Appendix R1.4

Geology and Soils

This appendix presents 2 tables that show acreage of geologic units and soil textures within the Plan Area as well as 10 maps of soil texture (one map for each ecoregion subarea).

Note on Rounding of Data:

The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore the subtotals may not sum to the total within the table.

Appendix R1.4 Geology and Soils

Table R1.4-1
Surficial Geology in the Plan Area

Parent Material	Geologic Unit Name	Acres[1]
Gabbroic	Mesozoic gabbroic rocks	44,000
	Total	**44,000**
Granitic	Cenozoic (Tertiary) granitic rocks	64,000
	Mesozoic granitic rocks	2,493,000
	Paleozoic and Permo-Triassic granitic rocks	1,000
	Precambrian granitic rocks	198,000
	Undated granitic rocks	96,000
	Total	**2,852,000**
Granitic and Metamorphic	Granitic and metamorphic rocks, undivided, of Pre-Cenozoic age	110,000
	Total	**110,000**
Igneous and Metamorphic	Precambrian igneous and metamorphic rock complex	438,000
	Total	**438,000**
Metavolcanic	Mesozoic volcanic and metavolcanic rocks; Franciscan volcanic rocks	135,000
	Paleozoic metavolcanic rocks	222,000
	Undivided pre-Cenozoic metavolcanic rocks	12,000
	Total	**369,000**
Mixed Rock	Miocene marine	190,000
	Total	**190,000**
Sand Dune	Extensive sand dune deposits	707,000
	Total	**707,000**
Sedimentary	Alluvium (mostly Holocene, some Pleistocene) Quaternary nonmarine and marine	13,684,000
	Miocene marine	70
	Miocene nonmarine	150,000
	Oligocene nonmarine	400
	Paleocene marine	900
	Pliocene marine	42,000
	Plio-Pleistocene nonmarine, Pliocene nonmarine	709,000
	Selected large landslide deposits	4,000
	Tertiary nonmarine, undivided	302,000
	Total	**14,893,000**
Sedimentary and Metasedimentary	Carboniferous marine	35,000
	Cretaceous marine undivided	49,000
	Devonian marine	20,000
	Jurassic marine	1,000
	Limestone of probable Paleozoic or Mesozoic age	19,000
	Paleozoic marine, undivided	71,000
	Permian marine	11,000
	Precambrian rocks, undivided	806,000

Table R1.4-1
Surficial Geology in the Plan Area

Parent Material	Geologic Unit Name	Acres[1]
	Schist of various types and ages (metasedimentary or metavolcanic	89,000
	Silurian and/or Ordovician marine	43,000
	Triassic marine	4,000
	Total	**1,147,000**
Volcanic	Quaternary volcanic flow rocks	143,000
	Quaternary pyroclastic rocks and volcanic mudflow deposits	20
	Recent (Holocene) pyroclastic rocks & volcanic mudflow deposits	2,000
	Recent (Holocene) volcanic flow rocks	58,000
	Tertiary intrusive rocks	124,000
	Tertiary pyroclastic rocks and volcanic mudflow deposits	205,000
	Tertiary volcanic flow rocks	1,089,000
	Total	**1,621,000**
Water	Water	215,000
	Total	**215,000**
	Grand Total	**22,587,000**

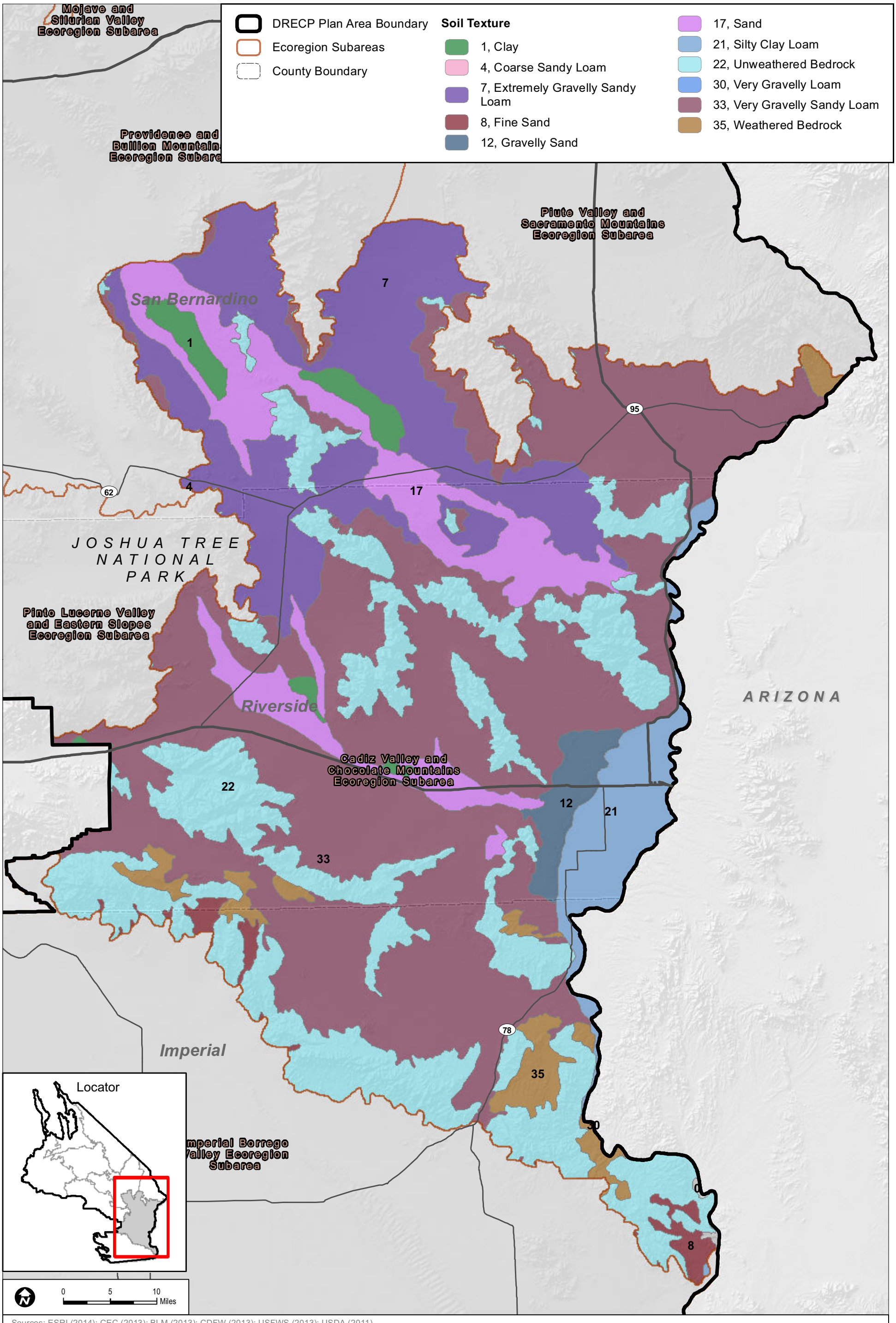
Source: California Department of Conservation 2010 as cited in Dudek and ICF 2012

