Summer 2015 ACHDA

Introduction

Field activities were carried out at the Antelope Creek Habitat Development Area (ACHDA) from 1 May to 21 August, 2015. The entirety of May was spent in assisting the ranch manager with various tasks. Several weeks were spent inspecting and repairing fences. Several days were spent mowing patches of the native pastures that are infested with Crested Wheatgrass (the mowing will be discussed in detail in the third section). A week was spent moving and placing grazing cages near the four exclosures as well as in the Cassils field. During May I also occasionally assisted the ranch manager with moving or handling livestock.

During the first week of June I attended range inventory training provided by AEP, prepared maps to be used during the inventory, and pulled up downy brome growing along roadsides in the native pastures. During the second week of June, I attended MULTISAR range inventory training, repaired fence, and pulled up downy brome along roadsides. The last two weeks of June were spent on range inventory of native pastures.

The entirety of July was spent on the range inventory of the native pastures. The inventory will be discussed in detail in the fourth section.

The first week of August was spent clipping the exclosures and range cages in the native pastures, as well as cages in the Cassils field. The second and third weeks were spent assisting the ranch manager with various tasks. The major task during the final weeks was demolition and removal of old fences. The final week of August was spent entering data and preparing this report.

Climatic conditions

Conditions were unusually dry for most of the 2015 field season. Table 1 shows precipitation recorded at Brooks, as well as the deviation from 30-year average monthly precipitation.

Table 1. Precipitation received at Brooks during the summer of 2015, average monthly precipitation, and percent deviation from normals.

		Precipitation (mm)		
Month		2015	Average	Deviation (%)
May		4.6	41.0	-88.8
June		20.8	64.5	-67.8
July		16.4	44.9	-63.5
August		47.4	35.3	34.3

Table 1 may present an underestimate of how dry this summer was; ACHDA is located approximately 20km from the Brooks weather station, and the weather often differed between ACHDA and Brooks. Over the course of the summer there were several rainfall events that affected Brooks but not ACHDA.

Mowing

The native pastures contain several large stands of Crested Wheatgrass (CWG) which have become decadent and contain large amounts of standing dead litter. Decadent material is poor quality forage, and is often much taller than the current year's growth. As a consequence, cattle may avoid grazing decadent stands of CWG. Mowing may make CWG stands more attractive to cattle by breaking up and dispersing litter, thereby exposing recent growth to livestock. The combination of mowing and grazing is expected to stress CWG, and over time this treatment may reduce the dominance of CWG and promote the re-establishment of native vegetation on the ACHDA landbase.

Mowing was carried out during 26 and 27 May, using a 15-foot wide rotary mower. The perimeter of the mowed patches was recorded using a GPS. Four transects were established to allow long-term evaluation of community composition and range health on mowed patches.

Both the ranch manager and I frequently observed cattle grazing and loafing on mowed areas.

Range Inventory

A range inventory was conducted in the native pastures from 15 June to 1 August, 2015. The purpose of this inventory was to provide ground truthing of Grassland Vegetation Inventory (GVI) classification of the ACHDA landbase, and to provide a vegetation map for future GPS collar studies. Prior to the beginning of the ACHDA range survey, training in range inventory methods was provided to me by Terri France and Craig Demaere of AEP as well as Ken Pitcher and Lee Moltsen of MULTISAR.

The inventory was conducted using standard range survey methods per Alberta Environment and Parks' Range Survey Manual. For the majority of sites sampled, a 50m transect was laid out in an area representative of the vegetation and range health for a given polygon. Ten nested microplots were sampled along the transect at 5 m intervals. Shrub cover was estimated using a 1 m^2 quadrat. Cover of grasses, forbs, moss & lichen, and bare soil was estimated using a 1/10 m^2 quadrat (or Daubenmire frame). All cover estimates were ocular. Litter was estimated by collecting all the litter present in a ¼ m^2 area at 5, 25, and 50 m along the transect. For each site sampled, a grassland range health assessment was conducted per AEP's Rangeland Health Assessment for Grassland, Forest, and Tame Pasture.

In polygons that contained more than one distinct plant community type, an effort was made to map each community separately. In polygons where more than one community type was present, but the boundaries were too diffuse to map, the percentage of the polygon occupied by each vegetation type was estimated to the nearest 10%. When noxious weeds were observed, they were mapped using a GPS. Weed patches that were smaller than the maximum accuracy of the GPS (a radius of 3m) were mapped using points. Where weed infestations were larger than 3m in radius, the perimeter of the infestation was walked and the perimeter was recorded using GPS.

Vegetation and site data were entered into AEP's EcoSys database, under the study code 74AC9. GVI polygons were edited using GIS software. Range health data was entered in a spreadsheet.

Inventory activities were carried out between 15 June and 1 August, 2015. A total of 28 days were spent on inventory activities. A total of 91 plots were sampled, of which 67 were detailed 50m transects. The remaining plots were range health plots based on 3 microplots spaced 50m apart. Range health plots were used mainly on disturbances whose plant communities were already well described by other transects. A total of 527.5 ha (2 sections) were inventoried which accounts for 27% of the area of native pasture at ACHDA. Figures 1 and 2 show the extent of the 2015 range survey.

Overall, the GVI classification of the ACHDA was excellent. Polygon linework and range site classifications were highly accurate, with only two polygons requiring major linework revision. The only shortcoming of the GVI classification was that it did not represent the complexity and fragmentation of the landscape associated with industrial disturbance. The vast majority of changes that I made to the linework was to identify the boundaries of wellsites, pipelines, and the impacts of developed roads.

Tha majority of inventory work conducted during 2015 was done in pasture #2. Pasture 2 was highly complex, with fragmentation caused by industrial activity, roads, and the influence of irrigation canals. The result of this complexity was a high diversity of plant

communities on a relatively short spatial scale, and many polygons required 3 or more sample points to completely describe them (Figure 2). The other native pastures, particularly pastures #1 and #4, are less complex and I am confident that future inventory work can be accomplished more quickly as fewer sample points will be required per polygon.

Of 90 sites on which range health assessments were conducted, 24, 59, and 7 sites were rated as "healthy", "healthy with problems", and "unhealthy", respectively. The most common causes of deductions to range health score were the presence of invasive agronomic species or noxious weeds. Erosion and bare soil were very rare, and the majority (71%) of sites had a "healthy" amount of litter as described by the table on page 36 of the range health assessment guide. Weeds were mapped, and the distribution of weeds is shown in figure 3.

The following data files, as well as original hard copies of data sheets and maps have been provided to Craig Demaere of AEP.

> Shapefiles
>
> > GVI polygons of ACHDA (achda_gvi_final_10tm)
> >
> > Main roads (achda_roads_10tm)
> >
> > Locations of survey points (achda_survey_points)
> >
> > Locations of weeds (polygons for large infestations, points for small infestations) (achda_weed_points_10tm, achda_weed_polys_10tm)
>
> Range Health Data (range_health_final)
>
> Comparison of GVI classifications and field range site calls (ACHDA polygons)
>
> Location of transects on mowed CWG stands (mowed_transect_locations)
>
> Plot Photos

Clipping

Exclosures and range cages were clipped in pastures 1-4 as well as the cassils field between 3 and 7 August, 2015. 10 plots were clipped within each exclosure, and 10 cage plots were clipped adjacent to the exclosure. In the Cassils field only cages were clipped. Each clipping plot was 1/4 m^2 and included litter and all green vegetation clipped to 1cm in height. Litter, grasses, forbs, and shrubs were separated. Samples were dried and weighed by the AEP public lands office in Lethbridge.