Major Land Resource Area 240X
Nulato Hills-Southern Seward Peninsula Highlands

Accessed: 12/14/2025

Description

The Nulato Hills-Southern Seward Peninsula Highlands (MLRA 240X) is in Western Alaska, which describes the mostly treeless zone of discontinuous permafrost in the arctic. This MLRA is approximately 18,500 square miles in size. The terrain is defined by rolling hills, low mountains and river valleys. Flood plains systems are common but generally narrow. This watershed drains into Norton Sound and Bering Sea. Major rivers include the Unalakleet, Koyuk, and Fish Rivers. The area is mostly undeveloped wild land that is sparsely populated. Residents use this remote area primarily for subsistence hunting, fishing, and gathering. Villages are primarily located along the coast and include the two larger municipalities of Nome and Unalakleet, and various other villages such as Koyuk and Saint Michael. • • Geology and Soils • • This MLRA was mostly unglaciated during the late Pleistocene. Glaciers were limited to upper elevations on the Seward Peninsula. Coastal lowlands are filled with Holocene deposits. Silty eolian deposits mantle coastal areas and the slopes of lower elevation hills and mountains. Flood plains and terraces are built on fluvial deposits. Modified glacial moraines are evident in areas of past glacial activity. Bedrock material is primarily a mix of sedimentary and volcanic rock (USDA, 2022). This MLRA is in the zone of discontinuous permafrost. Shallow permafrost is most common on coastal plains, gentle footslopes, and organic swales. Permafrost constitutes a root- restrictive layer that perches water and creates poorly drained or poorly drained soils. Common soil orders include Gelisols that support permafrost and Entisols and Inceptisols which are marked by little to no development. The Gelisols are typically shallow or moderately deep to permafrost, occur on finer to gravelly textured sediments, and are poorly or very poorly drained. Common Gelisol suborders are Histels, Orthels, and Turbels. The Histels have thick accumulations of surface organic material and commonly occur on mounds of plains. The Orthels and Turbels have comparably thinner surface organic material. Turbels show signs of cryoturbation while Orthels do not. Entisols and Inceptisols are common on shallow rocky soils of the alpine and subalpine, as well as scoured flood plain soils. Non-soil areas (rock outcrop, rubble land and beaches) make up approximately five percent of the MLRA surface. • • Climate • • The climate is a mix of maritime in the summer and continental in the winter, which is a result of sea ice in Norton Sound. Summers are brief and cool summers and winters are long and cold. Mean annual precipitation is 15 to 20 inches at lower elevations, increasing to 20 to 40 inches at higher elevations (USDA, 2022). Mean annual temperatures ranges from 23 to 31 degrees F (SNAP, 2014a). • • Vegetation • • Vegetation is mainly influenced by site and soil characteristics such as temperature-degree days, exposure to wind, soil depth, and soil

hydrology. Dwarf scrublands are present across much of the uplands. Lower elevations generally support more developed soils. Well drained soils support tall shrubs. Organic soils support mosses, graminoids and low shrubs. Forests occur on some low mountain slopes and river valleys but are associated with the Yukon-Kuskokwim Highlands (MLRA 230X). Tussock tundra is ubiquitous across much of the poorly drained, low gradient slopes and coastal plains (USDA, 2022).

Ecological site keys

AK630_Nulato Hills Survey

I. Maritime

A. Coastal Plains

1 Berms ... R240XY136AK – Meadow Coastal Plain Berm

2 Talfs

i. Scrub Coastal Plain ... R240XY135AK – Open Scrub Coastal Plains

ii. Grass Tidal Plains and Depressions ... R240XY139AK – Grassland Coastal Plain Talf and Tidal Flats

