

Restoration Plan
for
Former Cultivation Area #2
APN: 208-241-007
Ridge Road, Dinsmore, California



Prepared By:

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EMERALD HILLS
ENVIRONMENTAL

Introduction

This report presents recommendations for treatments to be applied to a former 0.23-acre cultivation area (“Historic Cultivation Area #2”; **Figure 1**), herein referred to as “the restoration site,” to restore natural topography and vegetation to reduce erosion and protect environmental resources and water quality. The restoration area was taken out of cannabis production in 2017, after it was determined to be poorly situated due to its placement on a steep hill slope and proximity to two Class III waterways. The plants, rootballs, and cultivation materials were removed from the area, leaving several dozen 3-4-foot diameter “divots” in the ground surface, each circled with a raised soil berm where excavated soil had been sidecast. Most of the holes have become vegetated by local grasses, but the soils are largely loose and unconsolidated. This surface condition is now vulnerable to erosion that could be caused by surface water flow during heavy rains being entrained into or around the divots. Without correction, over several seasons, such conditions could result in movement of soil with potential creation of erosive channels, ultimately delivering sediment to the waterways and degrading water quality. The recommendations in this report comprise a plan to remediate the condition and thereby protect resources and water quality.



Figure 1. Location of Restoration Area – Historic Cultivation Area #2



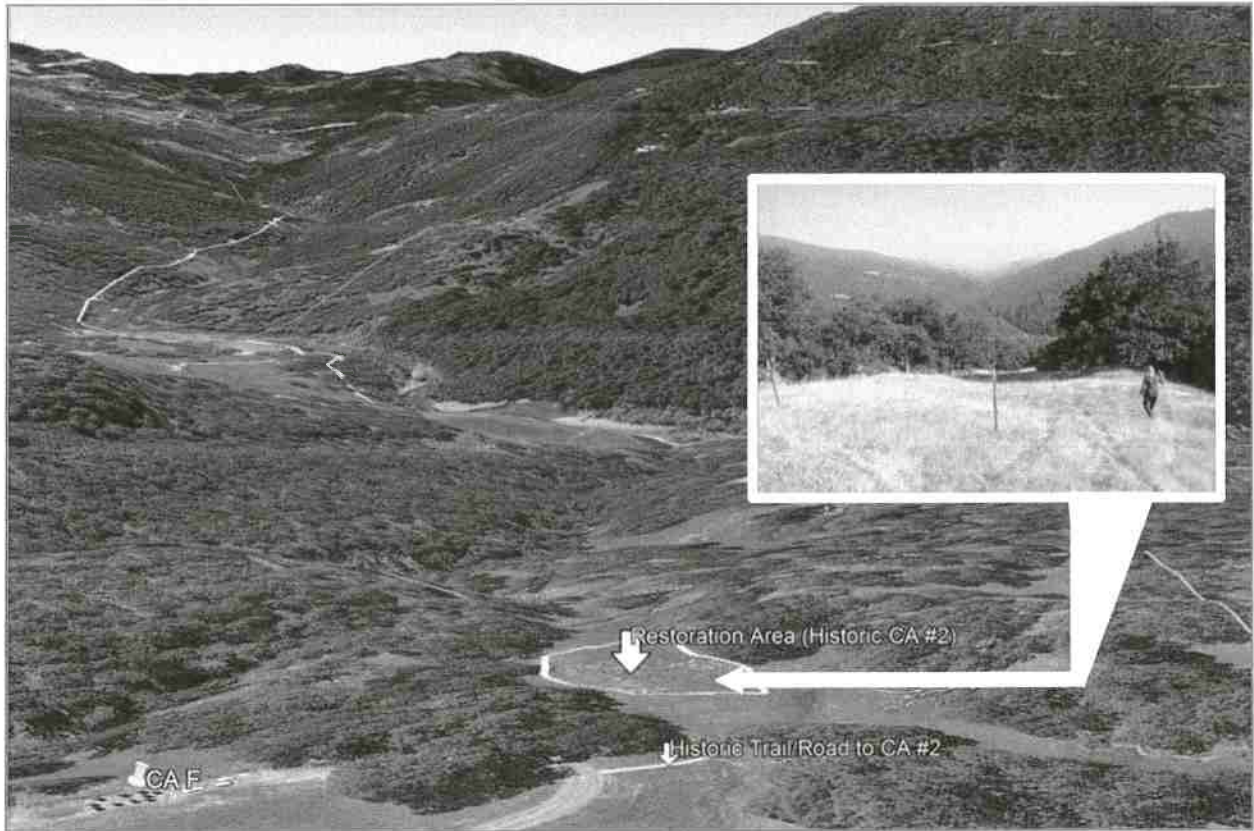


Figure 2. Oblique aerial view showing location of Restoration Area on a south-facing slope with the Mad River in the distance. Inset shows ground view of the area during reconnaissance visit on .

Restoration Site

The property is located near the eastern border of Humboldt County, just to the north of the Mad River and Highway 36. The restoration area is situated on a south-facing hillside about 250 feet from the southern property boundary (**Figure 1** and **Figure 2**), at Latitude 40° 30' N, Longitude 123° 33' W. The restoration site elevation is approximately 3,050 ft above mean sea level.

Weather

The area has a warm-summer Mediterranean climate, with summer high temperatures sometimes reaching the 90s (degrees Fahrenheit), but averaging in the mid-70s. An average of 58 inches of rain per year falls mostly between November and March, and snow up to 30 total inches per year falls over 8-9 days throughout the winter months (**See Appendix A**). There are seldom prolonged cold periods and never deep freezes.



Soils

The soils of California are mapped by the US Department of Agriculture Natural Resources Conservation Service USDA-NRCS) (<https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>). Soil in the restoration area was mapped as the Highyork-Elkcamp-Airstrip complex (unit 4422), or potentially the Pasturerock-Coyoterock-Maneze complex (unit 4426) (**Appendix B**). In either complex, the soils are loamy, with varying levels of gravel (gravelly to extremely gravelly) and with some clay loams. Inspection of soil near the restoration are confirmed a gravelly loam, with a thin top soil layer.

A collaborative project between UC Davis, UC-ANR and USDA-NRCS (<https://casoilresource.lawr.ucdavis.edu/gmap/>) provides additional information on these soil classification, including description of typical associated vegetation. The dominant Highyork series was associated with annual and perennial grass and forms including soft prome, bristly dogtail grass, wildrye, medusahead, and western rush. The Elkcamp series was associated with naturalized annual and perennial grasses and forbs including California oatgrass, tall oatgrass, dogtail, medusahead, and hairy cat's ear, plantain, sheep sorrel and annual legumes (**Appendix B**).

Vegetation

A botanical survey was not conducted during the reconnaissance-level assessment, however based on the soil associations described above and historical land use, it is anticipated that the grassy open areas of the property are dominated by a mix of introduced grasses, such as Mediterranean barley (*Hordeum marinum*), tall fescue (*Festuca arundinacea*), Italian ryegrass (*Festuca perennis*), and wild oat (*Avena fatua*). Many of these types of plants were historically introduced throughout the state from Eurasia, North Africa, Italy and other areas to provide feed for livestock. With aggressive reseeding and grazing by sheep and cattle, native grasses became marginalized, except in limited areas where grazing did not occur. In addition, agricultural supply stores commonly sell mixes of non-native grasses for erosion control and feed, sometimes labeling them in a manner that implies that they are "native" or "local". These seed mixes are frequently used by land owners to stabilize excavated or disturbed areas of their properties.

