

Northern Rocky Mountain Foothills South – ECOLOGICAL SITE KEY

To identify an ecological site, first determine which one of these three questions can be answered "YES", then go to the appropriate group.

1. Does the site receive significant additional moisture from overflow or sub-irrigation, or does it have ground water at the surface during part of the growing season? (Go to Group I)
2. Is the soil depth 20 inches or more from the surface with no sign of significant additional moisture? (Go to Group II)
3. Is the soil depth less than 20 inches to hard or soft bedrock? (Go to Group III)

GROUP I SOILS RECEIVING ADDITIONAL MOISTURE

1. Groundwater appears at the surface during part of the growing season and is no deeper than 20 inches during the rest of the growing season..... **WET MEADOW (WM)**
2. Groundwater is within 20 to 40 inches of the surface during at least part of the growing season with no significant salt accumulations..... **SUBIRRIGATED (Sb)**
3. Site receives additional moisture from runoff or stream overflow..... **OVERFLOW (Ov)**

GROUP II SOILS AT LEAST 20 INCHES DEEP - NO ADDITIONAL MOISTURE

1. Is there loose sand and/or significant gravel within 20 inches of the surface? (Go to Subgroup A)
2. Does the surface layer have a sand, loamy sand or sandy loam texture? (Go to Subgroup B)
3. Does the surface layer have a loam or silt loam texture? (Go to Subgroup C)
4. Does the surface layer have a clayey or clay loam texture? (Go to Subgroup D)

Subgroup A

1. Loamy surface layer over loose sand and gravel at 10-20" **SHALLOW TO GRAVEL (SwGr)**
2. Loamy sand with 50% or more gravel and cobbles though out..... **GRAVEL (Gr)**

Subgroup B

1. Strongly or violently effervescent in surface mineral 4". Lime concentration increasing with depth (typically limestone parent material)..... **LIMY (Ly)**
2. Surface layer is coarse to fine sandy loam, and water drains through fairly fast. Nearly level to strongly sloping landscapes (<15% slopes)..... **SANDY (Sy)**
3. Surface layer is coarse to fine sandy loam, and water drains through fairly fast. Strongly sloping landscape (>15% slope)..... **SANDY STEEP (SyStp)**

Subgroup C

1. Surface layer is strongly or violently effervescent (bubbles)LIMY (Ly)
2. Loam or silt loam surface >20" deep with a dark surface layer, on >15% slopes. Weak to no structure in subsoil.....LOAMY STEEP (LoStp)
3. Loamy surface over a slowly permeable dense claypan subsoil.....CLAYPAN (Cp)
4. Surface layer is loam or silt loam; on level to rolling (0-15%) slopes.....LOAMY (Lo)
5. Soil has gravels or cobbles greater than 35% in surface 20 inches.....DROUGHTY (Dr)

Subgroup D

1. Loam to silty clay surface, mod, to strongly saline, on <8% slopes.....SALINE UPLAND (SU)
2. A thin surface layer of clayey texture on slopes of hilly landscapes (>15% slopes); weak to no structure in subsoil.....CLAYEY STEEP (CyStp)
3. Relatively impervious clay soil with non-granular crust, very sticky when wet and extremely hard when dry.....DENSE CLAY (DC)
4. Granular acidic clay surface. Subsurface materials are porous clay with small shale chips, which act like sand. Sandy site plants grow in this soil.....COARSE CLAY (CC)
5. Granular clay surface, clayey subsoil with blocky or prismatic structure, <15% slope
.....CLAYEY (Cy)

GROUP III SOIL DEPTH LESS THAN 20 INCHES

1. Is the soil depth 10 to 20 inches? (Go to Subgroup A)
2. Is the soil depth less than 10 inches? (Go to Subgroup B)

Subgroup A

1. Clayey soils, over shale or dense clay.....SHALLOW CLAY (SwCy)
2. All other shallow soils,SHALLOW (Sw)

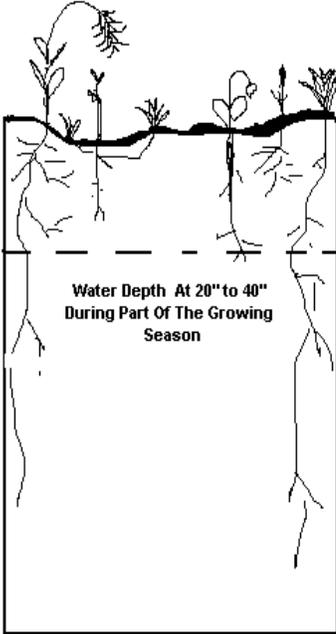
Subgroup B

1. All soils less than 10 inches deep over root-limiting bedrock.....VERY SHALLOW (VSw)
2. Clayey surface with some angular shale fragments and parent shale within 10"SHALE (Sh)

