	Sandberg’s bluegrass	20	8.6	1.4	6.2	26%	13%
	Bottlebrush squirreltail	5*	6.3	1.4	4.1	-----	-----
Whirlwind 3	Sandberg’s bluegrass	30	8.7	1.1	5.0	54%	8%
	Bottlebrush squirreltail	20	8.7	1.5	5.2	46%	8%
Average utilization	-----	70	-----	-----	-----	36%	6%

**Summary:**

The two KMAs in the Whirlwind Use Area have similar vegetation composition. The Whirlwind 1 KMA met the prescribed utilization levels set in the Settlement Agreement; whereas the Whirlwind 3 KMA did not. When the two similar sites are averaged, the use on the key grass species was light to moderate and met the prescribed utilization level set in the Settlement Agreement. However, because part of the 95% confidence intervals extends above the prescribed utilization level, these sites will be prioritized to receive a higher frequency of within-season monitoring in 2016 so livestock moves can be made before prescribed utilization levels are exceeded.





Figure 19A. Overview of the new upland KMA Whirlwind 1, Whirlwind Use Area



Figure 19B. Overview of the new upland KMA Whirlwind 3, Whirlwind Use Area.

## Winter Use Area

**Monitoring site:** New Winter

**Location** (UTM Coordinates): Zone 11T 500989m E 4491527m N

**Field Observations and Results:** This site was dominated by shadscale and bud sagebrush. The site was lacking key perennial grass species. There was no sign of use or presence of livestock.

Table 19. Utilization data on key shrubs for Winter Use Area

Key Species	Frequency	Average Utilization	Confidence Interval (+/-)
Shadscale	20	4%	3%

**Summary:** Use on the key shrub species was slight and met the prescribed utilization level set in the Settlement Agreement.



Figure 20. Overview of the new upland KMA, Winter Use Area.



## Upland Monitoring Summary

The following table summarizes the upland end-of-season use levels. The end-of-season prescribed utilization level in all use areas (except Mule Canyon) is 30% for key woody species and 40% for key herbaceous species. Mule Canyon allowable use levels are 30% for key woody species and 50% for key herbaceous species.

**Table 20. Summary of 2015 use levels by Use Area, operator and location.**

<b>Upland Monitoring Location meeting Settlement Agreement Use Levels</b>			
<b>Use Area</b>	<b>Operator(s)</b>	<b>Location</b>	<b>Use Level Met Prescribed Utilization Level</b>
Corral Canyon	Julian Tomera	AG-02	Yes
East Flat	Julian Tomera	New East Flat	Yes
Fire Creek	H. Filippini Jr.	New Fire Creek	Yes
Harry Canyon	Chiara Ranch	New Harry Canyon	Yes
Horse Haven	H. Filippini Jr.	AG-23	No
Indian Creek	Julian Tomera	New Indian Creek	Yes
Lewis	Julian Tomera	AG-10	No
Mill Creek	Chiara Ranch	New Mill Creek	Yes
Mule Canyon	Julian Tomera	New Mule Canyon	Yes
	Julian Tomera	AG-01	Yes†
	Julian Tomera	AG-21	Yes†
North Fork Mill Creek	Tomera/Chiara	New North Fork	Yes
North Maysville	Julian Tomera	AG-03	Yes
	Julian Tomera	AG-09	Unknown*
Sansinena	H. Filippini Jr.	AG-18A	No†
Slaven	Julian Tomera	AG-08	No†
South Flat	Chiara Ranch	AG-04	Yes
South Maysville	Julian Tomera	AG-15	Yes
Trout Creek	Julian Tomera	New Trout Creek	No
West Flat	Julian Tomera	New West flat	Yes
Whirlwind	H. Filippini Jr.	New Whirlwind 1	Yes#
	H. Filippini Jr.	New Whirlwind 3	No#
Winter	Julian Tomera	New Winter	Yes
<b>Summary</b>			
Total Use Ares Monitored			19
Total Upland Locations Monitored			23
Total Use Areas that met prescribed utilization Levels			15 of 19 (79%)
<p>*One monitoring location was inconclusive due to absence of a height-weight curve for intermediate wheatgrass.</p> <p># Average of the two sites in Whirlwind Use Area are within allowable use levels; however, one of the two KMAs did exceed the allowable use levels.</p> <p>† Site dominated by a non-native, seeded, forage plant (crested wheatgrass), which is tolerant of high annual use levels (USDA NRCS 1999, 2001, 2006)</p>			



# Riparian Monitoring Report

## Riparian Monitoring Methods

Riparian monitoring was conducted in accordance with the *Multiple Indicator Monitoring* (MIM) protocol. This protocol was developed to provide information necessary to adaptively manage riparian resources. The MIM protocol integrates short-term (annual-use) and long-term trend indicators to allow for the evaluation of livestock grazing management on streambanks, stream channels and streamside riparian vegetation at established riparian designated monitoring areas (DMAs). The three short-term indicators measured by the CMG for annual-use monitoring on the Argenta Allotment included stubble height, streambank alteration and woody species use. More information on the MIM protocol can be found in BLM Technical Reference 1737-23 (Burton et al. 2011). Within this report, only stubble height and woody species use are evaluated as there was no prescribed level for streambank alteration in the settlement agreement.

The MIM protocol defines stubble height as the measure of the residual height of key herbaceous vegetation species remaining after grazing. The amount of foliar cover remaining is important because it helps protect riparian systems from erosion especially during times of high stream flows. MIM uses a modified version of the stubble height method as described in the BLM Technical Reference, *Utilization Studies and Residual Measurements* (Coulloudon et al. 1996). One of the primary differences that the MIM protocol employs is the use of a 20 centimeter by 50 centimeter quadrat (i.e. a Daubenmire frame) to define the sample area. A measurement is taken for each key species present within the quadrat.

Woody species are often an important component of healthy riparian systems as they provide shade cover to keep streams cool and have deep root systems that stabilize the soil. The woody species use is an effective short-term indicator and can help define the relation between woody plant health and large herbivores. In the MIM protocol, woody plants are selected for sampling within a 2-meter by 2.75-meter quadrat that is centered on the greenline. The greenline is defined as the linear grouping of perennial vegetation, embedded rock or anchored wood that forms above and adjacent to the waterline. Only one individual of each key woody species present is selected per quadrat. Utilization is assigned to a class by the observer on an ocular basis as described in Table 21.

**Table 21: Woody Use Classes.**

Class	Midpoint	Description
Unavailable	Blank	Shrubs and trees that have most (over 50%) of their actively growing stems over 1.5m (5 feet) tall for cattle grazing.
Slight (0%-20%)	10	Browse plants appear to have little or no use. Available year's leaders may show some use.
Light (21%-40%)	30	There is obvious evidence of use of the current year's leaders. The available leaders appear cropped or browsed in patches.
Moderate (41%-60%)	50	Browse plants appear rather uniformly used.
Heavy (61%-80%)	70	The use of browse gives the general appearance of complete search by grazing animals. Most available leaders are used and some terminal buds remain on browse plants.
Severe (81%-100%)	90	The use of browse gives the appearance of complete search by grazing animals. There is grazing use on second and third years' leaders growth.

The CMG used the MIM protocol during the week of October 19-23 to evaluate the short-term indicators of livestock grazing during the 2015 grazing season at 10 riparian DMAs. As outlined in the Argenta Settlement Agreement, the average stubble height on key herbaceous species should be greater than or equal to 4 inches, and browse on key woody species should be 30% or less. Key species for both indicators vary depending on the plant communities present at each DMA. Criteria for selecting key species is summarized in Burton et al. (2011, pp. 23, 24, 144). A summary of the riparian monitoring data is presented in Table 22.

Table 22. 2015 Argenta Allotment--Annual Use Indicators

DMA	Stubble Height			Woody Browse			Bank Alteration		
	Average Height (in)	95% Conf. Int. (+/-)	Sample Size	%	95% Conf. Int. (+/-)	Sample Size	%	95% C.I. (+/-)	Sample Size
Harry Canyon#	2.5	0.7	99	77	8	18	31†	8	80
Fire Creek	6.5	1.0	145	----	----	----	42	9	83
The Park	1.9	0.6	129	----	----	----	42	9	85
Corral Creek	3.6	0.8	76	----	----	5	26	7	80
Indian Creek	3.7	0.8	60	62	11	24	15*†	6	79
Ferris Creek	1.6	0.6	72	76	8	18	41	9	74
Crippen Creek	1.8	0.6	102	69	7	29	8*†	5	80
Slaven Creek	1.6	0.6	126	----	----	----	32†	8	81
Trout Creek	2.1	0.6	135	----	----	1	23*	7	82
N. Fork Mill Creek	2.3	0.7	130	----	----	----	15†	6	83
Mill Creek	(No suitable DMA established in 2015)								
Rock Creek	(No suitable DMA established in 2015)								

\* Bank alteration is comparatively low due to abundant rock within the DMA

† Bank alteration measurement affected by high water flow from recent rains

# High water may have changed position of greenline and point where short-term indicators were measured

## Harry Canyon

The Harry Canyon DMA is located at Zone 11T 501648m E 446219m N (UTM coordinates). The upstream portion of the Harry Canyon DMA exhibits lentic (still water) characteristics whereas the lower portion of the DMA has a more defined streambank exhibiting lotic (stream) traits. Stream flow within the DMA was likely above average due to precipitation events that had occurred over a period of a few days preceding monitoring or due to changes in flow into a pipeline above the DMA. This higher-than-normal flow potentially shifted the greenline towards the margin of the drainageway. Herbaceous key species used for stubble height measurements were Nebraska sedge, few-flowered spikerush, Baltic rush and Sandberg's bluegrass. Only one species of willow, Lemmon's willow, was present to measure woody browse. The average measurement for key species stubble height on this site was 2.5 +/- 0.7 inches (Table 22), which does not meet the prescribed use level set in the Settlement Agreement. Woody browse was an average of 77% +/- 8% (Table 22), which does not meet the prescribed utilization level of 30% set in the Settlement Agreement.