Table R1.4-2
Soil Textures Mapped within the Plan Area

Soil Texture	Acres
Clay	301,000
Clay loam	65,000
Coarse sand	6,000
Coarse sandy loam	871,000
Cobbly fine sandy loam	87,000
Cobbly sand	60,000
Extremely gravelly sandy loam	1,606,000
Fine sand	831,000
Fine sandy loam	479,000
Gravelly loam	10,000
Gravelly loamy coarse sand	195,000
Gravelly sand	47,000
Gravelly sandy loam	114,000
Loam	17,000
Loamy fine sand	732,000
Loamy sand	4,533,000
Sand	1,160,000
Sandy loam	1,051,000
Silt loam	2,000
Silty clay	223,000
Silty clay loam	692,000
Unweathered bedrock	4,190,000
Very channery loam	22,000
Very cobbly fine sandy loam	5,000
Very cobbly loamy sand	39,000
Very cobbly sandy loam	7,000
Very fine sandy loam	211,000
Very gravelly coarse sand	388,000
Very gravelly fine sandy loam	39,000
Very gravelly loam	50
Very gravelly loamy fine sand	13,000
Very gravelly loamy sand	347,000
Very gravelly sandy loam	3,231,000
Very gravelly silt loam	500
Weathered bedrock	822,000
Not Mapped	188,000
Total	**22,585,000**

Source: Dudek and ICF 2012

INSERT Figure R1.4-1, Soil Textures within the Cadiz Valley and Chocolate Mountains Ecoregion Subarea
INSERT Figure R1.4-2, Soil Textures within the Imperial Borrego Valley Ecoregion Subarea
INSERT Figure R1.4-3, Soil Textures within the Kingston and Funeral Mountains Ecoregion Subarea
INSERT Figure R1.4-4, Soil Textures within the Mojave and Silurian Valley Ecoregion Subarea
INSERT Figure R1.4-5, Soil Textures within the Owens River Valley Ecoregion Subarea
INSERT Figure R1.4-6, Soil Textures within the Panamint Death Valley Ecoregion Subarea
INSERT Figure R1.4-7, Soil Textures within the Pinto Lucerne Valley and Eastern Ecoregion Subarea
INSERT Figure R1.4-8, Soil Textures within the Piute Valley and Sacramento Mountains Ecoregion Subarea
INSERT Figure R1.4-9, Soil Textures within the Providence and Bullion Mountains Ecoregion Subarea
INSERT Figure R1.4-10, Soil Textures within the West Mojave and Eastern Slopes Ecoregion Subarea

