Ecological Sites

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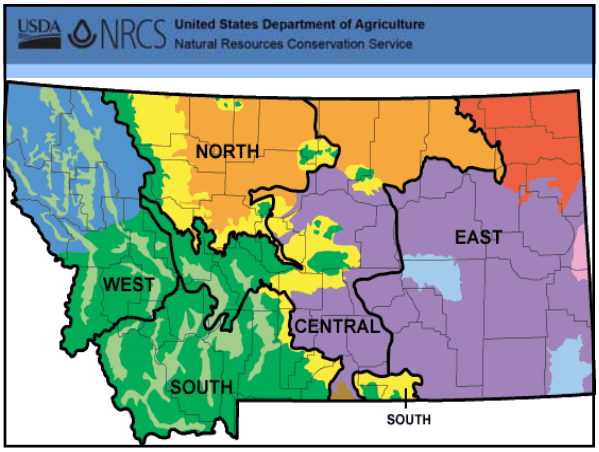
Montana NRCS

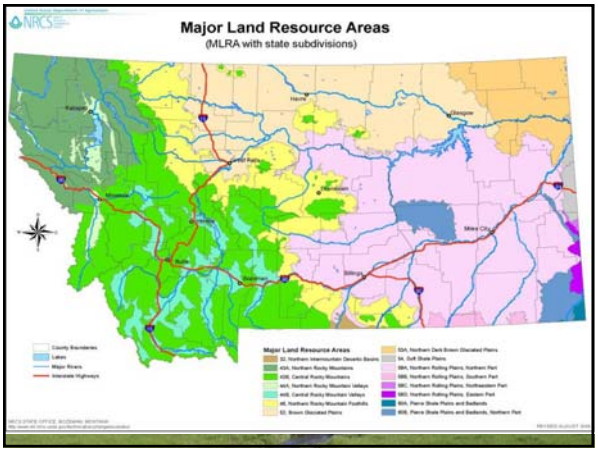
Helping People Help the Land

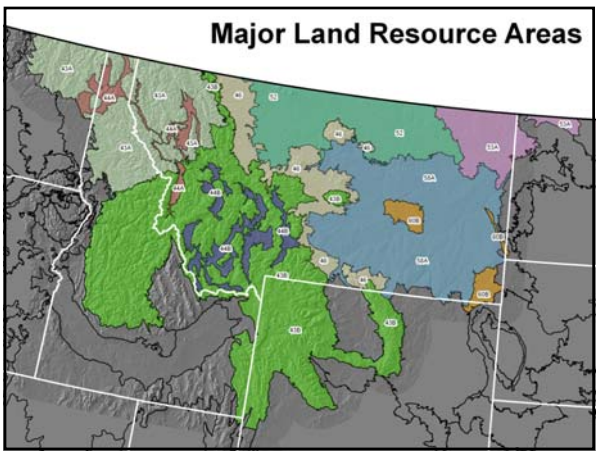
USDA NRCS United States Department of Agriculture
Natural Resources Conservation Service

Topics of Discussion

- Ecological Site Classification
- Ecological Site Key
- Ecological Site Descriptions







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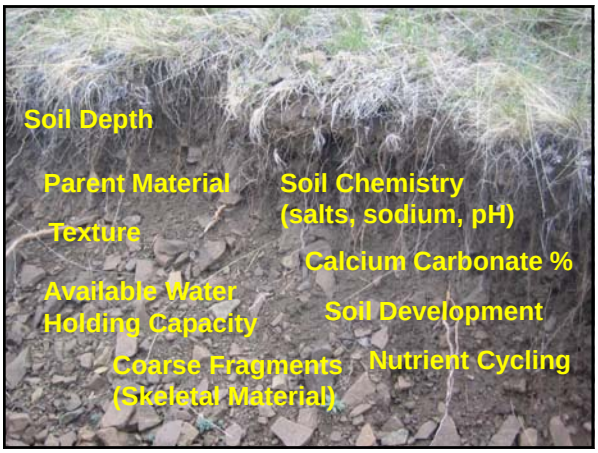
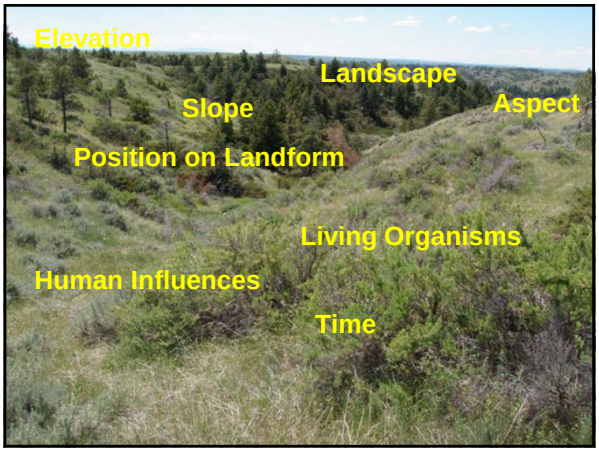
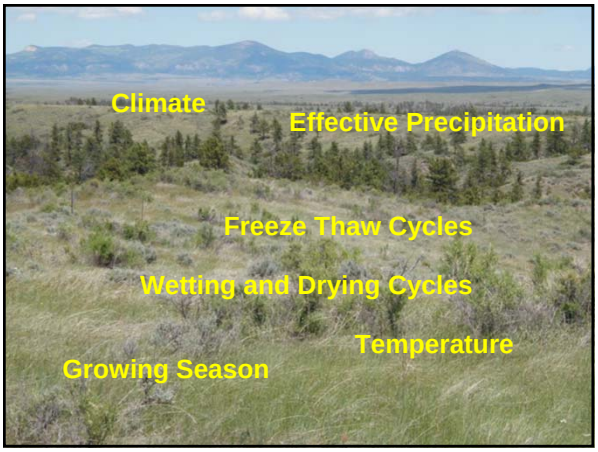
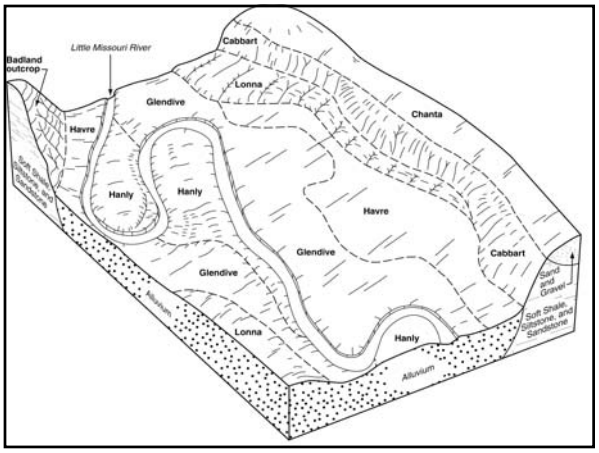
An **Ecological Site** is defined as a distinctive kind of land, with specific physical characteristics which differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation and in its ability to respond similarly to management actions and natural disturbances.