B. All Other Landforms

1 Plains

i. Lava Flow (or Proximal to Lava Flow)

a. Lava Flow

1) Lava flow ... R240XY151AK – Dwarf Ericaceous Scrub Relict Lava Flows

2) Swale on lava flow ... R240XY150AK – Tall Scrub Lava Flow Swales and Low Mountain Slopes, dry

b. Proximal to lava flow

1) Boulder field - well drained ... R240XY155AK – Dwarf Scrub Boulder Fields

2) Tussock tundra - poorly drained ... R240XY166AK – Grassland Tundra Plain, wet

ii. Other Landforms

a. Polygonal ground ... R240XY169AK – Open Scrub Polygonal Ground

b. Non-polygonal ground

1) Concave landforms

a) Organic soil - swale, drainageway, depression ... R240XY162AK – Grassland Swales and Drainageways

b) Mineral soil

(1) Drainageway ... R240XY160AK – Closed Scrub Drainageway, mineral

(2) Swale ... R240XY161AK – Open Scrub Swale, mineral

2) Linear and Convex landforms and microfeatures

a) Plain talf ... R240XY166AK – Grassland Tundra Plain, wet

b) Peat mounds ... R240XY162AK – Grassland Swales and Drainageways

2 Mountains and Hills

i. Dunes and Sandy Ridges (F230XY113AK)

ii. All Other Landforms

a. Hills and Low Elevation Mountains

1) Volcanic Cones

a) Backslopes, warm ... R240XY153AK – Open Scrub Volcano Cone Backslopes, warm

b) Backslopes and shoulders, moist ... R240XY180AK – Mosaic Tall Mountain Slopes and Volcano Cone Backslopes, cool

2) Slopes - broad, bedrock controlled

a) Upper Mountain Sites - summits, shoulders, upper backslopes & saddles

(1) Summits & Shoulders

(a) Summits ... R240XY183AK – Alpine Open Dwarf Scrub Tall Mountain Upper Slopes, cool

(b) Shoulders ... R240XY182AK – Alpine Open Dwarf Scrub Mountain Tops

(2) Upper Backslopes and Saddles

(a) Slopes

(1) Upper Backslopes

(a) Dry slopes

(1) Linear ... R240XY181AK – Subalpine Closed Low Scrub Tall Mountain Slopes

(2) Exposed ... R240XY186AK – Subalpine Open Low Scrub Tall Mountain Upper Backslopes

(b) Moist slopes ... R240XY150AK – Tall Scrub Lava Flow Swales and Low Mountain Slopes, dry

(2) Saddles ... R240XY168AK – Open Scrub Low Mountain Saddles and Slopes, moist

(b) Slope microfeatures: depressions & mounds ... R240XY162AK – Grassland Swales and Drainageways

b) Other Slopes

(1) Drainageway & associated flood plain ... R240XY160AK – Closed Scrub Drainageway, mineral

(2) Slopes

(a) Backslopes and Noseslopes

(1) Lower elevation - alder slopes

(a) Dryer sites ... R240XY150AK – Tall Scrub Lava Flow Swales and Low Mountain Slopes, dry

(b) Moist sites ... R240XY180AK – Mosaic Tall Mountain Slopes and Volcano Cone Backslopes, cool

(2) Higher elevations - ericaceous scrub

(a) Dry sites ... R240XY181AK – Subalpine Closed Low Scrub Tall Mountain Slopes

(b) Moist sites ... R240XY168AK – Open Scrub Low Mountain Saddles and Slopes, moist

(b) Headslopes and Footslopes

(1) Boulders present ... R240XY155AK – Dwarf Scrub Boulder Fields

(2) Boulders absent

(a) Forest sites

(b) Scrub sites

(1) Swales and Narrow Headslopes ... R240XY172AK – Open Scrub Low Mountain Headslopes and Swales

(2) Headslopes of wide valley ... R240XY173AK – Closed Scrub Low Mountain Footslopes and Wide Headslopes

b. High Elevation Mountains

1) Summits, Shoulders and Upper Backslopes

a) Alpine

(1) Summits ... R240XY183AK – Alpine Open Dwarf Scrub Tall Mountain Upper Slopes, cool

(2) Other Landforms

(a) Shoulders

(1) Warm Slopes ... R240XY185AK – Alpine Lichen-Scrub Tall Mountain Shoulders, warm