ECOLOGICAL SITE Profiles and Descriptions

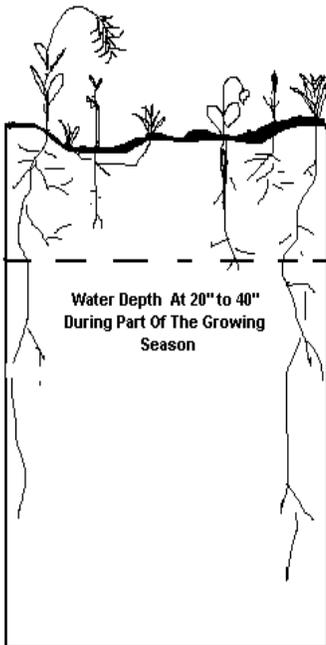
(* INDICATES PLANT SPECIES THAT INCREASE WITH GRAZING PRESSURE)

WET MEADOW



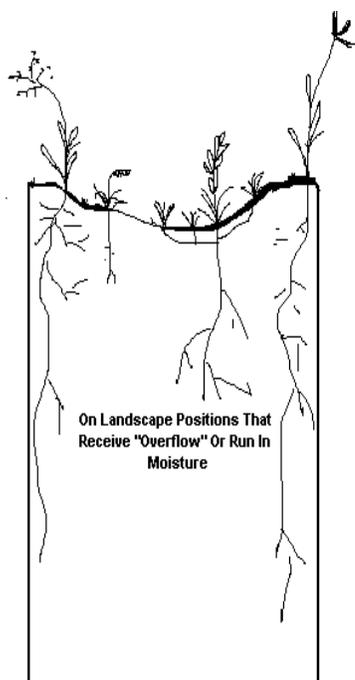
- **PHYSIOGRAPHIC FEATURES:** Occurs on low terraces, fans and flood plains. Slopes range from 0-2%.
- **NATIVE CLIMAX VEGETATION:** The potential plant community is comprised of 90% grasses and grass-like and 10% forbs. Shrubs and trees usually do not grow on this site. Common plant species include prairie cordgrass, bluejoint reedgrass, American sloughgrass, American Mannagrass, tufted hairgrass, western wheatgrass, tall sedges and rushes, *low sedges, *cinquefoil species and *blue-eyed grass. *Kentucky bluegrass, *foxtail spp., thistles and other weedy forbs commonly invade this site.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production of wet meadow sites with high similarity indexes varies from 6700 pounds/acre on a good year to 4880 pounds/acre on a poor year.
- **GRAZING:** Wet meadow sites respond well to deferred grazing systems. These sites should not be grazed when submerged and boggy.

SUBIRRIGATED



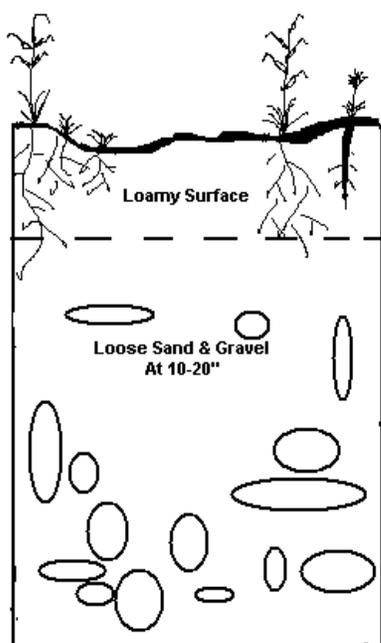
- **PHYSIOGRAPHIC FEATURES:** Occurs on level terraces and flood plains. Slopes range from 0-2%.
- **NATIVE CLIMAX VEGETATION:** The potential plant community is comprised of 80% grasses and grass-like, 10% forbs and 10% trees and shrubs. Common plant species include prairie cordgrass, Canada wildrye, reed canarygrass, northern reedgrass, basin wildrye, *western wheatgrass, slender wheatgrass, tall sedges, *low sedges, cinquefoil spp., prairie thermopsis, cow parsnip, goldenrod spp., horsemint, bedstraw, willow spp., rose spp., chokecherry, *buffaloberry, American plum, cottonwood, boxelder and red-osier dogwood. Kentucky bluegrass, foxtail barley, thistles and weed-like forbs commonly invade these sites.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production on subirrigated sites with high similarity indexes varies from 5460 pounds/acre on a good year to 3467 pounds/acre on a poor year.
- **GRAZING:** Subirrigated sites respond well to grazing systems that alter the season of use. These sites should not be utilized when overly wet.