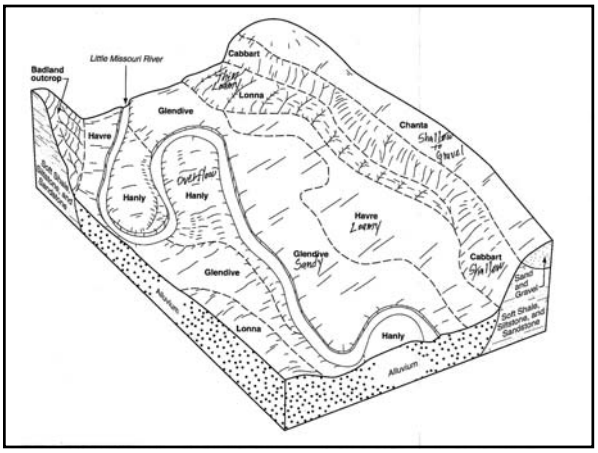

Milton Ranch from Big Wall Looking NW at Field 14, 10-19-05
What characteristics cause sites to be different?


Soil Depth
Parent Material
Texture
Soil Chemistry (salts, sodium, pH)
Calcium Carbonate %
Available Water Holding Capacity
Soil Development
Coarse Fragments (Skeletal Material)
Nutrient Cycling


Elevation
Landscape
Slope
Aspect
Position on Landform
Living Organisms
Human Influences
Time


Climate
Effective Precipitation
Freeze Thaw Cycles
Wetting and Drying Cycles
Temperature
Growing Season


Little Missouri River
Badland outcrop
Cabbart
Lonna
Glendive
Chanta
Havre
Hanly
Hanly
Havre
Glendive
Cabbart
Glendive
Sand and Gravel
Soft Shale, Siltstone, and Sandstone
Lonna
Hanly
Alluvium


Little Missouri River
Badland outcrop
Cabbart
Lonna
Glendive
Chanta
Havre
Hanly
Hanly
Havre
Glendive
Cabbart
Glendive
Sand and Gravel
Soft Shale, Siltstone, and Sandstone
Lonna
Hanly
Alluvium

Ecological Site Key

The Key is a tool to collect effective documentation.

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Structure of the Key

- An ecological site only exists in the context of MLRA / LRU
- Descriptive dichotomous key
- Hierarchy to the key
- 53 ecological sites in the key

ESD Key Terminology

- Texture - %Clay
- Shallow to very shallow
- Saline or saline-sodic
- Strongly or violently effervescent
- Argillic horizon
- Soil Skeletal
- Mollic epipedon present

RANGELAND ECOLOGICAL SITE KEY – Soil Site Component (Version 13.0)

For MLRA's 43A, 43B, 44A 44B, 46X, 52X, 53A, 58A, & 60B

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Part of Montana's Ecosite Key

24a. Slope < 15%
  25a. Coarse sandy loam to fine sandy loam texture within surface mineral 4"
    26a. Any argillic horizon in surface 20" with > 20% clay – Sandy Argillic (SyA)
    26b. Argillic horizon, if present, has ≤ 20% clay – Sandy (Sy)

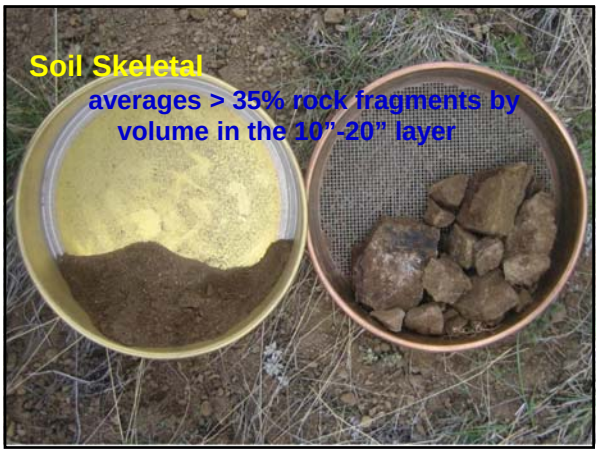
  25b. Clay content is > 32% in surface mineral 4" of mineral soil (ribbon ≥ 2" long)
    27a. Soil > 40% clay within surface mineral 2" – Dense Clay Nonsodic (DCX)
    27b. Site not as above – Clayey (Cy)
  25c. Clay content is ≤ 32% in surface mineral 4"
    28a. Stones and/or boulders cover 3-15% surface area (15-30% cover measured by step transect) – Stony (St)
    28b. Site not as above
      29a. Any argillic horizon in surface 20" with >35% clay (ribbon ≥ 2" long) – Loamy Argillic (LoA)
      29b. Argillic horizon, if present, has ≤ 35% clay of mineral soil (ribbon < 2" long) – Loamy (Lo)
24b. Slope ≥15%
  30a. Mollic epipedon present
    31a. Clay content is > 32% (ribbon ≥ 2" long) in surface mineral 4" – Clayey Steep (CySttp)
    31b. Clay content is ≤ 32% (ribbon < 2" long) in surface mineral 4" – Loamy Steep (LoStp)
  30b. Mollic epipedon not present
    32a. Coarse sandy loam to fine sandy loam texture – Thin Sandy (TSy)
    32b. Other texture
      33a. Clay content > 32% (ribbon ≥ 2") in surface mineral 4" – Thin Clayey (TCy)
      33b. Clay content ≤ 32% (ribbon < 2") in surface mineral 4" – Thin Loamy (TLo)