(2) Cold slopes ... R240XY184AK – Alpine Open Scrub Tall Mountain Tops, rocky

(b) Upper Backslopes ... R240XY182AK – Alpine Open Dwarf Scrub Mountain Tops

b) Subalpine

(1) Permafrost absent ... R240XY181AK – Subalpine Closed Low Scrub Tall Mountain Slopes

(2) Permafrost present ... R240XY168AK – Open Scrub Low Mountain Saddles and Slopes, moist

2) Other Mountain Positions

a) Drainageways

(1) Heather scrub valley terrace

(2) Willow drainage - poorly drained

b) Backslopes

(1) Very steep slope ... R240XY186AK – Subalpine Open Low Scrub Tall Mountain Upper Backslopes

(2) Slopes less than 45%

(a) Linear to convex slope ... R240XY186AK – Subalpine Open Low Scrub Tall Mountain Upper Backslopes

(b) Linear to concave slope

(1) Wetter sites - swales and concave lower backslopes ... R240XY187AK – Closed Tall Scrub Tall Mountain Backslopes, concave

(2) Drier sites - linear to concave mid backslopes ... R240XY180AK – Mosaic Tall Mountain Slopes and Volcano Cone Backslopes, cool

II. Boreal

A. Organic depressions - R230XY100AK

B. Other Landforms

1 Mountains and Hills

i. Saddles - R230XY131AK

ii. Other Mountain Positions

a. Summits, Shoulders and Convex Backslopes - F230XY102AK

b. Other Mountain Positions

1) Headslopes - F230XY121AK

2) Backslopes and Toeslopes

a) Backslopes

(1) Steep, dry slopes ... F240XY193AK – Maritime Open Forest Low Mountain Backslopes, warm

(2) Other Backslopes
(a) Warmer, drier slopes
(1) Mixed woodland - F230XY105AK
(2) Spruce woodland - F230XY102AK
(b) Wetter slopes - F230XY102AK
b) Toeslopes and Footslopes
(1) Colder, wetter areas - F230XY103AK
(2) Warmer, drier areas - F230XY102AK
2 Flood Plains and Valleys
i. Thermokarst Landscape - F230XY108AK
ii. Non-thermokarst Landscape
a. Drainages on Flood Plains and Terraces - R230XY119AK
b. Flood Plains and Terraces
1) Flood Plains
a) Depressions on Flood Plain - R230XY109AK
b) Flood Plains
(1) River Flood Plain
(a) Braided river system - F230XY110AK
(b) Mountain stream system - R230XY111AK
(2) Mountain Drainage - R230XY119AK
2) Terraces
a) Depression on Terrace - R230XY100AK
b) Terraces
(1) Earth hummocks absent - R230XY112AK
(2) Earth hummocks present - F230XY113AK

AK630_MLRA 240 only

I. Maritime
A. Coastal Plains
1 Berms ... R240XY136AK – Meadow Coastal Plain Berm
2 Talfs
i. Scrub Coastal Plain ... R240XY135AK – Open Scrub Coastal Plains
ii. Grass Tidal Plains and Depressions ... R240XY139AK – Grassland Coastal

Plain Talf and Tidal Flats

B. All Other Landforms

1 Plains

i. Lava Flow (or Proximal to Lava Flow)

a. Lava Flow

1) Lava flow ... R240XY151AK – Dwarf Ericaceous Scrub Relict Lava Flows

2) Swale on lava flow ... R240XY150AK – Tall Scrub Lava Flow Swales and Low Mountain Slopes, dry

b. Proximal to lava flow

1) Boulder field - well drained ... R240XY155AK – Dwarf Scrub Boulder Fields

2) Tussock tundra - poorly drained ... R240XY166AK – Grassland Tundra Plain, wet

ii. Other Landforms

a. Polygonal ground ... R240XY169AK – Open Scrub Polygonal Ground

b. Non-polygonal ground

1) Concave landforms

a) Organic soil - swale, drainageway, depression ... R240XY162AK – Grassland Swales and Drainageways