OVERFLOW



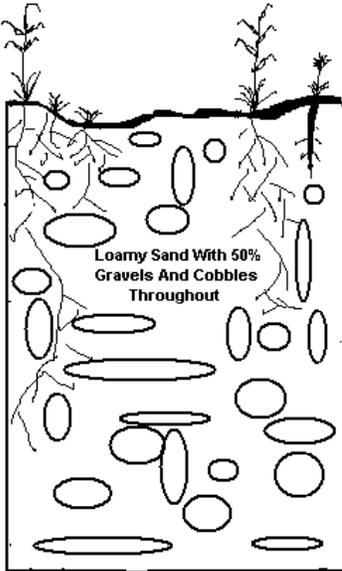
- **PHYSIOGRAPHIC FEATURES:** Occurs on low terraces, flood plains, or areas subject to frequent flooding. Slopes range from 0-2%.
- **NATIVE (CLIMAX) VEGETATION:** The potential plant community is comprised of 80% grasses and grass-like, 5% forbs and 15% trees and shrubs. Common plant species include western wheatgrass, needlegrass spp., slender wheatgrass, basin wildrye, prairie junegrass, *bluegrass spp., sedges, western yarrow, prairie thermopsis, American vetch, astragalus spp, buffaloberry, *snowberry, prairie rose, chokecherry, *silver sagebrush, and golden current. Prairie rose, silver sagebrush, foxtails, thistles and weed-like forbs commonly invade this site.
- **TOTAL ANNUAL HERBAGE PRODUCTION (air dry):** Forage production on overflow sites with high similarity indexes is 3715 pounds/acre on a good year and 2260 pounds/acre on a poor year.
- **GRAZING:** These sites respond poorly to continuous, year-long grazing during the growing season.

SHALLOW TO GRAVEL



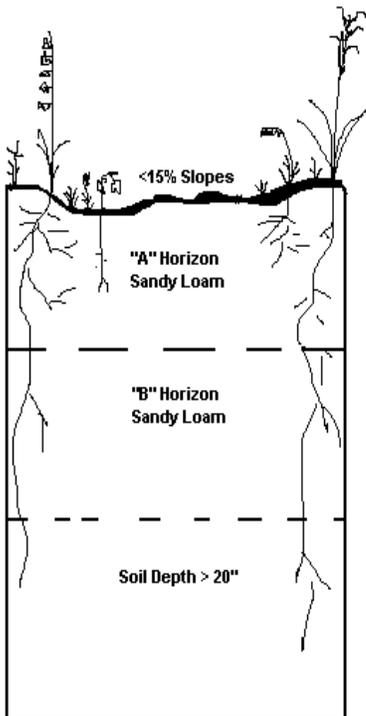
- **PHYSIOGRAPHIC FEATURES:** Occurs on strong to moderately sloping, rolling uplands. Slopes range from 0-15%.
- **NATIVE (CLIMAX) VEGETATION:** The potential plant community is composed of 85% grasses and grass-like, 10% forbs and 5% shrubs. Common plant species include bluebunch wheatgrass, Idaho fescue, western wheatgrass, plains reedgrass, *needle and thread, prairie junegrass, purple threeawn, *threadleaf sedge, prairie clover, astragalus spp., scurfpea spp., dotted gayfeather, hairy goldenaster, *fringed sagewort, common yarrow, winterfat, lupine, death camas, larkspur, skunkbush sumac, and woods rose. Broom snakeweed, pricklypear cactus, curlycup gumweed, hairy goldenaster and other weed-like forbs commonly invade the site.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production on shallow to gravel sites with high similarity indexes ranges from 1600 pounds/acre on a good year to 990 pounds/acre on a poor year.
- **GRAZING:** This site responds well to management systems that rotate the season of use.