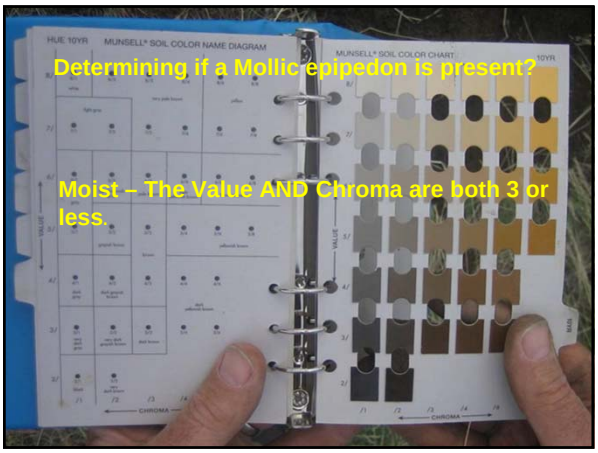
Definitions

Saline soil	1) A nonsodic soil containing sufficient soluble salt to adversely affect the growth of most crop electrical conductivity (EC) of such soils is conventionally set at >4 mmhos/cm(at 25°C). highly tolerant ones at about twice this salinity. SSSA 2) Soil which has an excess of total soluble salts. Sodium absorption ratio (SAR) <12 and exch Occurs with high water table. Plants have a reduced ability to absorb salinized water. PRO
Skeletal soil material	Soil which averages 35 percent or more (by volume) rock fragments (>2mm) in 10-20" layer.
Sodic soil	1) A nonsaline soil containing sufficient exchangeable sodium to adversely affect crop product and plant type. The sodium adsorption ratio of the saturation extract is at least 13. SSSA 2) Soil with excess sodium salts. Electrical conductivity (EC) <4mmhos/cm, Sodium absorptio particles and causes plant growth problems. Usually appears as slick spots or pan spots. P
Stoniness classes	1) Stony – Stones or boulders cover about 3-15% of the surface, correlating to a extremely sto

Brief Description of Ecological Sites

Limy (Ly) (030)	Site often occurs on stream terraces, alluvial fans, hillslopes, hills, fan remnants, terraces, and escarpments and is dominantly associated with limestone parent material. Can occur on slopes 0-40% but mainly exists on slopes less than 8%. Soil surface textures vary from sandy loam to clay loam. >5% CaCo3 by content; Strongly or violently effervescent with in top 4" with lime concentration increasing with depth.
Limy Droughty (LyDr) (031)	Site regularly occurs on terraces, alluvial fans, stream terraces, fan remnants, moraines, and hills on slopes ranging from 0-65%. Soils are >20" deep and consist of loamy skeletal or clayey skeletal soil material (averages >35% rock fragments by volume in 10-20" layer). This skeletal soil material decreases the water holding capacity of the ecological site. Soil surface textures range from sandy loam to clay loam. >5% CaCo3 by content; Strongly or violently effervescent with in top 4" with lime concentration increases with depth. Site typically associated with limestone parent material.
Loamy (Lo) (032)	Site often occurs on alluvial fans, hills, plains, till plains, low hills and stream terraces. Soil surface textures are typically very fine sandy loam, loam, silt loam, silt, sandy clay loam, or clay loam and clay content is ≤32%. Slopes can range from 0 to





Ecological Site Descriptions (ESD)—

The documentation of the characteristics of an ecological site. An ESD consists of descriptions of the biotic and abiotic characteristics that differentiate the site and the dynamics of the site that describes how changes in climate and management can affect the site. An ESD also describes the land uses that a particular ecological site can support, ecosystem services associated with different states and management alternatives for achieving land management objectives. (Draft interagency handbook 2010)

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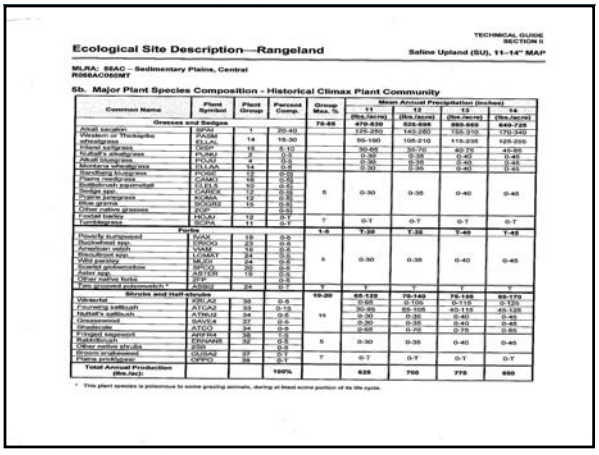
- *General Site Information*
- *Physiographic Features*
- *Climate Features*
- *Water Features*
- *Soil Features*
- *Plant Communities*
- *Site Interpretations*
- *Supporting Information*
- *Rangeland Health Reference Sheet*

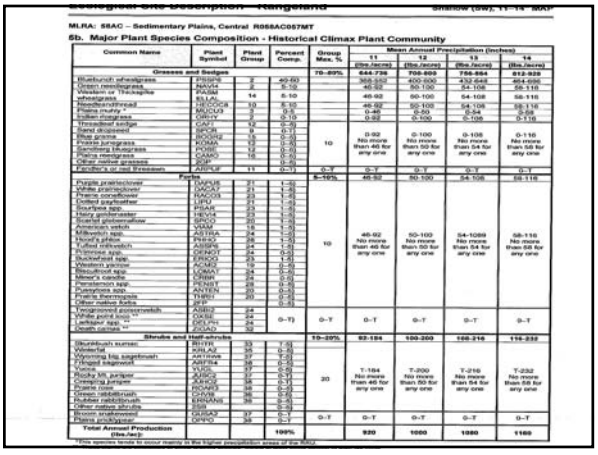

Ecological Site Description—Rangeland

Saline Upland (SU), 11–14" MAP

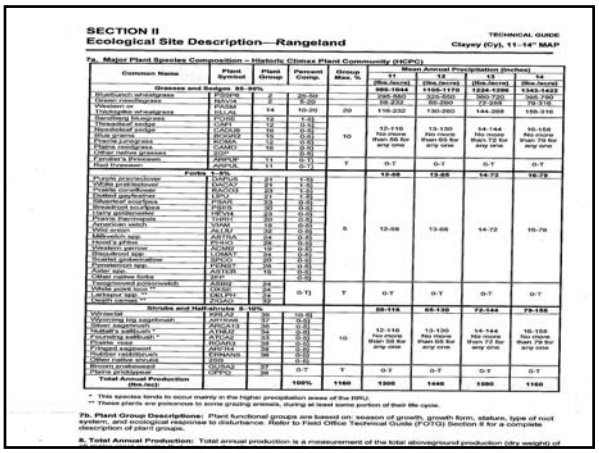
MLRA: 58AC – Sedimentary Plains, Central

