APPENDIX D Part 2

Biological Resources Technical Report

4 ENVIRONMENTAL SETTING (EXISTING CONDITIONS)

4.1 Site Description

4.1.1 Boulder Brush Boundary

The Boulder Brush Boundary consists of 18 private parcels, totaling approximately 2,000 acres, in unincorporated southeastern San Diego County, California (Figure 1-2, Project Location). The Boulder Brush Boundary is on private land in the McCain Valley area, north of the community of Boulevard, and is accessed via I-8 and Ribbonwood Road. The Boulder Brush Facilities would be developed within an approximately 320-acre corridor (Boulder Brush Corridor). The Boulder Brush Facilities also include improvements to Ribbonwood Road to the south outside of the Boulder Brush Boundary (but within the Boulder Brush Corridor). The total area of disturbance associated with the Boulder Brush Facilities is approximately 130 acres.

The Boulder Brush Boundary lies between two major drainage divides: the Tecate Divide to the west, and the In-Ko-Pah Mountains to the east. It occurs within the Live Oak Springs and Sombrero Peak U.S. Geographic Survey (USGS) topographic quadrangles. The surrounding landscape consists of open space with mountainous terrain consisting of steep slopes, prominent ridgelines, and rock outcroppings. Existing land uses within the vicinity of the Boulder Brush Boundary can be characterized as predominantly rural, large-lot ranches and single-family homes and undeveloped lands, with the exception of the Tule Wind project, located on both Bureau of Land Management and County of San Diego lands. The 500-kilovolt Sunrise Powerlink traverses the northern portion of the Boulder Brush Boundary, with towers located within the Boulder Brush Corridor. The Tule Wind project is located west, northeast, and east of the Boulder Brush Boundary.

The terrain in the area ranges from valley bottoms to house-sized boulder-covered ridgelines. The elevation ranges across the Boulder Brush Corridor from approximately 3,280 feet above mean sea level (amsl) to approximately 4,120 feet amsl. The U.S. Department of Agriculture Soil Survey mapped the Boulder Brush Corridor as being underlain by the following soil types: Calpine coarse sandy loam, 5% to 9% slopes; La Posta loamy coarse sand, 5% to 30% slopes, eroded; La Posta rocky loamy coarse sand, 5% to 30% slopes, eroded; Loamy alluvial land; Mottsville loamy coarse sand, 2% to 9% slopes; and Tollhouse rocky coarse sandy loam, 5% to 30% slopes, eroded (USDA 2018b).

The Boulder Brush Boundary is within the Anza Borrego Hydrologic Unit, Jacumba Hydrologic Area, and the McCain Hydrologic Subarea (722.71). The jurisdictional areas within the Boulder Brush Corridor consist of tributaries to Tule Creek, Tule Creek itself, and tributaries to Carrizo Creek. The majority of land within the Boulder Brush Boundary is characterized by small

ephemeral channels, draining runoff, and surface flow from the hillslopes and roads that drain toward Tule Creek, which is located in the southern portion of the Boulder Brush Corridor. Many of these features do not directly connect to Tule Creek, since these surface features abate into uplands prior to a direct conveyance into Tule Creek; however, these features may have a subsurface connection to downstream receiving waters.

Tule Creek has a wide floodplain with occasional low-flow channels where it receives surface flow, but the majority of the floodplain appears to be supported by subsurface flow, indicated by the patches of riparian herbs, shrubs, and trees within portions of the floodplain. There are sections within the Boulder Brush Corridor where data was collected within Tule Creek that were dominated by upland species, such as big sagebrush scrub, tall tumblemustard (*Sisymbrium altissimum*), and cheatgrass (*Bromus tectorum*).

The northern portion of the Boulder Brush Corridor includes ephemeral non-wetland waters that are tributary to Carrizo Creek. Many of these ephemeral channels have been directly impacted by off-road vehicle use (predominantly motorized dirt bikes). The disturbance created by these activities often bisect the channel, or the length of the channel is used for dirt bike activity. Overall, the features in the Boulder Brush Corridor are dry and lack evidence of recent flows, which is likely due to lack of rainfall in recent years.

Tule Creek receives surface and subsurface flows from headwaters originating in the Laguna Mountains northwest of the Boulder Brush Corridor. It continues draining in a downward gradient in an east and southeast orientation into Tule Lake, located approximately 4.5 miles southeast of the Boulder Brush Corridor. Water then flows into Tule Canyon, which eventually outlets into Carrizo Creek where it drains north–northeast. Carrizo Creek turns into Carrizo Wash and connects to San Felipe Wash and eventually drains into the Salton Sea.

The Boulder Brush Corridor is primarily undeveloped. There are existing areas of disturbance that show evidence of motorcross, all-terrain vehicle (ATV), and other off-highway vehicle use.

4.1.2 Campo Band of Diegueño Mission Indians Reservation (Reservation)

The Reservation is located in the inner-montane zone of southeastern San Diego County, west of a desert transition zone associated with the Sonoran Desert. Elevation within the entire Reservation ranges from 3,280 feet above mean sea level to 4,120 feet above mean sea level. Topography of the Reservation exhibits a range from moderate to steep ridges, to semiarid plateaus and valleys. The area is in a desert transition zone, supporting desert and high desert habitats and vegetative communities. The Reservation is in the central area of the Peninsular Ranges geomorphic province. Altitude and relief generally decrease from east to west towards the Pacific Ocean. Seismicity is

common throughout the Southern California region, with the San Andreas Fault located approximately 65 miles east-northeast near the Salton Sea. Although, areas like the Reservation appear to be relatively quiescent compared to nearby fault lines.

The Reservation supports large, intact expanses of relatively undisturbed habitats characteristic of the region. Dense chaparral covers much of the undeveloped portions of the Reservation, with oak woodlands and riparian habitats present along scattered canyons. A series of north–south-oriented ridges separated by the occasional broad valley or narrow drainages dominate the topography, and various large rock outcrops occur primarily along the ridgelines. Scattered, low-density commercial and residential developments are located within and adjacent to the Reservation. Other development features present include major transportation corridors (I-8 and State Route [SR] 94), asphalt and compacted earthen roads, trails, and fencing.

Drainage patterns on the Reservation vary greatly across topographic changes. Campo Creek flows in an east–west direction through the southern portion of the Reservation. There are numerous tributaries to Campo Creek as well as seeps and springs on the Reservation. Surface water on the Reservation is not sufficient to support domestic uses; therefore, domestic water resources are solely from groundwater wells.

The Campo Corridor is comprised of native upland vegetation communities typical of the high desert and transition zones. Additionally, there are a few wetland and riparian woodland vegetation communities. Additionally, the Campo Corridor is traversed by a portion of Church Road and numerous dirt roads used to access the Reservation.

The northeastern portion of the Campo Corridor is within the Colorado River Hydrologic Basin Planning Area within the Anza Borrego Hydrologic Unit, Jacumba Hydrologic Area, and the McCain Hydrologic Subarea (722.71). The southeastern portion of the Campo Corridor is within the San Diego Hydrologic Basin Planning Area within the Tijuana River Hydrologic Unit and Campo Hydrological Area; there are three Hydrologic Subareas including Hill (911.84), Clover Flat (911.83), and Hipass (911.85) within this hydrologic unit and hydrologic area. The jurisdictional areas include Campo Creek, and tributaries to Campo Creek, Miller Creek, Tule Creek, and Tijuana River (Figure 4 series). All jurisdictional resources (non-wetland waters) within the Campo Corridor are presumed to have a physical, chemical, or biological connection with downstream traditional navigable waters (i.e., Pacific Ocean).

4.2 Habitat Types/Vegetation Communities

4.2.1 Boulder Brush Corridor

Eleven vegetation communities and four non-native communities or land cover types were mapped by Dudek biologists within the Boulder Brush Corridor. Native vegetation communities within the Boulder Brush Corridor are big sagebrush scrub, coast live oak woodland (including open coast live oak woodland), emergent wetland, granitic chamise chaparral, granitic northern mixed chaparral, montane buckwheat scrub, red shank chaparral, semi-desert chaparral, southern arroyo willow riparian forest, and wildflower field. Two non-native vegetation communities, disturbed habitat and eucalyptus woodland, and two land cover types, unvegetated stream channel and urban/developed, were mapped within the Boulder Brush Corridor. These vegetation communities and land cover types are described below. Their acreages are presented in Table 4-1, Vegetation Communities and Land Cover Types within the Boulder Brush Corridor, and their spatial distributions are presented in Figure 4-1, Existing Biological Resources – Boulder Brush Corridor – Index, and Figures 4-1a through 4-1m, Existing Biological Resources – Boulder Brush Corridor.

These vegetation communities follow the Draft Vegetation Communities of San Diego County (Oberbauer et al. 2008). Vegetation communities considered special status are those that require mitigation by the County (County of San Diego 2010a) (Table 4-1).

Table 4-1
Vegetation Communities and Land Cover Types within the Boulder Brush Corridor

General Vegetation Community/Land Cover Category	Vegetation Type (Holland/Oberbauer Code[a])	Total (Acres)
Disturbed and Developed Areas (10000)	Disturbed Habitat (11300)	10.9
	Urban/Developed (12000)	0.2
	Eucalyptus Woodland (79100)	2.3
	Disturbed and Developed Areas Subtotal	*13.4*
Scrub and Chaparral (30000)	Big Sagebrush Scrub (35210)[b]	32.2
	Granitic Chamise Chaparral (37210)[b]	11.5
	Granitic Northern Mixed Chaparral (37131)[b]	87.1
	Montane buckwheat scrub (32800)[b]	44.4
	Red Shank Chaparral (37300)[b]	46.0
	Semi-Desert Chaparral (37400)[b]	42.7
	Scrub and Chaparral Subtotal[c]	*263.9*

Table 4-1
Vegetation Communities and Land Cover Types within the Boulder Brush Corridor

General Vegetation Community/Land Cover Category	Vegetation Type (Holland/Oberbauer Code[a])	Total (Acres)
Grasslands, Vernal Pools, Meadows, and other Herb Communities (40000)	Wildflower field (42300)[b]	14.8
Grasslands, Vernal Pools, Meadows, and other Herb Communities Subtotal		*14.8*
Bog and Marsh (50000)	Emergent Wetland (52440)[b]	3.4
Bog and Marsh Subtotal[c]		*3.4*
Riparian and Bottomland Habitat (60000)	Southern Arroyo Willow Riparian Forest (61320)[b]	0.9
Riparian and Bottomland Habitat Subtotal[c]		*0.9*
Woodland (70000)	Coast Live Oak Woodland (71160)[b]	19.4
	Open Coast Live Oak Woodland (71161)[b]	0.5
Woodland Subtotal[c]		*19.9*
Waters of the United States/State	Unvegetated Stream Channel[b]	1.1
Waters of the United States/State Subtota[c]		*1.1*
Total[c]		**317.4**

[a] Holland (1986) as modified by Oberbauer et al. (2008).
[b] Considered special status by the County (2010a).
[c] Totals may not sum due to rounding.

Special-Status Communities

There are 15 vegetation communities or land covers considered special-status by the County that occur within the Boulder Brush Corridor. Each of these are described below and shown on Figures 4-1a through 4-1m.

Montane Buckwheat Scrub (37K00)

Montane buckwheat scrub is nearly a monoculture community of eastern Mojave buckwheat (*Eriogonum fasciculatum* var. *polifolium*) within San Diego County (Oberbauer et al. 2008). A major factor related to this community is that it is found at higher elevations within San Diego County. Montane buckwheat scrub is usually found on sandy soils and around mountain meadows. Montane buckwheat scrub is typically associated with several varieties of buckwheat. Dominant buckwheat species associated with this community include eastern Mojave buckwheat and bastard sage (*Eriogonum wrightii* var. *membranaceum*) (USDA 2018a). At lower elevations and where disturbance has occurred, flat-topped buckwheat scrub (32800) is associated with California buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), which is another variety of *Eriogonum fasciculatum* with the common name California buckwheat.

Montane buckwheat scrub occurs throughout the northern and southern portions of the Boulder Brush Corridor. Areas mapped as montane buckwheat scrub are dominated by three species of buckwheat. As described in Oberbauer et al. 2008, both eastern Mojave buckwheat and bastard sage dominate this montane buckwheat community. Other dominant annual buckwheat species include Davidson's buckwheat (*Eriogonum davidsonii*) and Thurber's buckwheat (*Eriogonum thurberi*). Less common in this montane buckwheat community are subshrubs like longstem buckwheat (*Eriogonum elongatum*), narrowleaf goldenbush (*Ericameria linearifolia*), California match weed (*Gutierrezia californica*), hairy yerba santa and pinebush (*Ericameria pinifolia*). Annuals found within the montane buckwheat scrub include red stem stork's bill (*Erodium cicutarium*), needle goldfields (*Lasthenia gracilis*) and valley lessingia (*Lessingia glandulifera*).

Big Sagebrush Scrub (35210)

Big sagebrush scrub contains soft-woody shrubs, from 1.5 to 6.5 feet tall, with bare ground underneath and between shrubs (Oberbauer et al. 2008). Big sagebrush scrub typically occurs on a wide variety of soils and terrain, including rocky, well-drained slopes and fine-textured valley soils with high water table. In San Diego County, this vegetation community occurs on alluvial washes along dry margins of high desert and montane valleys. Characteristic species include big sagebrush (*Artemisia tridentata*), four-winged saltbush (*Atriplex canescens*), blackbrush (*Coleogyne ramosissima*) and Califonria brome (*Bromus carinatus*).

Big sagebrush scrub occurs within small areas in the northern and central portions of the Boulder Brush Corridor and within the southern portion of the Boulder Brush Corridor, including along Ribbonwood Road. Areas mapped as big sagebrush scrub are dominated by big sagebrush which is a distinctive monoculture. Less commonly occurring species interspersed within this vegetation community include hairy yerba santa, canyon silktassel (*Garrya veatchii*), California evening primrose (*Oenothera californica* spp. *avita),* flatbud prickly poppy (*Argemone minuta*), desert baccharis (*Baccharis sergiloides*) wild tarragon (*Artemisia dracunculus*), narrowleaf goldenbush and threadleaf ragwort (*Senecio flaccidus*).

Granitic Northern Mixed Chaparral (37131)

Granitic northern mixed chaparral is similar to northern mixed chaparral but with granitic soils. Granitic northern mixed chaparral contains broad-leaved sclerophyll shrubs, from 6.5 to 13 feet tall, with little to no understory vegetation (Oberbauer et al. 2008). Granitic northern mixed chaparral forms on granitic soils on dry, rocky, often steep slopes. The shrubs form a dense layer, are typically deep-rooted, and are adapted to repeated fires, to which many species respond by stump sprouting. Plant growth is highest in the spring, reduced in the late summer-fall dry season,

and the flowering season extends from late winter to early summer. Characteristic species include chamise (*Adenostoma fasciculatum*), chaparral white thorn (*Ceanothus leucodermis*), desert ceanothus (*Ceanothus perplexens*), bigberry manzanita (*Arctostaphylos glauca*), sugarbush (*Rhus ovata*), and birch leaf mountain mahogany (*Cercocarpus betuloides*).

Granitic northern mixed chaparral is the most dominant vegetation community within the Boulder Brush Corridor. Granitic northern mixed chaparral occurs throughout the Boulder Brush Corridor. Areas mapped as granitic northern mixed chaparral are dominated by desert ceanothus, chamise, birch leaf mountain mahogany, sugarbush, Mojave buckwheat, holly leaf cherry (*Prunus illicifolia*) and chaparral white thorn. Less commonly occurring species within this vegetation community include, Gander's buckhorn cholla (*Cylindropuntia ganderi*), hairy yerba santa, narrowleaf goldenbush (*Ericameria linearifolia*), silver bird's foot trefoil (*Acmispon argophyllus* var. *argophyllus*), hybrid scrub oak (*Quercus x acutidens*), hollyleaf redberry (*Rhamnus illicifolia*). Dominant annuals that cover the ground component of this vegetation community include needle goldfields and cheatgrass (*Bromus tectorum*).

Granitic Chamise Chaparral (37210)

Granitic chamise chaparral contains shrubs, overwhelmingly dominated by chamise, from 3 to 10 feet tall, with little cover provided by other species. Mature stands of granitic chamise are densely interwoven and contain few herbaceous species within the understory (Oberbauer et al. 2008). Stump sprouting allows this vegetation to adapt to repeated fires. Granitic chamise chaparral typically occurs on dry slopes and ridges (Holland 1986). The chamise chaparral alliance is ranked by CDFW as a G5S5 alliance (CDFG 2010). This ranking indicates that globally and within California the alliance is widespread, abundant, and considered secure (CDFG 2010; NatureServe 2014).