Figure 21. Lower end of Harry Canyon DMA looking across the channel.

**Summary:** Browse on the key woody species was heavy and did not meet the prescribed utilization level set in the Settlement Agreement. Also, the residual stubble-height measurements did not meet the prescribed level set in the Settlement Agreement. Therefore, the CMG will use Appendix 1 of the Settlement Agreement to make adjustments to the 2016 grazing plan. In addition, this site will require a higher frequency of within-season monitoring so livestock moves can be made before prescribed utilization levels are exceeded. Finally, the CMG will need to determine if legal water withdrawals above the DMA constitute a permanent alteration of site potential and would necessitate the selection of an alternative DMA in the Harry Canyon Use Area.

## Fire Creek

The Fire Creek DMA is located at Zone 11T 528886m E 4478962m N (UTM coordinates). Fire Creek DMA contains an herbaceous complex with abundant paniced bulrush, Nebraska sedge, and Baltic rush. Woods rose is common and located along the channel margin. Although it is not a key woody species, it provides important protection to the banks by limiting animal access. Where rose is present, bank alteration is low or absent. The residual stubble height within the Fire Creek DMA was 6.5 +/- 1.0 inches, which met the prescribed utilization level set in the Settlement Agreement. No woody browse data were collected, because the site does not have key woody species.

A few knickpoints occur within and near the DMA. Knickpoints are areas where there is incipient channel incision. If knickpoints are not stabilized, the entire riparian system can be destabilized and groundwater can drain from the site, greatly compromising the overall health and function of the riparian area.



Figure 22. Upstream photo of the Fire Creek DMA.

**Summary:** The residual stubble-height measurements did meet the prescribed levels set in the Settlement Agreement. In 2016, the Fire Creek Use Area will be scheduled for early, cool-season use, which generally coincides with lighter pressure on riparian areas and better livestock distribution in uplands.

### The Park

The Park DMA is located in the North Maysville use area at Zone 11T 521958m E 4474992m N (UTM coordinates.) There are no shrubs or trees within the Park DMA. There was no surface flow or standing water within the stream channel at the time of monitoring. Nevertheless, the presence of hydric (water loving) herbaceous species including Nebraska sedge, Baltic rush, and meadow barley provide evidence that the system is still maintaining wetland characteristics during the growing season. The average measurement for key species stubble height on this site was 1.9 +/- 0.6 inches, which does not meet the prescribed level in the Settlement Agreement.



Figure 23. Lower end of Park DMA looking upstream

**Summary:** Because the stubble-height measurements did not meet the prescribed level in 2015, this site will require a higher frequency of within-season monitoring in 2016 so livestock moves can be made before prescribed levels are exceeded. In addition, the CMG will use Appendix 1 of the Settlement Agreement to adjust the stockmanship plan for 2016.



## Corral Creek

The DMA at Corral Creek is located at Zone 11T 522916m E 4474937m N (UTM coordinate). This DMA includes a mixed complex with herbaceous and woody plants. There are few key woody plants present, most of which are non-rhizomatous mature willow species; however, Woods rose was common throughout the site. The average residual stubble height was 3.6 inches +/- 0.8 inches (Table 22). When the 95% confidence interval is considered, which is the standard statistical practice observed in the MIM protocol (Burton et al. 2011) and other BLM technical references (e.g. Coulloudon et al. 1996; Elzinga et al. 1998), the residual stubble height does meet the 4-inch prescribed level set in the Settlement Agreement. Although there were key woody species present at this site, the sample size was too small to calculate a woody browse level (Table 22).



Figure 24. Lower end of Corral Creek DMA looking upstream.

**Summary:** The residual stubble-height measurements did meet the prescribed level set in the Settlement Agreement. However, because part of the 95% confidence intervals extends below the 4-inch level, these sites will be prioritized to receive a higher frequency of within-season monitoring in 2016 so livestock moves can be made before prescribed utilization levels are exceeded.

## Indian Creek

The Indian Creek DMA is located at Zone 11T 522762m E 4463989m N (UTM coordinates). The Indian Creek DMA is within an intermittent reach; however, perennial reaches do exist both upstream and downstream of the DMA. These perennial reaches have the potential for a higher abundance of key herbaceous and key woody species than the intermittent reach. At the time of the 2015 monitoring, the stream channel within the DMA was dry and there were few riparian species present. Consequently, the herbaceous vegetation that was present was desiccated and unpalatable and therefore mostly ungrazed. Monitoring photos from 2009 show little riparian herbaceous vegetation and mostly mature willows within the DMA, however, water was flowing within the DMA at that time. The stream channel within the DMA has a fair amount of large cobble, making it well armored and fairly impervious to hoof shear. The average measurement for key species stubble height on this site was 3.7 +/- 0.8 inches (Table 22). When the 95% confidence interval is considered, which is the standard statistical practice observed in the MIM protocol (Burton et al. 2011) and other BLM technical references (e.g. Coulloudon et al. 1996; Elzinga et al. 1998), the residual stubble height does meet the 4-inch prescribed level set in the Settlement Agreement. Woody browse on the key woody species was an average of 62% +/- 11%, which does not meet the prescribed use level of 30% (Table 22).



Figure 25. Lower end of the Indian Creek DMA looking upstream. Channel was dry, had very few riparian herbaceous plants, and was partially armored by cobble-sized particles.

**Summary:** The residual stubble-height measurements did meet the prescribed level set in the Settlement Agreement. However, browse on the key woody species was moderate to heavy and did not meet the prescribed utilization level. Consequently, the CMG will use Appendix 1 of the Settlement Agreement to make adjustments to the 2016 grazing plan. In addition, this site will require a higher frequency of within-season monitoring so livestock moves can be made before prescribed utilization levels are exceeded. Finally, the CMG will review the continued use of this DMA, because it is located on an intermittent reach, which does not entirely satisfy the MIM protocol to locate DMAs within the most sensitive complex. Preferably the DMA would be located within a perennial reach, where there is a greater potential to grow hydric stabilizing vegetation that is desirable forage to livestock.

### Ferris Creek

The Ferris Creek DMA is located at Zone 11T 516428m E 4463145m N (UTMs). The Ferris Creek DMA has a mix of both herbaceous and woody riparian plants. Willows occur in two distinct age/size classes. The older willow plants are largely unavailable to grazing and thriving, and the younger plants are showing clubbing from chronically high levels of browse, which tend to prevent them from reaching taller height classes and older age classes. Towards the downstream end of this DMA, the stream channel is not well defined and appears to be more of a lentic (still water) system than lotic (stream) system. The average stubble height for key species was 1.6 +/- 0.6 inches, which did not meet the 4-inch prescribed use level (Table 22). Woody browse was an average of 76% +/- 8%, which does not meet the prescribed use level of 30% (Table 22).



Figure 26. Upper part of the Ferris Creek DMA looking downstream.



**Summary:** Browse on key woody shrubs was heavy and did not meet the prescribed level set in the Settlement Agreement. In addition, the residual stubble-height measurements did not meet the prescribed use level. Therefore, the CMG will use Appendix 1 of the Settlement Agreement to make adjustments to the 2016 grazing plan. In addition, this site will require a higher frequency of within-season monitoring so livestock moves can be made before prescribed utilization levels are exceeded.

### Crippen Creek

The Crippen Creek DMA is located at Zone 11T 509860m E 4470629m N (UTMs). Crippen Creek DMA is a high elevation stream with a channel slope over 4%. In general, DMAs are located in reaches with gradients under 4%. However, after the stream was stratified, the reach selected for the DMA was the most sensitive complex given its combination of accessibility by livestock, sensitivity to grazing, and vegetation communities present. This is a newly established DMA, which replaced a previous site that was dry part of the year and had limited riparian potential. Within this complex is a mix of both herbaceous and woody plants. The average stubble height measurement for key species was 1.8 +/- 0.6 inches, which does not meet the prescribed use level (Table 22). Woody browse was an average of 69% +/- 7%, which does not meet the prescribed use level of 30%.

**Summary:** Browse on key woody shrubs was heavy and did not meet the prescribed level set I the Settlement Agreement. In addition, the residual stubble-height measurements did not meet the prescribed use level. Therefore, the CMG will use Appendix 1 of the Settlement Agreement to make adjustments to the 2016 grazing plan. In addition, this site will require a higher frequency of within-season monitoring so livestock moves can be made before prescribed utilization levels are exceeded.



Figure 27. Upper part of the Crippen Creek DMA looking downstream.

### Slaven Creek

The Slaven Creek DMA is located at Zone 11T 521559m E 4482096m N (UTMs). Slaven Creek DMA is in a fairly straight channel. Cobble and gravel are common in reach, and this material partially armors the site. Herbaceous vegetation within the DMA is dominated by early successional, low stabilizing species and there were no woody species present. The average stubble height measurement for key species was 1.6 +/- 0.6 inches, which does not meet the prescribed use level set in the Settlement Agreement.

**Summary:** The stubble-height measurements did not meet the prescribed use level in 2015. Therefore, the CMG will use Appendix 1 of the Settlement Agreement to make adjustments to the 2016 grazing plan. In addition, this site will require a higher frequency of within-season monitoring so livestock moves can be made before prescribed utilization levels are exceeded.



Figure 28. Downstream end of Slaven DMA looking upstream.

### Trout Creek

The Trout Creek DMA is located at Zone 11T 512063m E 4468165m N (UTMs). Trout Creek DMA was established in 2015 to address concerns over the previous site that was affected by a road crossing and by topography, which concentrated livestock along the previous DMA. This reach is primarily herbaceous, though the gradient and substrate should support woody plants too. The DMA is partially armored with cobble. The average stubble height measurement for key species was 2.1 +/- 0.6 inches which did not meet the prescribed use level set in the Settlement Agreement. There was only 1 key woody plant in the DMA; therefore woody browse was not evaluated because of an inadequate sample size.



