MPG Ranch Habitat Classifications

2020-05-21, Chuck Casper

# Description

I created these vegetation type maps by manually drawing class polygons within ArcMap. To this point I’ve trained and run many iterations of supervised and unsupervised image classification tools within ArcMap in an attempt to classify habitat types or even a single species like sagebrush or bitterbrush with our 15cm pixel aerial imagery, I was not satisfied with the quality of most resulting classifications. By looking at the 2017 and 2018 15cm pixel RGB aerial imagery with on the ground experience and knowledge of the ranch, I tediously drew each polygon by hand.

The intention was to best capture existing vegetation cover in the recent years of imagery. This also lines up with land use history in the rangeland class where the distinction between former cultivated or not, guided restoration effort and the current habitat types.

In reference to shapefile, ‘habitat\_types\_branch4\_1’ in elc\shared\Workspace\MPG Ranch\projects\vegetation\_classification\VegTypeShapefiles\habitat\_types\_branch4\_1.shp

# Type 1 - biome

* Two classes

## Rangeland

Any non-forest habitat type. This includes all herbaceous and shrub dominated plant communities. Parts of shrub dominated draws are included as rangeland when tree presence is rare. Species like rocky mountain maple, serviceberrry, and hawthorn in these draws are considered more shrub than tree in this classification and were included in the rangeland classification

## Forest

Includes only tree dominated habitat types. Typical communities are mid-elevation montane conifer forests, riparian cottonwood and ponderosa pine forest, and draws dominated by douglas fir.

A close up of a map

Description automatically generated

# Type 2 - vegetation community

* Four classes

## Rangeland

* **Grassland** - Herbaceous dominated plant community. Classified mostly based on the absence of woody species.
* **Shrubland** - dominated by woody non-tree species with herbaceous species in interspaces.

## Forest

* **Riparian** - Forest adjacent to perennial water source. Forest characteristics are dependent on proximity to water.
* **Upland** - Dry, mostly conifer forest

A picture containing text

Description automatically generated

# Type 3 - dominant vegetation

* Twelve classes

## Rangeland

* **Grassland** - Herbaceous dominated plant community. Classified mostly based on the absence of woody species.
  + **Former cultivated** - Has been plowed for production of crop or pasture at any point in history. This was determined by oral history given by Bob Schroeder. I included knowledge from aerial imagery from the 1950s and 60s, and by presence of forage grass or rotational crops prior to any restoration.
  + **Uncultivated grassland native or degraded -** Grassland that has never been plowed. Areas may have been seeded intentionally or incidentally with desirable non-native forage species like alfalfa or forage grass, but were never plowed to produce rotational crop.
* **Shrubland** - dominated by woody non-tree species with herbaceous species in interspaces.
  + **Mixed sage and bitterbrush** - This class is mostly sage dominated with interspersed bitterbrush. Created this as a separate designation from sage shrubland since even limited bitterbrush presence is an important habitat trait.
  + **Bitterbrush** - Clearly dominated by bitterbrush. This class may have some sagebrush interspersed within bitterbrush stands.
  + **Sagebrush -** Mostly sagebrush, can and usually does have bare ground or herbaceous understory and interspace.
  + **Other shrub deciduous** - Non-sage or bitterbrush upland deciduous shrubs. Serviceberry, hawthorne, snowberry, rose, rabbitbrush, nine-bark, etc.
  + **Wooded draw non-forest** - Non-tree woody species in lower ranch draws. Rocky mountain maple, serviceberry, hawthorne, etc.

## Forest

* **Riparian** - Forest adjacent to perennial water source. Forest characteristics are dependent on proximity to water.
  + **Riparian woodland** - Cottonwood and or ponderosa pine forest dependent on perennial water source or floodplain connectivity.
* **Upland** - Dry, mostly conifer forest
  + **Wooded draw** -Mostly douglas fir dominated, tree presence is dependent on aspect and topography of draw.
  + **Mixed canopy conifer** - In between open and closed. Not open enough to be considered a park or savannah but not closed canopy either.
  + **Closed canopy conifer** - Forest with mostly tree cover, little ground surface visible in imagery.
  + **Open canopy conifer** - Park or savannah woodland. Mostly ground surface visible with limited tree cover.

A close up of text on a white background

Description automatically generated

# Type 4 - dominant vegetation and historical context

* Fifteen classes
* Additional split only within the “former cultivated” class to specify type of restoration work within this class.