Granitic chamise chaparral occurs within the southwestern portion of the Boulder Brush Corridor. Areas mapped as granitic chamise chaparral contain numerous granitic boulders and at least 80% cover of chamise. In many areas with granitic chamise chaparral, chamise is the only subshrub present. Other less commonly occurring species include infrequent distributions of birch leaf mountain mahogany, hybrid scrub oak, desert ceanothus and eastern Mojave buckwheat. Dominant annuals found in limited openings of granitic chamise include fringed spineflower (*Chorizanthe fimbriata*) and chia (*Salvia columbariae*). One perennial herb was also abundant in openings: woollyfruit desertparsley (*Lomatium dasycarpum* ssp. *dasycarpum*).

Red Shank Chaparral (37300)

Red shank chaparral is dominated by pure stands of redshank (*Adenostoma sparsifolium*) of at least 50% cover (Oberbauer et al. 2008). Red shank chaparral shrub layer is typically open, 6.5 to 13 feet in height, and confined to granitic soils. This vegetation community occurs on interior cismontane slopes between 300 and 6,000 feet with greater precipitation and colder winters. Plant species observed within this vegetation community include chamise, tulip pricklypear (*Opuntia phaeacantha*), desert ceanothus, and bigberry manzanita.

Red shank chaparral occurs throughout the Boulder Brush Corridor. Areas mapped as red shank chaparral are dominated by redshank. Areas mapped as redshank chaparral consisted of redshank communities with more than 75% cover of redshank. Less commonly occurring species include desert ceanothus, point leaf manzanita, common silktassel (*Garrya veatchii*), eastern Mojave buckwheat, hybrid oak, narrowleaf goldenbush, woolly easterbonnets (*Eriophyllum wallacei*), Mojave yucca (*Yucca schidigera*), desert ceanothus, scarlet buglar (*Penstemon centranthifolius*), big sagebrush and sticky geraea.

Semi-Desert Chaparral (37400)

Semi-desert chaparral contains 5- to 10-foot-tall sclerophylls in an open layer dominated by *Juniperus*, *Eriogonum*, and *Opuntia* (Oberbauer et al. 2008). Semi-desert chaparral occurs in dry, cold winters and dry, hot summers, and on rocky soils or recently burned sites. This vegetation community is less fire-prone than other chaparrals due to lower fuel loads. Semi-desert chaparral is found in San Diego County on high desert plateaus and escarpment of the Peninsular Range. Characteristic species include chamise, bigberry manzanita, eastern Mojave buckwheat, and California juniper (*Juniperus californica*).

Semi-desert chaparral occurs within the northern and southern portion of the Boulder Brush Corridor. Semi-desert chaparral is dominated by cactus species and characteristic desert associates including California joint fir (*Ephedra californica*), flatbud prickly poppy (*Argemone munita*), numerous combseeds (*Pectocarya*), eastern Mojave buckwheat, tulip pricklypear (*Opuntia phaecantha*), Gander's buckhorn cholla (*Cylindropuntia ganderi*) and brownspined pricklypear (*Cylindropuntia californica* var. *parkeri*). Less commonly occurring associates within this community include California juniper (*Juniperus californica*) and desert ceanothus.

Wildflower Field (42300)

Wildflower fields consist of native herb dominated communities. Wildflower fields are noted for an obvious annual wildflower display. Dominance of flowers varies from year to year depending

on rainfall patterns. Site factors include being associated with grasslands and oak woodlands. Within San Diego County, sandy soils are often present within these vegetation communities.

Wildflower fields within the Boulder Brush Corridor consist of abandoned pasture for grazing animals. These wildflower fields primarily occur in the southern portion of the Boulder Brush Corridor and along Ribbonwood Road. Range managers may have irrigated some of these areas historically, since left over water pipes and irrigation equipment were found within some sections of these pasture lands. During the spring season needle goldfields dominated this vegetation community creating a blanket of yellow across the range. Less commonly occurring wildflowers like variable linanthus (*Leptosiphon parviflorus*) were also mixed in with the needle goldfields. In the late season giant woollystar (*Eriastrum densifolium*) dominated the community, creating a blanket of purple within some areas of the wildflower fields. Jacumba milk-vetch also dominated the wildflower field community and is positively affected by disturbance; one example of disturbance being that of historically grazed lands. Other dominant perennial herbs and annuals within the pasture include western tansymustard (*Descurainia pinnata*), tall tumblemustard (*Sisymbrium altissimum*), and herb Sophia (*Descurainia sophia*). Grass species were scattered within the vegetation community and include slender wild oats (*Avena barbata*), mouse barley (*Hordeum murinum*), compact brome (*Bromus madritensis* ssp. *madritensis*), and rat-tail fescue (*Festuca myuros*). Less commonly occurring species include cheatgrass, Mediterranean grass (*Schismus barbatus*), shortpod mustard (*Hirschfeldia incana*), and London rocket (*Sisymbrium irio*).

Emergent Wetland (52440)

Emergent wetland is a generally persistent wetland dominated by low-growing, perennial plant species. It occurs in channels, seeps, and springs, and along the margins of perennial aquatic features. This vegetation community can be dominated by various wetland plant species, including sedges (*Carex* spp.), pale spike rush (*Eleocharis macrostachya*), rushes (*Juncus* spp.), curly dock (*Rumex salicifolius*), and many others (Oberbauer et al. 2008).

Emergent wetland occurs within southern portion of the Boulder Brush Corridor. Areas mapped as emergent wetland are dominated by Mexican rush (*Juncus mexicanus*), cheatgrass, western ragweed (*Ambrosia psilostachya*), salt grass (*Distichlis spicata*), and seaside heliotrope (*Heliotropium curassavicum* var. *oculatum*). Less commonly occurring species within this vegetation community include tamarisk (*Tamarix ramosissima*), mulefat (*Baccharis salicifolia*), ripgut brome (*Bromus diandrus*), yerba mansa (*Anemopsis californica*), and red willow (*Salix laevigata*).

Southern Arroyo Willow Riparian Forest (61320)

Southern arroyo willow riparian forest is a winter-deciduous riparian forest dominated by broad-leafed trees and arroyo willow (*Salix lasiolepis*). Typically it consists of a moderately tall, closed, or nearly closed canopy, with an understory of shrubby willows (Oberbauer et al. 2008). Southern arroyo willow riparian forest is characterized by the presence of several species besides arroyo willow, including San Diego sagewort (*Artemisia palmeri*), mulefat (*Baccharis salicifolia*), manroot (*Marah macrocarpus*), California sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), Goodding's willow (*Salix gooddingii*), narrowleaf willow (*Salix exigua*), and yellow willow (*Salix lasiandra*) (Oberbauer et al. 2008). Southern arroyo willow riparian forest occurs in sub-irrigated and frequently overflowed areas along rivers and streams that are perennially wet (Oberbauer et al. 2008).

Southern arroyo willow riparian forest occurs in the southern portion of the Boulder Brush Corridor and along Ribbonwoor Road. Areas mapped as southern arroyo willow riparian forest are dominated by red willow, mulefat, broom baccharis (*Baccharis sergiloides*), and arroyo willow with associated species including yerba mansa, Mexican rush, western ragweed, Mexican whorled milkweed (*Asclepias fascicularis*), salt cedar (*Tamarix ramosissima*), wild tarragon (*Artemisia dracunculus*) and stinging nettle (*Urtica dioica* ssp. *holosericea*). Some sections of the southern arroyo willow riparian forest consisted of little to no herbaceous perennial plant species, and other areas were abundant with Mexican rush, yerba mansa, western ragweed and wild tarragon.

Coast Live Oak Woodland (71160) and Open Coast Live Oak Woodland (71161)

Coast live oak woodland is dominated by a single evergreen species: coast live oak (*Quercus agrifolia*) with a canopy height reaching 32.8 to 82.0 feet (10 to 25 meters). The shrub layer is poorly developed, but may include toyon (*Heteromeles arbutifolia*), gooseberry (*Ribes* spp.), or laurel sumac (*Malosma laurina*). The herb component is continuous, dominated by a variety of introduced species (Oberbauer et al. 2008).

Coast live oak woodland occurs within the northern and southern portions of the Boulder Brush Corridor. Areas mapped as coast live oak woodland are dominated by coast live oak with an understory of annual cheatgrass, bare ground and small scattered subshrubs. Areas mapped as open coast live oak woodland have an overall lower density of coast live oak, but still functions as a coast live oak woodland. Less common associated species include eastern Mojave buckwheat, Jacumba milk-vetch, desert ceanothus, valley lessingia (*Lessingia gladulifera* var. *glandulifera*), needle goldfields, white margin sand mat (*Euphorbia albomargina*), Colorado four o'clock (*Mirabilis multiflora*), and redstem stork's bill (*Erodium cicutarium*).

Unvegetated Stream Channel

Unvegetated stream channel is not recognized by Holland (1986) or Oberbauer et al. (2008). Vegetation may be present but is usually less than 10% total cover and grows on the outer edge of the channel. Unvegetated stream channels occur along Tule Creek and throughout portions of the Boulder Brush Corridor. These resources are discussed more in Section 4.7, Jurisdictional Aquatic Resources.

Non-Special-Status Communities and Land Covers

There are three non-special-status vegetation communities and land covers mapped within the Boulder Brush Corridor and are described below.

Disturbed Habitat (11300)

Disturbed habitats are areas that have been physically disturbed and are no longer recognizable as a native or naturalized vegetation association (Oberbauer et al. 2008). These areas may continue to retain soil substrate. If vegetation is present, it is almost entirely composed of non-native vegetation, such as ornamentals or ruderal exotic species. Examples of these areas may include graded landscapes or areas, graded firebreaks, graded construction pads, temporary construction staging areas, off-road-vehicle trails, areas repeatedly cleared for fuel management, or areas that are repeatedly used in ways that prevent revegetation (e.g., parking lots, trails that have persisted for years).

Disturbed habitat occurs throughout the Boulder Brush Corridor. Dirt roads, prominent dirt trails, and other disturbed areas are mapped as disturbed habitat. The disturbed habitat mostly consists of bareground with few plant species. Dominant plant species that were present within the disturbed habitat include non-native cheatgrass (*Bromus tecortum*) and Jacumba milk-vetch (*Astragalus douglasii* var. *perstrictus*). Jacumba milk-vetch is a rare plant species found in the Boulder Brush Corridor in both disturbed areas and undisturbed areas but within the disturbed vegetation community (roads, trails) Jacumba milk-vetch is the dominant plant species. Although less common, hairy yerba santa (*Eriodictyon trichocalyx* var. *lanatum*) also occurred. One annual species, sapphire wooly star (*Eriastrum sapphirinum* ssp. *sapphirium*) was abundant on some of the dirt roads and trails for a short duration.

Urban/Developed (12000)

Urban/developed refers to areas that have been constructed upon or disturbed so severely that native vegetation is no longer supported. Developed land includes areas with permanent or semi-permanent structures, pavement or hardscape, landscaped areas, and areas with a large amount of debris or other materials (Oberbauer et al. 2008).

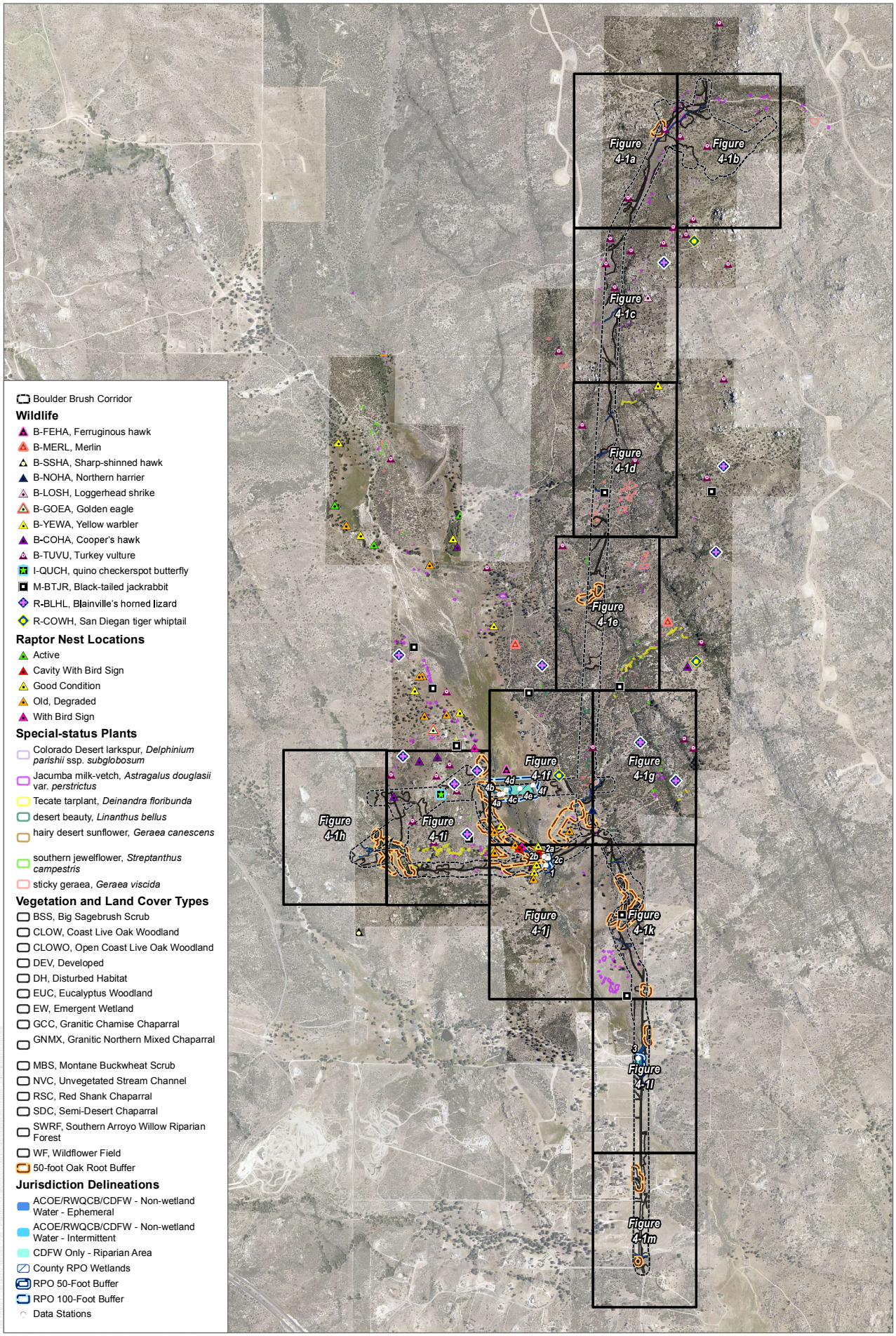
Within the Boulder Brush Corridor, urban and developed areas are located along Ribbonwood Road.

Eucalyptus Woodland (79100)

Eucalyptus woodland is not recognized by Holland (1986), but is recognized by Oberbauer et al. (2008). This "naturalized" vegetation community is fairly widespread in Southern California and is considered a woodland habitat. Eucalyptus woodland occurs along Ribbonwood Road. It typically consists of monotypic stands of introduced Australian eucalyptus trees (*Eucalyptus* spp.). The understory is either depauperate (i.e., lacking species variety) or absent, owing to high leaf litter. Although eucalyptus woodlands are of limited value to most native plants and animals, they frequently provide nesting and perching sites for several raptor species.

4.2.2 Campo Corridor

Twenty-two vegetation communities and land cover types were mapped by Dudek within the Campo Corridor. Native vegetation communities within the Campo Corridor include big sagebrush scrub (including disturbed), coast live oak woodland (including open and dense forms), emergent wetland, freshwater marsh, granitic chamise chaparral, granitic northern mixed chaparral, montane buckwheat scrub, mulefat scrub, non-native grassland, non-native grassland broadleaf-dominated, red shank chaparral, scrub oak chaparral, southern coast live oak riparian forest, southern willow scrub, upper Sonoran subshrub scrub, and valley Sacaton grassland. Developed and disturbed habitat, as well as one land cover–unvegetated stream channel, occur within the Campo Corridor. These vegetation communities follow the *Draft Vegetation Communities of San Diego County* (Oberbauer et al. 2008). The vegetation communities and land cover types listed above are described below. Their spatial distributions are presented in the Figure 4-2, Existing Biological Resources – Reservation – Index, and Figures 4-2a through 4-2bo, Existing Biological Resources – Reservation. These vegetation communities and land cover types are described in detail in the *Campo Wind Project Biological Technical Report* (Appendix H to the Campo EIS).