Grasses native to the hills of Northern California include Lemon's needlegrass (*Stipa [Achnatherum] lemmonii*), California brome (*Bromus carinatus*), leafy reedgrass (*Calamagrostis foliosa*), California oatgrass (*Danthonia californica*), tufted hairgrass (*Deschampsia cespitosa*), blue wildrye (*Elymus glaucus*), big squirreltail (*Elymus multisetus*),



Figure 3. Soil map produced by U.S. Department of Agriculture, Natural Resource Conservation Service, National Cooperative Soil Survey (<https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>)



California fescue (*Festuca californica*), Idaho fescue (*Festuca idahoensis*), junegrass (*Koeleria macrantha*), California melic (*Melica californica*), and purple needlegrass (*Stipa pulchra*, aka *Nassella pulchra* (**Figure 4**), and many other species. Many of these grasses can serve equally well as commercial varieties for erosion control; when mature, the extensive root system of the California state grass, purple needlegrass, can reach 20 feet deep into the soil, binding the soil against erosion and making the grass more drought tolerant.

Reestablishing native plant species helps to restore the foundation of a natural ecosystem, supplying food for wildlife, pollen for bees and flies, subsurface environments among the roots and rhizomes for specialized insects and invertebrates, and water retention and conservation – each piece helping to stitch together the fabric of a damaged system and restore ecological health. Environmental regulatory agencies, including the State Water Resources Control Board, Regional Water Quality Control Board, and State Department of Fish and Wildlife, that permit commercial cannabis operations, often require the integration of native and water conserving plants into restoration and erosion control plans.

Many native plants and seeds suitable for restoration are available for sale in specialized nurseries. A good native plant nursery uses care to select and propagate materials that are appropriate for a specific geographic area, considering plant species and characteristics, as well as genetics. The process typically requires an on-site assessment by a trained plant ecologist and may include harvesting and propagating specially selected seed stock for a project.

The cost associated with obtaining and installing native plant starts and seeds may be many times greater than the cost of planting agricultural mixes. And unless the area is carefully prepared and managed, including regular weed control, nearby non-native species will quickly reestablish and overrun the new plantings.

Restoration Plan

The primary goal of the restoration project is to restore natural topography and vegetation to reduce erosion and protect environmental resources and water quality. This can readily be accomplished on the site. A secondary goal would be to increase the abundance of native plant species, if possible. However, because of the small size of the site (0.23 acre) and the current predominance of naturalized non-native grasses, many of which are invasive, on the site and in the surrounding area, it is unlikely that native grass habitat could be

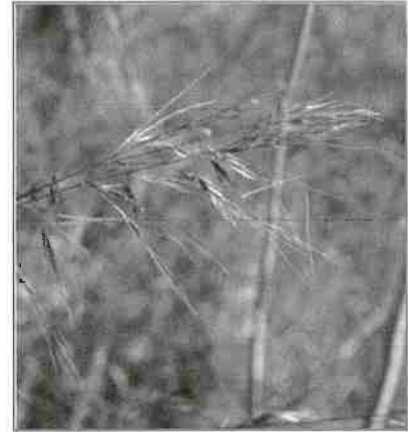


Figure 4. The roots of native purple needlegrass, *Stipa pulchra*, can reach 20 feet below ground surface, binding soil, and conserving water. Photo by Lynn Watson, USDA.



established or sustained. The work will therefore prioritize rapid stabilization and elimination of erosion.

The approach for the restoration will be to remove the sidecast berm features, fill and compact the “divots”, and contour the surface so that surface water will spread evenly over the ground surface, without forming channels or ponds. A grass seed mix will be applied.

The work will be accomplished using primarily hand tools. If there is sufficient standing grass to obscure the ground surface (i.e., make it difficult to see the holes), a string or blade trimmer will first be used to remove the grass. Shovels, rakes, and picks will be used to level the sidecast berms and fill the holes, and a hand compactor will be applied to compress the loose dirt into the holes. If necessary, additional dirt will be added to bring the surface to grade, and the surface will be smoothed and contoured to match the surrounding hillside slope. A suitable grass seed mix (ideally native) will be broadcast over the prepared area and pressed in with a weighted roller. Seeding will be timed to occur before the first rains. If necessary or advised by the seed manufacturer, the seeded areas will be hand irrigated until established.

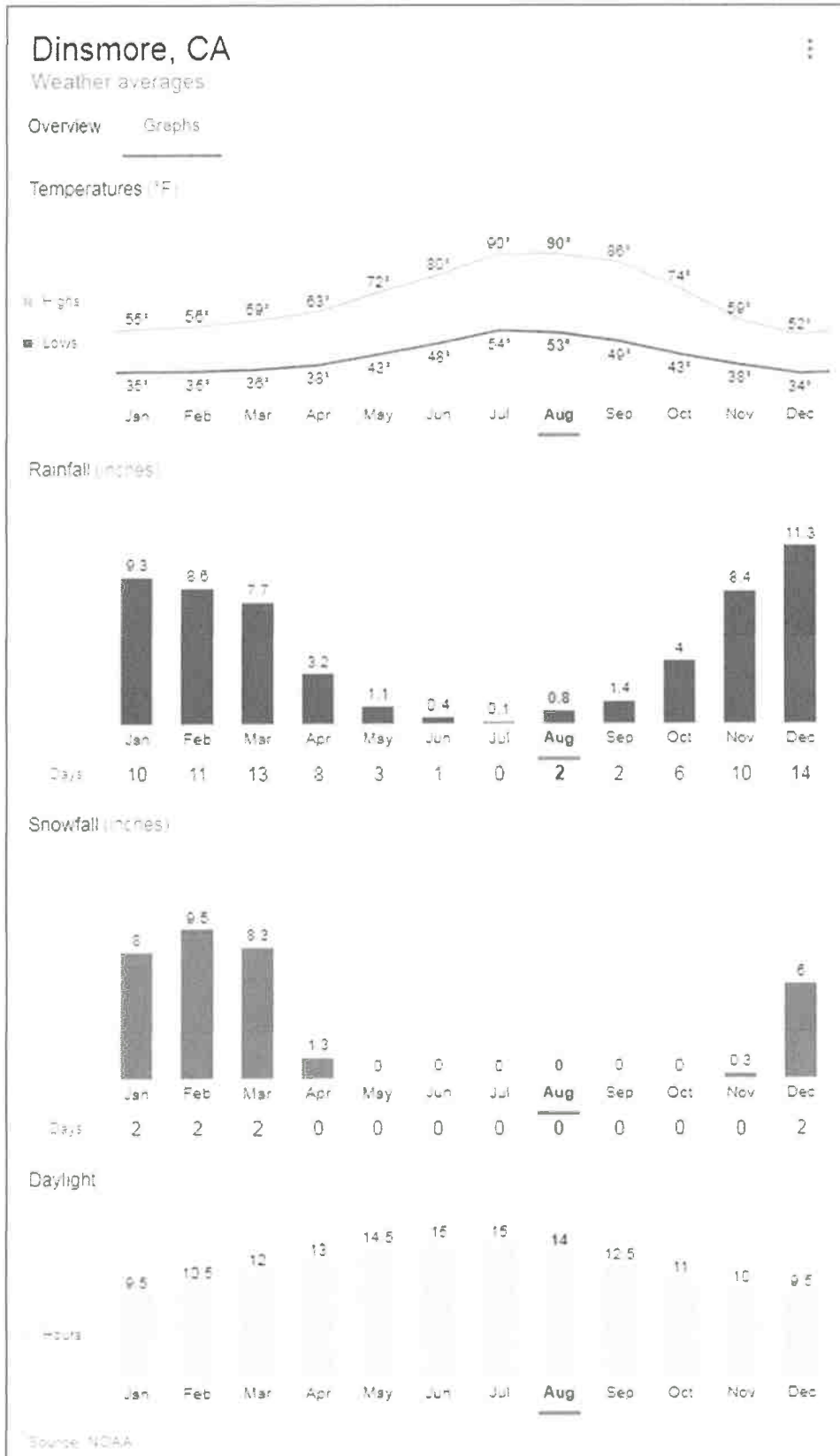
The restored and planted areas will be inspected monthly and after heavy rainstorms to identify any washed out, channelizing, or eroding areas. The cause of any such problems will be determined and remediated.