## Rangeland

* **Grassland** - Herbaceous dominated plant community. Classified mostly based on the absence of woody species.
  + **Former cultivated** - Has been plowed for production of crop or pasture at any point in history. This was determined by oral history given by Bob Schroeder. I included knowledge from aerial imagery from the 1950s and 60s, and by presence of forage grass or rotational crops prior to any restoration.
    - **Forage grass diversification** - Restoration activity is defined by the incomplete removal or conversion from initial forage grass. This is typically done with “islands” where small patches of forage grass are removed with herbicide and then revegetated with seed or other plant material. In some limited areas like sheep camp, seed was planted directly into unmanipulated forage grass.
    - **Forage grass diversification (natural)** - This class defines a single area on spurge hill east of the powerline of introduced forage grass where active restoration has not happened but introduced intermediate wheatgrass is being passively invaded by native herbaceous species.
    - **Forage grass restoration** - restoration activity is defined by the attempt (successful or not) to remove and wholly convert from an introduced forage grass to native dominated plant community. Forage grasses were removed with multiple herbicide applications and often seeded multiple times with native species.
    - **Irrigated agriculture restoration** - Most of these areas still receive supplemental water from existing irrigation infrastructure. They’ve been converted from rotational crops like alfalfa, wheat, grass hay, corn, or beans to native dominated communities by revegetation with seed or live plant material.
  + **Uncultivated grassland native or degraded -** Grassland that has never been plowed. Areas may have been seeded intentionally or incidentally with desirable non-native forage species like alfalfa or forage grass, but were never plowed to produce rotational crop.
* **Shrubland** - dominated by woody non-tree species with herbaceous species in interspaces.
  + **Mixed sage and bitterbrush** - This class is mostly sage dominated with interspersed bitterbrush. Created this as a separate designation from sage shrubland since even limited bitterbrush presence is an important habitat trait.
  + **Bitterbrush** - Clearly dominated by bitterbrush. This class may have some sagebrush interspersed within bitterbrush stands.
  + **Sagebrush -** Mostly sagebrush, can and usually does have bare ground or herbaceous understory and interspace.
  + **Other shrub deciduous** - Non-sage or bitterbrush upland deciduous shrubs. Serviceberry, hawthorne, snowberry, rose, rabbitbrush, nine-bark, etc.
  + **Wooded draw non-forest** - Non-tree woody species in lower ranch draws. Rocky mountain maple, serviceberry, hawthorne, etc.

## Forest

* **Riparian** - Forest adjacent to perennial water source. Forest characteristics are dependent on proximity to water.
  + **Riparian woodland** - Cottonwood and or ponderosa pine forest dependent on perennial water source or floodplain connectivity.
* **Upland** - Dry, mostly conifer forest
  + **Wooded draw** -Mostly douglas fir dominated, tree presence is dependent on aspect and topography of draw.
  + **Mixed canopy conifer** - In between open and closed. Not open enough to be considered a park or savannah but not closed canopy either.
  + **Closed canopy conifer** - Forest with mostly tree cover, little ground surface visible in imagery.
  + **Open canopy conifer** - Park or savannah woodland. Mostly ground surface visible with limited tree cover.

### Chuck Casper’s nested habitat classification scheme

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Type1 | Type2 | Type3 | Type4 | hab\_2010 | hab\_2025 |
| forest | riparian | riparian woodland | riparian woodland | riparian woodland | Riparian woodland |
| upland | closed canopy conifer | closed canopy conifer | Upland conifer | Upland conifer |
| mixed canopy conifer | mixed canopy conifer | Upland conifer | Upland conifer |
| open canopy conifer | open canopy conifer | Upland conifer | Upland conifer |
| wooded draw | wooded draw | wooded draw | wooded draw |
| rangeland | grassland | former cultivated | forage grass diversification | grassland planted forage | Restoration grassland |
| forage grass diversification (natural) | grassland planted forage | Restoration grassland |
| forage grass restoration | grassland planted forage | Restoration grassland |
| irrigated agriculture restoration | agriculture | Restoration grassland irrigated |
| uncultivated grassland native or degraded | uncultivated grassland native or degraded | Grassland native | Grassland native |
| shrubland | bitterbrush | bitterbrush | Shrubland | Shrubland |
| mixed sage and bitterbrush | mixed sage and bitterbrush | Shrubland | Shrubland |
| other shrub deciduous | other shrub deciduous | Shrubland | Shrubland |
| sagebrush | sagebrush | Shrubland | Shrubland |
| wooded draw non-forest | wooded draw non-forest | Shrubby draw | Shrubby draw |