SOURCE: SANGIS 2017

DUDEK

0 850 1,700 Feet

FIGURE 4-1

Existing Biological Resources - Boulder Brush Corridor - Index

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: SANGIS 2017

DUDEK

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FIGURE 4-1a

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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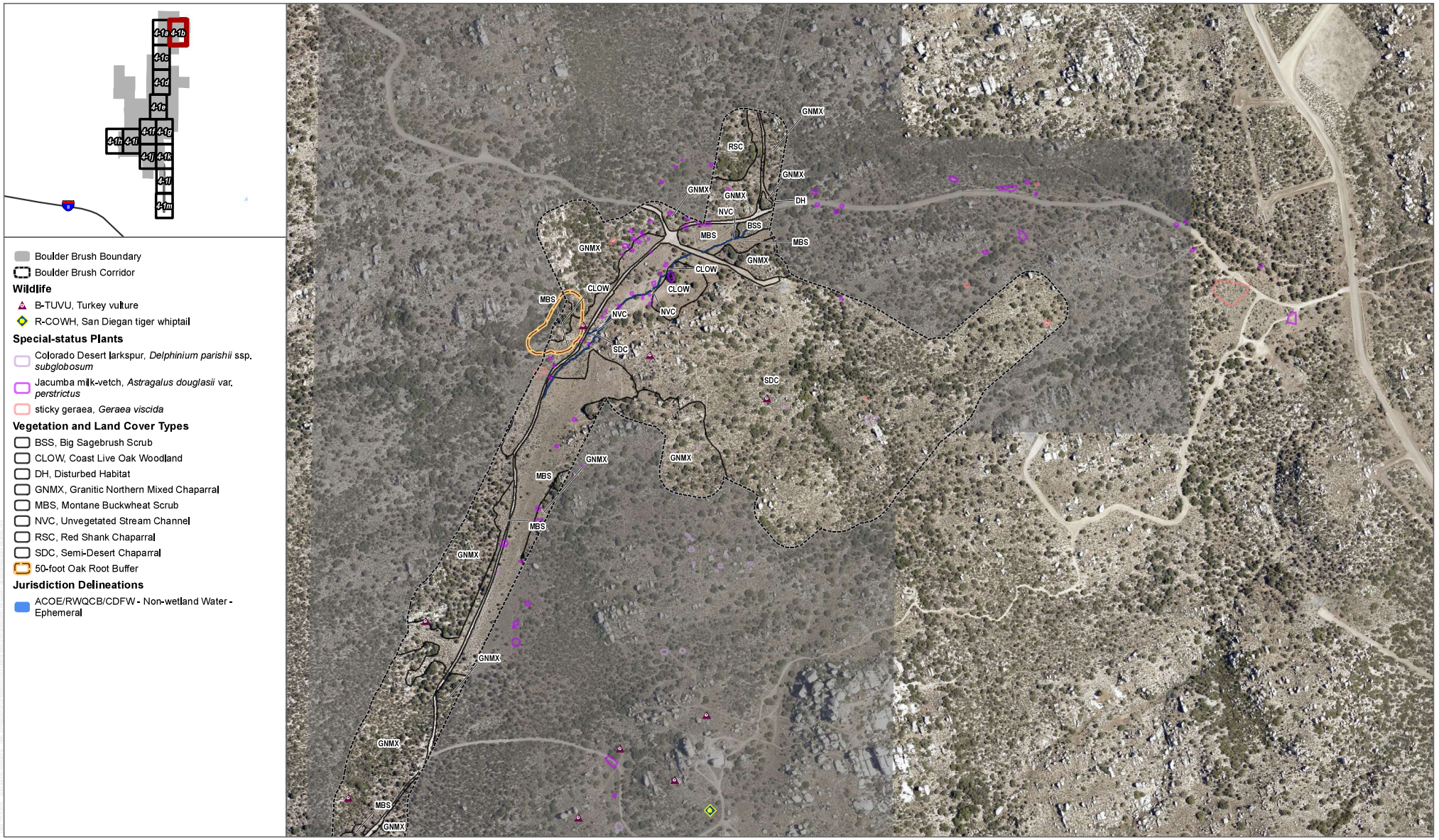

SOURCE: SANGIS 2017

DUDEK

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FIGURE 4-1b

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: SANGIS 2017

DUDEK

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FIGURE 4-1c

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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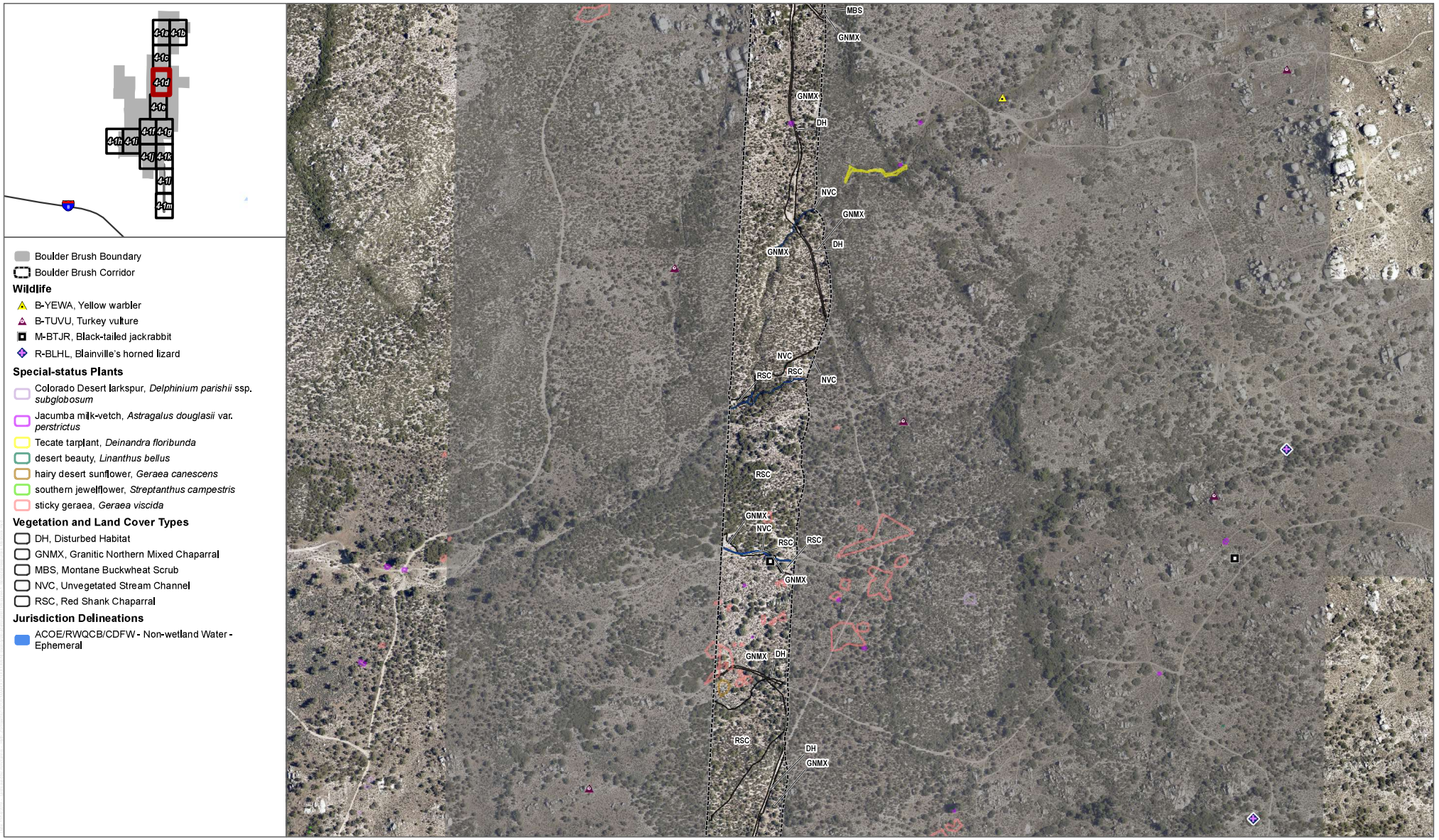

SOURCE: SANGIS 2017

DUDEK

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FIGURE 4-1d

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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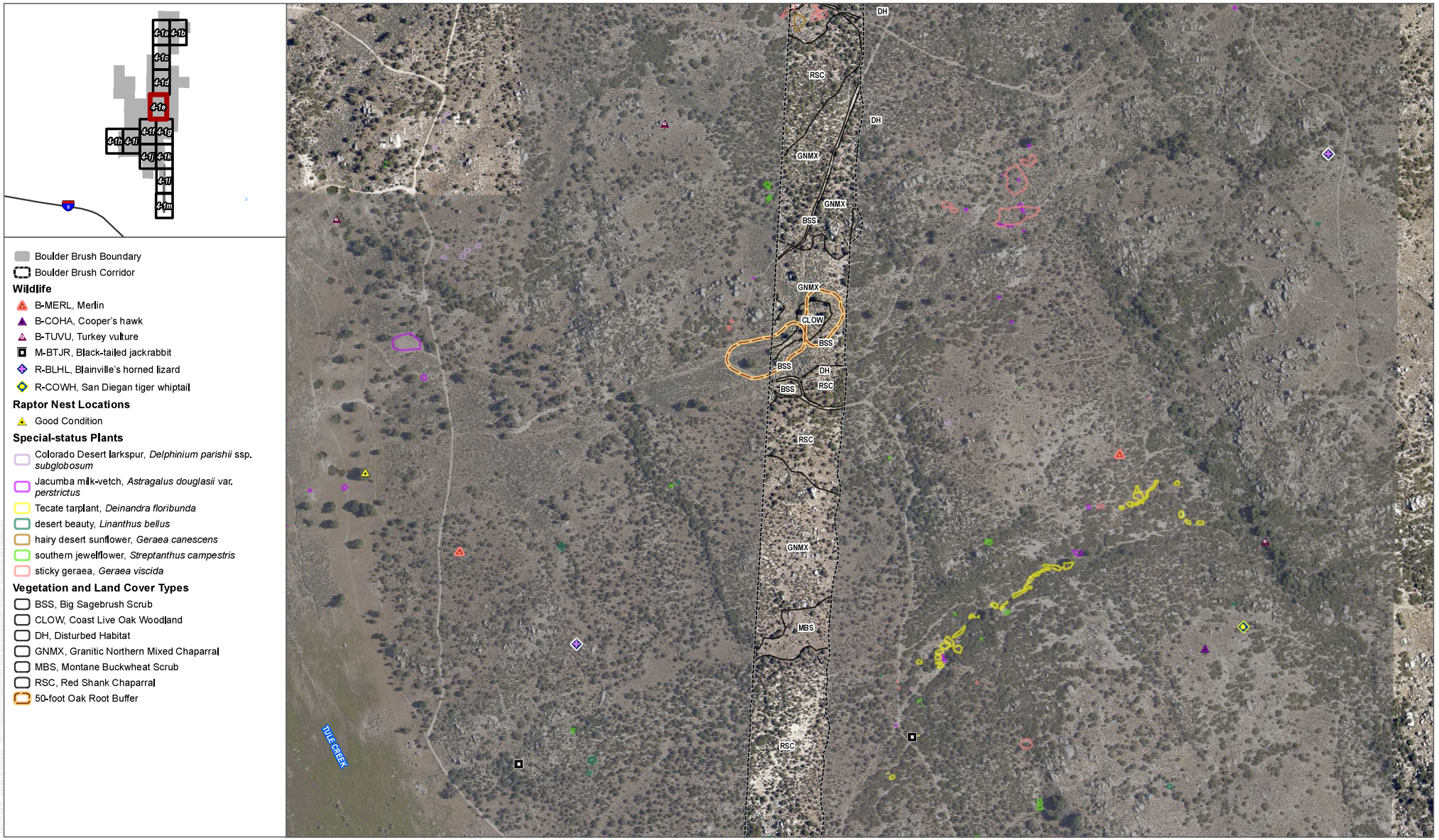

SOURCE: SANGIS 2017

DUDEK

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FIGURE 4-1e

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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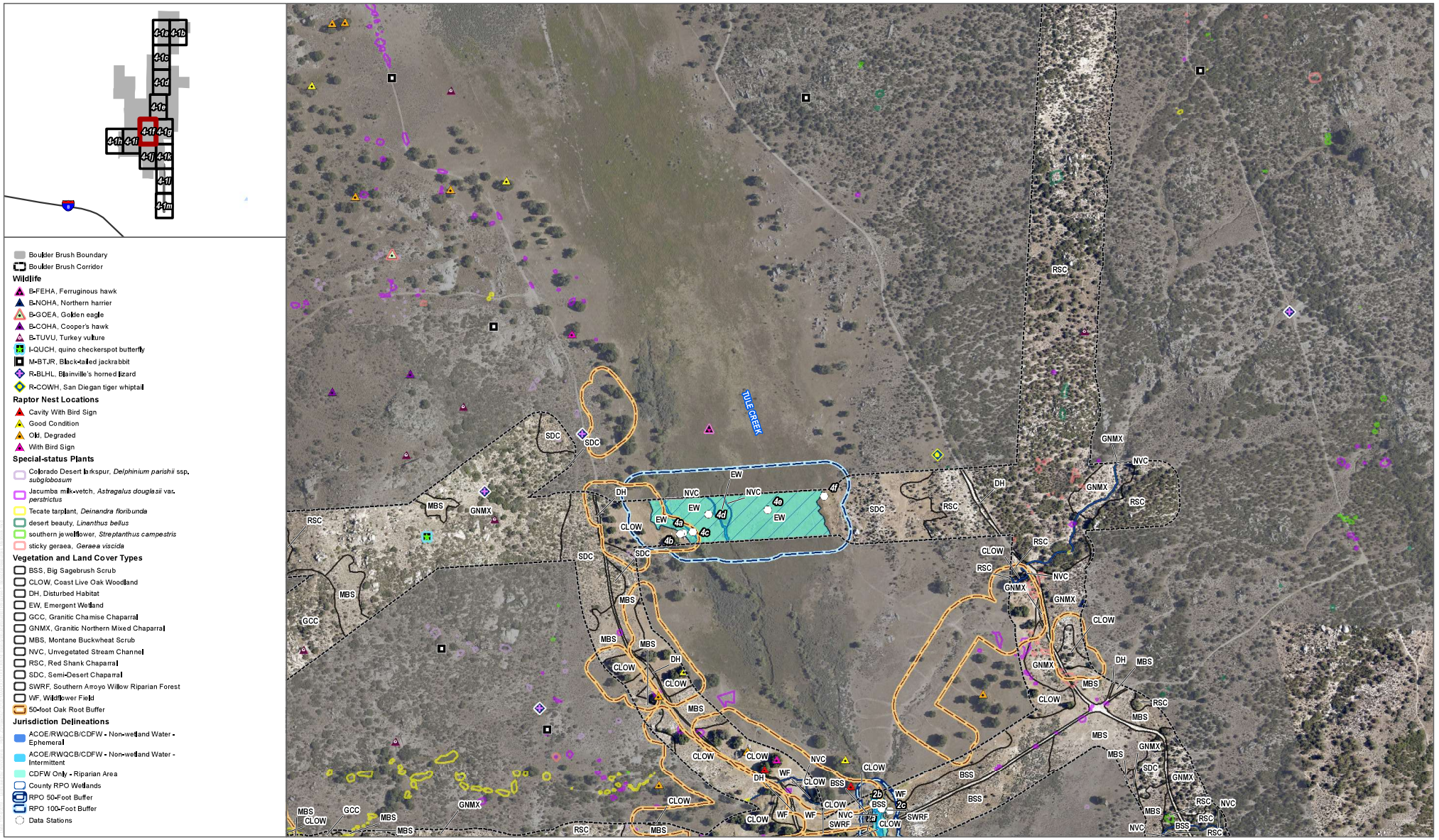