R058AC050MT

5b. Major Plant Species Composition - Historical Climax Plant Community


MLRA: 58AC – Sedimentary Plains, Central R058AC057MT

5b. Major Plant Species Composition - Historical Climax Plant Community



SECTION II
Ecological Site Description—Rangeland

TECHNICAL GUIDE
Clayey (Cy), 11–14" MAP

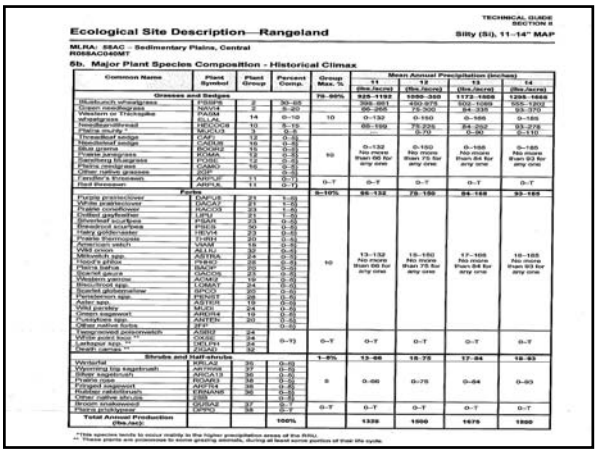
7a. Major Plant Species Composition – Historic Climax Plant Community (HCPC)

Common Name	Plant Symbol	Plant Group	Percent Comp.	Group Max. %	Mean Annual Precipitation (inches) 11 (lbs./acre)	12 (lbs./acre)	13 (lbs./acre)	14 (lbs./acre)
Grasses and Sedges 85-95%					885-1044	1105-1170	1224-1296	1343-1422
Bluebunch wheatgrass	PSSP6	2	20-30		296-480	320-500	360-720	396-792
Green needlegrass	NAVI4	2	5-20		59-232	55-260	72-288	79-316
Western wheatgrass	PASM	14	10-20	20	118-232	130-260	144-288	158-316
Needleandthread	HECOC8	10	5-15		59-177	55-195	72-216	79-237
Threadleaf sedge	CAFI	12	0-5					
Needleleaf sedge	CADU6	10	0-5	10	12-118	13-130	14-144	15-158
Blue grama	BOGR2	13	0-5		No more than 59 for any one	No more than 65 for any one	No more than 72 for any one	No more than 79 for any one
Plains reedgrass	CALO	15	0-5					
Other native grasses	2GP		0-5					
Fendler's threeawn	ARFE	11	0-1)	T	0-T	0-T	0-T	0-T
Red threeawn	ARPU9	11	0-1)					
Forbs 1–5%					12-59	13-65	14-72	15-79
Purple prairieclover	DAPU5	21	1-3)					
White prairieclover	DACA7	21	1-3)					
Prairie coneflower	RACO3	23	1-3)					
Dotted gayfeather	LIPU	21	1-3)					
Silverleaf scurfpea	PSAR	23	0-3)					
Breadroot scurfpea	PSES	20	0-3)					
Hairy goldaster	HEVI4	23	0-3)					
Prairie thermopsis	THRH	20	0-3)					
American vetch	VIAM	18	0-3)	5	12-59	13-65	14-72	15-79
Wild onion	ALLIU	19	0-3)					
Milkvetch spp.	ASTRA	24	0-3)					
Hood's phlox	PHHO	25	0-3)					
Western yarrow	ACMI2	19	0-3)					
Shaggy soldier	SOAM3	20	0-3)					
Scarlet globemallow	SPCO	20	0-3)					
Penstemon spp.	PENST	26	0-3)					
Aster spp.	ASTER	16	0-3)					
Other native forbs	2FP		0-3)					
Timothy	PHPR3	24	0-1)	T	0-T	0-T	0-T	0-T
White point loco **	OXSE	24	0-1)					
Lambert loco **	OXLA3	24	0-1)					
Tapertip hawksbeard **	CRAC2	24	0-1)					
Shrubs and Half-shrubs 5–10%					59-118	65-130	72-144	79-158
Wyoming big sagebrush	ARTRW8	37	10-5)					
Silver sagebrush	ARCA13	36	0-5)					
Nuttall's saltbush *	ATNU2	34	0-5)					
Fourwing saltbush *	ATCA2	34	0-5)	10	12-118 No more than 59 for any one	13-130 No more than 65 for any one	14-144 No more than 72 for any one	15-158 No more than 79 for any one
Fringed sagewort	ARFR4	36	0-5)					
Rubber rabbitbrush	ERNAN8	36	0-5)					
Other native shrubs	2SD		0-5)					
Broom snakeweed	GUSA2	37	0-1)	T	0-T	0-T	0-T	0-T
Plains pricklypear	OPPO	38	0-1)					
Total Annual Production (lbs./ac)			100%	1160	1300	1440	1580	1160

* This species tends to occur mainly in the higher precipitation areas of the RRU.
** These plants are poisonous to some grazing animals, during at least some portion of their life cycle.

7b. Plant Group Descriptions: Plant functional groups are based on: season of growth, growth form, stature, type of root system, and ecological response to disturbance. Refer to Field Office Technical Guide (FOTG) Section II for a complete description of plant groups.