Reporting

A report detailing the installation, any problems and associated remedies, and the status of the restoration through May 31st will be submitted by June 30th of the year following the installation. If the work was successful through the first winter, no additional reports will be submitted unless requested by the County.



APPENDIX A: CLIMATE INFORMATION

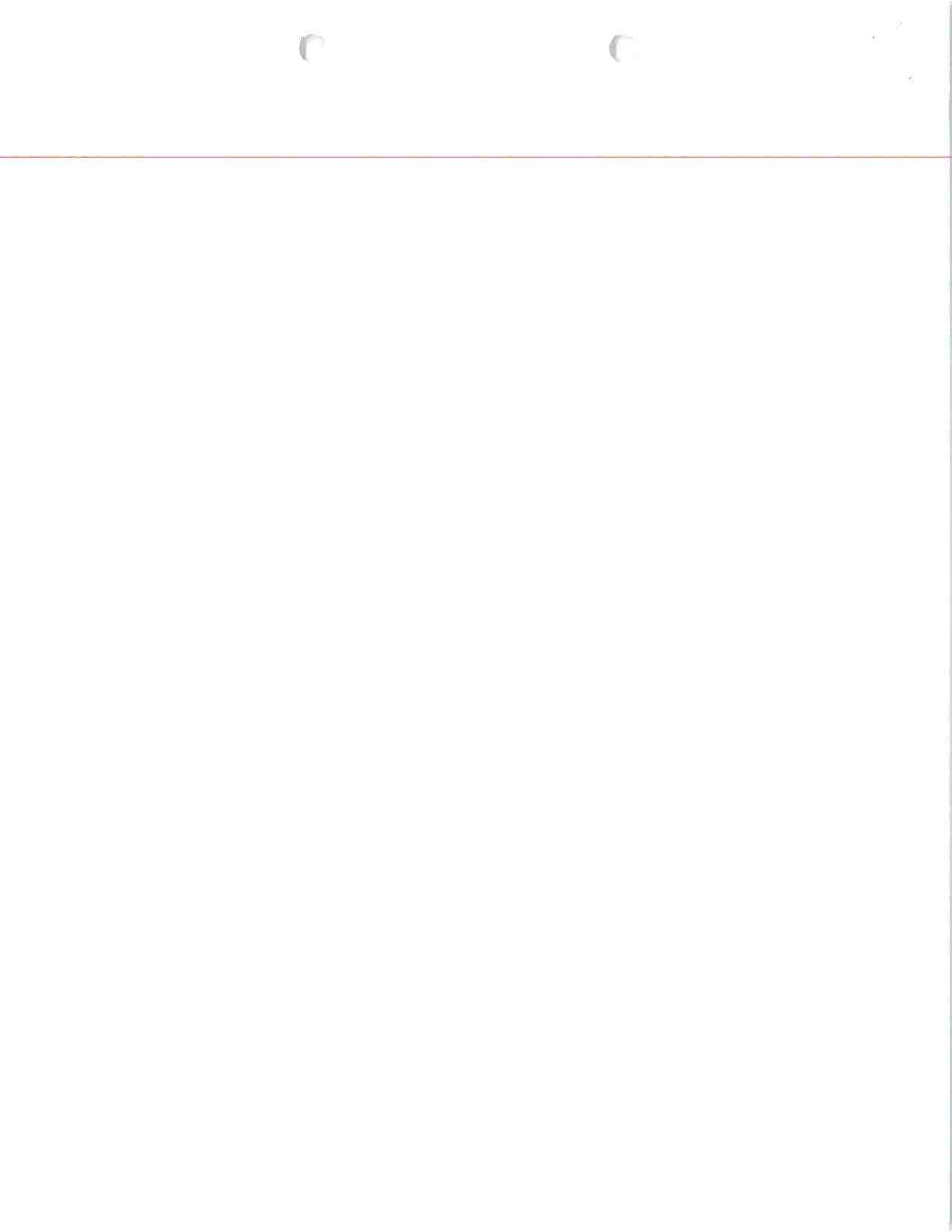


Monthly Weather Averages for the Project Area. (source: National Oceanic Atmospheric Administration)