SOURCE: SANGIS 2017

DUDEK

FIGURE 4-1f

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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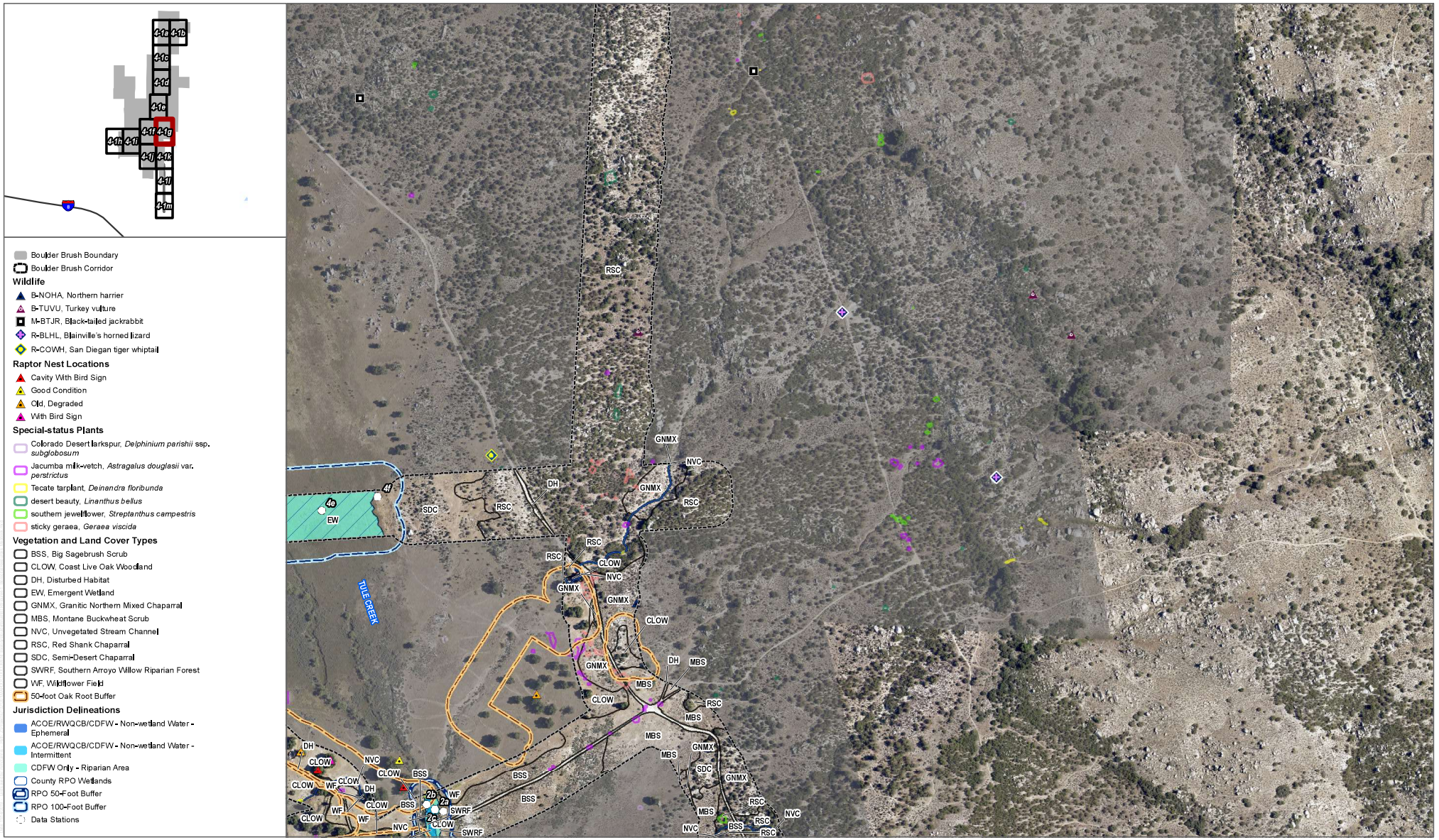

SOURCE: SANGIS 2017

DUDEK

FIGURE 4-1g

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: SANGIS 2017

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FIGURE 4-1h

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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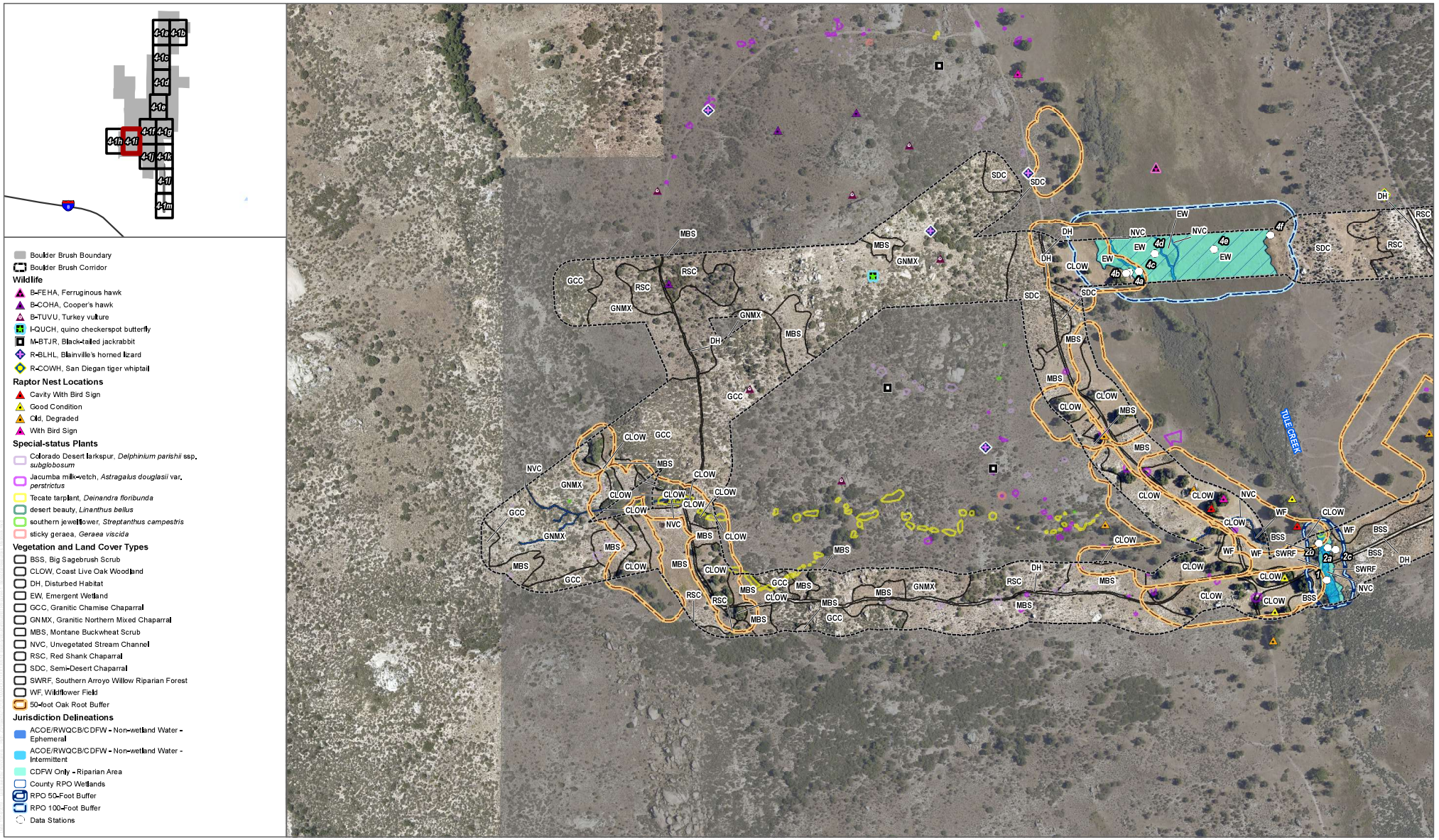

SOURCE: SANGIS 2017

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FIGURE 4-1i

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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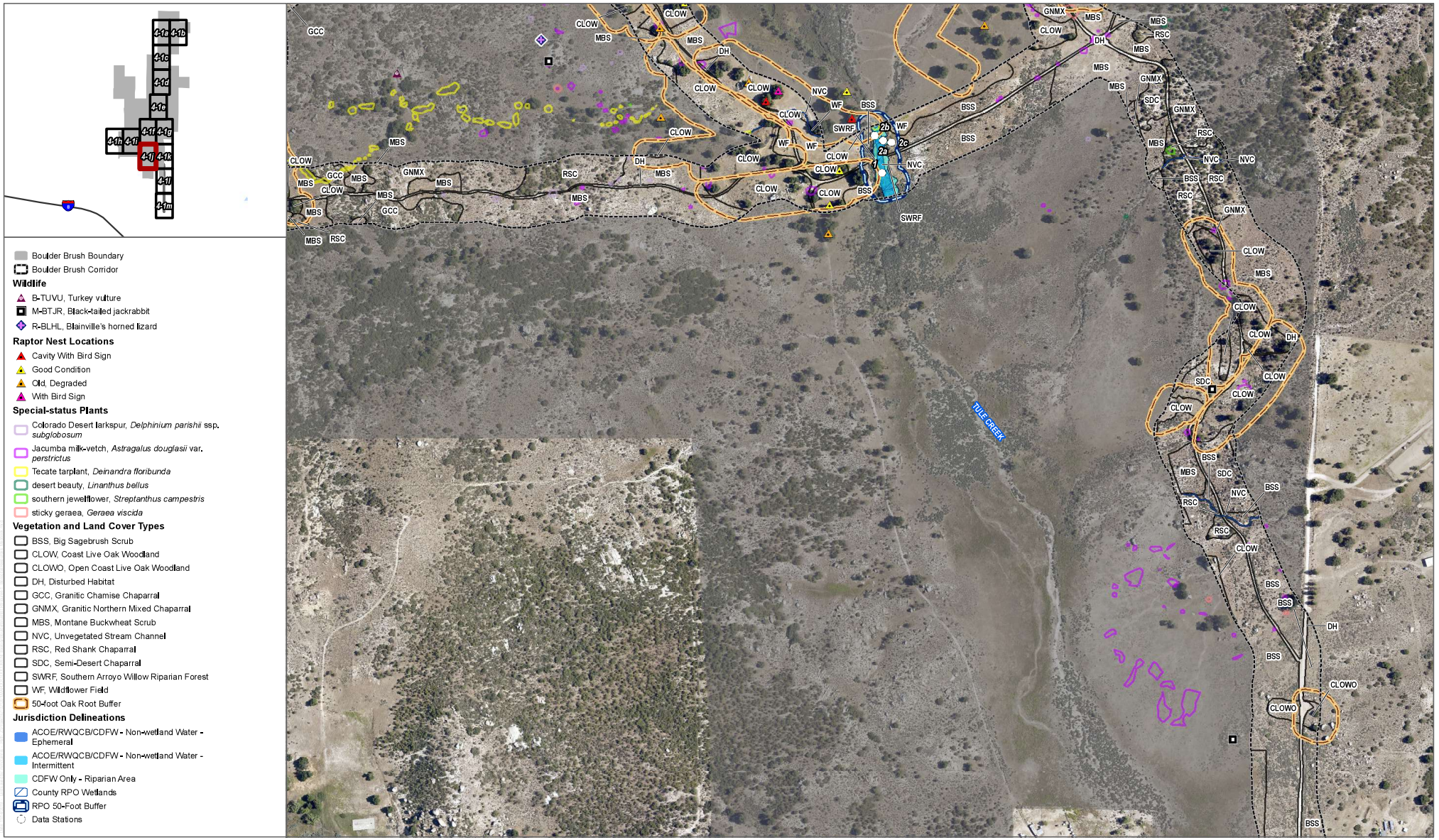

SOURCE: SANGIS 2017

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FIGURE 4-1j

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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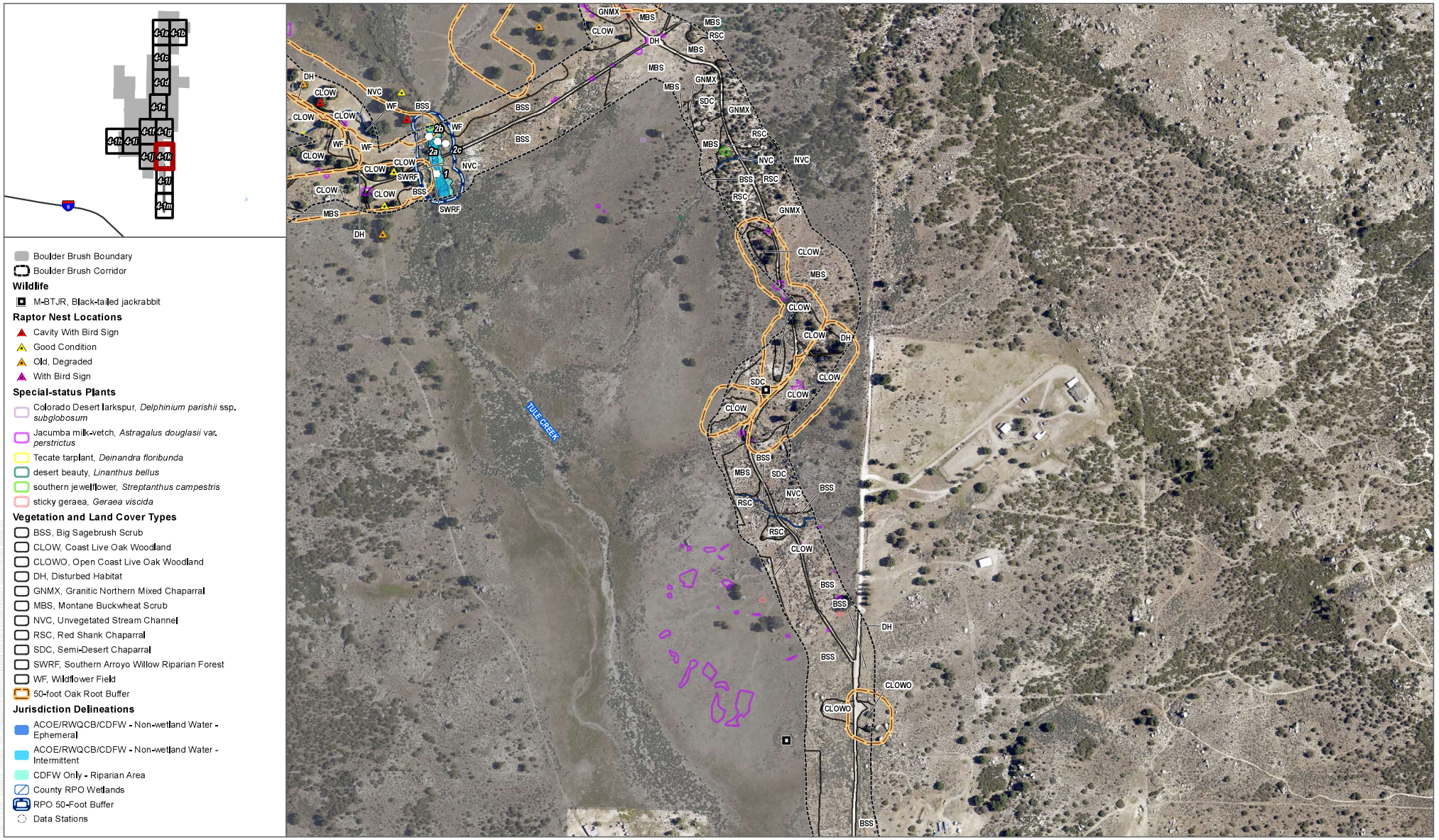