GRAVEL



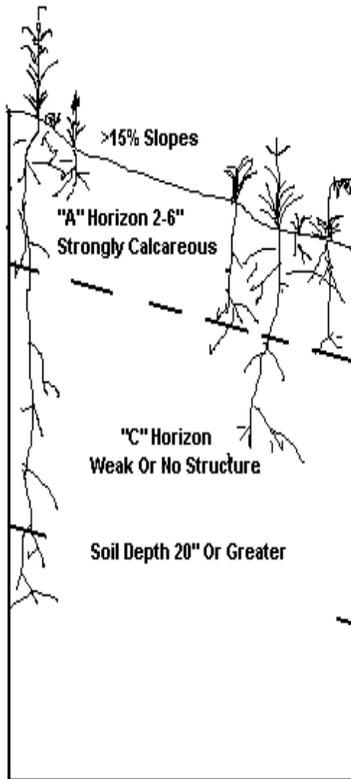
- **PHYSIOGRAPHIC FEATURES:** Occurs on uplands, terrace breaks and floodplains with nearly level to very steep slopes.
- **NATIVE (CLIMAX) VEGETATION:** The potential plant community is comprised of 80% grasses, 10% forbs and 10% shrubs. Common plant species include bluebunch wheatgrass, Idaho fescue, western wheatgrass, plains reedgrass, *needle and thread, prairie junegrass, *purple threeawn, threadleaf sedge, *fringed sagewort, common yarrow, hairy goldenaster, lupine, death camas, larkspur, prairie clover, winterfat, Woods rose. Needle and thread, annual weeds, clubmoss, bluegrama and threadleaf sedge commonly invade the site.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production on gravel sites with high similarity indexes varies from 1700 pounds/acre on a good year to 990 pounds/acre on a poor year.
- **GRAZING:** This site responds well to grazing system that rotate season of use with light grazing.

SANDY



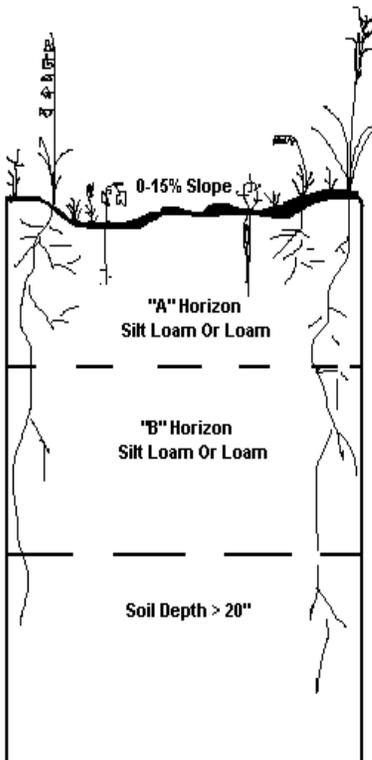
- **PHYSIOGRAPHIC FEATURES:** Sandy sites occur on rolling uplands, low terraces, fans and flood plains. Slopes are generally less than 8 percent.
- **NATIVE (CLIMAX) VEGETATION:** The potential plant community is comprised of 85% mid/short grasses, 10% forbs and 5% shrubs. Common plant species include prairie sandreed, *needle and thread, indian ricegrass, bluebunch wheatgrass, plains muhly, western wheatgrass, blue grama, prairie junegrass, *red threeawn, threadleaf sedge, scurfpea spp., astragalus spp., American licorice, dotted gayfeather, hairy goldenaster, fringed sagewort, green sagewort, stiff sunflower, goldenrod spp., eriogonum spp. prairieclovers, silver sagebrush, snowberry, skunkbush sumac, rose species, creeping juniper, cottonwood and yucca. Annual bromes, broom snakeweed and sagewort species commonly invade this site.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production on sandy sites with high similarity indexes varies from 2300 pounds/acre on a good year to 1000 pounds/acre on a poor year.
- **GRAZING:** These sites respond well to rotational grazing systems that prevent wind erosion by maintaining ground cover.