8. Total Annual Production: Total annual production is a measurement of the total aboveground production (dry weight) of



TECHNICAL GUIDE
SECTION II

Ecological Site Description—Rangeland

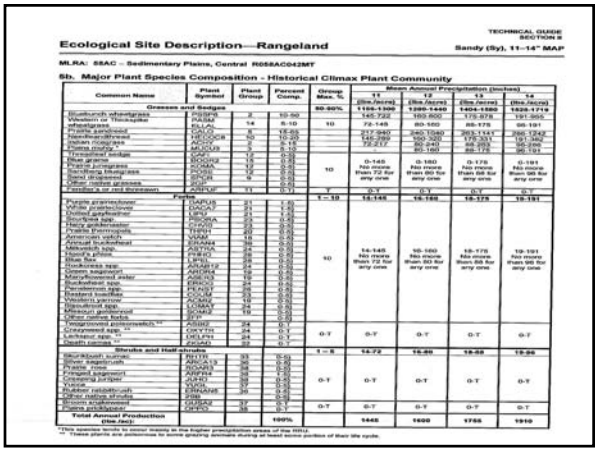
Silty (Si), 11–14" MAP

MLRA: 58AC – Sedimentary Plains, Central
R058AC040MT

5b. Major Plant Species Composition - Historical Climax

Common Name	Plant Symbol	Plant Group	Percent Comp.	Group Max. %	Mean Annual Precipitation (inches) 11 (lbs./acre)	12 (lbs./acre)	13 (lbs./acre)	14 (lbs./acre)
Grasses and Sedges				75-90%	925-1192	1050-350	1172-1508	1295-1668
Bluebunch wheatgrass	PSSP6	2	30-40		396-661	450-975	502-1089	555-1202
Green needlegrass	NAVI4	2	5-20		66-265	75-300	84-335	93-370
Western wheatgrass	PASM	14	0-10	10	0-132	0-150	0-168	0-185
Needleandthread	HECOC8	10	5-15		66-199	75-225	84-252	93-278
Prairie junegrass	KOMA	3	0-5			0-75	0-90	0-110
Threadleaf sedge	CAFI	12	0-5)					
Needleleaf sedge	CADU6	10	0-5)					
Blue grama	BOGR2	13	0-5)	10	0-132 No more than 66 for any one	0-150 No more than 75 for any one	0-168 No more than 84 for any one	0-185 No more than 93 for any one
Sandberg bluegrass	POSE	12	0-5)					
Plains reedgrass	CALO	15	0-5)					
Other native grasses	2GP		0-5)					
Fendler's threeawn	ARFE	11	0-1)	0-T	0-T	0-T	0-T	0-T
Red threeawn	ARPU9	11	0-1)					
Forbs				5-10%	66-132	75-150	84-168	93-185
Purple prairieclover	DAPU5	21	1-3)					
White prairieclover	DACA7	21	1-3)					
Prairie coneflower	RACO3	23	1-3)					
Dotted gayfeather	LIPU	21	1-3)					
Silverleaf scurfpea	PSAR	23	0-3)					
Breadroot scurfpea	PSES	20	0-3)					
Hairy goldaster	HEVI4	23	0-3)					
Prairie thermopsis	THRH	20	0-3)					
American vetch	VIAM	18	0-3)					
Wild onion	ALLIU	32	0-3)					
Milkvetch spp.	ASTRA	24	0-3)	10	13-132 No more than 66 for any one	15-150 No more than 75 for any one	17-168 No more than 84 for any one	18-185 No more than 93 for any one
Hood's phlox	PHHO	25	0-3)					
Western yarrow	ACMI2	19	0-3)					
Shaggy soldier	SOAM3	20	0-3)					
Scarlet globemallow	SPCO	20	0-3)					
Penstemon spp.	PENST	26	0-3)					
Aster spp.	ASTER	16	0-3)					
Other native forbs	2FP		0-3)					
Timothy	PHPR3	24	0-1)	0-T	0-T	0-T	0-T	0-T
White point loco **	OXSE	24	0-1)					
Lambert loco **	OXLA3	24	0-1)					
Tapertip hawksbeard **	CRAC2	24	0-1)					
Shrubs and Half-shrubs				1–5%	13-66	15-75	17-84	18-93
Winterfat	KRLA2	35	0-5)					
Wyoming big sagebrush	ARTRW8	37	0-5)					
Silver sagebrush	ARCA13	36	0-5)					
Prairie rose	ROAR3	38	0-5)	5	0-66	0-75	0-84	0-93
Fringed sagewort	ARFR4	36	0-5)					
Rubber rabbitbrush	ERNAN8	36	0-5)					
Other native shrubs	2SD		0-5)					
Broom snakeweed	GUSA2	37	0-1)	0-T	0-T	0-T	0-T	0-T
Plains pricklypear	OPPO	38	0-1)					
Total Annual Production (lbs./ac)			100%		1320	1500	1675	1850

*This species tends to occur mainly in the higher precipitation areas of the RRU.
** These plants are poisonous to some grazing animals, during at least some portion of their life cycle.



TECHNICAL GUIDE
SECTION II

Ecological Site Description—Rangeland

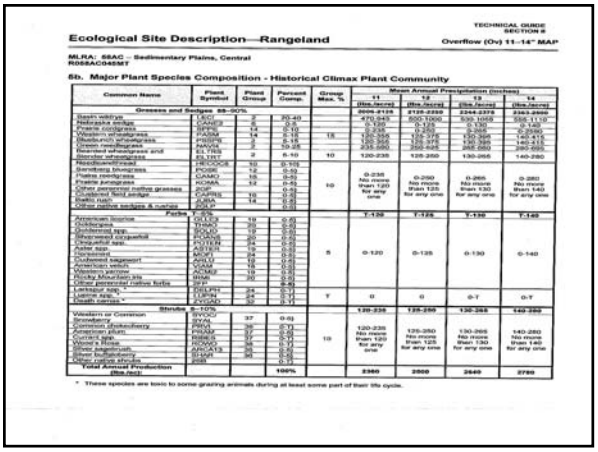
Sandy (Sy), 11–14" MAP

MLRA: 58AC – Sedimentary Plains, Central R058AC042MT

5b. Major Plant Species Composition - Historical Climax Plant Community

Common Name	Plant Symbol	Plant Group	Percent Comp.	Group Max. %	Mean Annual Precipitation (inches) 11 (lbs./acre)	12 (lbs./acre)	13 (lbs./acre)	14 (lbs./acre)
Grasses and Sedges				80-90%	1156-1300	1280-1440	1404-1580	1528-1719
Western or Thickspike wheatgrass	PASM	14	5-10	10	145-722	160-802	175-878	191-965
Needleandthread	HECOC8	10	10-20		72-145	80-160	88-175	96-191
Prairie sandreed	CALO	15	15-25		217-362	240-1040	263-1141	286-1242
Needleleaf sedge	CADU6	10	10-20		145-289	160-320	175-331	191-362
Blue grama	BOGR2	13	5-15		72-217	80-240	88-263	96-286
Plains reedgrass	CALO	15	5-15			80-240	88-263	96-191
Threadleaf sedge	CAFI	12	0-5)					
Blue grama	BOGR2	13	0-5)		0-145	0-160	0-176	0-191
Prairie junegrass	KOMA	12	0-5)	10	No more than 72 for any one	No more than 80 for any one	No more than 88 for any one	No more than 96 for any one
Sandberg bluegrass	POSE	12	0-5)		72-217	80-240	88-263	96-286
Other native grasses	2GP		0-5)					
Fendler's or Red threeawn	ARPU9	11	0-1)	T	0-T	0-T	0-T	0-T
Forbs				1–10	14-145	16-160	18-175	19-191
Purple prairieclover	DAPU5	21	1-5)					
White prairieclover	DACA7	21	1-5)					
Dotted gayfeather	LIPU	21	1-5)					
Silverleaf scurfpea	PSAR	23	0-5)					
Hairy goldaster	HEVI4	23	0-5)					
American vetch	VIAM	18	0-5)					
Annual buckwheat	ERAN4	34	0-5)					
Milkvetch spp.	ASTRA	24	0-5)	10	14-145 No more than 72 for any one	16-160 No more than 80 for any one	18-175 No more than 88 for any one	19-191 No more than 96 for any one
Wild onion	ALLIU	32	0-5)					
Blue flax	LIPE2	29	0-5)					
Hookless cactus	ARAR12	24	0-5)					
Green sagewort	ARCR4	34	0-5)					
Many-flowered aster	ASEH3	19	0-5)					
Hood's phlox	PHHO	25	0-5)					
Penstemon spp.	PENST	26	0-5)					
Sessile beardtongue	PEAC4	23	0-5)					
Western yarrow	ACMI2	19	0-5)					
Stemmy stiff goldenrod	LIMA7	24	0-5)					
Shaggy soldier	SOAM3	20	0-5)					
Other native forbs	2FP		0-5)					
Cheatgrass, prolonged poisonvetch**	ASSE2	24	0-1)	1 – 5	1-14	2-16	2-18	2-19
Crested wheatgrass, **	AGCR	24	0-1)					
Locoweed spp. **	OXYTR	24	0-1)	0-T	0-T	0-T	0-T	0-T
Death camas, **	DELPH	24	0-1)					
Tapertip hawksbeard **	CRAC2	24	0-1)					
Shrubs and Half-shrubs				1 – 5	14-72	16-80	18-88	19-96
Skunkbush sumac	RHTR	33	0-5)					
Silver sagebrush	ARCA13	36	0-5)					
Prairie rose	ROAR3	38	0-5)					
Fringed sagewort	ARFR4	36	0-5)					
Creeping juniper	JUHO	39	0-5)	0-T	0-T	0-T	0-T	0-T
Yucca	YUCCA	39	0-5)					
Rubber rabbitbrush	ERNAN8	36	0-5)					
Other native shrubs	2SB		0-5)					
Broom snakeweed	GUSA2	37	0-1)	0-T	0-T	0-T	0-T	0-T
Plains pricklypear	OPPO	38	0-1)					
Total Annual Production (lbs./ac)			100%		1440	1600	1755	1910