SOURCE: SANGIS 2017

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FIGURE 4-1k

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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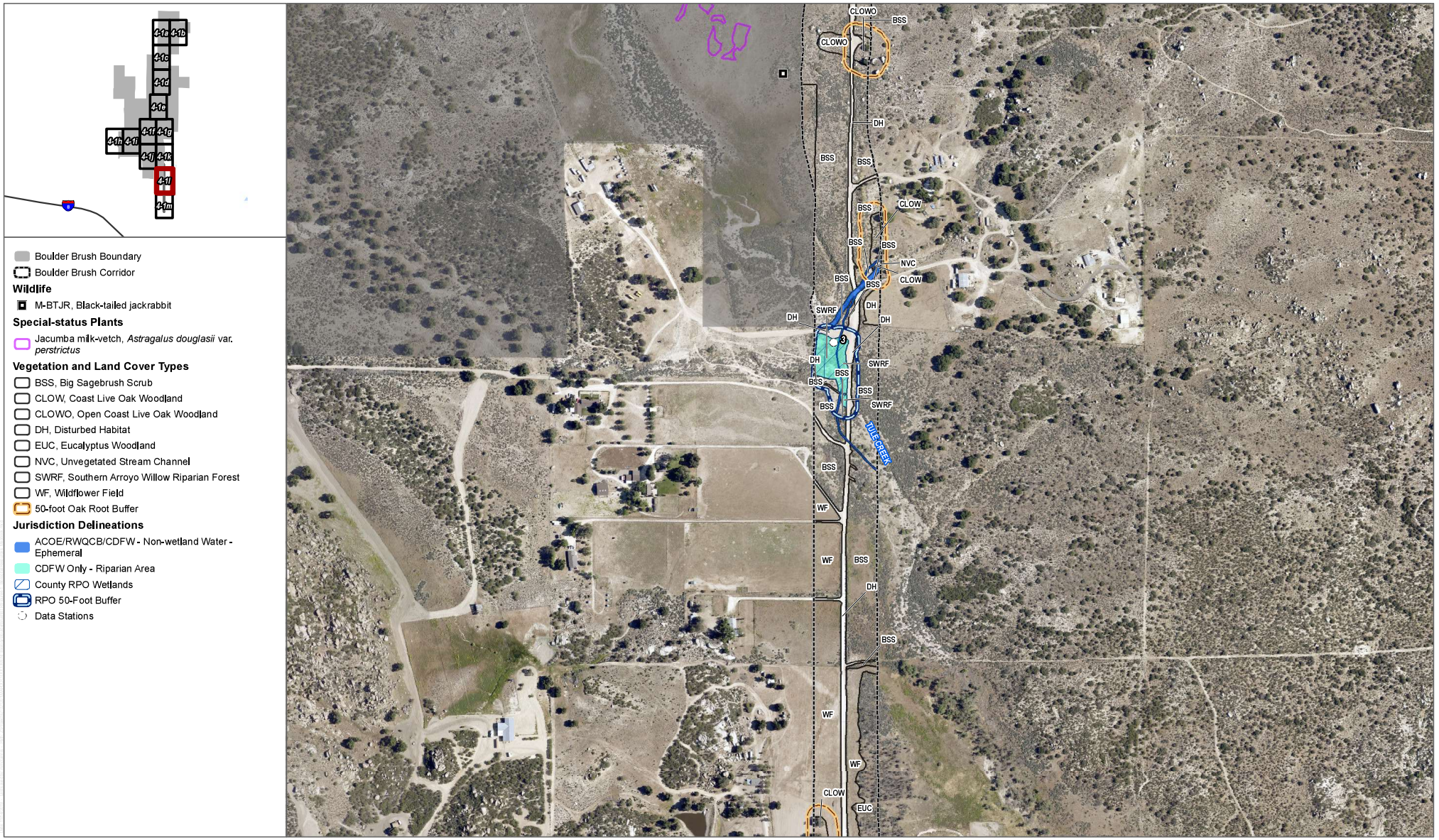

SOURCE: SANGIS 2017

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FIGURE 4-1l

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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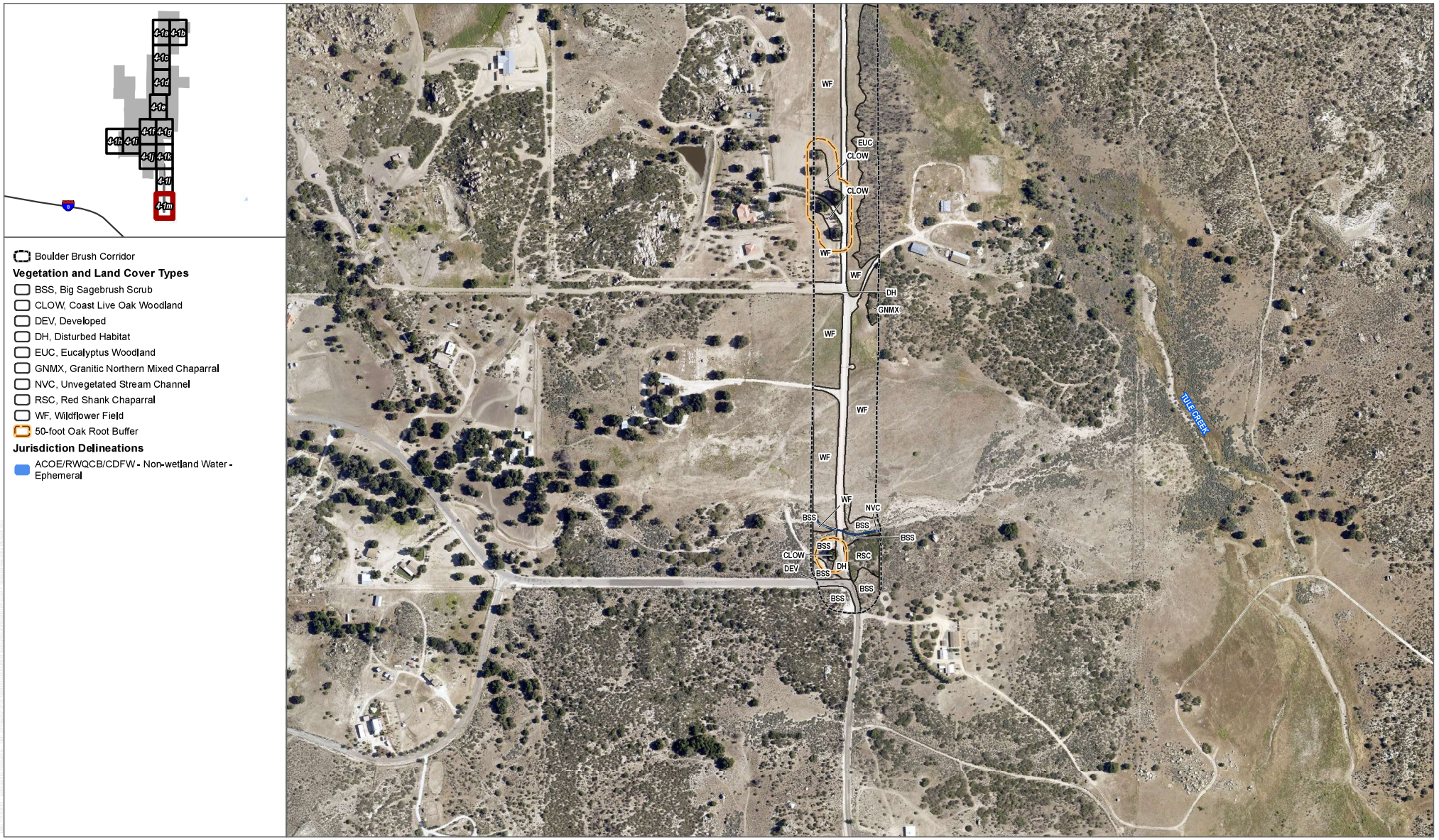

SOURCE: SANGIS 2017

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FIGURE 4-1m

Existing Biological Resources - Boulder Brush Corridor

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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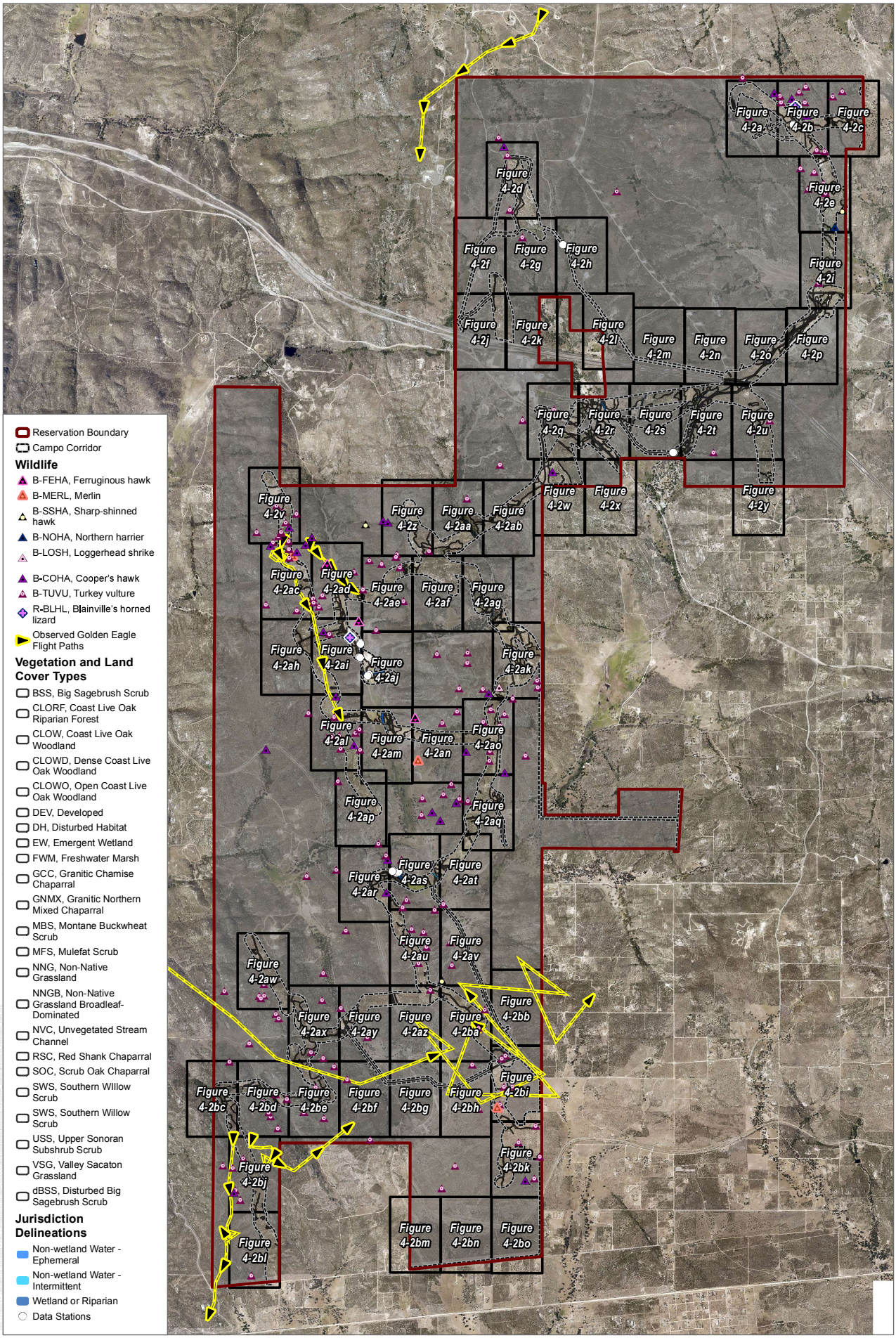

SOURCE: SANGIS 2017

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FIGURE 4-2

Existing Bioloigcal Resources - Reservation - Index

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2a

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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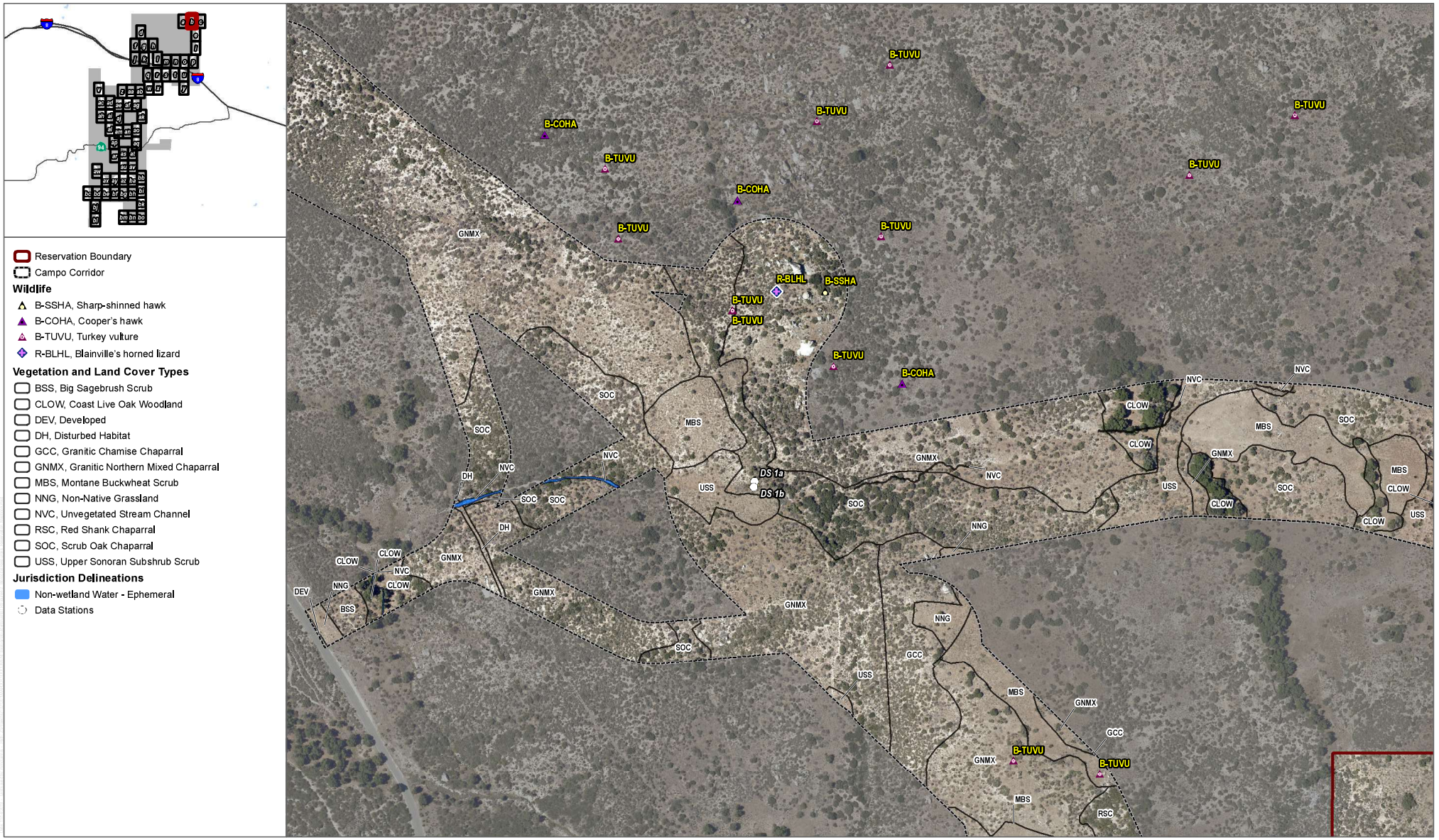

SOURCE: Source: SANGIS 2017

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FIGURE 4-2b

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2c

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2d

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2e

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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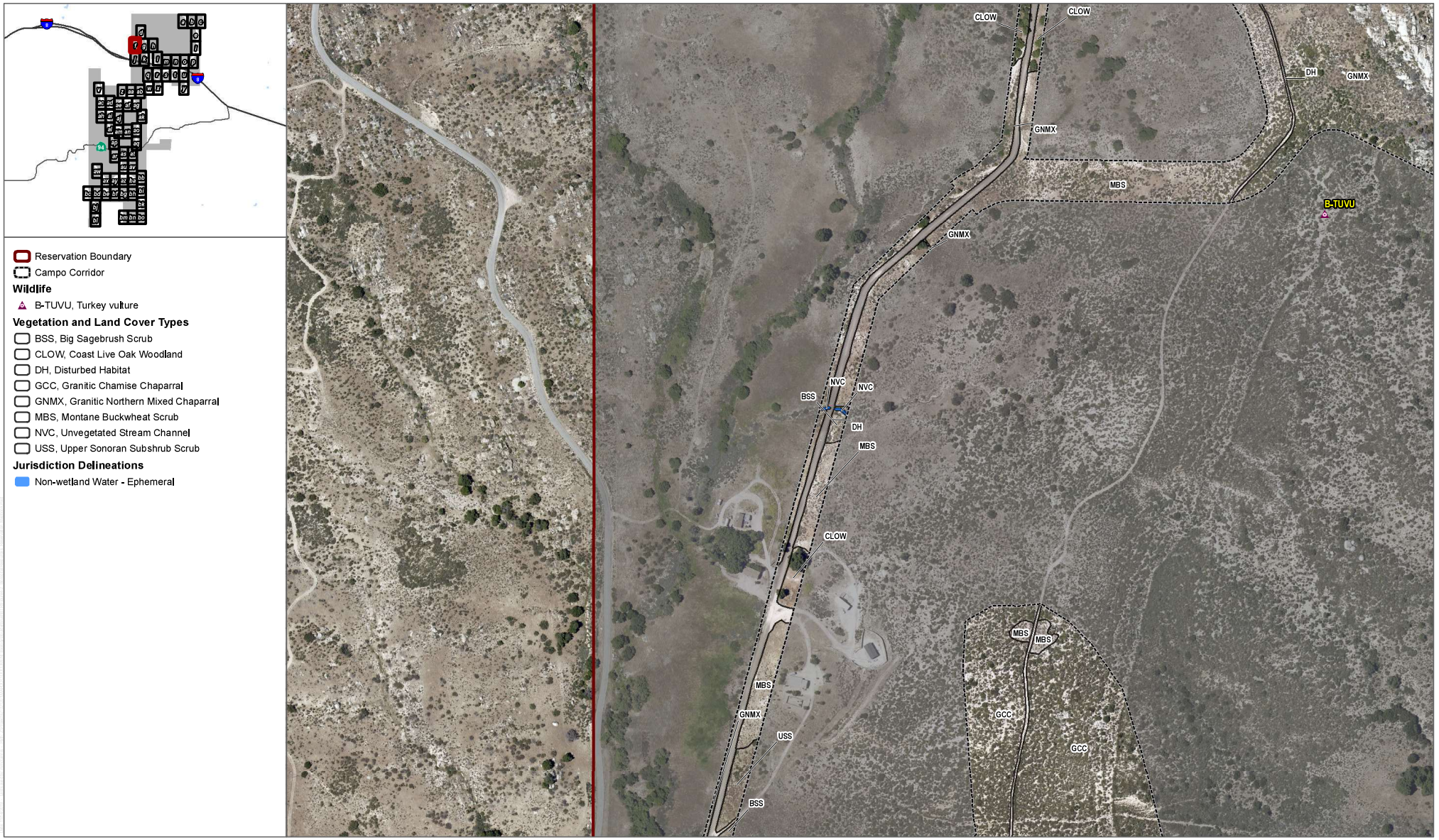

