

Major Land Resource Area 070A

High Plateaus of the Southwestern Great Plains

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Ecological site keys

LRU Key for High Plateaus of the Southwestern Great Plains (MLRA 70A)

I. The site exists on a landform of volcanic origin, such as a basalt plateau, or is part of an escarpment system that rises directly to a volcanic structure. These escarpments are included if they have volcanic alluvium or colluvium overlying non-volcanic residuum or bedrock. Summits of volcanic plateaus are included unless they are overlain by thick layers of water- or wind-transported material. → VOLCANIC PLATEAUS LRU (VP) ... Key 3 – Key to the LRU Subsets (Climate Zones) of the Volcanic Plateaus (70A.3)

II. Site either does not meet the criteria above, or user is uncertain about whether it does. Common sources of uncertainty are thick deposits of transported material on summits of volcanic mesas and plateaus, and gently-sloping landforms beneath volcanic escarpments.

A. The site exists in the annulus or floor of a playa. User tip: Within MLRA 70A, playas either fit the CP or the VP LRU. However, small islands of playas occur within large areas of the HP-LRU. These sites may be far from the nearest CP landform but will still key-out to the CP-LRU. The playa rim and dune components, however, may key out to the CP, VP, or HP LRUs, so it is important to properly identify their soil properties.

1 Volcanic fragments are visible on the soil surface of the playa rim and/or playa floor. → Volcanic Plateaus LRU (VP) ... Key 3 – Key to the LRU Subsets (Climate Zones) of the Volcanic Plateaus (70A.3)

2 Volcanic fragments are not visible on the soil surface of the playa rim and/or playa floor. → Canadian Plateaus LRU (CP) ... Key 1 – ESD Key for the Canadian Plateaus LRU of the High Plateaus of the Southwestern Great Plains (MLRA 70A)

B. All other sites.

1 4a. The site exists either on a landform directly below a volcanic escarpment system, or on a portion of a volcanic plateau summit that is overlain by a deposit of non-volcanic materials such as strath terrace cobbles or High Plains deposits. Common examples of landforms underlying volcanic escarpments are fan remnants, stream terraces, drainageways, and the summits of underlying plateaus.

i. The largest fragments on the soil surface are volcanic. → Volcanic Plateaus LRU (VP) ... Key 3 – Key to the LRU Subsets (Climate Zones) of the Volcanic Plateaus (70A.3)

ii. Either no fragments are visible on the soil surface, or the largest surface fragments are not volcanic in origin.

a. Site on escarpment or in canyon directly below a zone that meets at least 4 of the following 5 criteria: I. Soils less than 50 cm deep in at least 50 percent of the landform area; II. Soils underlain by sandstone of Dakota Formation or older; III. Presence of at least 2 percent conifers; IV. Landform has a slope of at least 10 percent; V. Immediate landscape drains towards a steep-walled escarpment or canyon that drops below the Dakota Fm.

1) Mesozoic Canyons and Breaks LRU (MCB)

b. Fewer than 4 of the above criteria are met at the upper end of the escarpment complex.

1) The site is on a plateau summit position (tread or flat-topped part) and soil depth is within 50 cm to contact with either plateau bedrock (non-soil bedrock of cemented sandstone, limestone, or shale) or strath terrace cobbles, but not a petrocalcic contact (caprock or caliche of cemented calcium carbonate). → CANADIAN PLATEAUS LRU (CP) ... Key 1 – ESD Key for the Canadian Plateaus LRU of the High Plateaus of the Southwestern Great Plains (MLRA 70A)

2) No plateau bedrock or strath terrace cobbles within 50 cm.

a) Fragments (>2 mm) are visible within the soil profile and/or on the surface. If fragments

cannot be found in the profile, it is acceptable to look nearby on ant mounds or around burrows. If site is in a drainageway, one can look for fragments on landforms immediately upslope.