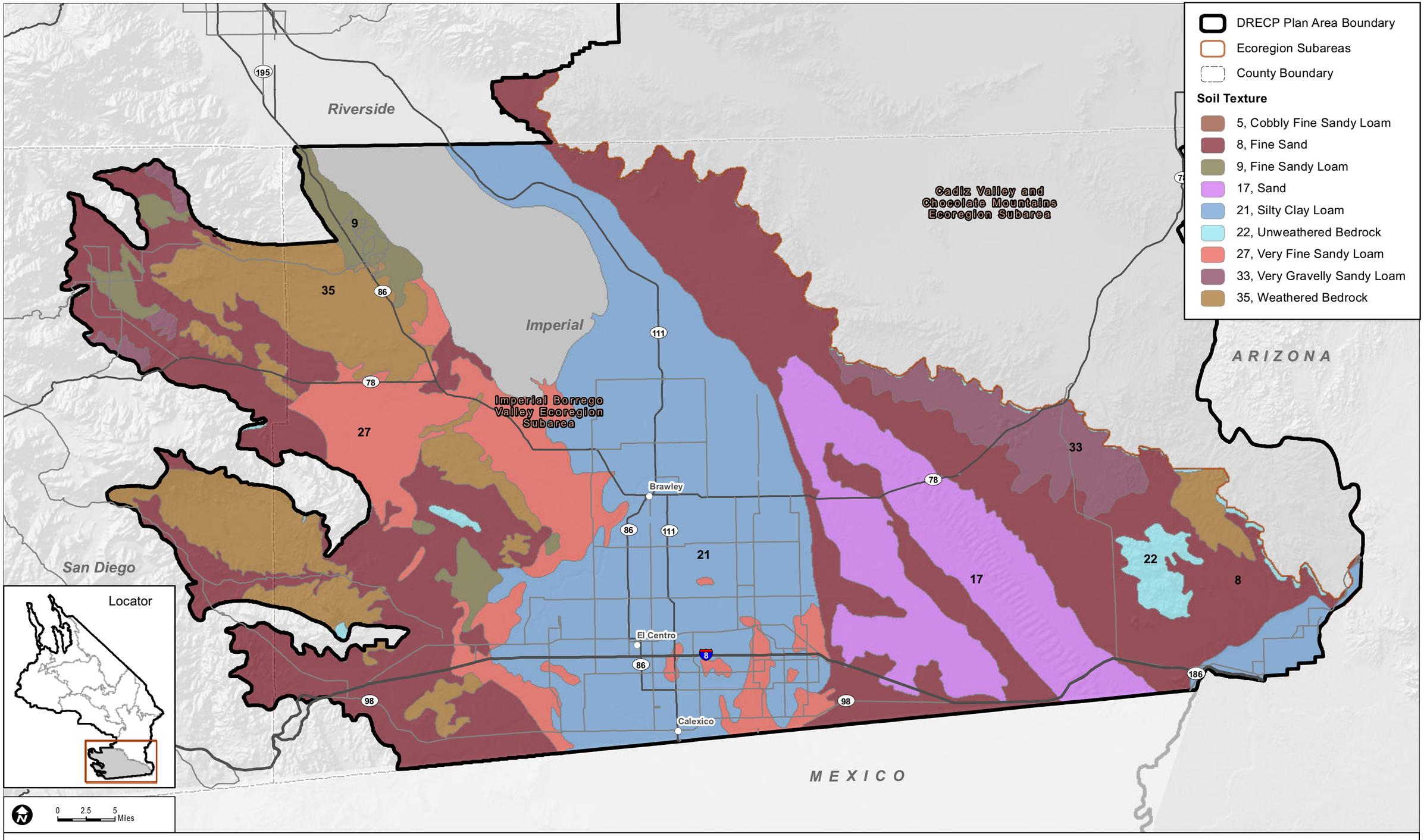


Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USDA (2011)

FIGURE R1.4-1

Soil Textures within the Cadiz Valley and Chocolate Mountains Ecoregion Subarea

M:\JOBS4\6287\common_gis\EIR_Figures_Spring_2014\Appendix R\R1.4-1_Soils\figR1.4-1.mxd 8/22/2014