SOURCE: Source: SANGIS 2017

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FIGURE 4-2f

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2g

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2h

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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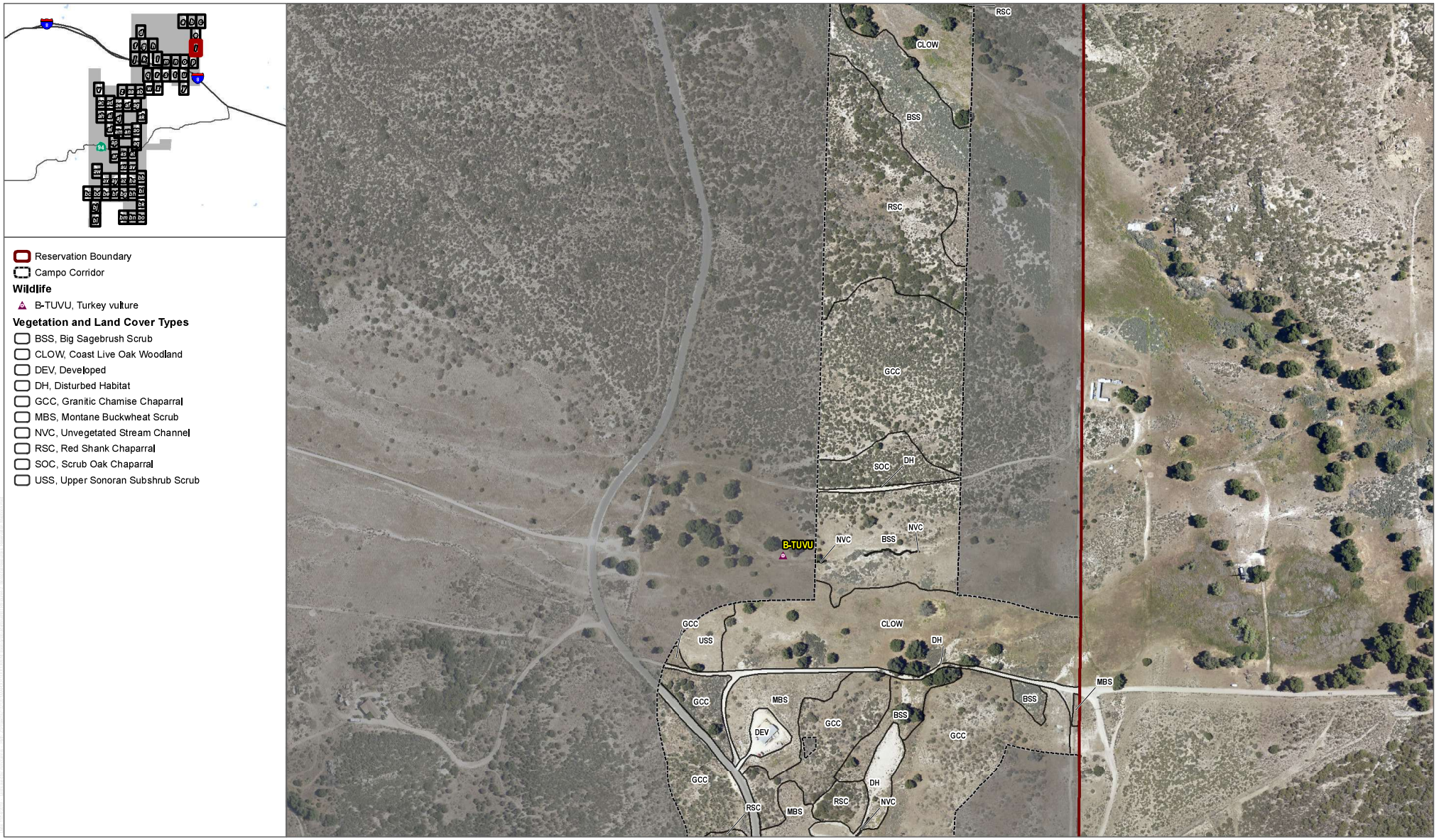

SOURCE: Source: SANGIS 2017

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FIGURE 4-2i

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2j

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2k

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-21

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2m

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2n

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2o

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2p

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2q

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2r

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2s

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2t

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2u

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2v

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2w

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

DUDEK

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FIGURE 4-2x

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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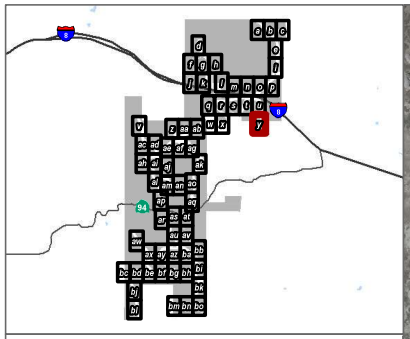

Reservation Boundary
Campo Corridor

Vegetation and Land Cover Types

GCC, Granitic Chamise Chaparral
MBS, Montane Buckwheat Scrub

SOURCE: Source: SANGIS 2017

DUDEK

0 162.5 325 Feet

FIGURE 4-2y

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2z

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2aa

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

DUDEK

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FIGURE 4-2ab

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

DUDEK

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FIGURE 4-2ac

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2ad

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2ae

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2af

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2ag

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2ah

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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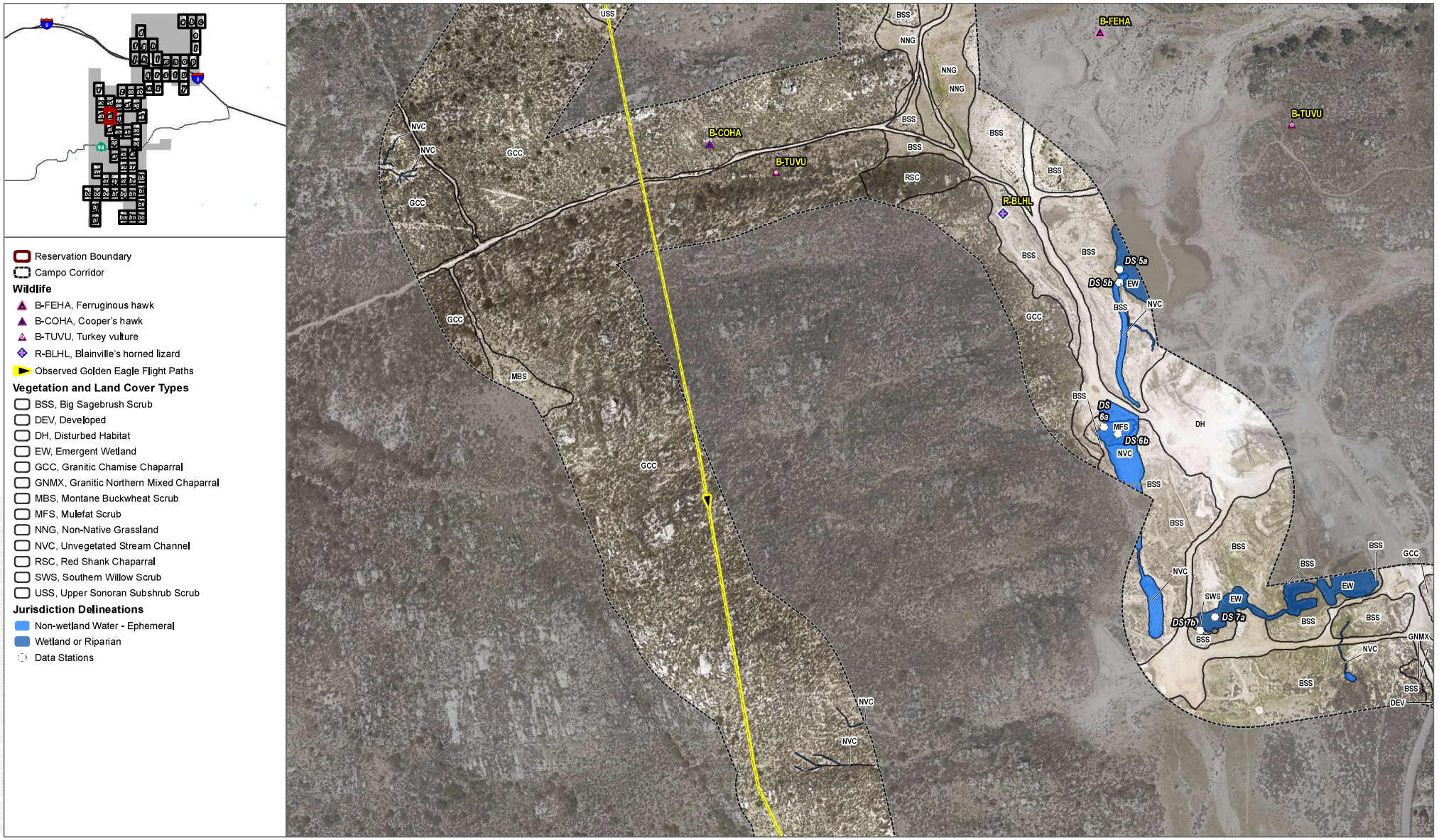

SOURCE: Source: SANGIS 2017

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FIGURE 4-2ai

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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FIGURE 4-2aj

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2ak

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2al

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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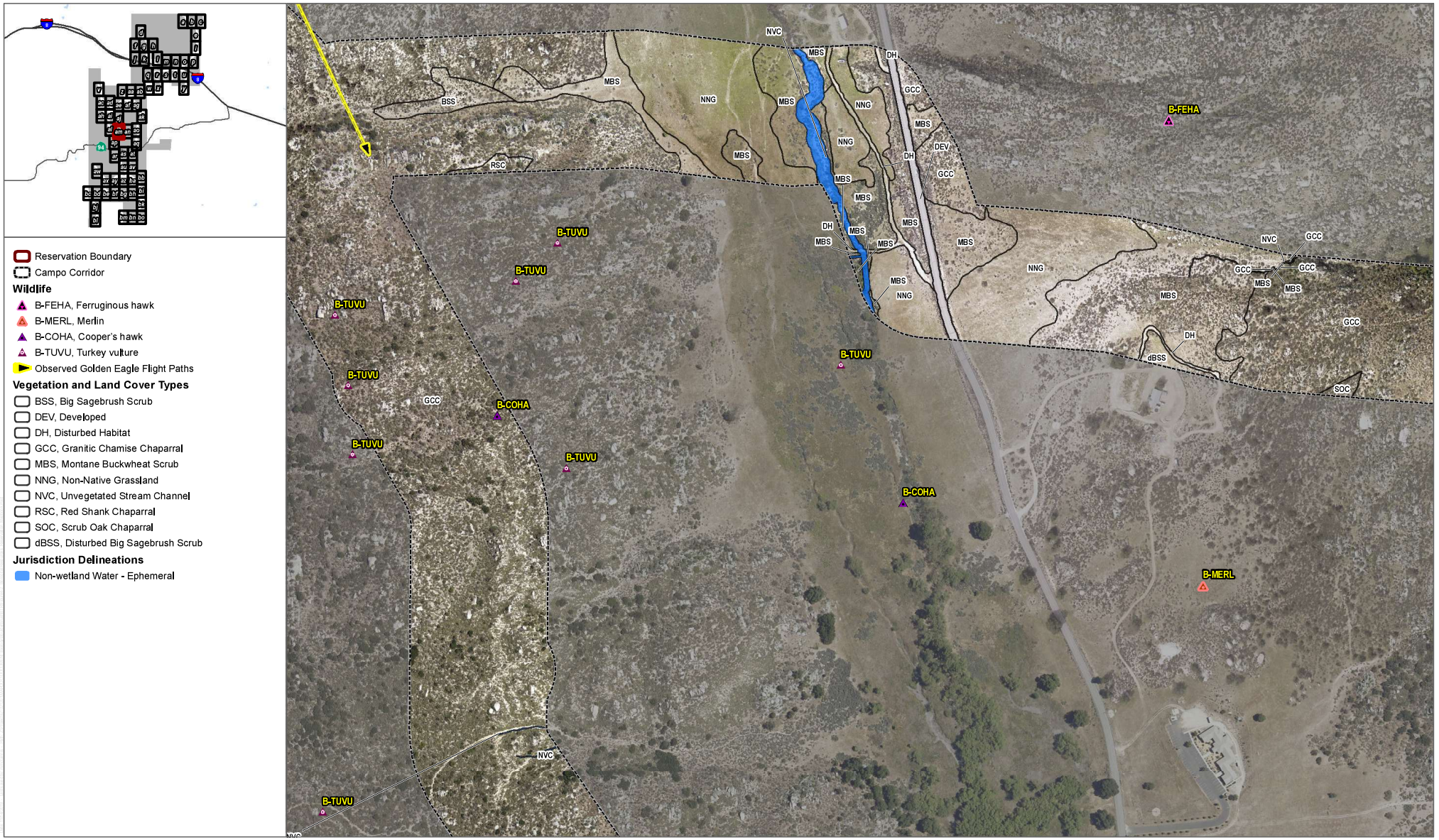

SOURCE: Source: SANGIS 2017

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FIGURE 4-2am

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2an

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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FIGURE 4-2ao

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

DUDEK

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FIGURE 4-2ap

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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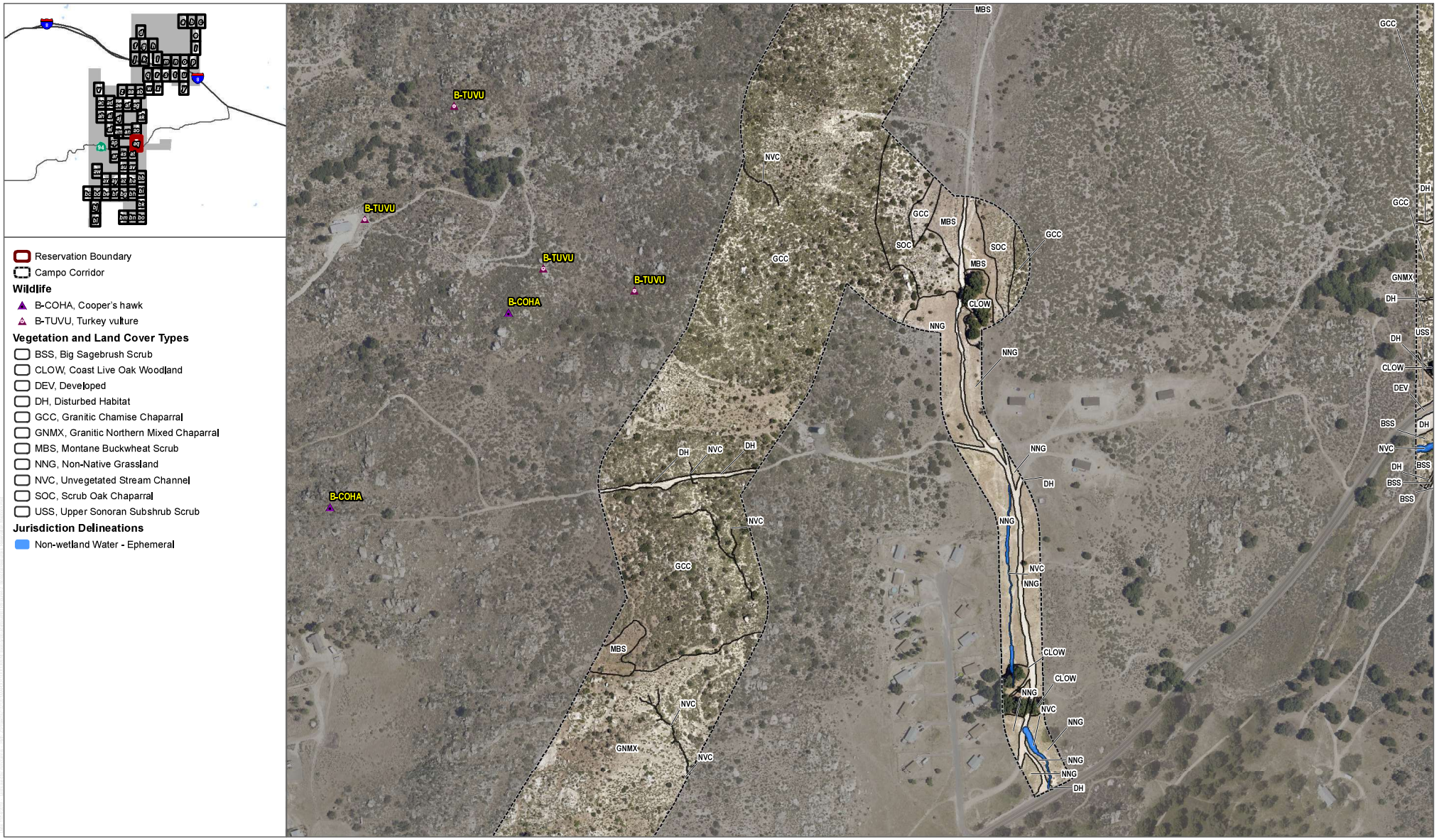