(1) Fragments are mostly petronodes or High Plains gravels (rounded fragments less than 75 mm across that are of mixed lithology--most often quartzite and igneous). → HIGH PLAINS LRU (HP)

(2) Fragments are mostly plateau bedrock fragments (sandstone, limestone, or shale of Cretaceous age). → CANADIAN PLATEAUS LRU ... Key 1 – ESD Key for the Canadian Plateaus LRU of the High Plateaus of the Southwestern Great Plains (MLRA 70A)

b) Fragments are entirely absent.

(1) No horizons in the upper 100 cm of soil have textures of sand, loamy sand, or sandy loam (variants such as loamy fine sand and fine sandy loam are included in this list). → CANADIAN PLATEAUS LRU (CP) ... Key 1 – ESD Key for the Canadian Plateaus LRU of the High Plateaus of the Southwestern Great Plains (MLRA 70A)

(2) At least one horizon in the upper 100 cm of soil has a texture of sand, loamy sand, or sandy loam (variants such as loamy fine sand and fine sandy loam are included in this list). → HIGH PLAINS LRU (HP)

2 All other sites.

i. Site on escarpment or in canyon directly below a zone that meets at least 4 of the following 5 criteria: I. Soils less than 50 cm deep in at least 50 percent of the landform area; II. Soils underlain by sandstone of Dakota Formation or older; III. Presence of at least 2 percent conifers; IV. Landform has a slope of at least 10 percent; V. Immediate landscape drains towards a steep-walled escarpment or canyon that drops below the Dakota Fm.

a. Mesozoic Canyons and Breaks LRU (MCB)

ii. Fewer than 4 of the above criteria are met at the upper end of the escarpment complex.

a. The site is on a plateau summit position (tread or flat-topped part) and soil depth is within 50 cm to contact with either plateau bedrock (non-soil bedrock of cemented sandstone, limestone, or shale) or strath terrace cobbles, but not a petrocalcic contact (caprock or caliche of cemented calcium carbonate). → CANADIAN PLATEAUS LRU (CP) ... Key 1 – ESD Key for the Canadian Plateaus LRU of the High Plateaus of the Southwestern Great Plains (MLRA 70A)

c. No plateau bedrock or strath terrace cobbles within 50 cm.

1) Fragments (>2 mm) are visible within the soil profile and/or on the surface. If fragments cannot be found in the profile, it is acceptable to look nearby on ant mounds or around burrows. If site is in a drainageway, one can look for fragments on landforms immediately upslope.

a) Fragments are mostly petronodes or High Plains gravels (rounded fragments less than 75 mm across that are of mixed lithology--most often quartzite and igneous). → HIGH PLAINS LRU (HP)

b) Fragments are mostly plateau bedrock fragments (sandstone, limestone, or shale of Cretaceous age). → CANADIAN PLATEAUS LRU ... Key 1 – ESD Key for the Canadian Plateaus LRU of the High Plateaus of the Southwestern Great Plains (MLRA 70A)

2) Fragments are entirely absent.

a) Fragments are mostly petronodes or High Plains gravels (rounded fragments less than 75 mm across that are of mixed lithology--most often quartzite and igneous). → HIGH PLAINS LRU (HP)

b) Fragments are mostly plateau bedrock fragments (sandstone, limestone, or shale of Cretaceous age). → CANADIAN PLATEAUS LRU ... Key 1 – ESD Key for the Canadian Plateaus LRU of the High Plateaus of the Southwestern Great Plains (MLRA 70A)

¹ User Tip 1. Other alluvial or colluvial landform features extending below the escarpments are not included unless they have a predominance of volcanic fragments. Also, note that playas atop volcanic plateaus fit in the VP LRU.

² User Tip 2. The site may also occur on any colluvial or alluvial bottomlands contained within these escarpments or canyons. → MESOZOIC

CANYONS AND BREAKS LRU (MCB) User tip: some river valleys transition from CP to MCB, and the turning point can be difficult to determine. Generally, the valley becomes MCB when entrenched between Dakota sandstone breaks or escarpments on both sides. Much of this acreage in the MCB is aproned by colluvial debris fans—composed of sandy materials with lots of sandstone fragments, including large stones or boulders. The soils in the bottoms of these valleys will also be in the MCB.