LOAMY STEEP



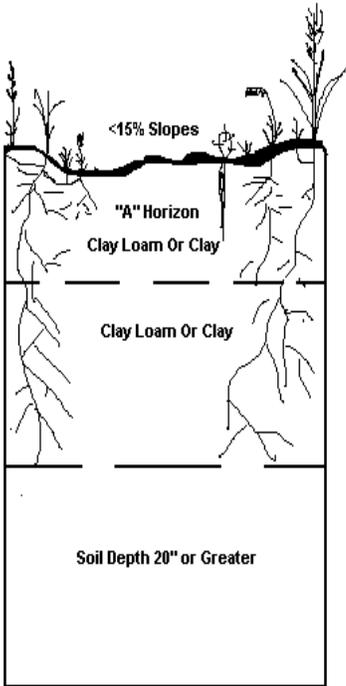
- **PHYSIOGRAPHIC FEATURES:** Loamy steep sites occur on steep, undulating hills and on steep side slopes along narrow ridges. Surface texture can be loam, silt loam or very fine sandy loam. Slopes are 15% or greater.
- **NATIVE (CLIMAX) VEGETATION:** The potential plant community is comprised of 80% grasses, 10% forbs and 10% shrubs/trees. Common plant species include: western wheatgrass, thickspike wheatgrass, bluebunch wheatgrass, needlegrass spp., *needle and thread, *blue grama, prairie junegrass, Sandberg bluegrass, oatgrass spp., plains reedgrass, threadleaf sedge, dotted gayfeather, scurfpea spp., scarlet globemallow, prairie coneflower, *fringed sagewort, goldenrod spp., astragalus spp., western yarrow, winterfat, *creeping juniper, shrubby cinquefoil, *silver sagebrush, nuttall saltbush, rabbitbrush spp., chokecherry, buffaloberry, rose spp., Rocky Mountain juniper, ponderosa pine, cottonwood, green ash. Creeping juniper, blue grama, needle and thread, threadleaf sedge, annual bromes, wooly plantain and broom snakeweed increase and/or invade as the site deteriorates.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production on loamy steep sites with high similarity indexes varies from 1800 pounds/acre on a good year to 800 pounds/acre on a poor year.
- **GRAZING:** This site deteriorates rapidly under continuous grazing systems. Well planned rotational grazing systems limit soil erosion and maximize forage production.

LOAMY



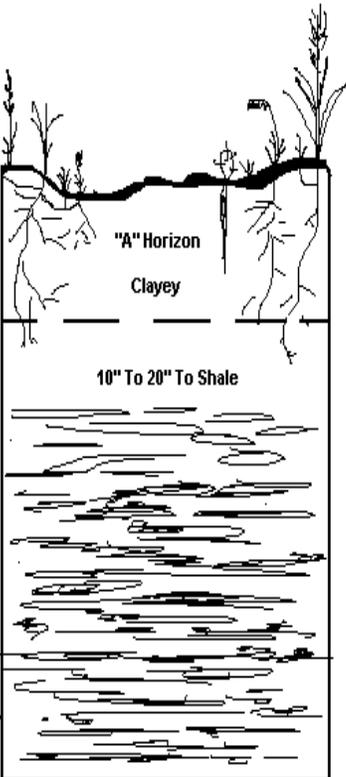
- **PHYSIOGRAPHIC FEATURES:** Loamy sites occur on rolling uplands, terraces, fans and flood plains. Slopes are generally less than 8 percent.
- **NATIVE (CLIMAX) VEGETATION:** The potential plant community is comprised of 85% grasses, 10% forbs and 5% shrubs. Common plants species include: bluebunch wheatgrass, Idaho fescue, mountain brome, *western wheatgrass, thickspike wheatgrass, needlegrass spp., *needle and thread, *prairie junegrass, Sandberg bluegrass, plains reedgrass, *threadleaf sedge, purple threeawn, hairy goldenaster, astragalus spp., scurfpea spp., sticky geranium, American vetch, lupine, arrowleaf balsamroot, prairie clover spp., biscuit root, eriogonum spp., prairie coneflower, western yarrow, larkspur, death camas, green sagewort, fringed sagewort, big sagebrush. Annual bromes, needle and thread, blue grama, dense clubmoss and sagebrush spp. commonly invade this site.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production of loamy sites with high similarity indexes varies from 2714 pounds/acre on a favorable year to 1875 pounds/acre on an unfavorable year.
- **GRAZING:** Loamy sites respond well to deferred grazing systems that vary season of use and incorporate rest.