SOURCE: Source: SANGIS 2017

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FIGURE 4-2aq

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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FIGURE 4-2ar

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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FIGURE 4-2as

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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DUDEK

FIGURE 4-2at

Vegetation Communities and Landcovers - Reservation

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FIGURE 4-2au

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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FIGURE 4-2av

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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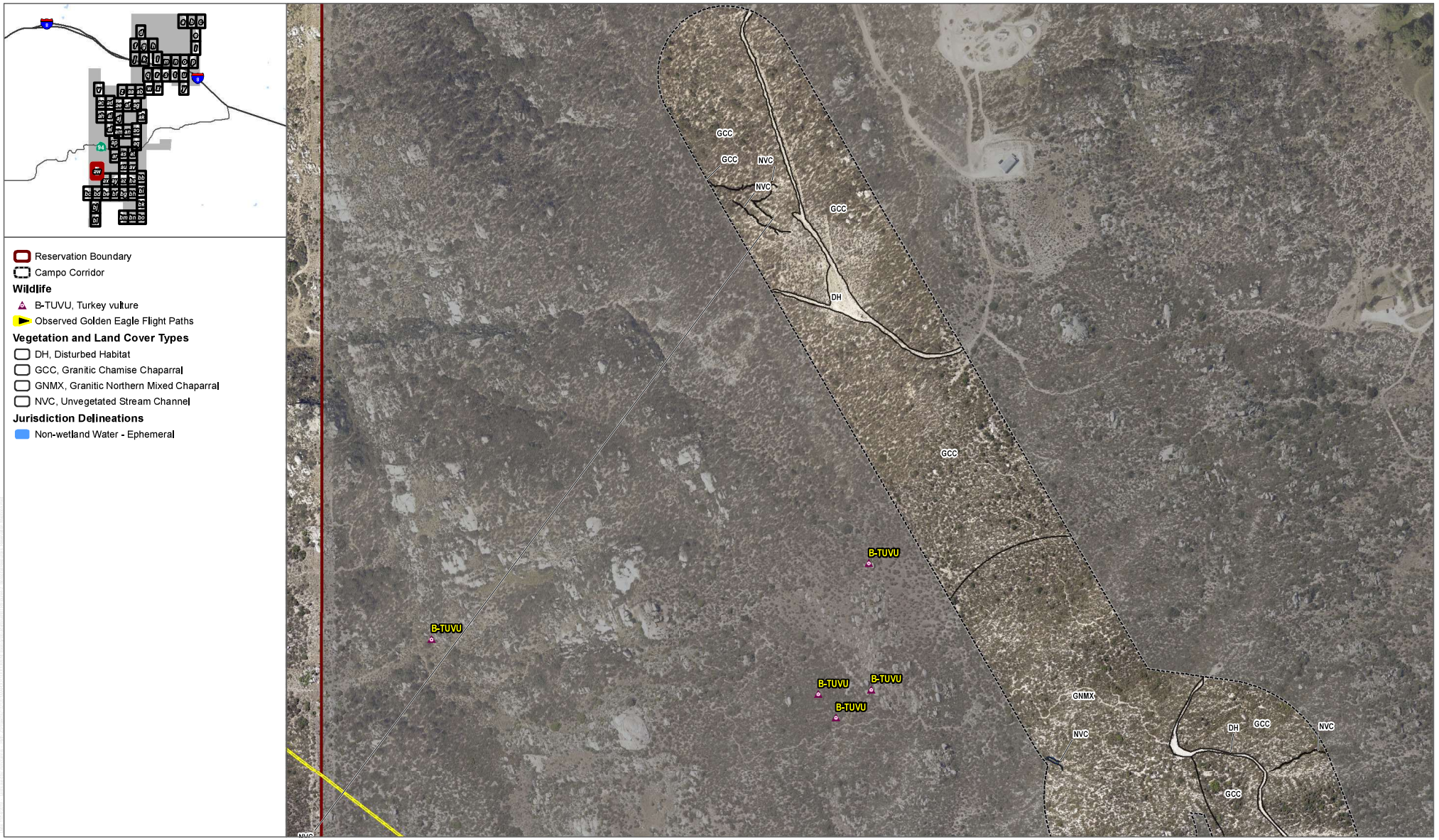

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FIGURE 4-2aw

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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FIGURE 4-2ax

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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FIGURE 4-2ay

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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FIGURE 4-2az

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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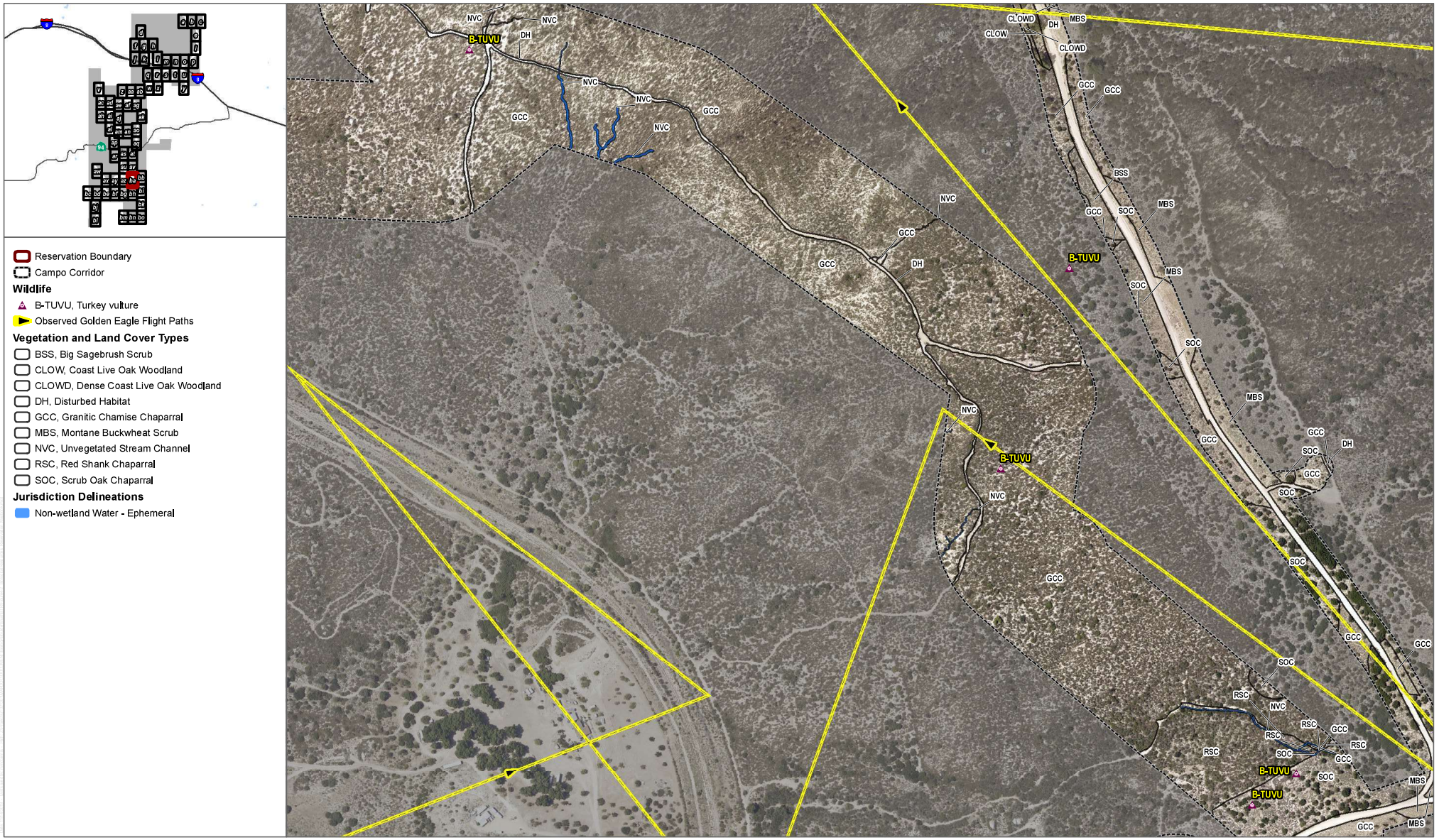

SOURCE: Source: SANGIS 2017

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FIGURE 4-2ba

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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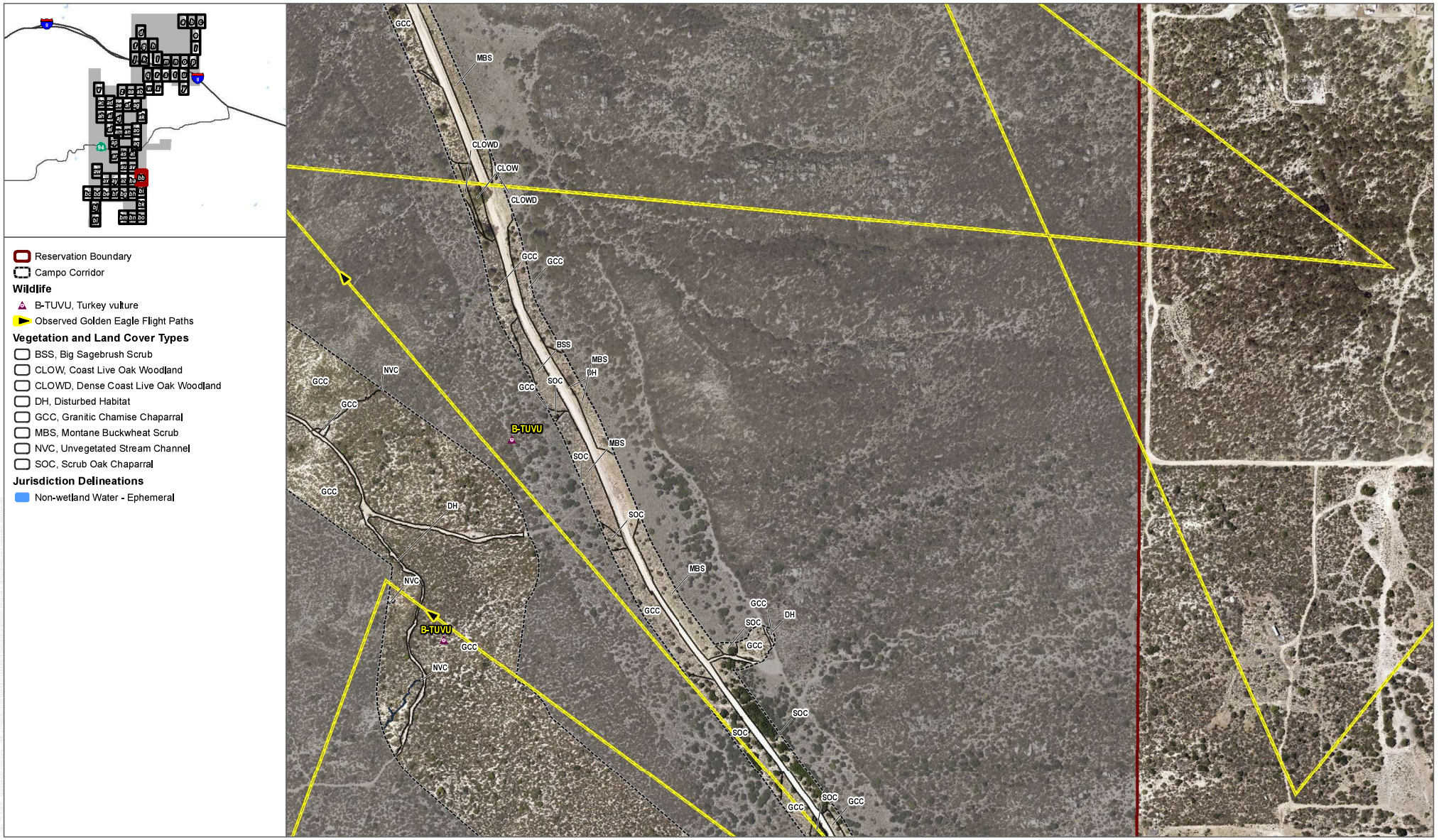

SOURCE: Source: SANGIS 2017

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FIGURE 4-2bb

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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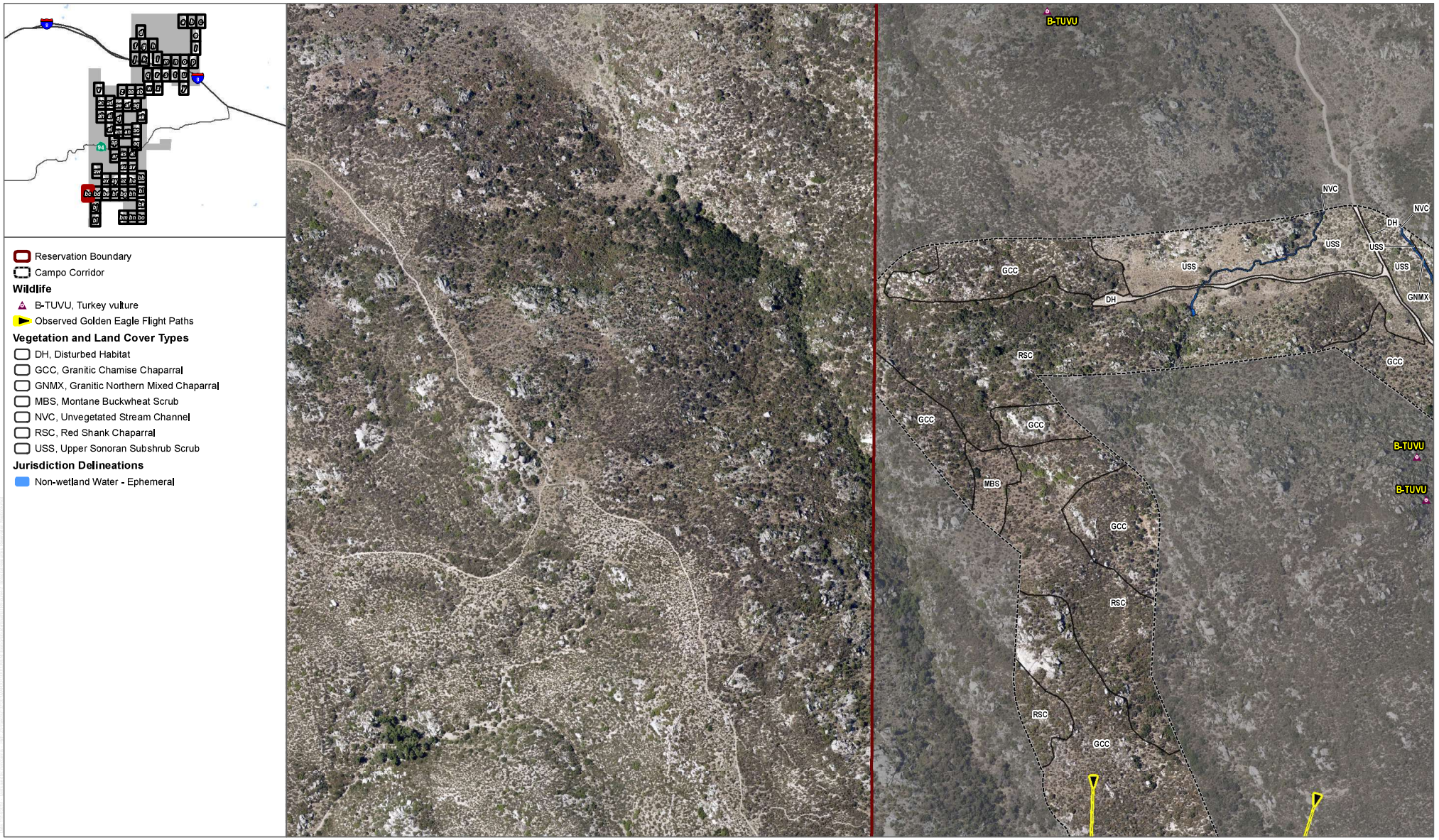