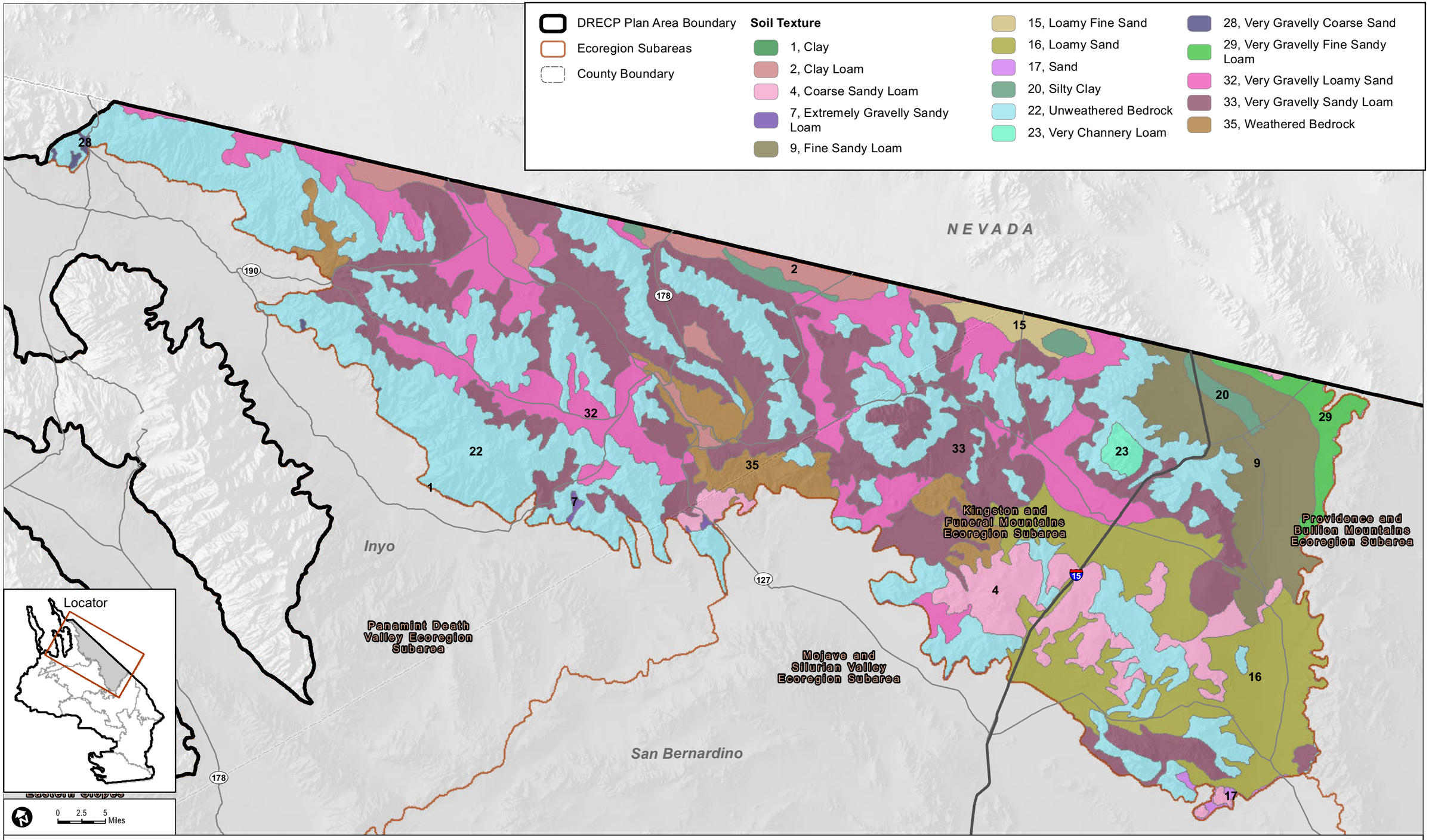


Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USDA (2011)

FIGURE R1.4-2

Soil Textures within the Imperial Borrego Valley Ecoregion Subarea

M:\JOBS4\6287\common_gis\EIR_Figures_Spring_2014\Appendix R\R1.4-1_Soils\figR1.4-2.mxd 8/22/2014

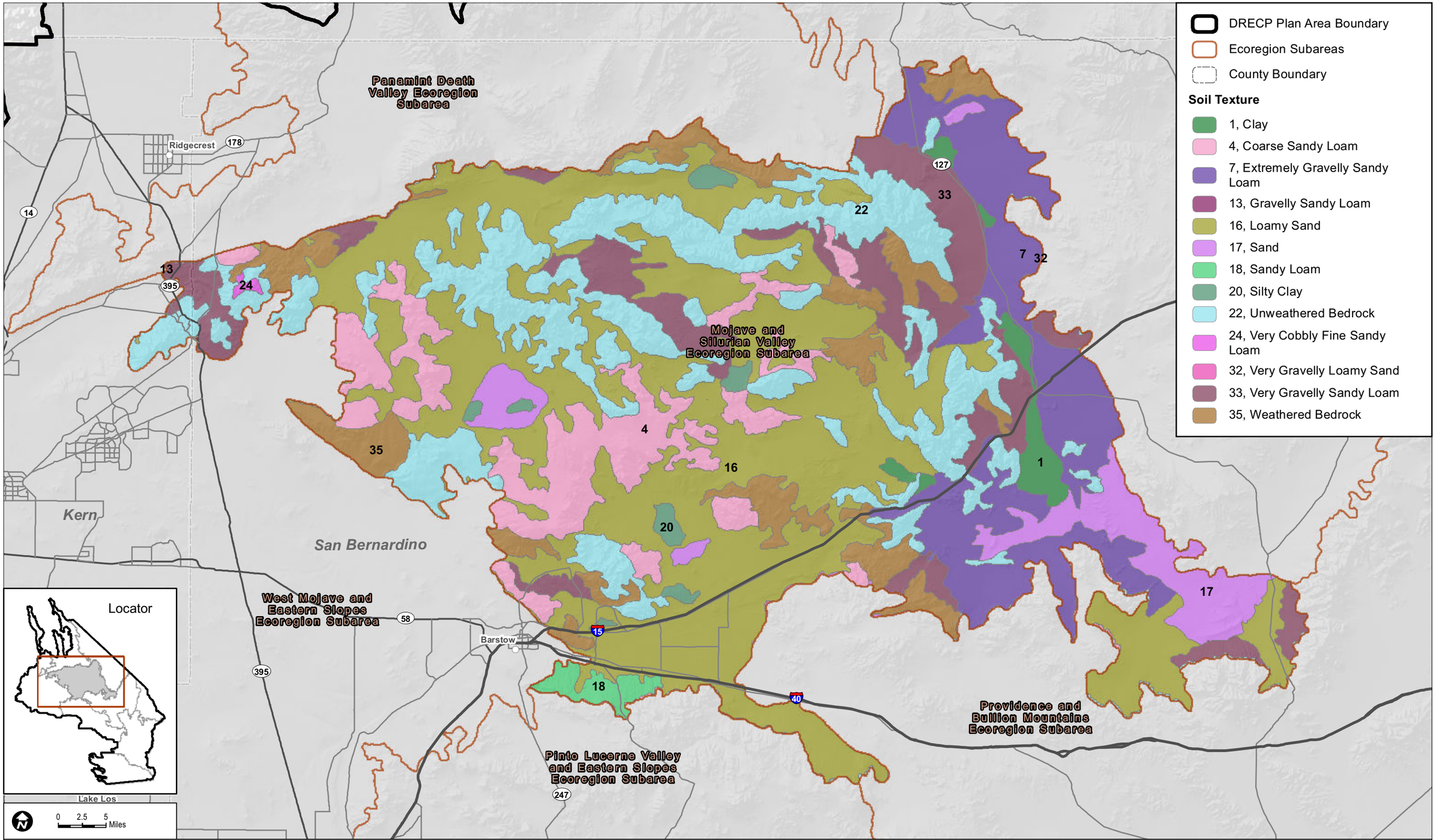


Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USDA (2011)

FIGURE R1.4-3

Soil Textures within the Kingston and Funeral Mountains Ecoregion Subarea

M:\JOBS4\6287\common_gis\EIR_Figures_Spring_2014\Appendix R\R1.4-1_Soils\figR1.4-3.mxd 8/22/2014



Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USDA (2011)