Figure 29. Upper Part of Trout Creek DMA looking downstream



**Summary:** The stubble-height measurements did not meet the prescribed use level in 2015. Therefore, the CMG will use Appendix 1 of the Settlement Agreement to make adjustments to the 2016 grazing plan. In addition, this site will require a higher frequency of within-season monitoring so livestock moves can be made before prescribed utilization levels are exceeded.

### North Fork Mill Creek

The DMA on the North Fork Mill Creek is located at Zone 11T 511570m E 4465620m N (UTMs). The North Fork of Mill Creek has a mix of lentic and lotic characteristics and is dominated by early successional, low-stabilizing, hydric herbaceous species with no woody species present at the site. The average stubble-height measurement for key species was 2.3 +/- 0.7 inches (Table 22), which did not meet the prescribed use level set in the Settlement Agreement.



Figure 30. Lower End of North Fork Mill Creek DMA looking upstream.

**Summary:** The stubble-height measurements did not meet the prescribed use level in 2015. Therefore, the CMG will use Appendix 1 of the Settlement Agreement to make adjustments to the 2016 grazing plan. In addition, this site will require a higher frequency of within-season monitoring so livestock moves can be made before prescribed utilization levels are exceeded.

### Riparian Monitoring Summary

The CMG collected annual-use data on 10 riparian DMAs in October 2015. Most of the DMAs were in herbaceous dominated plant communities (Table 22). All 10 DMAs were monitored for stubble height, 3 of the 10 DMAs (30%) had an average mean stubble height at or above the prescribed use level (Figure 30; Table 22) when the 95% confidence interval is accounted for.

Woody species were present at only 4 DMAs (Harry Canyon, Indian Creek, Ferris Creek, and Crippen Creek) in adequate numbers for monitoring and evaluation. Annual browse at these 4 DMAs ranged from 62% to 77%, which did not meet the prescribed level of 30%.

When stubble height and woody browse data are combined, only 2 (Fire Creek and Corral Creek) of the 10 DMAs (20%) met the prescribed use levels for both woody browse and residual stubble height (Table 23).

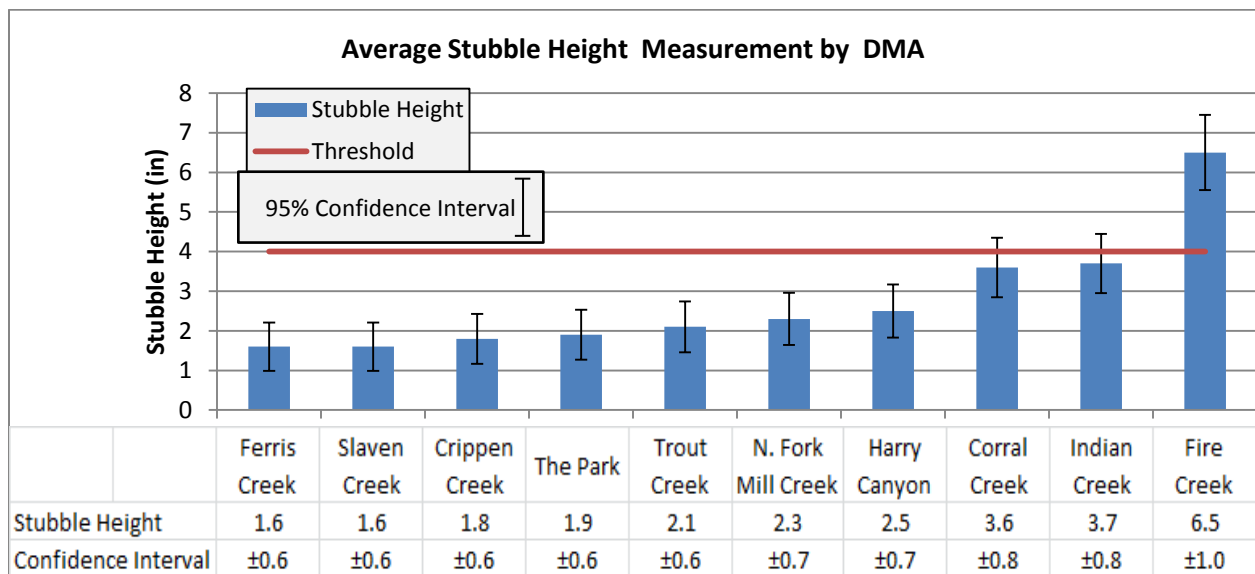


Figure (31): Average stubble-height measurement in inches by DMA. Values below the 4” level (red threshold line) represent sites that exceeded triggers. Those values above 4”, or close enough that the 95% confidence interval extends above the 4” level, had use within the allowable limit set by the Settlement Agreement.

Table (23): Summary of annual use measurements that met (Yes) or did not meet (No) the prescribed use levels set in the Settlement Agreement. Sites that lacked an adequate population of key woody species are indicated as NA (not applicable). To meet the Settlement Agreement, **both** the stubble height and the woody browse levels must be within the prescribed levels.

DMA	Corral Creek	Crippen Creek	Ferris Creek	Fire Creek	Harry Canyon	Indian Creek	N. Fk Mill Creek	Slaven	The Park	Trout Creek
Stubble Height	Yes	No	No	Yes	No	Yes	No	No	No	No
Woody Use	NA	No	No	NA	No	No	NA	NA	NA	NA
Met all applicable annual use levels	Yes	No	No	Yes	No	No	No	No	No	No

## **2015 STOCKMANSHIP REPORT PROVIDED BY PERMITTEES AND NRST**

### **Julian Tomera Ranches, Inc.:**

The following is the abridged 2015 Stockmanship Report as submitted to the BLM by Julian Tomera Ranches Inc.

#### **April**

April 2, 2015 - 3 semi-loads of cattle to Mosquito Canyon & Solar well in Mule Canyon

April 3, 2015 - Drove cows from Martin to Hilltop

April 4, 2015 - Drove cows to Skyline Mule Canyon from Hilltop

April 13, 2015 -Hauled cows to Water Canyon - in Mule Canyon

April 14, 2015 -Hauled cows to freeway Mule Canyon

April 19, 2015- Turned Cows & baby calves off Martin Ranch, East Flat

April 28/29, 2015 - Turned Cows & baby calves off Martin Ranch, East Flat

#### **May**

May 4, 2015- Drove cows to South end of East Flat

May 11, 2015- Steve Cote & Steve Leonard train cows in Mule Canyon

May 12, 2015- Steve Cote & Steve Leonard train cows in Mule Canyon

May 14, 2015- Bring bulls out & cows & baby calves

May 15, 2015-Bring Bulls out

May 17, 2015-Bring Bulls out

May 20, 2015- Moved cattle from Skyline to higher areas

May 28, 2015- Moved cattle from Freeway to higher areas

May 29, 2015-Moved cattle East Flat to higher areas in East Flat Hauled water to Mule Canyon

#### **June**

June 1, 2015- Crew push cattle up canyons, Mule Canyon

June 3, 2015-Rode Ferris Creek stray cattle

June 4, 2015-troughs on flat

June 6, 2015-South East Flat cattle to Lewis Canyon

June 11, 2015- put 5 troughs in Lewis Canyon

June 28, 2015-Re-rode Ferris Creek stray cattle

June 29, 2015- can put cattle on mountain

June 30, 2015- Rode East Flat. pushed to Hilltop Canyon

#### **July**

July 1, 2015- Rode East Flat. pushed to Hilltop Canyon

July 2, 2015- Rode East Flat. pushed to Hilltop Canyon

July 3, 2015- Rode Mule canyon put into East Flat

July 4, 2015- Check Cattle pushed up Hilltop canyon

July 5, 2015-Rode Ratfink to Northside put into East Flat

July 8, 2015-Rode Water Canyon & Freeway put into East Flat

July 10, 2015-Rode East Flat put into Hilltop

July 11, 2015- Rode Skyline to Hilltop ranch. Hard Rain all day

July 13, 2015-Worked Cattle at ranch and drove up Hilltop Canyon.

July 14, 2015-Drove cows & baby calves to above Hilltop

July 16, 2015- Haul 3 semi-loads to Mill Creek North Fork.