*This species tends to occur mainly in the higher precipitation areas of the RRU.
** These plants are poisonous to some grazing animals during at least some portion of their life cycle.



TECHNICAL GUIDE
SECTION II

Ecological Site Description—Rangeland

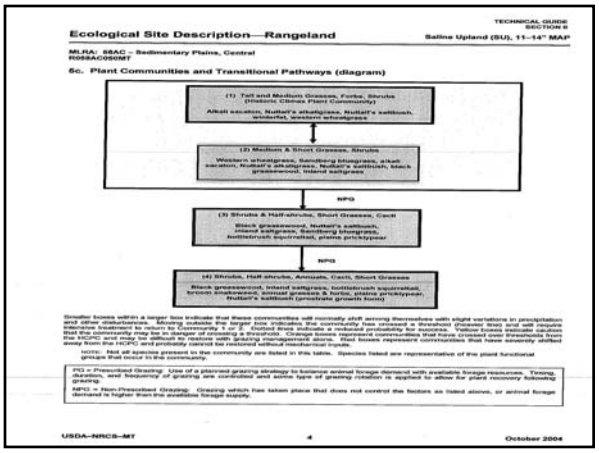
Overflow (Ov) 11–14" MAP

MLRA: 58AC – Sedimentary Plains, Central
R058AC045MT

5b. Major Plant Species Composition - Historical Climax Plant Community

Common Name	Plant Symbol	Plant Group	Percent Comp.	Group Max. %	Mean Annual Precipitation (inches) 11 (lbs./acre)	12 (lbs./acre)	13 (lbs./acre)	14 (lbs./acre)
Basin wildrye	LECI4	2	20-40		470-845	500-1000	530-1055	555-1110
Nebraska sedge	CANE2	3	0-5		0-190	0-125	0-130	0-140
Western wheatgrass	PASM	14	5-15		190-380	125-250	130-265	140-280
Bluebunch wheatgrass	PSSP6	2	0-15	15	190-380	125-250	130-265	140-280
Green needlegrass	NAVI4	2	0-15		190-380	125-375	130-395	140-415
Reverted wheatgrass and Intermediate wheatgrass	ELTRS	2	5-10	10	190-380	250-500	265-530	280-555
Needleandthread	HECOC8	10	0-15		120-235	125-250	130-265	140-280
Sandberg bluegrass	POSE	12	0-10					
Prairie junegrass	KOMA	12	0-5)					
Other native grasses	2GP		0-5)					
Clustered field sedge	CAPR5	15	0-5)					
Baltic rush	JUAR	14	0-5)					
Other native sedges & rushes	2SEDS		0-5)					
Forbs					0-235 No more than 120 for any one	0-250 No more than 125 for any one	0-265 No more than 130 for any one	0-280 No more than 140 for any one
American licorice	GLLE3	19	0-5)					
Goldenpea	THMO	20	0-5)					
Goldenrod spp.	SOLID	19	0-5)					
Silverweed cinquefoil	POAN	20	0-5)					
Cinquefoil spp.	POTEN	14	0-5)					
Aster spp.	ASTER	16	0-5)					
Curtis' dropseed	SPCU	14	0-5)	5	0-120	0-125	0-130	0-140
Clustered sagewort	ARCA	18	0-5)					
American vetch	VIAM	18	0-5)					
Western yarrow	ACMI2	19	0-5)					
Rocky Mountain iris	IRMI	20	0-5)					
Other native native forbs	2FP		0-5)					
Timothy	PHPR3	24	0-1)					
Lambert loco	OXLA3	24	0-1)	T	0	0	0-T	0-T
Death camas *	DELPH	24	0-1)					
Shrubs 5–10%					120-235	125-250	130-265	140-280
Western or Common Snowberry	SYOC	37	0-5)					
Silver sagebrush	ARCA13	36	0-5)					
American plumseed	FRAM2	34	0-5)					
Currant spp.	RIBES	37	0-5)	10	120-235 No more than 120 for any one	125-250 No more than 125 for any one	130-265 No more than 130 for any one	140-280 No more than 140 for any one
Wood's Rose	ROWO	38	0-5)					
Silver sagebrush	ARCA13	36	0-5)					
Other native shrubs	2SB		0-5)					
Total Annual Production (lbs./ac)			100%		2360	2500	2640	2780

* These species are toxic to some grazing animals during at least some part of their life cycle.