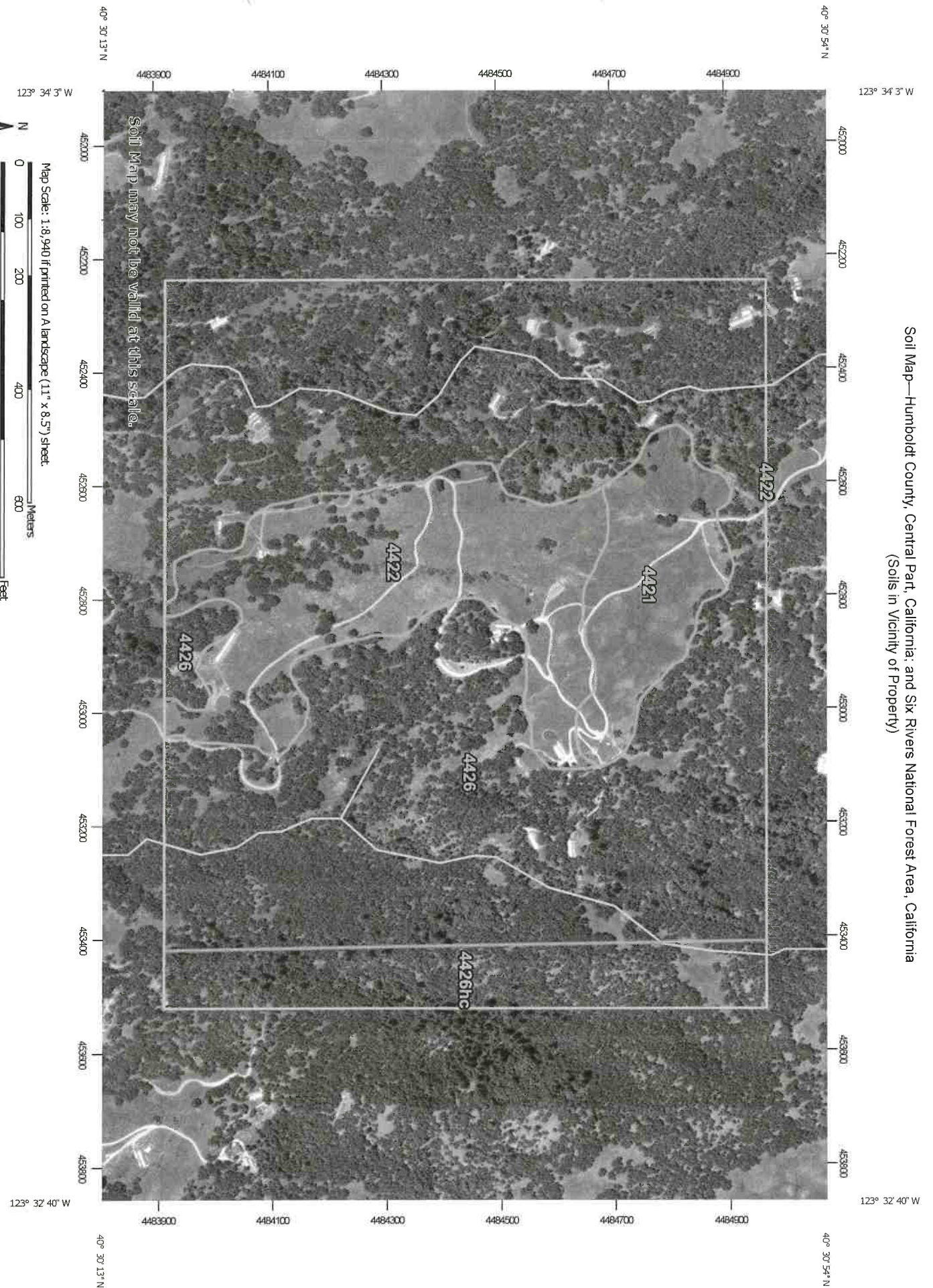
APPENDIX B: SOIL INFORMATION







Soil Map—Humboldt County, Central Part, California; and Six Rivers National Forest Area, California
(Soils in Vicinity of Property)













































Soil Map may not be valid at this scale.

Map Scale: 1:8,940 if printed on A landscape (11" x 8.5") sheet.



MAP LEGEND

| | | | |
|---|------------------------|---|-----------------------|
|  | Area of Interest (AOI) |  | Spoil Area |
|  | Area of Interest (AOI) |  | Stony Spot |
|  | Soils |  | Very Stony Spot |
|  | Soil Map Unit Polygons |  | Wet Spot |
|  | Soil Map Unit Lines |  | Other |
|  | Soil Map Unit Points |  | Special Line Features |
|  | Special Point Features |  | Water Features |
|  | Blowout |  | Streams and Canals |
|  | Borrow Pit |  | Transportation |
|  | Clay Spot |  | Rails |
|  | Closed Depression |  | Interstate Highways |
|  | Gravel Pit |  | US Routes |
|  | Gravelly Spot |  | Major Roads |
|  | Landfill |  | Local Roads |
|  | Lava Flow |  | Background |
|  | Marsh or swamp |  | Aerial Photography |
|  | Mine or Quarry | | |
|  | Miscellaneous Water | | |
|  | Perennial Water | | |
|  | Rock Outcrop | | |
|  | Saline Spot | | |
|  | Sandy Spot | | |
|  | Severely Eroded Spot | | |
|  | Sinkhole | | |
|  | Slide or Slip | | |
|  | Sodic Spot | | |

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Humboldt County, Central Part, California
Survey Area Data: Version 3, Sep 11, 2017

Soil Survey Area: Six Rivers National Forest Area, California
Survey Area Data: Version 11, Oct 3, 2017

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 10, 2014—Mar 13, 2017

Soil Map—Humboldt County, Central Part, California; and Six Rivers National Forest Area, California
(Soils in Vicinity of Property)

MAP LEGEND

MAP INFORMATION

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---------------------------------------|---|--------------|----------------|
| 4421 | Highyork-Elkcamp-Airstrip complex, 15 to 30 percent slopes | 23.5 | 7.0% |
| 4422 | Highyork-Elkcamp-Airstrip complex, 30 to 50 percent slopes | 55.4 | 16.5% |
| 4426 | Pasturerock-Coyoterock-Maneze complex, 15 to 50 percent slopes, dry | 228.0 | 67.9% |
| Subtotals for Soil Survey Area | | 306.9 | 91.4% |
| Totals for Area of Interest | | 335.8 | 100.0% |

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---------------------------------------|---|--------------|----------------|
| 4426hc | Pasturerock-Coyoterock-Maneze complex, 15 to 50 percent slopes, dry | 28.9 | 8.6% |
| Subtotals for Soil Survey Area | | 28.9 | 8.6% |
| Totals for Area of Interest | | 335.8 | 100.0% |

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Humboldt County, Central Part, California

4422—Highyork-Elkcamp-Airstrip complex, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: 2p9v1

Elevation: 1,970 to 4,000 feet

Mean annual precipitation: 55 to 90 inches

Mean annual air temperature: 46 to 55 degrees F

Frost-free period: 200 to 280 days

Farmland classification: Not prime farmland

Map Unit Composition

Highyork and similar soils: 40 percent

Elkcamp, dry, and similar soils: 30 percent

Airstrip, dry, and similar soils: 20 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Highyork

Setting

Landform: Mountain slopes

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Mountainflank

Down-slope shape: Concave, linear, convex

Across-slope shape: Linear, concave

Parent material: Colluvium derived from sandstone and/or earthflow deposits derived from schist

Typical profile

A1 - 0 to 7 inches: loam

A2 - 7 to 18 inches: gravelly clay loam

Bt1 - 18 to 26 inches: gravelly clay loam

Bt2 - 26 to 37 inches: clay loam

Bt3 - 37 to 53 inches: clay loam

Bt4 - 53 to 67 inches: very gravelly clay loam

Bt5 - 67 to 79 inches: gravelly clay loam

Properties and qualities

Slope: 30 to 50 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to moderately high (0.06 to 0.60 in/hr)

Depth to water table: About 10 to 20 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 2 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C/D

Hydric soil rating: No

Description of Elkcamp, Dry

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Colluvium derived from mudstone and/or colluvium derived from sandstone

Typical profile

A1 - 0 to 6 inches: loam
A2 - 6 to 16 inches: loam
ABt - 16 to 28 inches: gravelly clay loam
Bt1 - 28 to 41 inches: gravelly clay loam
Bt2 - 41 to 55 inches: very gravelly clay loam
Bt3 - 55 to 71 inches: very gravelly clay loam

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat):
Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 39 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Airstrip, Dry

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope, footslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave, linear
Across-slope shape: Linear, concave
Parent material: Residuum weathered from sandstone

Typical profile

A1 - 0 to 6 inches: gravelly loam
A2 - 6 to 13 inches: gravelly loam
AC - 13 to 22 inches: very gravelly loam
R - 22 to 79 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent

Depth to restrictive feature: 20 to 39 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat):

Moderately high to high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 2.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Hydric soil rating: No

Minor Components

Kinman

Percent of map unit: 10 percent

Landform: Mountain slopes

Landform position (two-dimensional): Backslope, footslope

Landform position (three-dimensional): Mountainflank

Down-slope shape: Concave, linear, convex

Across-slope shape: Linear, concave

Hydric soil rating: No

Data Source Information

Soil Survey Area: Humboldt County, Central Part, California

Survey Area Data: Version 3, Sep 11, 2017

Soil Survey Area: Six Rivers National Forest Area, California

Survey Area Data: Version 11, Oct 3, 2017

Humboldt County, Central Part, California

4426—Pasturerock-Coyoterock-Maneze complex, 15 to 50 percent slopes, dry

Map Unit Setting

National map unit symbol: 2pt36
Elevation: 520 to 3,160 feet
Mean annual precipitation: 56 to 80 inches
Mean annual air temperature: 50 to 59 degrees F
Frost-free period: 200 to 260 days
Farmland classification: Not prime farmland