CLAYEY



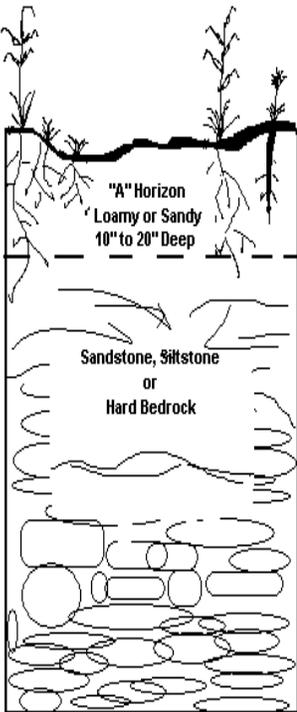
- **PHYSIOGRAPHIC FEATURES:** Clayey sites occur on rolling uplands, low terraces, fans and flood plains. Slopes generally range from 4 to 8%.
- **NATIVE (CLIMAX) VEGETATION:** The potential plant community is comprised of 80% grasses/grasslikes, 10% forbs and 10% shrubs. Common plant species include bluebunch wheatgrass, western wheatgrass, Idaho fescue, oatgrass spp., needlegrass spp., *blue grama, needleleaf sedge, Cusick's bluegrass, prairie junegrass, biscuit root, aster spp., dotted gayfeather, wild onion, American vetch, fringed sagewort, scarlet globemallow, western yarrow, lupine, larkspur, death camas, *pricklypear cactus, winterfat, rabbittbrush spp., *big sagebrush. Annual bromes, fescues, woolly plantain, salsify and pepperweed commonly invade clayey sites.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production of clayey sites varies from 2478 pounds/acre on a good year to 1440 pounds/acre on a poor year.
- **GRAZING:** Clayey sites respond well to deferred grazing systems that vary seasons of grazing and incorporate adequate rest periods.

SHALLOW CLAY



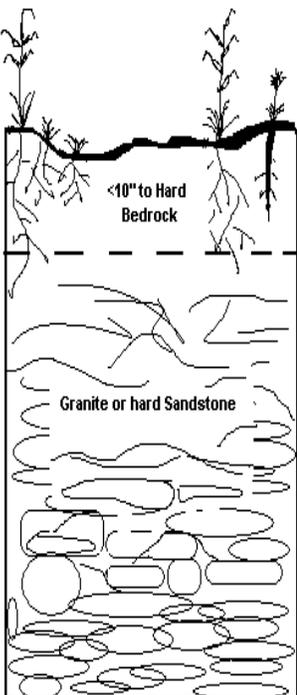
- **PHYSIOGRAPHIC FEATURES:** Shallow clay sites occur on rolling to strongly dissected uplands. Slopes range from 0-35%.
- **NATIVE (CLIMAX) VEGETATION:** The potential plant community is comprised of 80% grasses, 10% forbs and 10% shrubs. Common plant species include: bluebunch wheatgrass, Idaho fescue, *western wheatgrass, spike fescue, green/Columbia needlegrass, *blue grama, plains reedgrass, Sandberg bluegrass, prairie junegrass, *purple threeawn, needleleaf sedge, scarlet globemallow, spiny phlox, buckwheat spp., lupine, biscuit root, wild onion, dotted gayfeather, American vetch, *fringed sagewort, *big sagebrush, winterfat, rabbitbush spp., silver sagebrush, broom snakeweed. Sandberg bluegrass, salsify, broom snakeweed, annual bromes and weedy forbs commonly invade the site.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production of shallow clay sites with high similarity indexes varies from 1400 pounds/acre on good years to 1045 pounds/acre on poor years.
- **GRAZING:** Shallow clay sites respond well to grazing systems that incorporate rest during the growing season.