FIGURE R1.4-4

Soil Textures within the Mojave and Silurian Valley Ecoregion Subarea

M:\JOBS4\6287\common_gis\EIR_Figures_Spring_2014\Appendix R\R1.4-1_Soils\figR1.4-4.mxd 8/22/2014

DRECP Plan Area Boundary
Ecoregion Subareas
County Boundary

Soil Texture

- 3, Coarse Sand
- 9, Fine Sandy Loam
- 11, Gravelly Loamy Coarse Sand
- 13, Gravelly Sandy Loam
- 14, Loam
- 16, Loamy Sand
- 17, Sand
- 20, Silty Clay
- 22, Unweathered Bedrock
- 24, Very Cobbly Fine Sandy Loam
- 26, Very Cobbly Sandy Loam
- 31, Very Gravelly Loamy Fine Sand

Fresno
Tulare
Inyo
Owens River Valley Ecoregion Subarea
West Mojave and Eastern Slopes Ecoregion Subarea
168
395
180
190
136

Locator

0 2.5 5 Miles

Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USDA (2011)

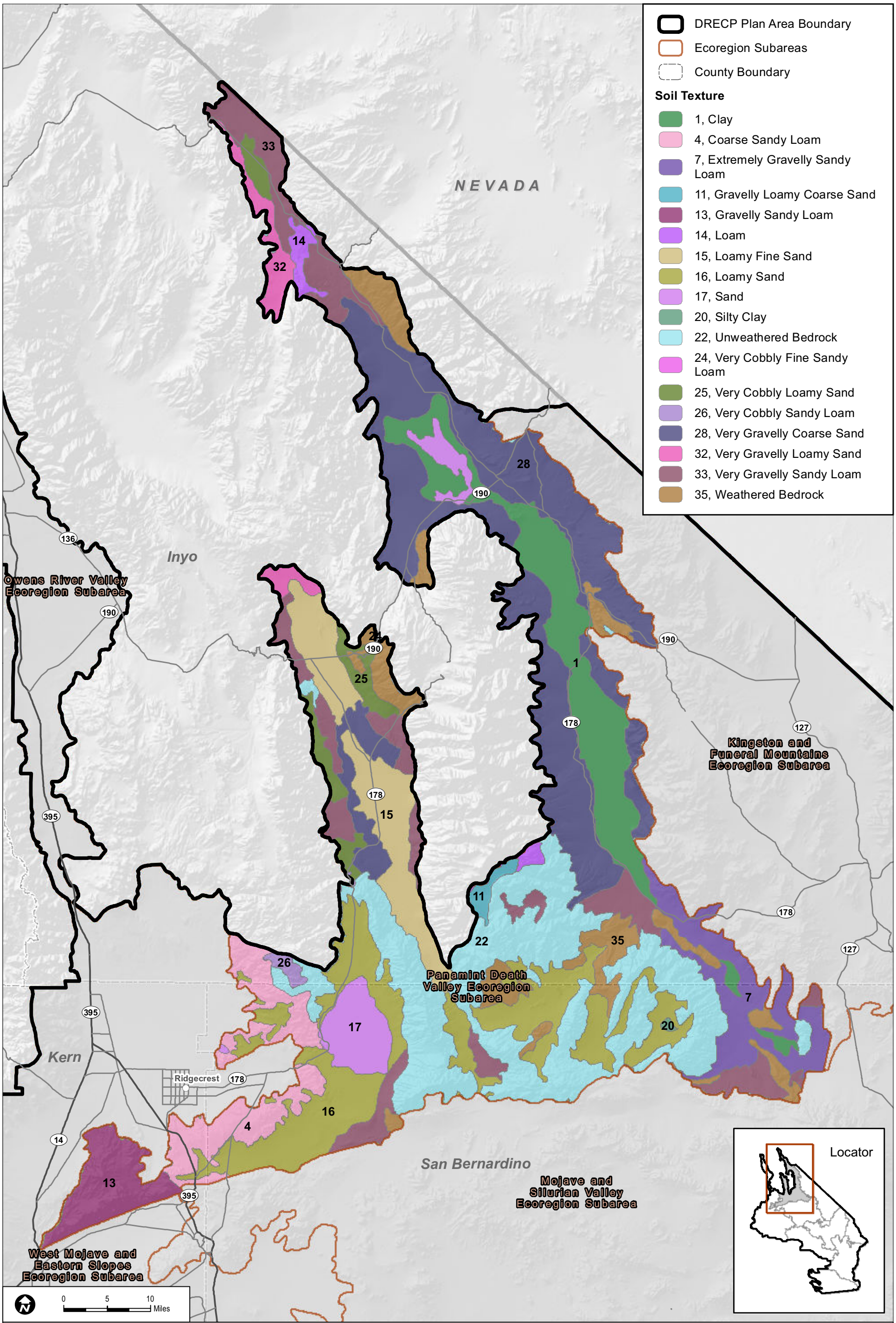
FIGURE R1.4-5

Soil Textures within the Owens River Valley Ecoregion Subarea

Draft DRECP and EIR/EIS

August 2014

M:\JOBS4\6287\common_gis\EIR_Figures_Spring_2014\Appendix R\R1.4-1_Soils\figR1.4-5.mxd 8/22/2014