Map Unit Composition

Pasturerock, dry, and similar soils: 40 percent
Coyoterock, dry, and similar soils: 25 percent
Maneze, dry, and similar soils: 15 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pasturerock, Dry

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Upper third of mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Colluvium derived from sandstone and mudstone

Typical profile

A - 0 to 10 inches: gravelly loam
A2 - 10 to 24 inches: loam
Bt1 - 24 to 35 inches: clay loam
Bt2 - 35 to 47 inches: gravelly clay loam
Bt3 - 47 to 71 inches: gravelly clay loam

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat):
Moderately high (0.20 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: Oregon white oak/perrenial and annual grasses,
mountain slopes, sandstone and mudstone, clay I
(F004BX114CA)

Other vegetative classification: Oak Woodland (RNPOW001CA)

Hydric soil rating: No

Description of Coyoterock, Dry

Setting

Landform: Mountain slopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Mountainflank

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium derived from sandstone and mudstone

Typical profile

A - 0 to 14 inches: loam

ABt - 14 to 24 inches: loam

Bt1 - 24 to 31 inches: clay

Bt2 - 31 to 37 inches: clay

Cg - 37 to 71 inches: clay

Properties and qualities

Slope: 15 to 50 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Low to
moderately low (0.01 to 0.06 in/hr)

Depth to water table: About 28 to 39 inches

Frequency of flooding: None

Frequency of ponding: None

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0
to 2.0 mmhos/cm)

Available water storage in profile: Moderate (about 8.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: D

Ecological site: Oregon white oak/perrenial and annual grasses,
mountain slopes, sandstone and mudstone, clay I
(F004BX114CA)

Other vegetative classification: Oak Woodland (RNPOW001CA)

Hydric soil rating: No

Description of Maneze, Dry

Setting

Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Colluvium derived from sandstone and mudstone

Typical profile

Oi - 0 to 1 inches: slightly decomposed plant material
A - 1 to 11 inches: very cobbly loam
AB - 11 to 24 inches: very cobbly loam
Bw1 - 24 to 37 inches: extremely gravelly clay loam
Bw2 - 37 to 55 inches: very gravelly clay loam
Bw3 - 55 to 79 inches: very gravelly clay loam

Properties and qualities

Slope: 15 to 50 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat):
Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 39 to 63 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: C
Ecological site: Oregon white oak/perennial and annual grasses, mountain slopes, sandstone and mudstone, clay I (F004BX114CA)
Other vegetative classification: Oak Woodland (RNPOW001CA)
Hydric soil rating: No

Minor Components

Rock outcrop

Percent of map unit: 10 percent
Landform: Mountain slopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Convex
Across-slope shape: Convex
Other vegetative classification: Oak Woodland (RNPOW001CA)
Hydric soil rating: No

Airstrip, dry

Percent of map unit: 10 percent

Landform: Mountain slopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Mountainflank

Down-slope shape: Convex

Across-slope shape: Convex

Ecological site: Upper prairie, mountain slopes, sandstone and
mudstone, clay (R004BX101CA)

Other vegetative classification: Prairie (RNPP001CA)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Humboldt County, Central Part, California

Survey Area Data: Version 3, Sep 11, 2017

Soil Survey Area: Six Rivers National Forest Area, California

Survey Area Data: Version 11, Oct 3, 2017

<https://casoilresource.lawr.ucdavis.edu/gmap/>

LOCATION HIGHYORK CA
Established Series
Rev. JWH/KP
10/2016

HIGHYORK SERIES

The Highyork series consists of very deep, somewhat poorly drained soils that formed in material weathered from chloritic schist and other metasedimentary rocks. Highyork soils are on mountains and have slopes of 15 to 50 percent. The mean annual precipitation is about 2160 millimeters and the mean annual temperature is about 11 degrees C.

TAXONOMIC CLASS: Fine, mixed, superactive, mesic Aquic Argixerolls

TYPICAL PEDON: Highyork silt loam on an east facing convex slope of 15 percent under grassland, at an elevation of 750 meters. (Colors are for dry soil unless otherwise noted.) When described on June 10, 2009, the soil was moist throughout.

A1--0 to 20 cm; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; moderately hard, friable, slightly sticky and slightly plastic; common very fine and fine roots throughout; common very fine and fine tubular pores; 3 percent very strongly cemented gravel; moderately acid (pH 5.8); clear smooth boundary. (15 to 35 cm thick)

A2--20 to 40 cm; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; moderately hard, friable, slightly sticky and moderately plastic; common very fine and fine roots throughout; common very fine tubular pores; 2 percent very strongly cemented gravel; moderately acid (pH 5.8); abrupt smooth boundary. (0 to 30 cm thick)

Bt1--40 to 65 cm; grayish brown (2.5Y 5/2) clay, dark grayish brown (2.5Y 4/2) moist; weak medium and coarse subangular blocky structure; extremely hard, firm,

very sticky and very plastic; few very fine roots throughout; common very fine tubular pores; 30 percent distinct clay films on all faces of peds; 5 percent fine prominent irregular light olive brown (2.5Y 5/6) moist, iron-manganese masses and 5 percent fine faint irregular light olive brown (2.5Y 5/6) moist, iron depletions; neutral (pH 6.6); gradual wavy boundary. (20 to 50 cm thick)

Bt2--65 to 94 cm; gray (2.5Y 5/1) clay, dark gray (2.5Y 4/1) moist; weak coarse subangular blocky structure; extremely hard, firm, very sticky and very plastic; few very fine tubular pores; 20 percent distinct clay films on all faces of peds; 5 percent fine faint irregular dark gray (2.5Y 4/1) moist, iron depletions and 7 percent fine prominent irregular light olive brown (2.5Y 5/6), moist, iron-manganese masses; 3 percent very strongly cemented gravel; neutral (pH 6.8); gradual wavy boundary. (15 to 50 cm thick)

Btg1--94 to 110 cm; gray (5Y 5/1) clay, dark gray (5Y 4/1) moist; weak coarse subangular blocky structure; extremely hard, firm, very sticky and very plastic; few very fine tubular pores; 10 percent faint clay films on all faces of peds; 4 percent fine prominent irregular light olive brown (2.5Y 5/6) moist, iron-manganese masses; 3 percent very strongly cemented gravel; neutral (pH 7.0); gradual wavy boundary. (15 to 50 cm thick)

Btg2--110 to 180 cm; olive gray (5Y 5/2) clay loam, dark gray (5Y 4/1) moist; weak coarse subangular blocky structure; hard, firm, moderately sticky and moderately plastic; 4 percent fine prominent spherical light olive brown (2.5Y 5/6) moist, iron-manganese masses; 25 percent very strongly cemented gravel and 5 percent very strongly cemented cobbles; neutral (pH 7.0). (40 to 70 cm thick)

TYPE LOCATION: Humboldt County, California; about 3 kilometers south of Iaqua Butte; USGS 7.5 minute quadrangle Mad River Buttes, California; 40.6408333 latitude and -123.8702778 longitude; UTM zone 10 426408mE, 4499268mN, NAD 83.