b) Mineral soil

(1) Drainageway ... R240XY160AK – Closed Scrub Drainageway, mineral

(2) Swale ... R240XY161AK – Open Scrub Swale, mineral

2) Linear and Convex landforms and microfeatures

a) Plain talf ... R240XY166AK – Grassland Tundra Plain, wet

b) Peat mounds ... R240XY162AK – Grassland Swales and Drainageways

2 Mountains and Hills

i. Dunes and Sandy Ridges

ii. All Other Landforms

a. Hills and Low Elevation Mountains

1) Volcanic Cones

a) Backslopes, warm ... R240XY153AK – Open Scrub Volcano Cone Backslopes, warm

b) Backslopes and shoulders, moist ... R240XY180AK – Mosaic Tall Mountain Slopes and Volcano Cone Backslopes, cool

2) Slopes - broad, bedrock controlled

a) Upper Mountain Sites - summits, shoulders, upper backslopes & saddles

(1) Summits & Shoulders

(a) Summits ... R240XY183AK – Alpine Open Dwarf Scrub Tall Mountain Upper Slopes, cool

(b) Shoulders ... R240XY182AK – Alpine Open Dwarf Scrub Mountain Tops

(2) Upper Backslopes and Saddles

(a) Slopes

(1) Upper Backslopes

(a) Dry slopes

(1) Linear ... R240XY181AK – Subalpine Closed Low Scrub Tall Mountain Slopes

(2) Exposed ... R240XY186AK – Subalpine Open Low Scrub Tall Mountain Upper Backslopes

(b) Moist slopes ... R240XY150AK – Tall Scrub Lava Flow Swales and Low Mountain Slopes, dry

(2) Saddles ... R240XY168AK – Open Scrub Low Mountain Saddles and Slopes, moist

(b) Slope microfeatures: depressions & mounds ... R240XY162AK – Grassland Swales and Drainageways

b) Other Slopes

(1) Drainageway & associated flood plain ... R240XY160AK – Closed Scrub Drainageway, mineral

(2) Slopes

(a) Backslopes and Noseslopes

(1) Lower elevation - alder slopes

(a) Dryer sites ... R240XY150AK – Tall Scrub Lava Flow Swales and Low Mountain Slopes, dry

(b) Moist sites ... R240XY180AK – Mosaic Tall Mountain Slopes and Volcano Cone Backslopes, cool

(2) Higher elevations - ericaceous scrub

(a) Dry sites ... R240XY181AK – Subalpine Closed Low Scrub Tall Mountain Slopes

(b) Moist sites ... R240XY168AK – Open Scrub Low Mountain Saddles and Slopes, moist

(b) Headslopes and Footslopes

(1) Boulders present ... R240XY155AK – Dwarf Scrub Boulder Fields

(2) Boulders absent

(a) Forest sites

(b) Scrub sites

(1) Swales and Narrow Headslopes ... R240XY172AK – Open Scrub Low Mountain Headslopes and Swales

(2) Headslopes of wide valley ... R240XY173AK – Closed Scrub Low Mountain Footslopes and Wide Headslopes

b. High Elevation Mountains

1) Summits, Shoulders and Upper Backslopes

a) Alpine

(1) Summits ... R240XY183AK – Alpine Open Dwarf Scrub Tall Mountain Upper Slopes, cool

(2) Other Landforms

(a) Shoulders

(1) Warm Slopes ... R240XY185AK – Alpine Lichen-Scrub Tall Mountain Shoulders, warm

(2) Cold slopes ... R240XY184AK – Alpine Open Scrub Tall Mountain Tops, rocky

(b) Upper Backslopes ... R240XY182AK – Alpine Open Dwarf Scrub Mountain Tops

b) Subalpine

(1) Permafrost absent ... R240XY181AK – Subalpine Closed Low Scrub Tall Mountain Slopes

(2) Premafrost present ... R240XY168AK – Open Scrub Low Mountain Saddles and Slopes, moist

2) Other Mountain Positions

a) Drainageways

(1) Heather scrub valley terrace

(2) Willow drainage - poorly drained

b) Backslopes

(1) Very steep slope ... R240XY186AK – Subalpine Open Low Scrub Tall Mountain Upper Backslopes