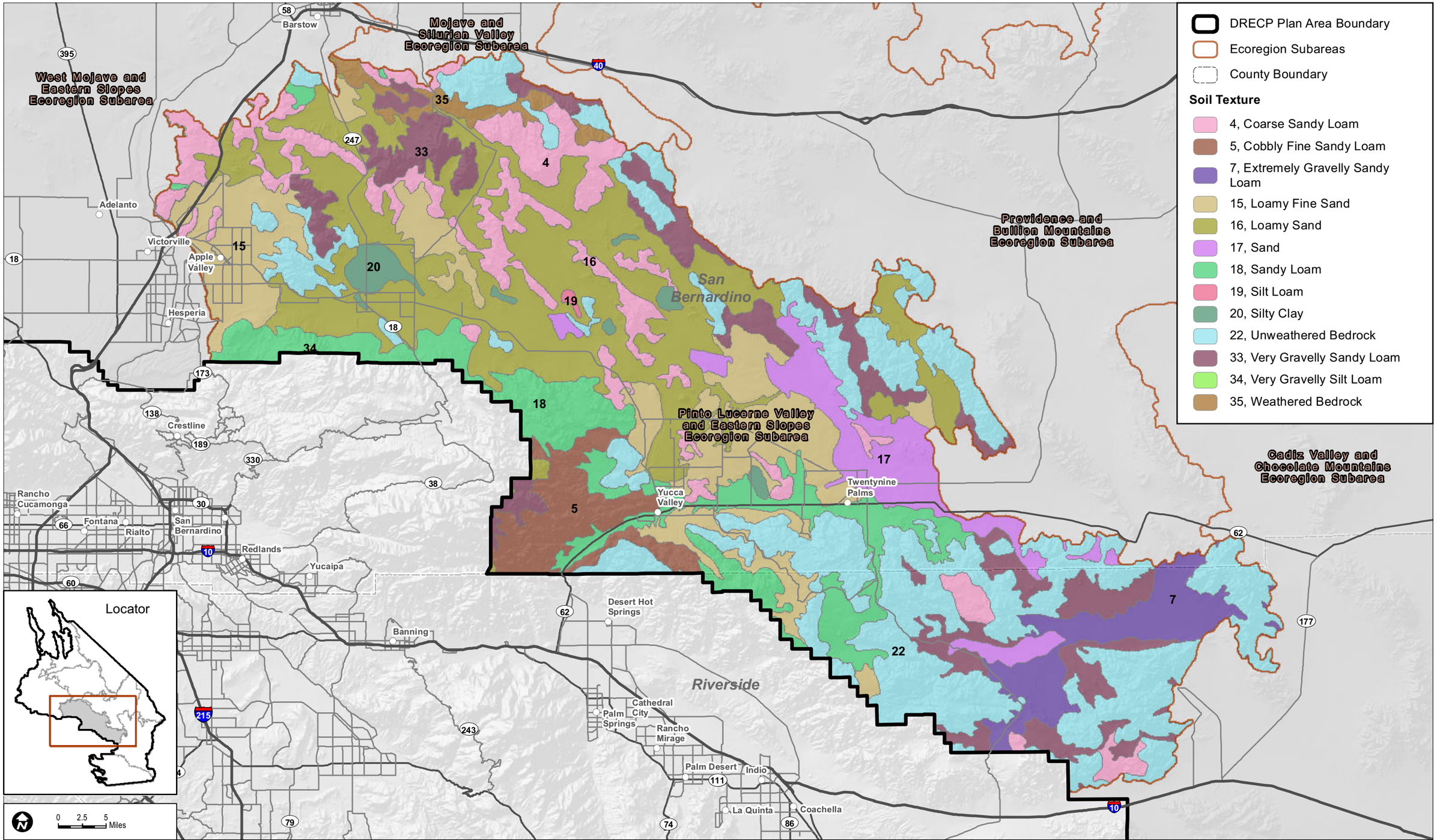


Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USDA (2011)

FIGURE R1.4-6

Soil Textures within the Panamint Death Valley Ecoregion Subarea

M:\JOBS4\6287\common_gis\EIR_Figures_Spring_2014\Appendix R\R1.4-1_Soils\figR1.4-6.mxd 8/22/2014