July 19, 2015-Drove cows up Bateman Canyon

July 20, 2015-Drove cows and baby calves to center allotment

July 21, 2015-Rode from Hilltop and pushed cattle up Lewis Canyon

July 22, 2015-Rode East Flat and pushed cattle back after crossing cattle guard-Pushed cattle above 2nd cattle guard Hilltop Canyon  
July 23, 2015- Pushed cattle up Lewis Canyon from center East Flat.  
July 24, 2015-Re-rode Mule Canyon, put into East Flat  
July 26, 2015-Re-rode Park and put cattle into Hilltop  
July 28, 2015-Re-rode Park  
July 29, 2015-Re-rode Hilltop canyon and put above second cattle guard  
July 30, 2015-Rode Indian Creek, pushed cattle back to bunch  
July 31, 2015-Re-rode Indian Creek

### **August**

August 2, 2015-Re-rode Skyline and drove to Lewis Canyon  
August 3, 2015-Pushed cattle up Hilltop Canyon to above second cattle guard  
August 4, 2015-Re-rode Park  
August 5, 2015-Re-rode Indian Creek  
August 6, 2015-Re-rode Park  
August 7, 2015-Re-rode Ferris Creek  
August 8, 2015-Rode North Fork of Mill Creek pushed into chicken creek  
August 11, 2015-Rode Trout Creek pushed into Indian Creek  
August 12, 2015-Rode Crippin put into East Flat  
August 13, 2015-Drove cattle from East Fork to Lewis  
August 31, 2015-Put some bulls into Hilltop ranch

### **September**

September 4, 2015- opened gates so cattle could come to flat.  
September 7, 2015-Rode Lewis Canyon brought cattle to Martin Ranch  
September 15, 2015-Rode from hill to East Flat, put on East Flat  
September 16, 2015-Re-rode Hilltop Canyon, put cattle on center of East Flat  
September 17, 2015-Drove cattle from Hilltop to Martin

### **October**

October 7, 2015-Rode Park and Slaven, put into Private Slaven  
October 8, 2015-Rode Bateman and Hilltop canyon  
October 9, 2015-Re-rode Slaven, put into Slaven

### **October**

October 10, 2015-Re-rode Park, Bateman, Slaven. Put into Slaven Field  
October 11, 2015- Rode Ferris Creek. Pushed over Tubing Hill  
October 12, 2015- Drove Cows from Tubing Hill to East Flat  
October 26, 2015- turned first bunch of cows onto Winter Range

### **November**

November 5, 2015- Rode East Flat took to Martin Ranch  
November 6, 2015-Rode East Flat took to Martin Ranch  
November 7, 2015-Rode East Flat took to Martin Ranch  
November 9, 2015-Rode West Flat, Miller Pit, East Flat  
November 16, 2015-Moved Cattle from Martin Ranch to Winter Range

Over 10 ton of low-moisture tubs were hauled to many upland sites. Two to three water trucks were in use hauling water almost daily to troughs to limit riparian area utilization.

Table 24. Tomera Actual Use, Argenta Allotment, 2015-2016

Pasture	No. Cattle	Beginning	Ending	No. Days	AUMs	PPL	BLM AUMs	Comments	
<b>Mule Canyon</b>	125	4/2/2015	4/3/2015	2	8	56	5	125 from Private	
	450	4/4/2015	4/12/2015	9	133	56	75	325 from Private	
	522	4/13/2015	4/13/2015	1	17	56	10	72 from Private	
	1	572	4/14/2015	7/5/2015	83	1561	56	874	50 from Private, 545 to East Flat on 7/3,5,8. Left cows with baby calves.
	2	27	7/6/2015	7/24/2015	19	17	56	9	Handfull of cows out, to East Flat UA on 7/24
	3	22	7/25/2015	8/2/2015	9	7	56	4	20 Cows with calves went to Lewis Canyon (Lewis UA). 2 dead.
	<b>East Flat and West Flat</b>	333	4/19/2015	4/27/2015	9	99	56	55	333 from Private
		621	4/28/2015	4/28/2015	1	20	56	11	288 from Private
		897	4/29/2015	5/3/2015	5	147	56	83	276 from Private
		1062	5/4/2015	5/13/2015	10	349	56	196	165 from Private
4		1223	5/14/2015	6/6/2015	24	965	56	540	161 from Private, 150 out on 6/6/15 to Lewis Canyon, Lewis Canyon UA
5		1073	6/7/2015	7/1/2015	25	882	56	494	428 to Hilltop Canyon, Maysville North UA June 30, July 1, 2,
		645	7/2/2015	7/5/2015	4	85	56	48	
1		1190	7/6/2015	7/10/2015	5	196	56	110	545 from Mule Cyn on 7/3,5,8; Took off East Flat on 10th, to Hilltop Ranch
6		645	7/11/2015	7/14/2015	4	85	56	48	57 to Hilltop Canyon 7/14
7		588	7/15/2015	7/15/2015	1	19	56	11	361 to Hilltop Canyon
8		227	7/16/2015	7/16/2015	1	7	56	4	117 dries and 10 bulls to NFM C
9		100	7/17/2015	7/21/2015	5	16	56	9	40 to Lewis UA on 7/21
10	60	7/22/2015	7/23/2015	2	4	56	2	60 to Lewis UA on 7/23; flat clean.	
2, 11	5	7/25/2015	7/26/2015	2	0	56	0	Handful from Mule Canyon; put into Hilltop Canyon on 26th.	
12	100	8/13/2015	8/15/2015	3	10	56	6	100 head from Crippen on August 12, into ranch private on 8/15.	



Table 24. Tomera Actual Use, Argenta Allotment, 2015-2016

Pasture	No. Cattle	Beginning	Ending	No. Days	AUMs	PPL	BLM AUMs	Comments	
	150	9/5/2015	9/30/2015	26	128	56	72	} Estimated average number on Flats at any one time.	
	77	10/1/2015	10/12/2015	12	30	56	17	} Groups worked as they came down or were brought down.	
14	223	10/13/2015	10/16/2015	4	29	56	16	223 from Hilltop Canyon (tubing hill bunch).	
	55	10/17/2015	10/31/2015	15	27	56	15	} Estimated average number on Flats at any one time.	
<b>Lewis</b>	4	150	6/7/2015	7/21/2015	45	222	56	124	150 from East & West Flat on 6/6/2015
	9	190	7/22/2015	7/22/2015	1	6	56	3	40 from EF UA on 7/21/15
	10	250	7/24/2015	8/2/2015	10	82	56	46	60 from EF UA on 7/23/15
3,									20 Cows with calves from Mule Canyon;
12	270	8/3/2015	8/12/2015	10	89	56	50	100 to E&W Flat 8/12/15	
	170	8/3/2015	9/4/2015	33	184	56	103	Gates to E&W Flat opened 9/4/15	
	50	9/5/2015	9/30/2015	26	43	56	24	Estimated average number for time period, cattle drifted out to E&W Flat	
<b>Maysville North</b>	5	428	7/2/2015	7/12/2015	11	155	56	87	428 from East Flat 6/30, 7/1, 7/2
		973	7/14/2015	7/14/2015	1	32	56	18	545 from Hilltop Ranch 7/13
	6	1030	7/15/2015	7/15/2015	1	34	56	19	57 from East Flat on 7/14
↓	7	1391	7/16/2015	7/26/2015	27	1235	56	691	361 from East Flat 7/15
	11	1396	7/27/2015	8/11/2015	40	1836	56	1,028	5 from East Flat 7/26
	13	1523	8/12/2015	9/4/2015	24	1202	56	673	127 from NF & TC on 8/11. Opened all gates to flats on 9/4
<b>Maysville South</b>		1373	9/5/2015	9/30/2015	26	1174	56	657	Based on cattle coming off in groups of approximately 125-175.
		1223	9/10/2015	9/14/2015	5	201	56	113	Based on cattle coming off in groups of approximately 125-175.
		1073	9/15/2015	9/19/2015	5	176	56	99	Based on cattle coming off in groups of approximately 125-175.
↓		923	9/20/2015	9/24/2015	5	152	56	85	Based on cattle coming off in groups of approximately 125-175.

Table 24. Tomera Actual Use, Argenta Allotment, 2015-2016

Pasture	No. Cattle	Beginning	Ending	No. Days	AUMs	PPL	BLM AUMs	Comments	
<b>Maysville North (Bateman)</b>	773	9/25/2015	9/30/2015	6	152	56	85	Based on cattle coming off in groups of approximately 125-175.	
	718	10/1/2015	10/3/2015	3	71	56	40	Based on cattle coming off in groups of 50-60.	
	663	10/4/2015	10/6/2015	3	65	56	37	Based on cattle coming off in groups of 50-60.	
	608	10/7/2015	10/9/2015	3	60	56	34	Based on cattle coming off in groups of 50-60.	
	14	553	10/10/2015	10/12/2015	3	55	56	31	Group pushed from tubing hill to East Flat on 10/12
↓		330	10/13/2015	10/15/2015	3	33	56	18	Based on cattle coming off in groups of 50-60.
		275	10/16/2015	10/18/2015	3	27	56	15	Based on cattle coming off in groups of 50-60.
		220	10/19/2015	10/21/2015	3	22	56	12	Based on cattle coming off in groups of 50-60.
<b>Slaven</b>		165	10/22/2015	10/24/2015	3	16	56	9	Based on cattle coming off in groups of 50-60.
		110	10/25/2015	10/27/2015	3	11	56	6	Based on cattle coming off in groups of 50-60.
		55	10/28/2015	10/31/2015	4	7	56	4	Based on cattle coming off in groups of 50-60.
<b>North Fork</b>	8, 13	127	7/18/2015	8/11/2015	25	104	56	58	127 Cattle from East Flat on 7/16. Moved to Chicken Creek and Indian Creek (S. Maysville UA) August 8 and 11. Used last date.
↓									
<b>Trout Creek</b>									
<b>Winter Range Pasture</b>		150	9/23/2015	9/30/2015	8	39	56	22	From Private
		300	10/1/2015	10/15/2015	15	148	56	83	From Private
		500	10/16/2015	11/30/2015	46	756	56	423	From Private, to Private
		200	12/1/2015	12/31/2015	31	204	56	114	To Private

Table 24. Tomera Actual Use, Argenta Allotment, 2015-2016

<b>Pasture</b>	<b>No.</b>	<b>Beginning</b>	<b>Ending</b>	<b>No.</b>	<b>AUMs</b>	<b>PPL</b>	<b>BLM</b>	<b>Comments</b>
Total AUMs	<b>Cattle</b>			Days			AUMs	
							<b>7,524</b>	

Did not place cattle in Indian Creek, Corral Canyon, Mill Creek, Harry Canyon, or County Line Uas. See Henry Filippini (Mariluch) AU for Fire Creek, Sansinena, & Horse Heaven Use Areas.

Pete Tomera \_\_\_\_\_

Date \_\_\_\_\_



## Chiara Ranch:

Actual use reported by the Chiara Ranch is summarized in Table 25.