RANGE IN CHARACTERISTICS:

Soil moisture: The soil moisture control section is dry in all parts for 45 or more consecutive days after the summer solstice and moist in all parts from November through May. The soil has a xeric soil moisture regime.

Soil Temperature: The mean annual soil temperature at 50 centimeters is 10 to 15 degrees C. The difference between mean summer and mean winter temperature is 6 degrees or more C. The soil has a mesic soil temperature regime

Depth to Redoximorphic Features: 25 to 50 centimeters

Particle size control section (weighted average):

Rock fragments: 0 to 10 percent gravel, 0 to 5 percent cobbles

Pararock fragments: 0 to 10 percent

Clay content: 35 to 45 percent

Mollic epipedon: 25 to 100 centimeters thick

A horizon

Hue: 10YR or 2.5Y

Value: 4 or 5, 2 or 3 moist

Chroma: 1 or 2, dry or moist

Texture: loam, clay loam or silt loam

Rock fragments: 0 to 25 percent gravel

Clay content: 20 to 27 percent

Reaction: strongly to slightly acid

Upper Bt horizon

Hue: 10YR through 5Y

Value: 4 through 6, 2 through 4 moist

Chroma: 1 through 4, dry or moist

Texture of fine earth: clay loam, silty clay loam, and clay

Rock fragments: 0 to 25 percent gravel

Clay content: 35 to 45 percent

Reaction: moderately acid to neutral

Redoximorphic Features: fine and medium iron-manganese masses

Quantity: few to many

Hue: 10YR or 2.5Y

Value: 3 through 6

Chroma: 3 through 6

Redoximorphic features: fine and medium iron depletions

Quantity: few to common

Hue: 2.5Y or 5Y

Value: 4 or 5

Chroma: 1 or 2

Lower Bt horizon

Hue: 10YR through 10Y and N
Value: 4 through 6, 2.5 through 4 moist
Chroma: 1 through 3, dry or moist
Texture of fine earth: clay loam, silty clay loam, and clay
Rock fragments: 0 to 34 percent gravel, 0 to 10 percent cobbles and stones
Pararock fragments: 0 to 34 percent paragravel
Clay content: 30 to 45 percent
Reaction: moderately acid to neutral

Redoximorphic Features: fine and medium iron-manganese masses
Quantity: few to many
Hue: 10YR or 2.5Y
Value: 4 through 6
Chroma: 3 through 8

Redoximorphic features: fine and medium iron depletions
Quantity: none to common
Hue: 2.5Y or 5Y
Value: 4 or 5
Chroma: 1 or 2

C horizon (when present)
Hue: 2.5Y through 10Y and N
Value: 4 through 6, 2.5 through 4 moist
Chroma: 0 to 3, moist or dry
Texture of fine earth: clay loam, silty clay loam, and clay
Rock fragments: 5 to 34 percent gravel, 0 to 10 percent cobbles
Pararock fragments: 0 to 34 percent paragravel
Clay content: 30 to 45 percent
Reaction: neutral to moderately alkaline

Redoximorphic Features: fine and medium iron-manganese masses
Quantity: few to many
Hue: 10YR or 2.5Y
Value: 3 through 6
Chroma: 3 through 8

Redoximorphic features: fine and medium iron depletions
Quantity: none to common
Hue: 2.5Y or 5Y
Value: 4 or 5

Chroma: 1 or 2

COMPETING SERIES: There are no other series in this family.

GEOGRAPHIC SETTING: Highyork soils are on mountain slopes. Slopes range from 15 to 50 percent. Highyork soils are on concave to slightly convex slopes. Elevations range from 600 to 1100 meters. These soils formed in slope alluvium, colluvium, and residuum. Landscapes dominated by Highyork soils have hummocky relief, slips, and intermittent springs. The climate is subhumid with warm, dry summers and cool, wet winters. Mean annual precipitation is 1500 to 2550 millimeters. Mean January temperature is about 6 degrees C, mean July temperature is about 17 degrees C., and the mean annual temperature is 10 to 15 degrees C. Frost free period is about 200 to 280 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Coolyork, Elkcamp, and Airstrip soils. Coolyork soils are moderately well drained on linear to concave positions, under forest vegetation. Airstrip soils are on convex positions, contain more than 35 percent coarse fragments, and have lithic contact below 50 centimeters. Elkcamp soils contain less than 35 percent clay and are on hummocky slopes.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Somewhat poorly drained; very high runoff; moderately low saturated hydraulic conductivity.

USE AND VEGETATION: This soil is used for livestock grazing, watershed, and wildlife habitat. Vegetation is annual and perennial grass and forbs including soft brome, bristly dogtail grass, wildrye, medusahead, and western rush.

DISTRIBUTION AND EXTENT: Siskiyou-Trinity Area; MLRA 5. The soils are not extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Davis, California

SERIES ESTABLISHED: Humboldt County, South Part, California, 2010. The name is coined.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
Mollic epipedon - the zone from 0 to 40 centimeters (A1, A2 horizons)
Argillic horizon - the zone from 40 to 180 centimeters (Bt1, Bt2, Btg1, and Btg2 horizons)
Particle size control section - the zone from 40 to 90 centimeters (Bt1 and Bt2)

horizons) averages 45 percent clay.

Aquic subgroup - the zone from 40 to 180 cm (Bt1, Bt2, Btg1, and Btg2 horizons)

ADDITIONAL DATA: NASIS Pedon ID: 09CA600241

Keys to Soil Taxonomy, 12th edition

National Cooperative Soil Survey
U.S.A.

LOCATION ELKCAMP CA

Established Series
Rev: JHP/JPS/ET/JH
07/2016

ELKCAMP SERIES

The Elkcamp series consists of very deep, well drained soils formed in colluvium and residuum derived from sandstone, siltstone, and mudstone. Elkcamp soils are on mountains and have slopes of 15 to 50 percent. The mean annual precipitation is about 2290 millimeters (90 inches) and the mean annual temperature is about 13 degrees C (55 degrees F).

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Ultic Palexeralfs

TYPICAL PEDON: Elkcamp loam - on a convex, southwest-facing slope of 30 percent under annual and perennial grasses and forbs at 716 meters (2350 feet) elevation. (Colors are for dry soil unless otherwise stated. When described on November 18, 1978, the soil was dry to a depth of 50 centimeters and moist below)

A--0 to 20 centimeters (0 to 8 inches); grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky parting to moderate very fine and fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine and fine irregular, and few fine and medium tubular pores; 14 percent gravel; very strongly acid (pH 5.0);

gradual smooth boundary. (A horizon is 10 to 30 centimeters thick)

ABt--20 to 54 centimeters (8 to 21 inches); grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure parting to moderate very fine and fine granular; slightly hard, firm, slightly sticky and slightly plastic; common very fine roots; common very fine and fine irregular, and few fine and medium tubular pores; 15 percent gravel; few faint clay films in pores; strongly acid (pH 5.2); gradual wavy boundary. (ABt horizon is 0 to 40 centimeters thick)

Bt1--54 to 95 centimeters (21 to 37 inches); light gray (10YR 7/2) gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard and hard, firm, moderately sticky and moderately plastic; few and common very fine roots; few very fine irregular, and fine and medium tubular pores; many distinct clay films on faces of peds and in pores; 16 percent gravel; strongly acid (pH 5.3); gradual wavy boundary.