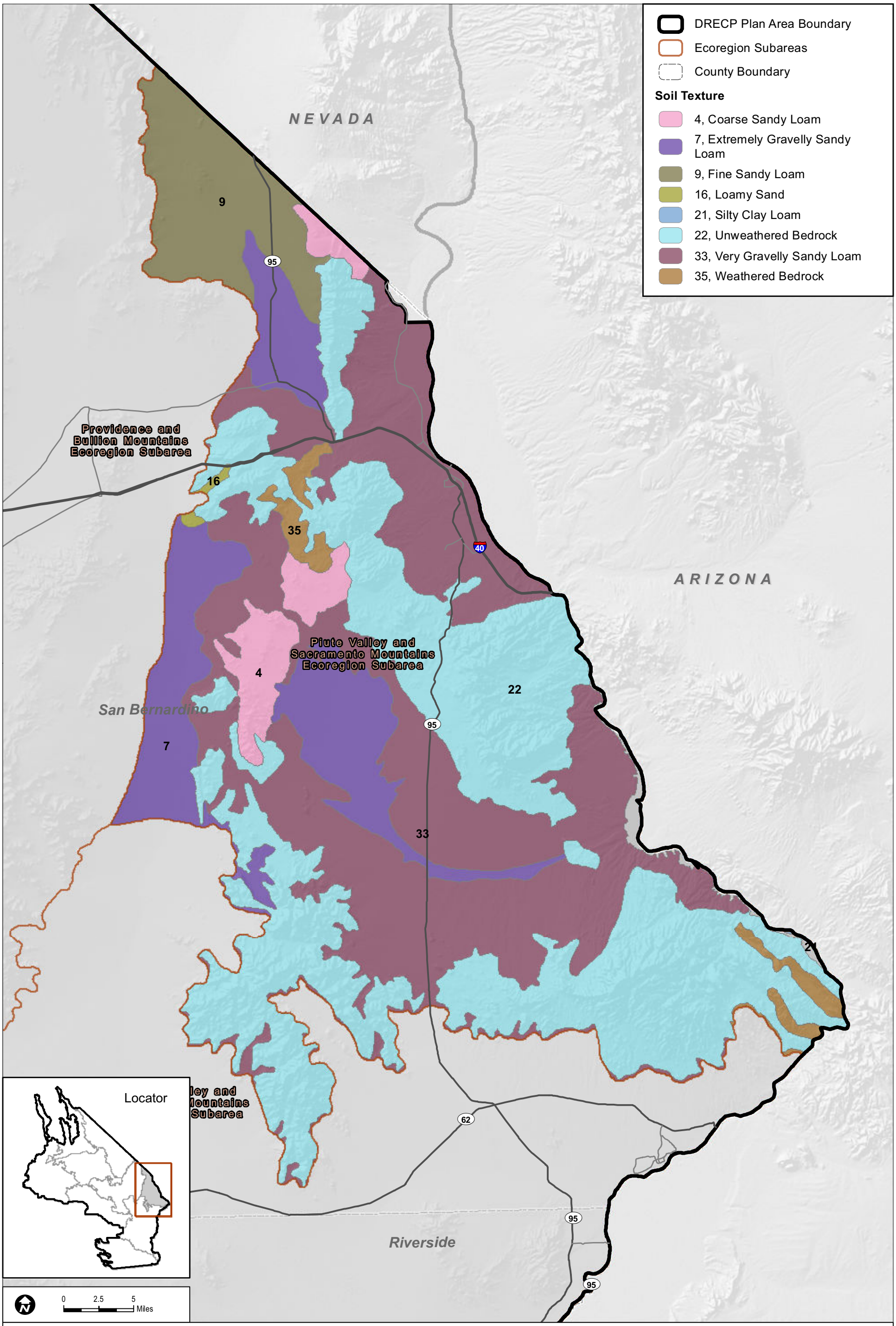


Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USDA (2011)

FIGURE R1.4-7

Soil Textures within the Pinto Lucerne Valley and Eastern Slopes Ecoregion Subarea

M:\JOBS4\6287\common_gis\EIR_Figures_Spring_2014\Appendix R\R1.4-1_Soils\figR1.4-7.mxd 8/22/2014



Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USDA (2011)