TECHNICAL GUIDE
SECTION II

Ecological Site Description—Rangeland

Saline Upland (SU), 11–14" MAP

MLRA: 58AC – Sedimentary Plains, Central
R058AC050MT

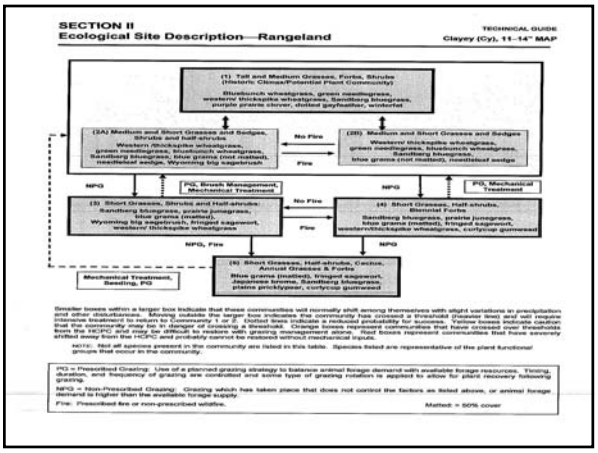
6c. Plant Communities and Transitional Pathways (diagram)

Smaller boxes within a larger box indicate that these communities will normally shift among themselves with slight variations in precipitation and other disturbances. Moving outside the larger box indicates the community has crossed a threshold (heavier line) and will require intensive management inputs (e.g., brush management, prescribed grazing, prescribed burning, etc.) to return to Community 1 or 2. Dotted lines indicate that the community may be in danger of crossing a threshold. Orange boxes represent communities that have crossed over thresholds from the HCPC and may be difficult to restore with grazing management alone. Red boxes represent communities that have severely shifted away from the HCPC and probably cannot be restored without mechanical inputs.

NOTE: Not all species present in the community are listed in this table. Species listed are representative of the plant functional groups that occur in the community.

PG = Prescribed Grazing: Use of a planned grazing strategy to balance animal forage demand with available forage resources. Timing, duration, and frequency of grazing are controlled and some type of grazing rotation is applied to allow for plant recovery following grazing.

NPG = Non-Prescribed Grazing: Grazing which has taken place that does not control the factors as listed above, or animal forage demand is higher than the available forage supply.



SECTION II
Ecological Site Description—Rangeland

TECHNICAL GUIDE
Clayey (Cy), 11–14" MAP

Smaller boxes within a larger box indicate that these communities will normally shift among themselves with slight variations in precipitation and other disturbances. Moving outside the larger box indicates the community has crossed a threshold (heavier line) and will require intensive treatment to return to Community 1 or 2. Dotted lines indicate a reduced productivity for biomass. Yellow boxes indicate communities that the community may be in danger of crossing a threshold. Orange boxes represent communities that have crossed over thresholds from the HCPC and may be difficult to restore with grazing management alone. Red boxes represent communities that have severely shifted away from the HCPC and probably cannot be restored without mechanical inputs.

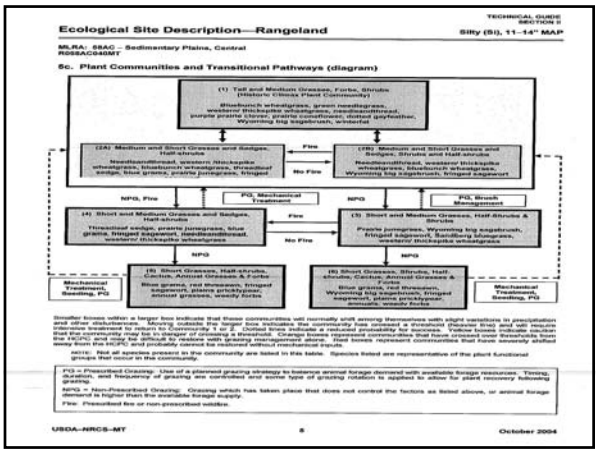
NOTE: Not all species present in the community are listed in this table. Species listed are representative of the plant functional groups that occur in the community.

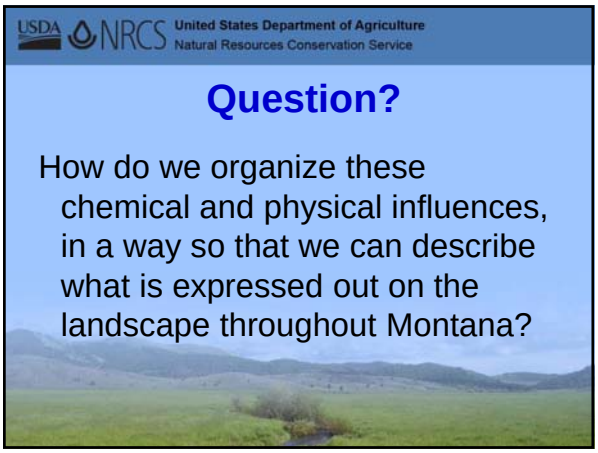
PG = Prescribed Grazing: Use of a planned grazing strategy to balance animal forage demand with available forage resources. Timing, duration, and frequency of grazing are controlled and some type of grazing rotation is applied to allow for plant recovery following grazing.

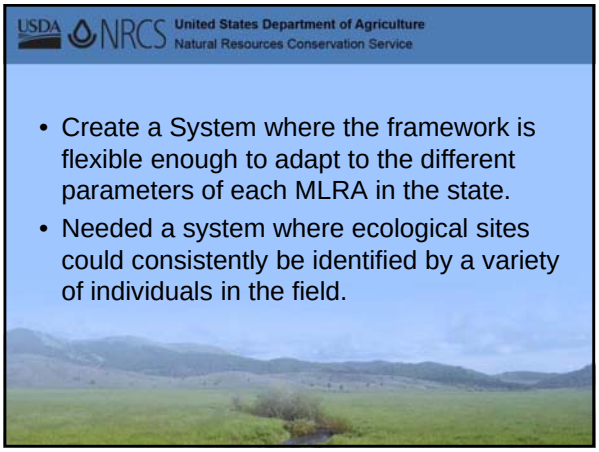
NPG = Non-Prescribed Grazing: Grazing which has taken place that does not control the factors as listed above, or animal forage demand is higher than the available forage supply.

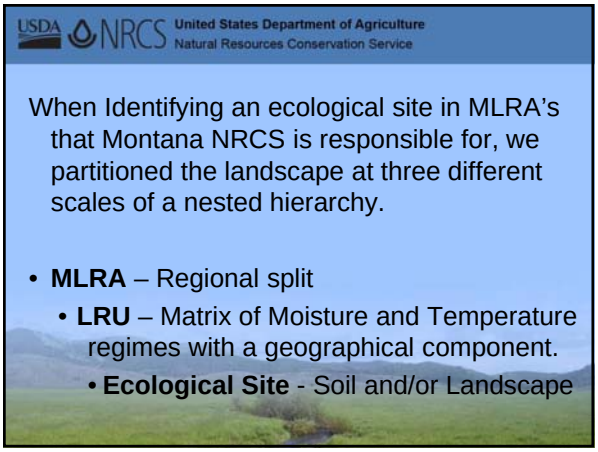
Fire: Prescribed fire or non-prescribed wildfire.