Bt2--95 to 125 centimeters (37 to 49 inches); light gray (10YR 7/1) gravelly clay loam, light olive brown (2.5Y 5/4) moist; moderate medium subangular blocky structure; slightly hard and hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine irregular and tubular, and medium tubular pores; common faint and few distinct clay films on faces of peds, and many distinct clay films in pores; 25 percent gravel; strongly acid (pH 5.3); gradual wavy boundary.

Bt3--125 to 166 centimeters (49 to 65 inches); light gray (10YR 7/1) very gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine interstitial and tubular pores; common faint and few distinct clay films on faces of peds, and many distinct clay films in pores; many medium yellowish brown (10YR 5/6) and few fine prominent yellowish brown (10YR 5/8) masses of iron-manganese accumulations in the matrix and around rock fragments, 39 percent gravel; strongly acid (pH 5.4). (Combined thickness of the Bt horizons is 90 to 130 centimeters)

TYPE LOCATION: Redwood National Park, Humboldt. County, California; located approximately 1500 meters; 4.3 kilometers south on K&K road from Bald Hills road, then 128 meters northeast, up slope; southwest quarter, northeast quarter, section 10, T. 9 N., R. 2 E., WGS84 Decimal degrees 40.6678291 latitude and -123.8017604 longitude; HBLM; USGS Bald Hills Quadrangle. UTM Zone 10 421239mE 4560474mN; NAD83.

RANGE IN CHARACTERISTICS:

Soil Moisture: The soil is dry in all parts in the moisture control section from about July 10 to September 20, and is moist in all parts from about October 1 to June 1. The soils have a xeric moisture regime. Depth to seasonal water table is 100 to 150 centimeters (40 to 60 inches).

Soil Temperature: The mean annual soil temperature is 10 to 15 degrees C. The difference between mean summer and mean winter temperature is 6 to 10 degrees C. The soils have a mesic soil temperature regime.

The umbric epipedon is 30 to 70 centimeters thick.

Depth to Redoximorphic features is 100 to 150 centimeters.

Reaction: moderately acid to very strongly acid.
Base saturation is 35 to 75 percent throughout, and may be higher near the surface, reaches a minimum in the Bt and then increases with depth.

Surface fragments: 0 to 15 percent gravel

Particle-Size Control Section (weighted average):

Rock fragments: 10 to 25 percent gravel and 0 to 10 percent cobbles.
Clay content: 23 to 35 percent clay.

A horizon

Hue: 10YR or 2.5Y.
Value: 4 or 5 dry, 2 or 3 moist.
Chroma: 1 through 3 dry, 1 or 2 moist.

Texture of fine earth: loam.
Rock fragments: 0 to 15 percent gravel
Clay content: 20 to 26 percent clay.

Bt horizon

Hue: 10YR or 2.5Y.
Value: 5 through 7 dry, 3 through 5 moist.
Chroma: 1 through 4 dry, 2 through 4 moist.

Texture of fine earth: clay loam or silty clay loam.

Rock fragments: 15 to 50 percent gravel and 0 to 10 percent cobbles.

Clay content: 27 to 35 percent clay.

Redoximorphic features:

Type: fine and medium iron-manganese masses in the matrix, iron stains lining root channels and/or pores

Quantity: common to many

Hue: 5YR, 7.5YR, 10YR, or 2.5Y.

Value: 5 through 7 dry and moist.

Chroma: 6 or 8 dry, 4 through 8 moist.

Some pedons have a Cg horizon.

Hue: 2.5Y or 5Y.

Value: 5 through 8 dry, 4 or 6 moist.

Chroma: 1 through 4 dry, / through 4 moist.

Texture of fine earth: clay loam or silty clay.

Rock fragments: 10 to 40 percent gravel.

Clay content: 35 to 45 percent clay.

Redoximorphic features:

Type: fine and medium iron-manganese masses in the matrix, iron stains lining root channels and/or pores

Quantity: common to many

Hue: 5YR, 7.5 YR, or 10YR.

Value: 5 through 7 dry and moist.

Chroma: 6 or 8 dry, 6 or 8 moist.

COMPETING SERIES: This is the Wolfpeak series. Wolfpeak soils have hues of 7.5YR or redder in the particle-size control section and have an ochric epipedon.

GEOGRAPHIC SETTING: Elkcamp soils are on slope breaks and irregular slopes in mountainous terrain. Slopes are 15 to 50 percent. Elevations are 187 to 985 meters (610 to 3230 feet). The soils formed in slow-moving earthflows derived from sandstone, siltstone, and mudstone. The climate is humid with cool, foggy summers

and cool, rainy winters. Mean annual precipitation is 1200 to 2550 millimeters (50 to 100 inches). Mean January temperature is about 7 degrees C; mean July temperature is about 15 degree C; and the mean annual temperature is 10 to 15 degree C (50 to 59 degrees F). Frost free season is about 200 to 250 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Airstrip and Dolason soils. Airstrip and Dolason soils lack an argillic horizon and lack redoximorphic features between the depths of 100 and 150 centimeters (30 to 60 inches). Airstrip soils are loamy-skeletal and 50 to 102 centimeters (20 to 40 inches) deep to a lithic contact. The Airstrip soils are on ridgetops and spur ridges. The Dolason soils are on smooth slopes alongside and above the Elkcamp soils.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained; high runoff; saturated hydraulic conductivity is moderately high in the surface layer and low in the subsoil.

USE AND VEGETATION: This soil has been used for livestock grazing, recreation, wildlife habitat, and watershed. Naturalized annual and perennial grasses and forbs include California oatgrass, tall oatgrass, dogtail, medusahead, hairy cat's ear, plantain, sheep sorrel and annual legumes.

DISTRIBUTION AND EXTENT: California Coastal Redwood Belt; MLRA 4b. The series is not extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Davis, California.

SERIES ESTABLISHED: Redwood National Park portion, Humboldt and Del Norte Area Soil Survey, California, 2001. The source of the name is from Elkcamp Prairie, located in Redwood National Park south of the town of Orick.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

1. Umbric epipedon - the zone from 0 to 54 centimeters (A1 & AB horizon)
2. Argillic horizon - the zone from 20 to 166 centimeters (ABt, Bt1, Bt2 & Bt3 horizons)
3. Palexeralfs feature - clay maximum is 32 percent in Bt1 horizon and exceeds 26 percent in the Bt2 and Bt3 horizons
4. Ultic feature - Base saturation is 35 to 75 percent throughout, and may be higher near the surface, reaches a minimum in the Bt and then increases with depth.
4. Redoximorphic features - in the zone from 125 to 166 centimeters (Bt2 & Bt3)

horizons)

5. Particle-size control section - the zone from 20 to 70 centimeters, averages 30 percent clay, by field estimate, and 30 percent rock fragments, by volume. CEC/clay ratio averages 0.65

ADDITIONAL DATA: Gordon (1980) presented results of chemical analyses on samples (sample P 3) of Elkcamp soils.

Literature cited: Gordon, B.R., 1980. Soils of the Bald Hills Area of Redwood National Park. Master's thesis, Humboldt State University, Arcata, California. 76 pp.

Soil classified using the 12th Edition of the Keys to Soil Taxonomy.