Allotment/Pasture	Date (mm/dd/yyyy)	Number of Livestock (cattle)	
		Turned in	Taken out
Argenta	05/13/2015	191	
Argenta	05/19/2015	9	
Argenta	10/27/2015		7
Argenta	10/28/2015		70
Argenta	11/03/2015		75
Argenta	11/04/2015		48

The following is a 2015 Stockmanship Report as submitted to the BLM by Chiara Ranch.

We started the 2015 grazing season with a stockmanship training exercise put on by Steve Leonard and Steve Cote. The training consisted of basic handling techniques and then actually moving and placing cattle. During the exercise, cattle were sorted and some were pushed up Harry Canyon while the rest were pushed below the Mill Creek campground (West Flat), as these were the only use areas open at the time. Along the way some older pairs and dry cows were sorted off.

Because it was recommended by the NRST, and we agree, that Mill Creek is not functioning as a riparian area due to the haul road, and because moving cattle away from Mill Creek would push cattle to other areas not impacted by the haul road, we did not place cattle away from Mill Creek.

After initial placement in Harry Canyon, cattle drifted to higher areas of the use area. End-of-season monitoring showed very little utilization. We did not see much concentrated utilization during the season, so we left cattle in place in the upper reaches of Mill and Harry Canyons.

The primary challenge in these use areas comes from cattle that move to the North Fork of Mill Creek. We pushed cattle out of this area when we found them there. The exclosures in this area will help in the future. We will continue to have this area be the focus of our stockmanship.

Because water is very limited in Harry Canyon, we agree with Steve Leonard's suggestion that juniper be cut in the area below the spring and the downed trees used as barriers to reduce accessibility to the creek. This would be even more effective with a trough in the Harry Canyon use area.

As the grazing season continued many cattle had come back down from the upper reaches of both use areas to the flats after being moved to the upper parts of these use areas. Attempting to move cattle while keeping "low stress" on the trip from the flats to the upper reaches has proven to be problematic due to timing issues with the amount of trucks traveling on a daily basis.

The 2015 plan relied on limited herd moves because of limited water capacity in centralized locations. Until additional water can be developed, rotating smaller groups of cattle around existing waters and placement of livestock on the uplands will remain the only practical method.

Tubs and salt were not used because key areas have yet to be determined and we did not want to inadvertently draw cattle to a key area. Once we have a determination of key areas and water hauls, we will reevaluate how to use them.

Overall, we find that the stockmanship techniques are limited by the lack of off-site water. With the proposed exclosures and additional water sources in place before the 2016 grazing season, we hope to have more success.

We watched for “problem cattle” that cannot learn the new program and have used this information when we culled cows. We will work to keep cows that fit better with the stockmanship techniques.

We look forward to working with NRST to identify changes and strategies to improve our success.

**Henry Filippini Jr.:**

The following is an abridged actual use and 2015 Stockmanship Report submitted to the BLM by Henry Filippini Jr.

Table 26.  
Actual Grazing Use – Henry Filippini Jr., Argenta Allotment

Actual Grazing Use			
Pasture	Date	Number of cattle	
	mm/dd/yyyy	Turned In	Taken Out
Sansinena	3/16/2015	120	
Sansinena	4/15/2015		120
Whirlwind/H.H.	4/15/2015	120	
Whirlwind/H.H.	5/11/2015	61	
Fire Creek	5/11/2015	200	
Fire Creek	6/29/2015		200
Whirlwind/H.H.	7/3/2015	200	
Whirlwind/H.H.	8/25/2015		160
Power Plant Rd	8/25/2015	160	
Whirlwind/H.H.	9/1/2015		180
Sansinena	9/1/2015	180	
Whirlwind/H.H.	9/25/2015		22
Sansinena	10/21/2015		20
Power Plant Rd	10/27/2015		19
Sansinena	11/9/2015		10
Allotment	11/13 to 11/15/2015		309

**March**

March 16, 2015-120 head of cattle to Sansinena

## **April**

April 15, 2015-120 head of cattle out of Sansinena to Whirlwind Valley/Horse Heaven

## **May**

May 11, 2015- 200 head of cattle turned out Fire Creek

May 11, 2015- 61 head of cattle turned out to Whirlwind Valley/Horse Heaven

## **June/July**

June 29-July 3, 2015-200 head of cattle from Fire Creek to Whirlwind Valley/Horse Heaven

## **August**

August 25, 2015- 160 head of cattle from Whirlwind Valley/Horse Heaven to Private ground (the waterfall on the Beowawe Power plant road)

## **October**

October 1, 2015 - 180 head of cattle from Whirlwind Valley/Horse Heaven to Sansinena

~ Tubs moved every 10-12 days, cattle were pushed every 2-3 days to tubs.

## **2016 STOCKMANSHIP PLAN DEVELOPED BY NRST AND PERMITTEES**

### **Background:**

The Argenta Allotment Permittees with the guidance from the NRST have developed a grazing plan for the 2016 grazing year. The purpose of this plan is to better distribute livestock off sensitive riparian areas and into the uplands. The overall philosophy for achieving the use levels outlined in the 2015 Argenta Settlement agreement is to more effectively move livestock through the use of low-stress stockmanship and the control of water and supplements.

In the spring of 2015, the BLM hosted a low-stress stockmanship workshop, which follows the philosophy of Bud Williams. The overall idea of this style of stockmanship is a calmer and more calculated approach to commonly-used stockmanship practices. Practitioners of this method claim substantially better livestock distribution and use it as an alternative to fencing out miles of riparian systems. For more information on this method refer to *Stockmanship: A powerful tool for grazing lands management* by Steve Cote.

In arid-land pastures, water is the most effective means of controlling livestock distribution other than fencing (Ganskopp 2001). Cattle will generally travel 1-2 miles away from water to available feed (Holechek et al. 2001). By distributing additional sources of water through a use area, a grazing operator can more efficiently distribute livestock. While the Argenta Allotment may not be lacking for water availability in many areas, the combination of low-stress stockmanship and supplemental water locations away from riparian areas may alleviate grazing pressure on riparian areas.

Best available science suggests that use of supplement in under-utilized rangelands can improve the distribution of livestock in foothills (Bailey and Welling 1999; Bailey et al. 2008). Livestock are attracted to supplements that contain limiting nutrients in their diet. By controlling the location of these supplements, a grazing plan can be further refined to uniformly distribute cattle across the range.



There are three primary operators within the Argenta Allotment. Julian Tomera Ranches, Inc., Chiara Ranch and Filippini Ranching, Co. The grazing plan for all three operators is under the same general philosophy. Upon turnout, ranchers will distribute the livestock widely across their use areas early on, and then implement tight control of location and duration of stay of cattle herds as the grazing season progresses.

Movement of cattle will occur under three categories. First, cattle will be moved between use areas in accordance with authorized dates and permitted numbers of livestock. This will be the general overall schedule for livestock locations and is the basis for billing by the BLM. Second, operators will disperse livestock within use areas through range riders to minimize concentrated disturbance. An integrated part of this second part is for operators to monitor use levels as they move livestock. The third type of movement will occur when use levels are met or exceeded. If this occurs in the uplands and/or riparian areas, operators will move their livestock to another part of the currently occupied use area where use levels are lower or to their next permitted use area.

### **Julian Tomera Ranches, Inc.:**

*Overview of issues based on 2015 monitoring data and CMG discussions.* Annual use levels in many of the upland use areas grazed by livestock of the Tomera Ranches met prescribed use levels set in the Settlement Agreement; however, special attention to within-season monitoring of use should occur in the Lewis, Slaven, and Trout Creek use areas, which did not meet the prescribed use levels in 2015.

The greater challenge will be control of use in riparian areas. Some proposed range improvements can help conditions along Ferris Creek and North Fork Mill Creek. If a south boundary fence is constructed, riparian use in Indian Creek will be transferred from the Argenta to the Calico Lake Allotment, but that fence has not yet been completed. One of the strategies described in the 2016 stockmanship plan is to defer hot-season grazing in the Mule Canyon, Crippen Canyon, Trout Creek and North Fork Mill Creek areas. Deferment during the hot season keeps livestock out of riparian areas when they are likely the most vulnerable to overuse because of livestock water demands and the prevalence of palatable forage when much of the upland forage declines in preference.

Although no riparian monitoring data was collected in 2015 along Rock Creek, the CMG will explore installation of a new DMA in this drainage. Visual observations in 2015 suggest livestock control and distribution will be important to improving riparian conditions and riparian function along Rock Creek.

Permittees noted that water hauls, salt blocks, and low-moisture supplement tubs all proved successful in creating greater upland distribution of livestock in 2015. Continued practice and experience with these tools, in combination with a rotational schedule, hot-season deferment, and proposed range improvements are parts of the 2016 plan to improve the condition of the riparian areas within the Tomera Ranches' use areas.

*2016 stockmanship plan for Julian Tomera Ranches.* Tomera ranches will begin grazing cattle in West Flat and East Flat and South End use areas in accordance with permitted numbers and dates. As soon as conditions permit, appropriate numbers of livestock will be moved into lower portions of Mule Canyon, N. F. Mill Creek, Trout Creek and Crippen Canyon. Remaining

livestock will be gradually moved into Lewis and Maysville North along a dispersed front. Late calving stock may be trucked to Maysville South if desired to facilitate dispersal. Livestock will then be dispersed throughout the use areas as growing conditions permit to minimize concentrated disturbance in potential sage-grouse nesting and brood-rearing areas.

On or about July 1, 2016, Tomera Ranches will begin removing all livestock from Mule Canyon, North Fork Mill Creek, Trout Creek and Crippen Creek drainages to effect hot-season deferment and allow adequate regrowth of riparian vegetation. All animals will be moved to Lewis, Maysville North and Maysville South by July 15. Tomera ranches and Filippinis will work collaboratively to remove any drift and prevent return of livestock to the subject drainages.