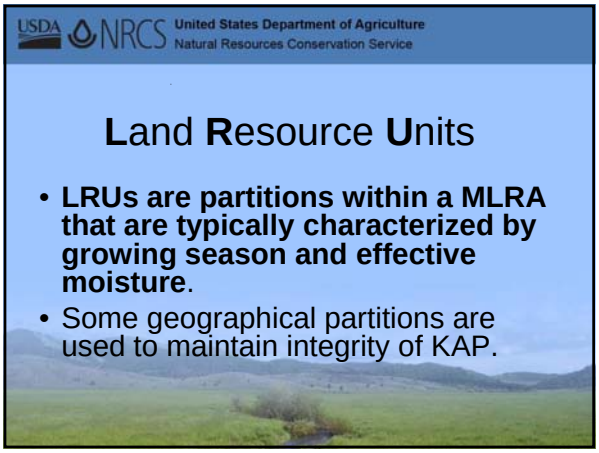
Matted: = 50% cover


Ecological Site Description—Rangeland
Silty (Si), 11–14" MAP
5c. Plant Communities and Transitional Pathways (diagram)
Fire
No Fire
NPG, Fire
PG, Mechanical Treatment
NPG
PG, Brush Management
NPG
NPG
Mechanical Treatment, Seeding, PG
Mechanical Treatment, Seeding, PG
PG = Prescribed Grazing: Use of a planned grazing strategy to balance annual forage demand with available forage resources. Timing, duration, and frequency of grazing are controlled and some type of grazing rotation is applied to allow for plant recovery following grazing.
NPG = Non-Prescribed Grazing: Grazing which has taken place that does not control the factors as listed above, or animal forage demand is higher than the available forage supply.
Fire: Prescribed fire or non-prescribed wildfire.
USDA–NRCS–MT
October 2004


USDA NRCS United States Department of Agriculture
Natural Resources Conservation Service
Question?
How do we organize these chemical and physical influences, in a way so that we can describe what is expressed out on the landscape throughout Montana?


USDA NRCS United States Department of Agriculture
Natural Resources Conservation Service
• Create a System where the framework is flexible enough to adapt to the different parameters of each MLRA in the state.
• Needed a system where ecological sites could consistently be identified by a variety of individuals in the field.

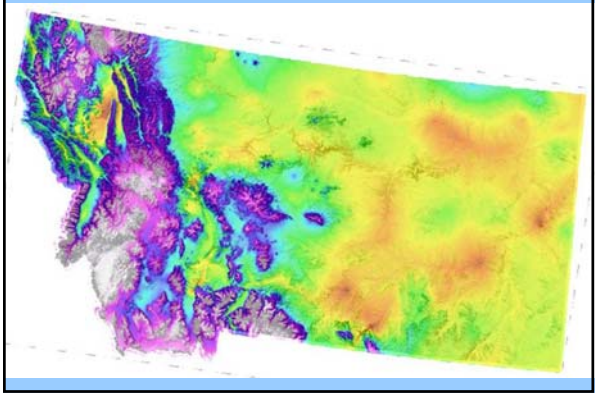

USDA NRCS United States Department of Agriculture
Natural Resources Conservation Service
When Identifying an ecological site in MLRA's that Montana NRCS is responsible for, we partitioned the landscape at three different scales of a nested hierarchy.
• MLRA – Regional split
• LRU – Matrix of Moisture and Temperature regimes with a geographical component.
• Ecological Site - Soil and/or Landscape


USDA NRCS United States Department of Agriculture
Natural Resources Conservation Service
Land Resource Units
• LRUs are partitions within a MLRA that are typically characterized by growing season and effective moisture.
• Some geographical partitions are used to maintain integrity of KAP.

USDA NRCS United States Department of Agriculture
Natural Resources Conservation Service

- **Growing Season** – consecutive days >32 degrees F
- **Use Frost Free Days**
  FFD are sourced from the soil survey

Frost Free Days

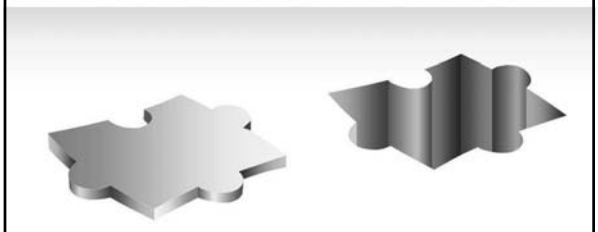


58A Sedimentary Plains

- Fairly consistent # of growing degree days
- Fairly similar growing season precipitation amount across MLRA
- Difference in precipitation timing within the growing season

58A Draft		Relative Effective Precipitation <---- Drier--- Moisture Regime ---- Moister ---->			
		Aridic Ustic	Typic Ustic	Ustic, Moist	Ubiquitous Sites
<-------- Early Season Precip (Cool Season) to Late Season Precip (Warm Season) -------->	Warm Season	LRU F -- Aridic Ustic (warm season ppt.) Little Bluestem	LRU C -- Typic Ustic (warm season ppt.)		LRU Y -- Typically includes ecological sites with water table less than 42"
	Mixed Cool and Warm Season	LRU A -- Aridic Ustic (mixed cool and warm season ppt.)	LRU D -- Typic Ustic (mixed cool and warm season ppt.)		
	Cool Season	LRU B -- Aridic Ustic (cool season ppt.) Bluebunch wheatgrass	LRU E -- Typic Ustic (cool season ppt.)		

This is the classification process we are using to divide the landscape into boxes.



USDA NRCS United States Department of Agriculture
Natural Resources Conservation Service

MT NRCS Homepage Under Technical Resources
http://www.mt.nrcs.usda.gov/technical/ecs/range/ecolsites/
- Rangeland Ecological Site Key
- ESD – LRU Matrix By MLRA
- Montana Ecological Site Development Policy

Electronic Field Office Technical Guide
http://efotg.sc.egov.usda.gov/efotg_locator.aspx?map=
- Ecological Site Descriptions
- Rangeland Health Reference Worksheets

Ecological Site Information System
http://esis.sc.egov.usda.gov/
- ESD's by MLRA

USDA NRCS **United States Department of Agriculture**
Natural Resources Conservation Service

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QUESTIONS?