SHALLOW



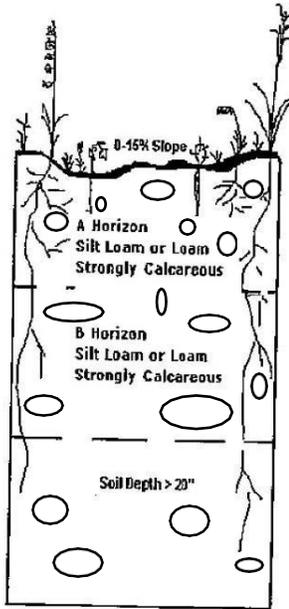
- **PHYSIOGRAPHIC FEATURES:** Shallow sites occur on rolling hills on uplands with outcrops of shale or sandstone. Slopes range from 0-35%.
- **NATIVE (CLIMAX) VEGETATION:** The potential plant community is comprised of 80% grass, 10% forbs, 10% shrubs and trees may occur on this site. Shallow sites can have up to 35% bare ground and still be in high ecological condition. Common plant species include: bluebunch wheatgrass, *western wheatgrass, needlegrass spp., plains reedgrass, *needle and thread, *threadleaf sedge, *blue grama, Sandberg bluegrass, prairie junegrass, dotted gayfeather, prairieclover spp., common yarrow, astragalus spp., hairy goldenaster, phlox spp., locoweed, death camas, fringed sagewort, woods rose, big sagebrush, broom snakeweed. Various annual and weed-like species commonly invade this site.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production of shallow sites with high similarity indexes varies from 1560 pounds/acre on a good year to 918 pounds/acre on a poor year.
- **GRAZING:** Grazing systems that rotate season of use maximize forage production and limit erosion on shallow sites.

VERY SHALLOW



- **PHYSIOGRAPHIC FEATURES:** Very shallow sites occur on level to moderately sloping landscapes where soils are less than 10 inches deep. Surface textures can be variable given parent material.
- **NATIVE (CLIMAX) VEGETATION:** The potential plant community is comprised of 70% grasses, 5% forbs and 25% shrubs and trees. Common plant species include: bluebunch wheatgrass, western wheatgrass, Idaho fescue, Indian ricegrass, *needle and thread, plains reedgrass, prairie junegrass, Sandberg bluegrass, threadleaf/needleleaf sedge, *purple threeawn, hairy goldenaster, phlox spp., pussytoes, scurpea spp., bitter root, locoweed, Eriogonum spp., *fringed sagewort, juniper spp., big sagebrush, *plains pricklypear, skunkbush sumac, broom snakeweed, yucca. Broom snakeweed, threeawn spp., pricklypear, wooly plantain and curlycup gumweed commonly invade very shallow sites.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production of very shallow sites with high similarity indexes varies from 1010 pounds/acre on a good year to 630 pounds/acre on a poor year.
- **GRAZING:** Very shallow sites respond best to grazing systems that discontinue grazing during the growing season.

LIMY-DROUGHTY



- **PHYSIOGRAPHIC FEATURES:** Sites occur on nearly level to strongly sloping landscapes. Slopes range from 0-15%, mainly less than 8%. Soils are very gravelly and very cobbly loams, more than 20 inches deep. They strongly to violently effervescent within 4 inches of the surface.
- **NATIVE (CLIMAX) VEGETATION:** The potential plant community is comprised of 80% grasses, 15% forbs and 5% shrubs and trees. Common plant species include: bluebunch wheatgrass, thickspike wheatgrass, Idaho fescue, green needlegrass, *needle and thread, plains reedgrass, prairie junegrass, Sandberg bluegrass, threadleaf sedge, *purple threeawn, hairy goldenaster, phlox spp., pussytoes, locoweed, *fringed sagewort, black sagebrush, *plains pricklypear, broom snakeweed. Broom snakeweed, threeawn spp., pricklypear, and annual grasses commonly invade this site.
- **TOTAL ANNUAL HERBAGE PRODUCTION (AIR DRY):** Forage production of very shallow sites with high similarity indexes varies from 1240 pounds/acre on a good year to 700 pounds/acre on a poor year.
- **GRAZING:** Limy-Droughty sites respond best to shorter grazing periods and providing adequate regrowth after grazing.