Periodic riding/monitoring to determine when or if within-season triggers are being approached/met will be implemented. Low-stress stockmanship principles along with low-moisture block supplement placement and water hauls as necessary will be used to move/place livestock where localized habituation jeopardizes agreed upon use levels overall. Priority efforts will be placed on the Park, Corral Canyon, Rock Creek, Ferris Creek and Indian Creek riparian areas.

Early season use on East Flat use area is anticipated to be slight to light under the prescribed use. As settlement agreement use levels are approached during the later grazing season, livestock will be gradually moved back to East Flat, West Flat, Winter Range and/or other deeded pastures.

Additional adaptive management considerations may be implemented pending completion of round one range improvements on public lands, any additional improvements on private lands, and within-season monitoring. Potential boundary fencing options along the southern allotment boundary and subsequent agreements in particular may provide additional management options.

The 2016 Tomera Ranches grazing schedule (depending on conditions and adaptive management considerations) is:

As soon as conditions allow or management needs dictate:

1. Fence designated riparian areas as approved by BLM and develop off-site water on private land
2. Use low-moisture tubs and salt to keep cattle away from creek bottoms
3. Haul water to keep cattle away from sensitive areas
4. Use low-stress livestock handling methods

March 15 or as soon as conditions will allow:

Turn cattle to East Flat, West Flat and South End 1200 head

March 15 or as soon as conditions will allow:

Put cattle in to Mule Canyon 600 head

April 20 or as soon as conditions will allow:

Take some cattle to North Fork, Trout and Crippen Canyons

May 1:

Begin moving remaining cattle from “flats” to Lewis, Maysville N., Slaven and Maysville S. as conditions permit; distribute

July 1:

Take cattle out of Mule Canyon and distribute them in Lewis, Maysville N., Maysville S. and Slaven as conditions permit

July 1-15:

Take cattle from North Fork, Trout and Crippen Canyons and distribute in Maysville S. and Indian Creek as conditions permit. Cattle removed from the lower end of canyons may be distributed in Lewis and Maysville N. if necessary.

Sept. 1:

Start putting cattle into the Winter Range, East and West Flat and into other deeded pastures

Oct. 30:

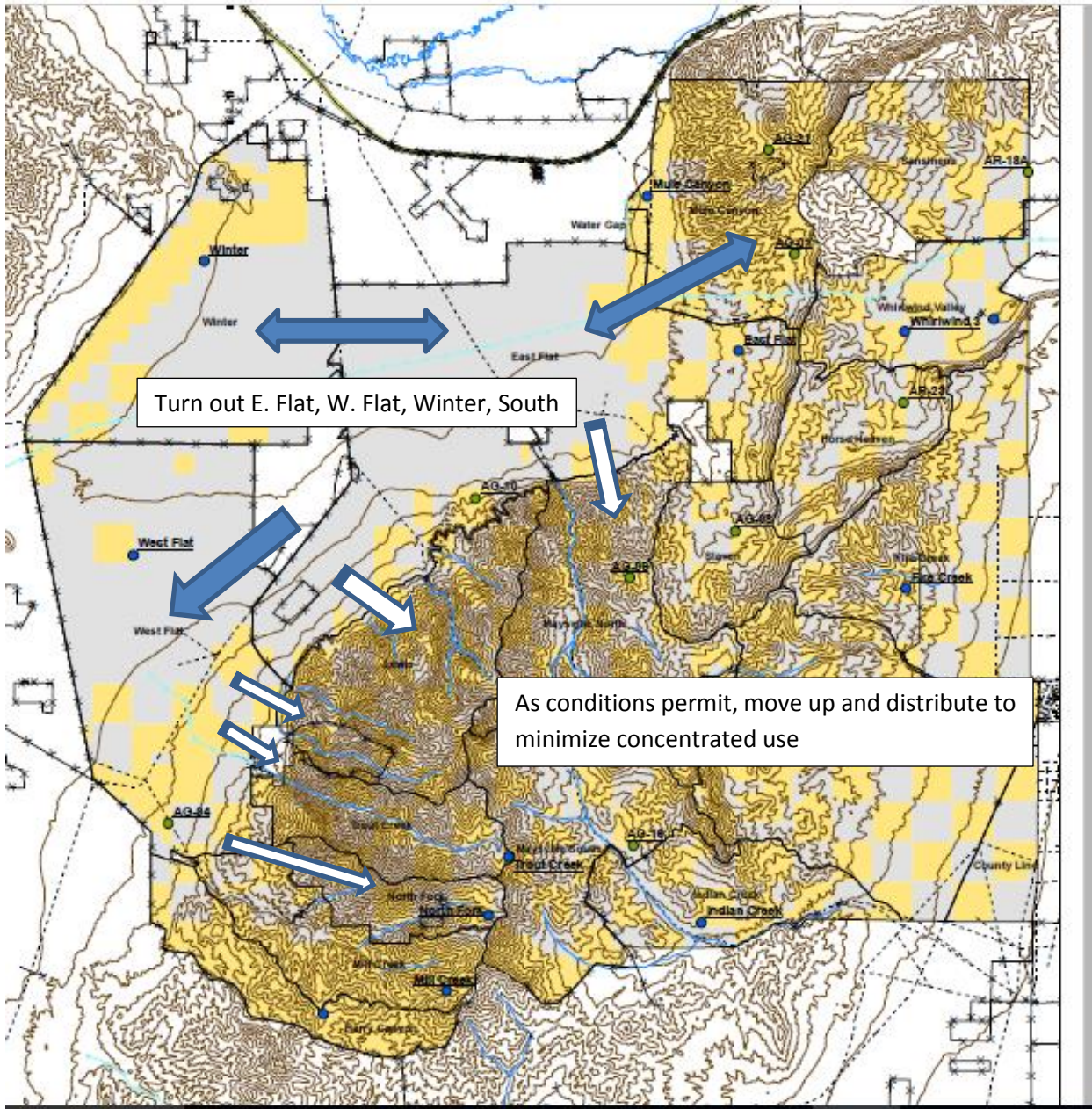
Most of the cattle are off the mountain and in the Winter Range, East and West Flat and other deeded pastures

Dec. 31:

All cattle will be taken off the Winter Range and put in deeded pastures



Figure 32A. Tomera Ranches 2016 Grazing (Early)



LEGEND



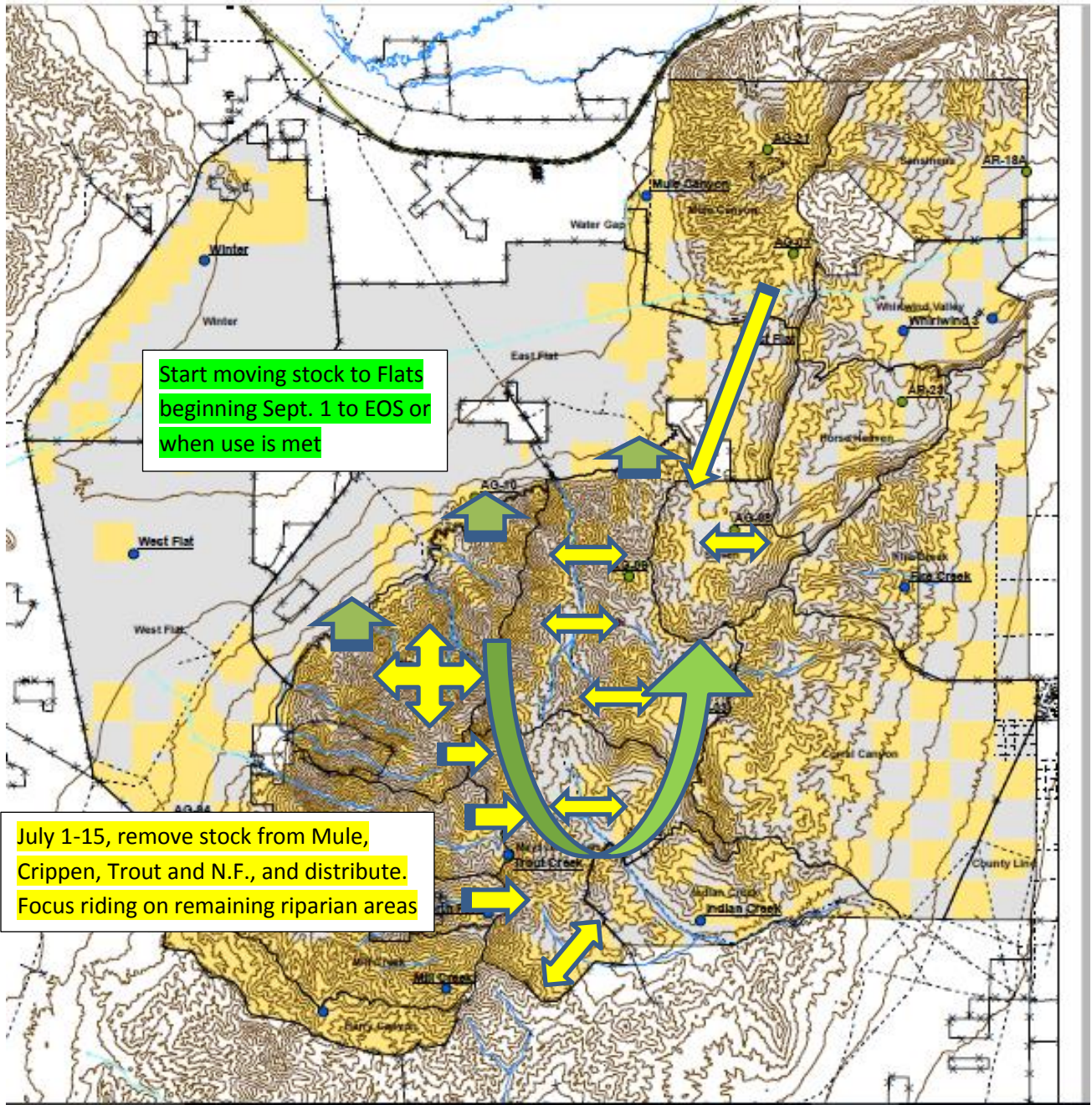
-- Move livestock into allotment according to permitted numbers and dates





-- Disperse using low stress stockmanship and as growing conditions permit minimize concentrated disturbance. Monitor use levels.