(2) Slopes less than 45%

(a) Linear to convex slope ... R240XY186AK – Subalpine

Open Low Scrub Tall Mountain Upper Backslopes

(b) Linear to concave slope

(1) Wetter sites - swales and concave lower backslopes ... R240XY187AK – Closed Tall Scrub Tall Mountain Backslopes, concave

(2) Drier sites - linear to concave mid backslopes ... R240XY180AK – Mosaic Tall Mountain Slopes and Volcano Cone Backslopes, cool

Practice_Key

I. Maritime

A. Coastal Plains

1 Berms ... R240XY136AK – Meadow Coastal Plain Berm

2 Talfs

i. Scrub Coastal Plain ... R240XY135AK – Open Scrub Coastal Plains

ii. Grass Tidal Plains and Depressions ... R240XY139AK – Grassland Coastal Plain Talf and Tidal Flats

B. All Other Landforms

1 Plains

i. Lava Flow (or Proximal to Lava Flow)

a. Lava Flow

1) Lava flow ... R240XY151AK – Dwarf Ericaceous Scrub Relict Lava Flows

2) Swale on lava flow ... R240XY150AK – Tall Scrub Lava Flow Swales and Low Mountain Slopes, dry

b. Proximal to lava flow

1) Boulder field - well drained ... R240XY155AK – Dwarf Scrub Boulder Fields

2) Tussock tundra - poorly drained ... R240XY166AK – Grassland Tundra Plain, wet

ii. Other Landforms

a. Polygonal ground ... R240XY169AK – Open Scrub Polygonal Ground

b. Non-polygonal ground ... R240XY172AK – Open Scrub Low Mountain Headslopes and Swales

2 Mountains and Hills ... R240XY181AK – Subalpine Closed Low Scrub Tall

Mountain Slopes

II. Boreal

A. Organic depressions - R230XY100AK

B. Other Landforms

1 Mountains and Hills

i. Saddles - R230XY131AK

ii. Other Mountain Positions

a. Summits, Shoulders and Convex Backslopes - F230XY102AK

b. Other Mountain Positions

1) Headslopes - F230XY121AK

2) Backslopes and Toeslopes – F230XY000AK

[Label] [Criteria]

MLRA 240 Provisional Ecological Site Key

I. Flooded Features - Coastal Plain, Flood Plain & Terraces

A. Coastal Plain Complex ... R240XY707AK – Arctic Scrub-Sedge Coastal Plain

B. Flood Plains

1 Boreal - F230XY601AK

2 Alpine & Subalpine ... R240XY702AK – Alpine Scrub Flood Plain Complex

II. Slopes

A. Hydric Features - Drainages and Swales ... R240XY710AK – Arctic Scrub Wet Drainages

B. Slopes - not as above

1 Boreal Climate supports trees - Concepts from MLRA 230X

i. Wetland soils

a. Poorly drained - F230XY611AK

b. Somewhat Poorly drained - F230XY613AK

ii. Non-wetland soils (Moderately well to well drained)

a. Slope mostly >20% - F230XY165AK

b. Slope mostly <20%

1) Warm Slopes, thin (<6") organic cap - F230XY612AK

2) Cold Slopes, thick (>6") organic cap - F230XY614AK

2 Arctic Climate, including non-treed Subalpine, Alpine (AGDD do not support

trees)

i. Plains

a. Organic soil plain tussock tundra ... R240XY720AK – Arctic Tussock Tundra Frozen Plains

b. Mineral soil volcanic lava plains ... R240XY721AK – Arctic Scrub Silt Lava Plains

ii. Mountains

a. Alpine elevations above 1,200 feet ... R240XY730AK – Alpine Dwarf Scrub Gravelly Slopes

b. Subalpine elevations between 1,000 and 1,200 feet

1) Poorly drained soil ... R240XY731AK – Subalpine Ericaceous Scrub Loamy Slopes

2) Well drained soil ... R240XY732AK – Subalpine Tall Scrub Gravelly Slopes