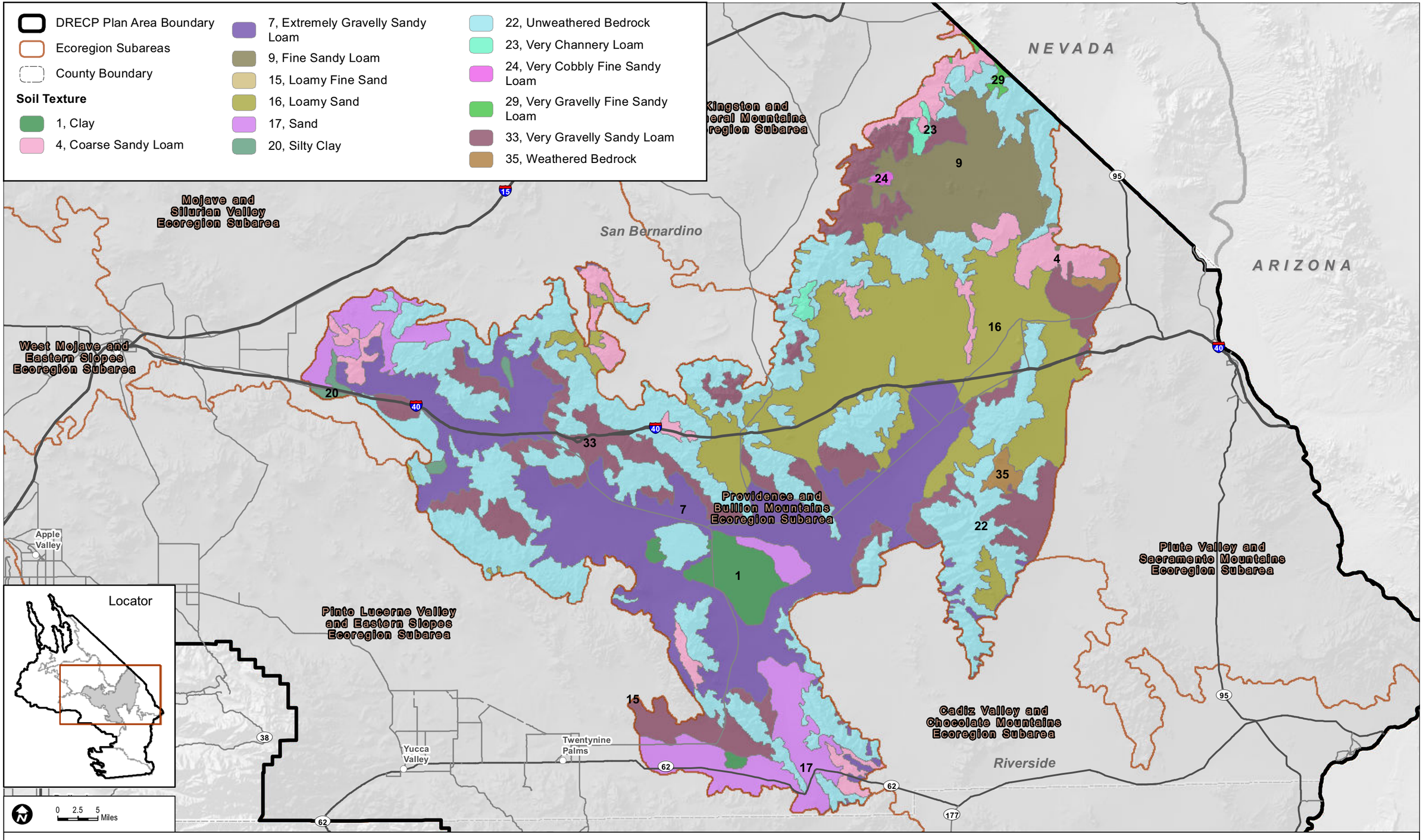
FIGURE R1.4-8

Soil Textures within the Piute Valley and Sacramento Mountains Ecoregion Subarea

Draft DRECP and EIR/EIS

August 2014

M:\JOBS4\6287\common_gis\EIR_Figures_Spring_2014\Appendix R\R1.4-1_Soils\figR1.4-8.mxd 8/22/2014

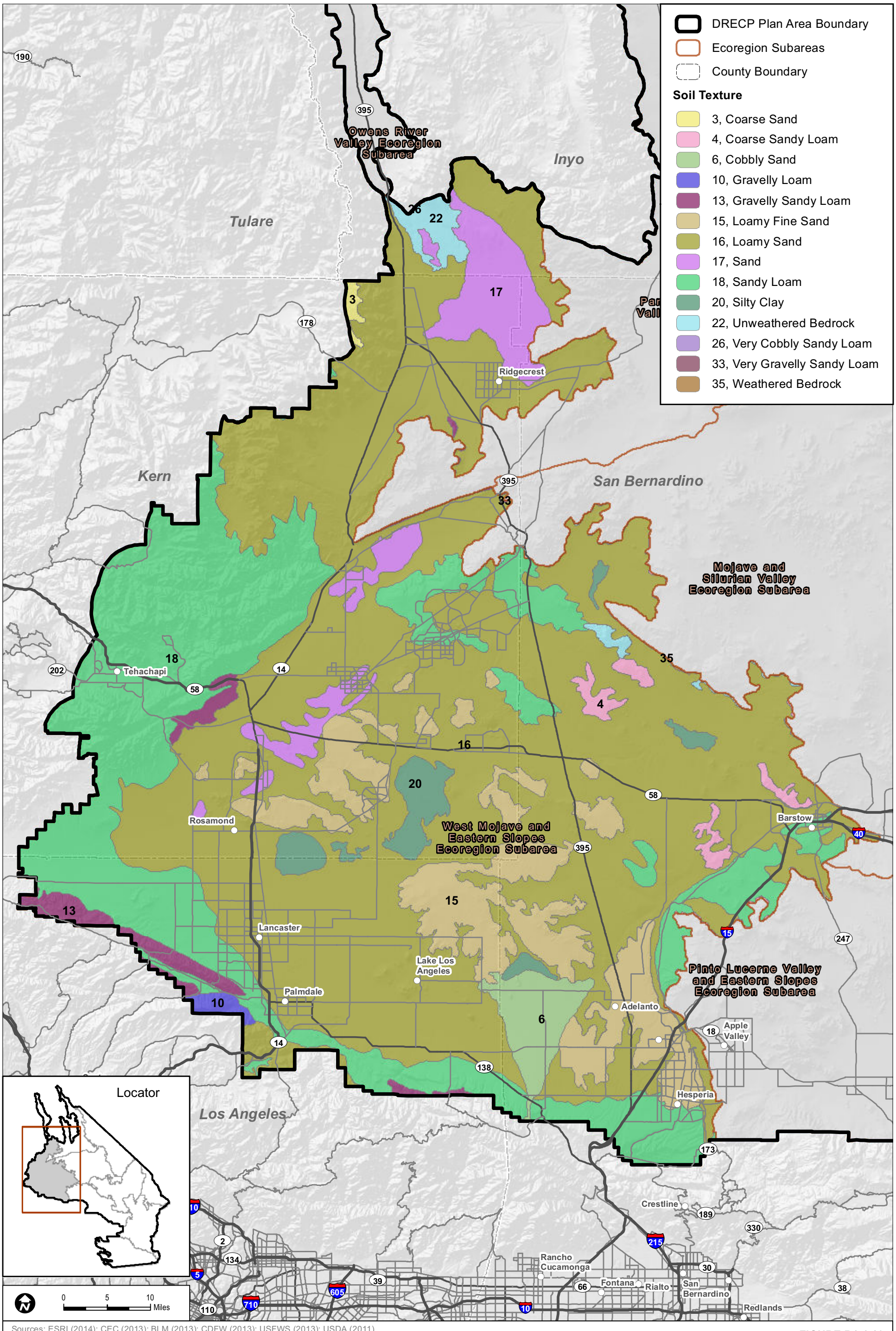


Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USDA (2011)

FIGURE R1.4-9

Soil Textures within the Providence and Bullion Mountains Ecoregion Subarea

M:\JOBS4\6287\common_gis\EIR_Figures_Spring_2014\Appendix R\R1.4-1_Soils\figR1.4-9.mxd 8/22/2014



Sources: ESRI (2014); CEC (2013); BLM (2013); CDFW (2013); USFWS (2013); USDA (2011)

FIGURE R1.4-10

Soil Textures within the West Mojave and Eastern Slopes Ecoregion Subarea

M:\JOBS4\6287\common_gis\EIR_Figures_Spring_2014\Appendix R\R1.4-1_Soils\figR1.4-10.mxd 8/22/2014