Figure 32B. Tomera Ranches 2016 Grazing (Late)



LEGEND

-  -- July 1-15, remove stock from Mule, Crippen, Trout and N.F., and distribute. Focus riding on remaining riparian areas
-  -- Start moving stock to Flats beginning Sept. 1 to EOS or when use is met

## **Chiara Ranch:**

***Overview of issues based on 2015 monitoring data and CMG discussions.*** Upland use levels in 2015 met prescribed use levels in all four use areas used by the Chiara ranch (Harry Canyon, Mill Creek, North Fork Mill Creek (used in part with Tomera Ranches), and South Flat). The annual use was light to moderate but within prescribed levels in two areas (44 +/- 10% in Mill Creek and 45% +/- 7% in North Fork Mill Creek); therefore, within-season monitoring will be important so moves can be scheduled before utilization levels are exceeded. Adherence to a general rotation, control of animal distribution, and timely moves based on within-season monitoring should produce continued upland grazing success in 2016 on all use area.

The greater challenge will be grazing management to reduce use on the riparian areas in Harry Canyon and North Fork Mill Creek. Although no DMA was monitored in the Mill Creek use area in 2015, the CMG will explore opportunities to establish a monitoring site in this use area in 2016. Proposed range improvements in parts of the Mill Creek and North Fork Mill Creek should reduce pressure on some of the most important riparian areas along these creeks. Attention to livestock distribution should be made so additional use is not transferred to other, unfenced riparian sites.

Dispersed use during the cool season, followed by active riding and distribution control in the hot season will be important in promoting improved riparian conditions.

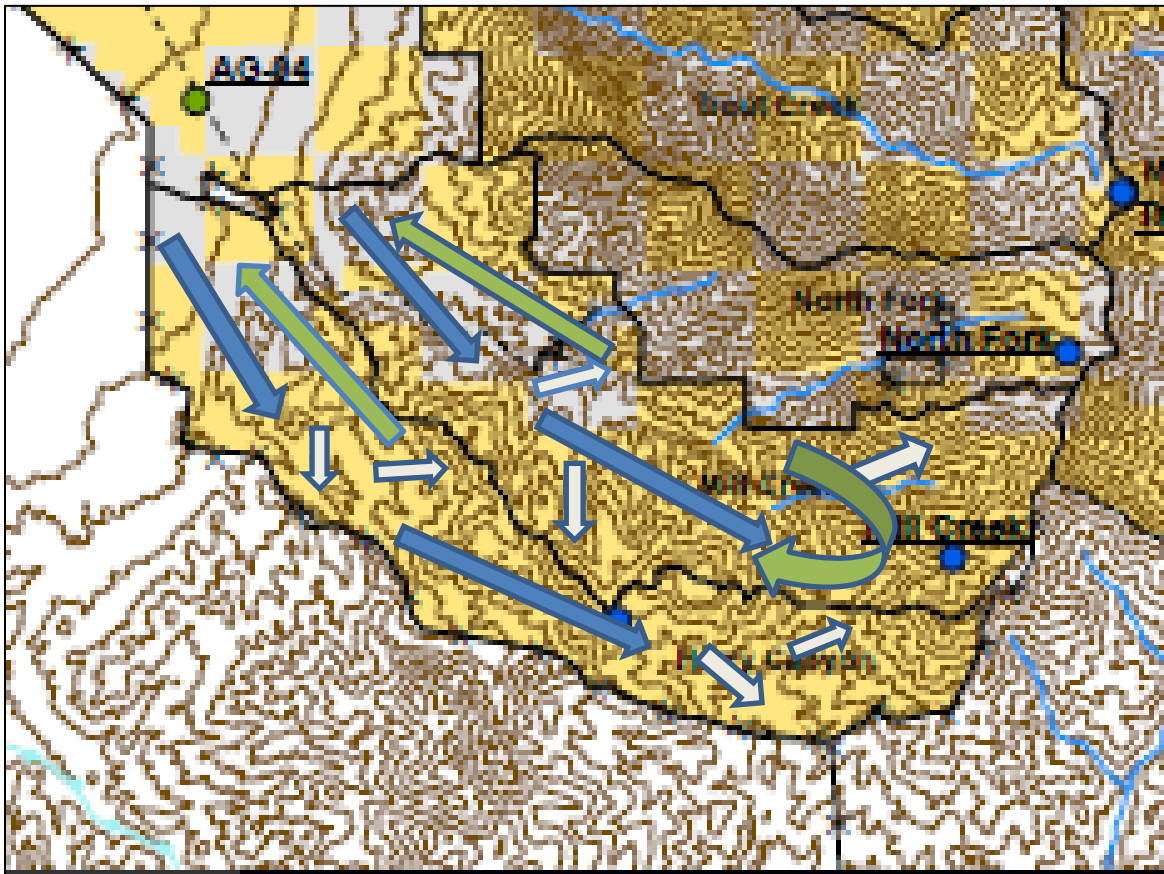
***2016 stockmanship plan for Chiara Ranch.*** Dan and EddyAnn Filippini will graze cattle in Harry Canyon and Mill Creek use areas in accordance with permitted numbers and dates. Livestock will be dispersed throughout the use areas as growing conditions permit to minimize concentrated disturbance in potential sage-grouse nesting and brood-rearing areas.

On or about July 1, 2016, Filippinis will work collaboratively with Tomera Ranches to remove any drift from North Fork Mill Creek, Trout Creek and Crippen Creek drainages to effect hot season deferment and allow adequate regrowth of riparian vegetation.

Periodic riding/monitoring to determine when or if within season triggers are being approached/met will be implemented. Low-stress stockmanship principles will be used to move/place livestock where localized habituation jeopardizes agreed upon use levels overall.

Livestock will be removed at the end of permitted use or achievement of applicable use levels.

Figure 33. Chiara Ranch--Stockmanship Map for 2016 Grazing



LEGEND



-- Move livestock into allotment or use area according to permitted numbers and dates



-- Disperse using low stress stockmanship and as growing conditions permit minimize concentrated disturbance. Monitor use levels.



-- Remove livestock when use levels are approached or met or end of grazing season, whichever occurs earliest



## **Henry Filippini Jr.:**

***Overview of issues based on 2015 monitoring data and CMG discussions.*** Shawn and Angie Mariluch graze cattle in the Fire Creek, Horse Haven, Whirlwind Valley and Sansinena use areas. The only riparian area monitored in these use areas is the Fire Creek DMA. Monitoring on this DMA indicates recent use has met the prescribed levels. The riparian community appears to be in generally good condition; however, a series of small knickpoints should be monitored.

The upland annual-use monitoring in 2015 indicated that utilization levels met the prescribed level at 3 KMA (Fire Creek (0%), Whirlwind 1 (26% +/- 13%) and Horse Haven (48% +/- 15%)), but did not meet the prescribed levels at 2 other KMAs (Sansinena (56% +/- 8%), and Whirlwind 3 (51% +/- 6%) KMAs. Therefore, within-season monitoring will be important to balance use across all available use areas and so moves can be scheduled before utilization levels are exceeded. To address the highest use levels in the Sansinena use area, deferment is planned until seed-ripe, which should promote better plant growth prior to the prescribed late-season grazing period in the Sansinena use area.

Adherence to a general rotation, control of animal distribution with riders, and timely moves based on within-season monitoring should produce grazing success in 2016 on all use area. Development of additional water sites (temporary water hauls in the immediate future with permanent water sites on private land possible later) should promote greater dispersal of livestock away from the Horse Haven/Whirlwind well.

***2016 stockmanship plan for Filippini Ranching, Co.*** Mariluches will begin grazing cattle in Fire Creek use area in accordance with permitted numbers and dates. Livestock will be dispersed within the use area using low-stress stockmanship techniques and additional water haul sites if necessary. Livestock will be moved from Fire Creek to Horse Haven and Whirlwind Valley use areas on or about June 1 or when designated use levels are met in Fire Creek, whichever occurs first to defer riparian use through the remainder of the “hot” growing season.

Livestock will be dispersed throughout Horse Haven and Whirlwind using low-stress stockmanship techniques in addition to water haul sites and low-moisture block supplements to minimize trailing effects to and from existing permanent waters.