NASIS User Pedon Id: 78CA605REDW011

National Cooperative Soil Survey
U.S.A.

LOCATION AIRSTRIP CA

Established Series
Rev: JHP/JPS/ET/RLM/SAA
07/2016

AIRSTRIP SERIES

The Airstrip series consists of moderately deep, well drained soils formed in colluvium and residuum derived from sandstone and siltstone. Airstrip soils are on mountains and have slopes of 9 to 50 percent. The mean annual precipitation is about 2290 millimeters (90 inches) and the mean annual temperature is about 11 degrees C (52 degrees F).

TAXONOMIC CLASS: Loamy-skeletal, mixed, superactive, mesic Pachic Humixerepts

TYPICAL PEDON: Airstrip gravelly loam - on a southwest-facing, convex slope of

5 percent under annual and perennial grasses at 910 meters (2985 feet) elevation. (Colors are for dry soil unless otherwise stated. When described October 31, 2002, the soil was moist throughout.)

A1--0 to 7 centimeters (0 to 3 inches); dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; weak fine and medium and granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; common very fine and fine interstitial and very fine and fine tubular pores; 15 percent gravel; very strongly acid (pH 5.0); clear wavy boundary.

A2--7 to 20 centimeters (3 to 8 inches); dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine interstitial and very fine and fine tubular pores; 15 percent gravel; very strongly acid (pH 5.0); gradual wavy boundary.

A3--20 to 42 centimeters (8 to 16 inches); dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak medium and coarse subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine, and few medium roots; common very fine and fine and few medium tubular pores; 10 percent gravel; strongly acid (pH 5.2); clear wavy boundary. (Combined thickness of A horizons is 15 to 50 centimeters)

AC--42 to 67 centimeters (16 to 26 inches); brown (10YR 5/3) extremely gravelly loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium and coarse roots; common very fine and fine interstitial pores; 45 percent gravel and 15 percent cobbles; strongly acid (pH 5.4); gradual wavy boundary. (0 to 30 centimeters thick)

R--67 centimeters (26 inches); fractured greywacke sandstone, fractures greater than 10 centimeters apart.

TYPE LOCATION: Trail Ridge, Humboldt County, California; located in Trail Ridge Prairie, southeast quarter of the northeast quarter, Section 5, T. 8 N., R. 3 E.; WGS84 Decimal degrees 41.1683056 latitude and -123.7490000 longitude; HBLM; USGS Hupa Mountain Quadrangle. UTM Zone 10 428469mE 4551271mN; NAD83.

RANGE IN CHARACTERISTICS:

Soil moisture: The soil is dry in all parts in the moisture control section from about

July 10 to September 20, and is moist in all parts from about October 1 to June 1. The soils have xeric moisture regime.

Soil temperature: The mean annual soil temperature is 10 to 15 degrees C (50 to 59 degrees F). The difference between mean summer and mean winter temperature is 6 to 10 degrees C. The soils have a mesic soil temperature regime.

Depth to a lithic contact: 50 to 100 centimeters.

The umbric epipedon is 50 to 75 centimeters thick.

Base saturation, by ammonium acetate, is less than 35 percent throughout.

Surface fragments: 15 to 35 percent gravel, 0 to 5 percent cobbles

Particle-Size Control Section (weighted average):

Rock fragments: 35 to 60 percent gravel and 0 to 25 percent cobbles.

Clay content: 12 to 26 percent clay.

Some pedons have an Oi horizon (0 to 4 centimeters thick) and some pedons have a Cambic horizon.

A horizon

Hue: 10YR or 2.5Y.

Value: 4 or 5 dry, 2 or 3 moist.

Chroma: 1 through 3 dry, 1 through 3 moist.

Texture of fine earth: loam.

Rock fragments: 10 to 35 percent gravel and 0 to 10 percent cobbles.

Clay content: 12 to 24 percent clay.

Reaction: strongly or very strongly acid.

Some pedons have a Bw horizon

Hue: 10YR or 2.5Y.

Value: 5 through 7 dry, 3 through 5 moist.

Chroma: 3 or 4 dry, 3 moist.

Texture of fine earth: loam.

Rock fragments: 35 to 60 percent gravel and 0 to 25 percent cobbles.

Clay content: 20 to 26 percent clay.
Reaction: strongly or very strongly acid.

Some pedons have a C horizon

Hue: 2.5Y.
Value: 5 through 7 dry, 3 through 5 moist.
Chroma: 2 through 4 dry, 2 through 4 moist.

Texture of fine earth: loam.
Rock fragments: 35 to 60 percent gravel and 0 to 25 percent cobbles.
Clay content: 20 to 26 percent clay.
Reaction: strongly or very strongly acid.

COMPETING SERIES: These are the Wyeth soils. Wyeth soils are very deep, and do not have a lithic contact.

GEOGRAPHIC SETTING: Airstrip soils are on strongly convex ridge tops, spur ridges and mountain slopes. Slopes are 9 to 50 percent. Elevations are 67 to 1032 meters (500 to 3385 feet). The soils formed in colluvium and residuum derived from sandstone and siltstone. The climate is humid with cool, foggy summers and cool, rainy winters. Mean annual precipitation is 1780 to 2550 millimeters (70 to 100 inches). Mean January temperature is about 7 degrees C; mean July temperature is about 15 degrees C; and the mean annual temperature is 10 to 15 degrees C (50 to 59 degrees F). Frost-free season is about 200 to 280 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Countshill and Dolason soils. Countshill and Dolason soils are fine-loamy and have umbric epipedons that are 50 to 102 centimeters (20 to 40 inches) thick. The Countshill soils are on smooth ridgetops and the Dolason soils are on smooth sideslopes and ridgetop saddles.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Well drained; high runoff; moderately high saturated hydraulic conductivity.

USE AND VEGETATION: This soil has been used for livestock grazing, wildlife habitat, and watershed. Natural vegetation consists of California oatgrass, dogtail grass, foxtail fescue, tall oatgrass, plantain, sheep sorrel, hairy cat's ear, and annual legumes. Invasion by Douglas-fir and other forest species occurs primarily in disturbed areas and along forest borders.

DISTRIBUTION AND EXTENT: California Coastal Redwood Belt; MLRA 4B.
The series is not extensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Davis,
California.

SERIES ESTABLISHED: Redwood National Park portion, Humboldt and Del Norte Area Soil Survey, California, 2007. The source of the name is from Airstrip Prairie, located in Redwood National Park south of the town of Orick.

REMARKS: The series type location was moved in 2004 to better reflect the series concept.

Diagnostic horizons and features recognized in this pedon are:

1. Umbric epipedon - the zone from 0 to 67 centimeters (A horizon)
2. Lithic contact - the bedrock interface at 67 centimeters depth
3. Particle-size control section - the zone from 25 to 67 centimeters, averages 14 percent clay, by field estimate, and 36 percent rock fragments, by volume. CEC/clay ratio averages 0.60

ADDITIONAL DATA: Soil samples 83-RNP-9 and 86-RNP-8 were collected from a similar pedon and analyzed chemically at the Oregon State University Soil Testing Laboratory (lab numbers 71712-71714, 82918 and 82919). Bulk density and moisture retention were determined at Humboldt State University.

NASIS User Pedon ID 02CA605REDW060

Soil classified using the 12th Edition of the Keys to Soil Taxonomy.

National Cooperative Soil Survey
U.S.A.