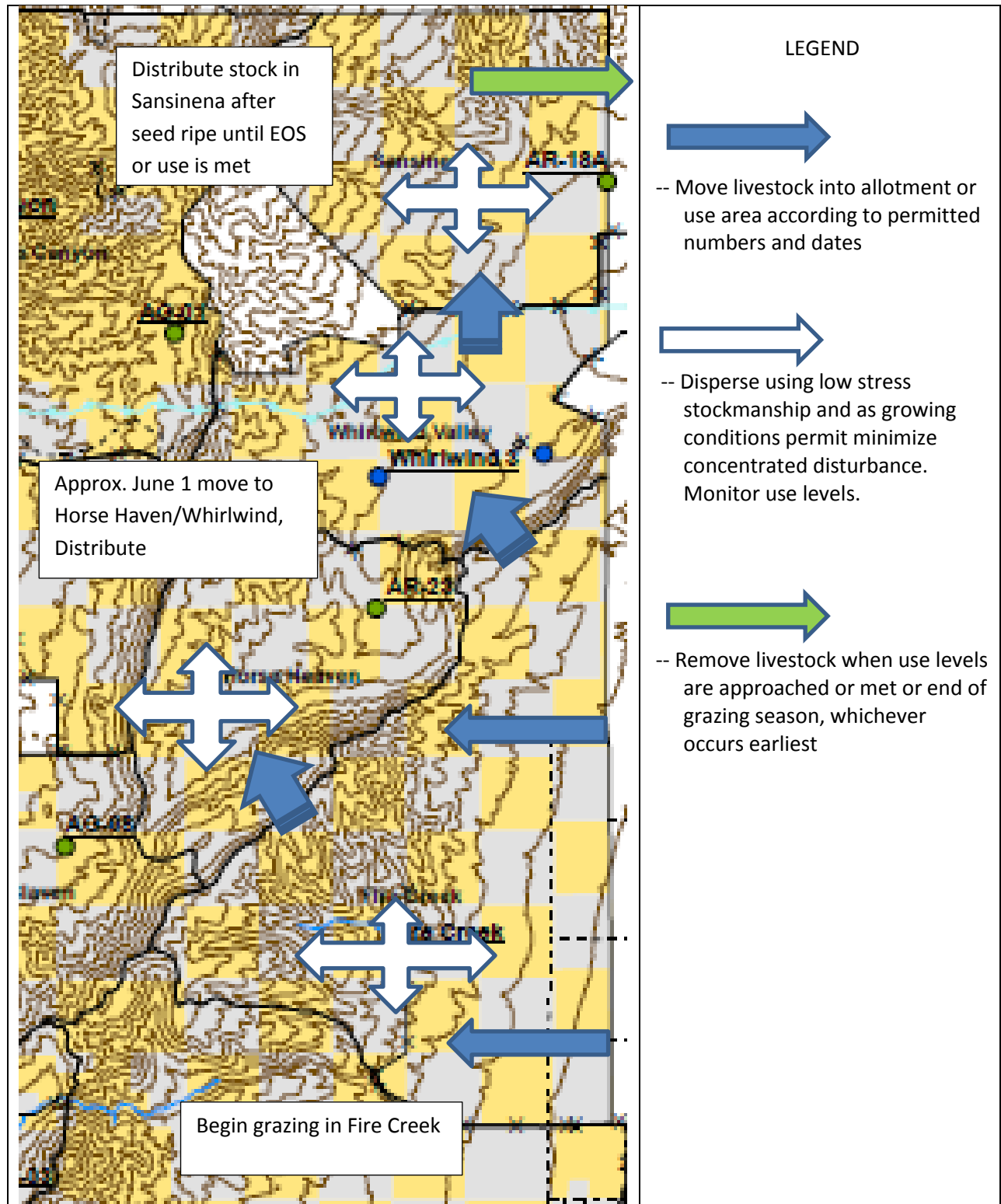
Sansinena use area will be deferred during the upland growing season until or on about August 15. Livestock will be moved to Sansinena and dispersed from localized areas in Horse Haven and Whirlwind as designated use levels are approached and/or to reduce trailing until:

- 1) Use in Horse Haven and Whirlwind dictates all livestock be removed to Sansinena or
- 2) Designated use levels in Sansinena are approached or exceeded or
- 3) End of grazing season dictates removal.

Periodic riding/monitoring to determine when or if within season triggers are being approached/met will be implemented.

Additional adaptive management considerations may be appropriate pending disposition of potential range improvements on both public and private lands.

Figure 34. Filippini Ranching – Stockmanship map for 2016 grazing season.



## 2016 CMG Activities

The CMG has a full calendar of activities in 2016. In summary, these activities include:

- A March meeting to review results of 2015 end-of-season monitoring data and to review draft 2016 stockmanship plans. Another CMG meeting (either in person or via conference calls and emails) will review public comments and CMG input to finalize 2016 grazing plans.
- A spring meeting of the CMG technical subgroup to conduct site stratification, to review of some problematic monitoring sites, and to establish new monitoring sites where none currently exist.
- A spring meeting to collect long-term condition information at upland and riparian monitoring sites.
- A late spring/early summer project to develop or validate height-weight curves on selected key herbaceous species.
- Within-season monitoring program at all monitoring sites with additional monitoring devoted to high priority sites (i.e. those that did not meet prescribed levels in 2015 or where the 95% confidence intervals had a range that spanned the use thresholds).
- A fall meeting to collect annual-use information.
- A late fall meeting to review the 2016 monitoring information and the 2016 stockmanship plan.

## References

- Bailey, D.W. and G.R. Welling. 1999. Modification of cattle grazing distribution with dehydrated molasses supplement. *Journal of Range Management* 52:575-582.
- Bailey, D.W., H.C. Van Wagoner, R. Weinmeister, and D. Jensen. 2008. Evaluation of low-stress herding and supplement placement for managing cattle grazing in riparian and upland areas. *Rangeland Ecology Management* 61:26-37.
- Bureau of Land Management, 2012. Battle Mountain District Drought Management Environmental Assessment, DOI-BLM-NV-B000-2012-0005-EA, Battle Mountain, Nevada.
- Burton, T.A., Smith, S.J., and Cowley, E.R., 2011. Riparian area management: Multiple indicator monitoring (MIM) of stream channels and streamside vegetation. U.S. Department of the Interior, Bureau of Land Management. Technical Reference 1737-23, Denver, CO.
- Cote, S., 2004. *Stockmanship: A powerful tool for grazing lands management*.
- Coulloudon, B., Eshelman, K., Gianola, J., Habich, N., Hughes, L., Johnson, C., Pellant, M., Podborny, P., Rasmussen, A., Robles, B., Shaver, P., Spehar, J., and Willoughby, J. 1996 (revised 1999). Utilization Studies and Residual Measurements. Interagency Technical Reference 1734-3, Bureau of Land Management, National Business Center, Denver, CO.
- Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. Measuring and monitoring plant populations. BLM Technical Reference 1730-1. U.S. Department of Interior, Bureau of Land Management, Denver, CO.
- Ganskopp, D., 2001. Manipulating cattle distribution with salt and water in large arid-land pastures: a GPS/GIS assessment. *Applied Animal Behavior Science* 73:251-262.
- Holechek, J.L., R.D. Pieper, and C.H. Herbel. 2001. *Range management: principles and practices*. Prentice-Hall Inc., Upper Saddle River, N.J.
- Krebs, C.J. 1989. *Ecological methodology*. Harper and Row, New York, NY.

- MacDonald, L.H., A.W. Smart, and R.C. Wissmar. 1991. Monitoring guidelines to evaluate effects of forestry activities on streams in the Pacific Northwest and Alaska. EPA/910/9-91-001. U.S. Environmental Protection Agency, Region 10, Seattle, WA.
- USDA Natural Resources Conservation Service, 1999. Plant Guide: Management and Use of Crested and Siberian Wheatgrasses, Boise, ID, 5 p.
- USDA Natural Resources Conservation Service, 2001. Plant Guide: Crested Wheatgrass *Agropyron cristatum* and *Agropyron desertorum*.
- USDA Natural Resources Conservation Service, 2006. Plant Guide: Crested Wheatgrass *Agropyron cristatum*. Idaho State Office, Boise, ID, 6 p.



**Appendix 1: Plant list from the 2015 end-of-season monitoring, Argenta Allotment**

<b>Scientific Name</b>	<b>Common Name</b>	<b>NRCS Plant Symbol</b>
<i>Achnatherum hymenoides</i>	Indian Ricegrass	ACHY
<i>Achnatherum lettermanii</i>	Letterman's needlegrass	STLE4/ACLE9
<i>Achnatherum thurberianum</i>	Thurber's needlegrass	STTH2/ACTH7
<i>Agropyron cristatum</i>	crested wheatgrass	AGCR
<i>Agrostis stolonifera</i>	creeping bentgrass/redtop	AGST2
<i>Alopecurus arundinaceus</i>	shortawn foxtail	ALAR
<i>Atriplex canescens</i>	fourwing saltbush	ATCA2
<i>Atriplex confertifolia</i>	shadscale	ATCO
<i>Bassia prostrata</i>	forage kochia	BAPR5
<i>Bromus marginatus</i>	mountain brome	BRMA4
<i>Bromus tectorum</i>	cheatgrass	BRTE
<i>Calamagrostis stricta</i>	slimstem reedgrass	CAST36
<i>Carex microptera</i>	smallwing sedge	CAMI7
<i>Carex nebrascensis</i>	Nebraska sedge	CANE2
<i>Deschampsia cespitosa</i>	tufted hairgrass	DECE
<i>Eleocharis acicularis</i>	needle spikerush	ELAC
<i>Eleocharis palustris</i>	common spikerush	ELPA3
<i>Elymus elymoides</i>	bottlebrush squirreltail	ELEL5/SIHY
<i>Festuca idahoensis</i>	Idaho fescue	FEID
<i>Hordeum brachyantherum</i>	meadow barley	HOBR2
<i>Juncus balticus</i>	Baltic rush	JUBA/JUAR2
<i>Juncus bufonius</i>	toad rush	JUBU
<i>Juncus ensifolius</i>	swordleaf rush	JUEN
<i>Leymus cinereus</i>	basin wildrye	LECI4
<i>Picrothamnus desertorum</i>	bud sagebrush	PIDE4
<i>Poa pratensis</i>	Kentucky bluegrass	POPR
<i>Poa secunda</i>	Sandberg bluegrass	POSE
<i>Poa sp.</i>	bluegrass species	POA
<i>Polypogon monspeliensis</i>	annual rabbitsfoot grass	POMO5
<i>Pseudoroegneria spicata</i>	bluebunch wheatgrass	PSSP6/AGSP
<i>Salix bebbiana</i>	Bebb willow	SABE2
<i>Salix exigua</i>	coyote willow	SAEX
<i>Salix lemmonii</i>	Lemmon's willow	SALE
<i>Salix lutea</i>	yellow willow	SALU2
<i>Scirpus microcarpus</i>	panicled bulrush	SCMI2
<i>Thinopyrum intermedium</i>	intermediate wheatgrass	THIN6