SOURCE: Source: SANGIS 2017

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FIGURE 4-2bc

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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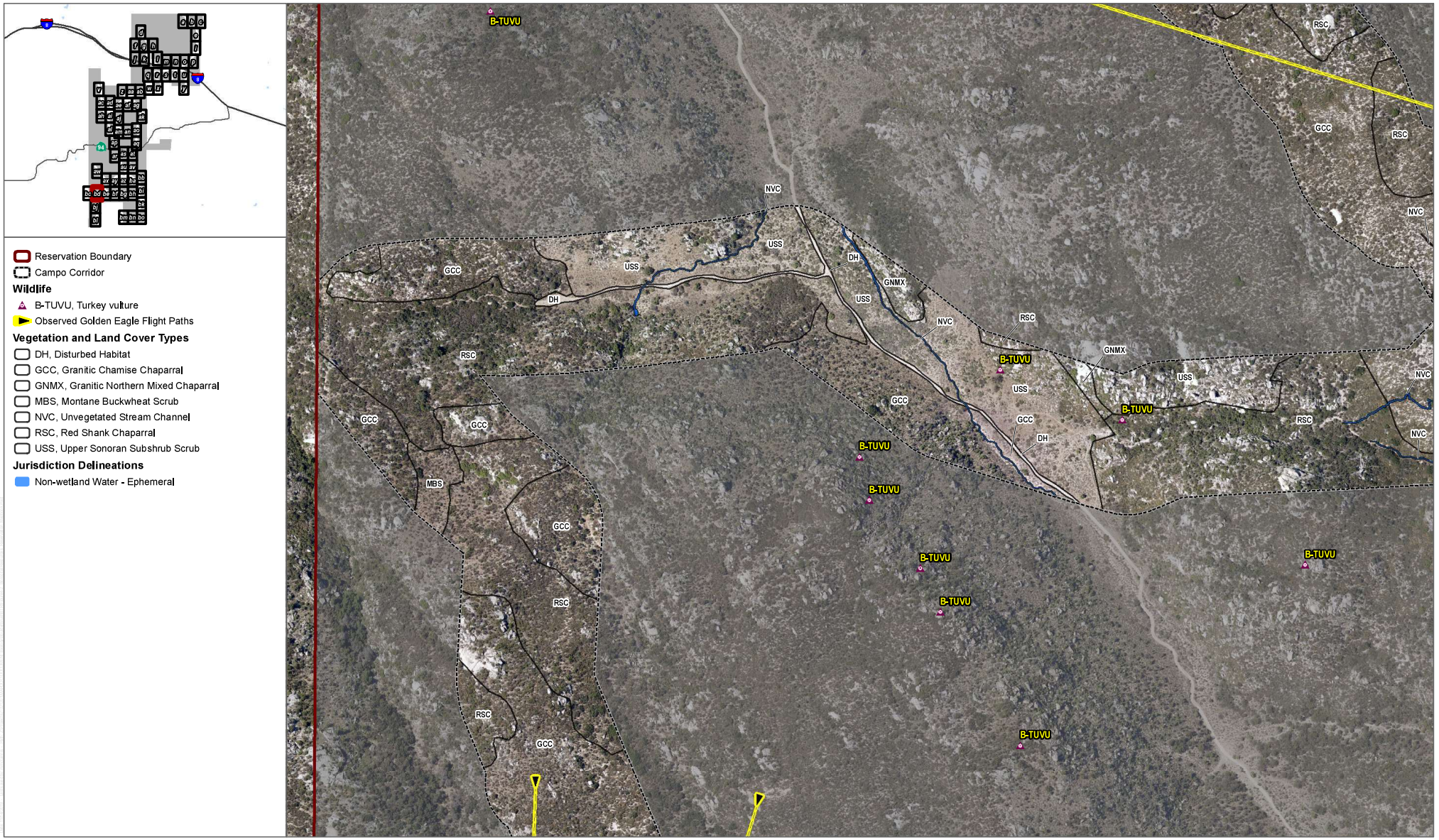

SOURCE: Source: SANGIS 2017

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FIGURE 4-2bd

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

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FIGURE 4-2be

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

DUDEK

0 162.5 325 Feet

FIGURE 4-2bf

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

DUDEK

0 162.5 325 Feet

FIGURE 4-2bg

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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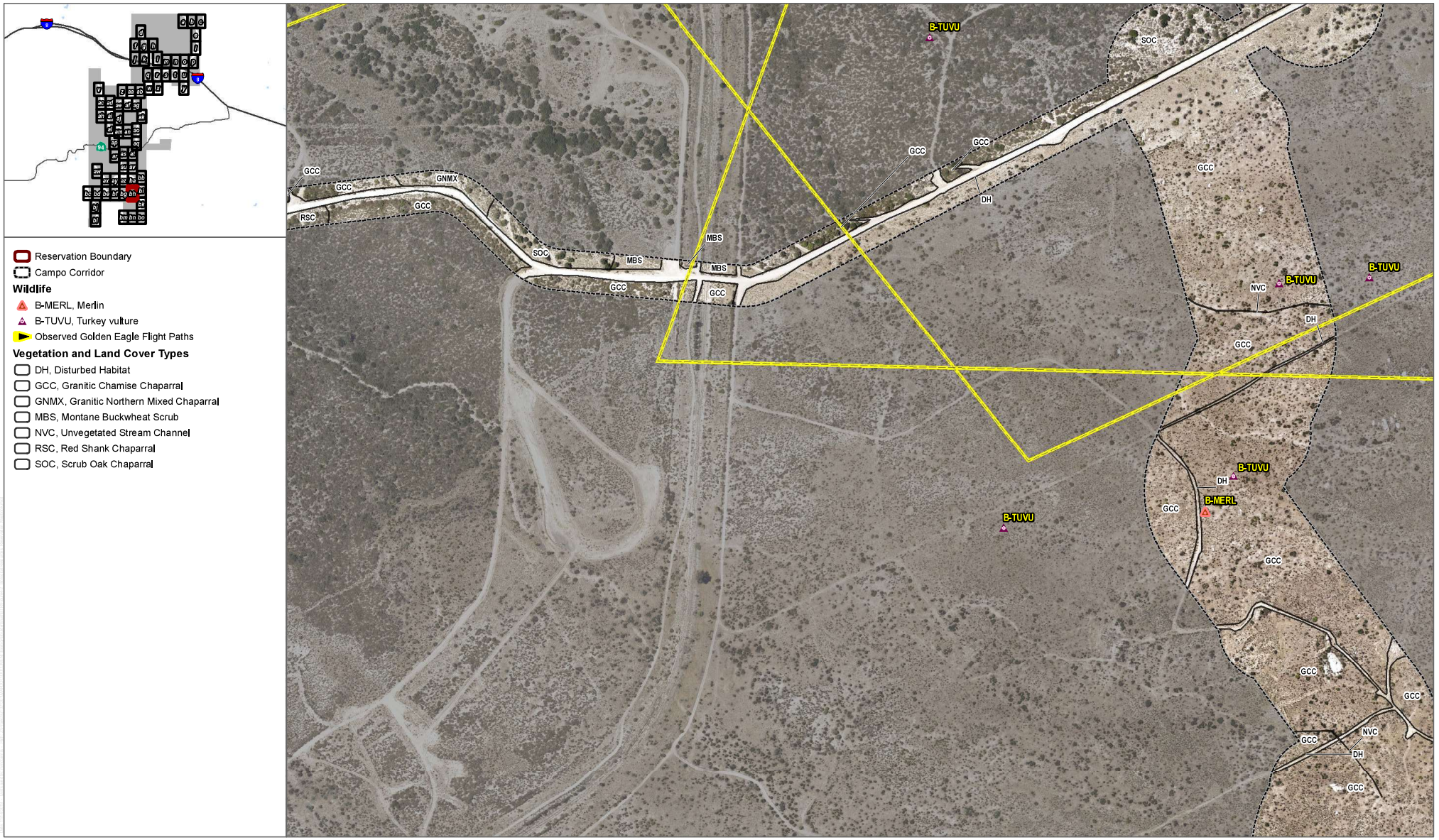

SOURCE: Source: SANGIS 2017

DUDEK 0 162.5 325 Feet

FIGURE 4-2bh

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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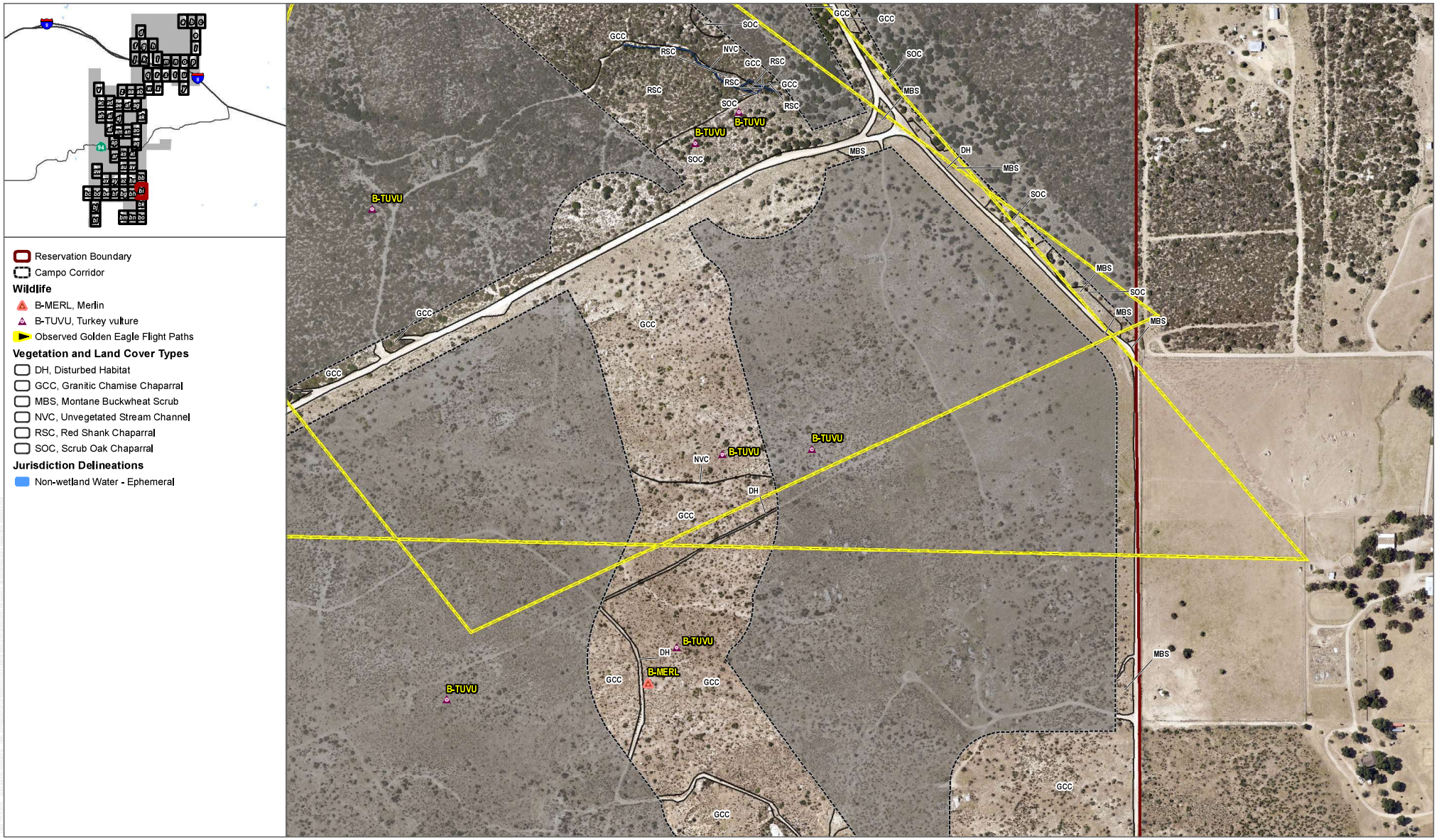

SOURCE: Source: SANGIS 2017

DUDEK 0 162.5 325 Feet

FIGURE 4-2bi

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

DUDEK

0 162.5 325 Feet

FIGURE 4-2bj

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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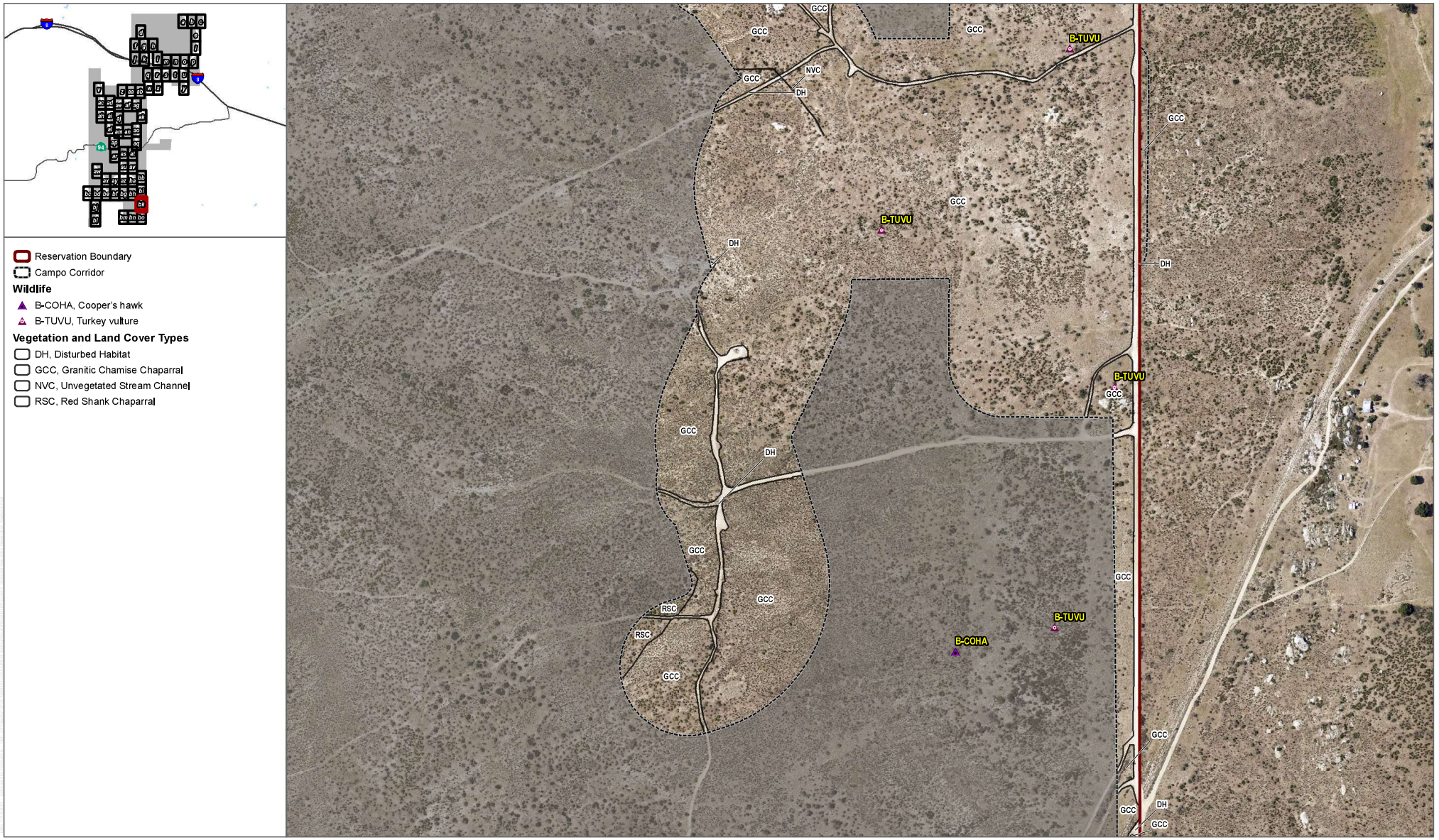

SOURCE: Source: SANGIS 2017

DUDEK

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FIGURE 4-2bk

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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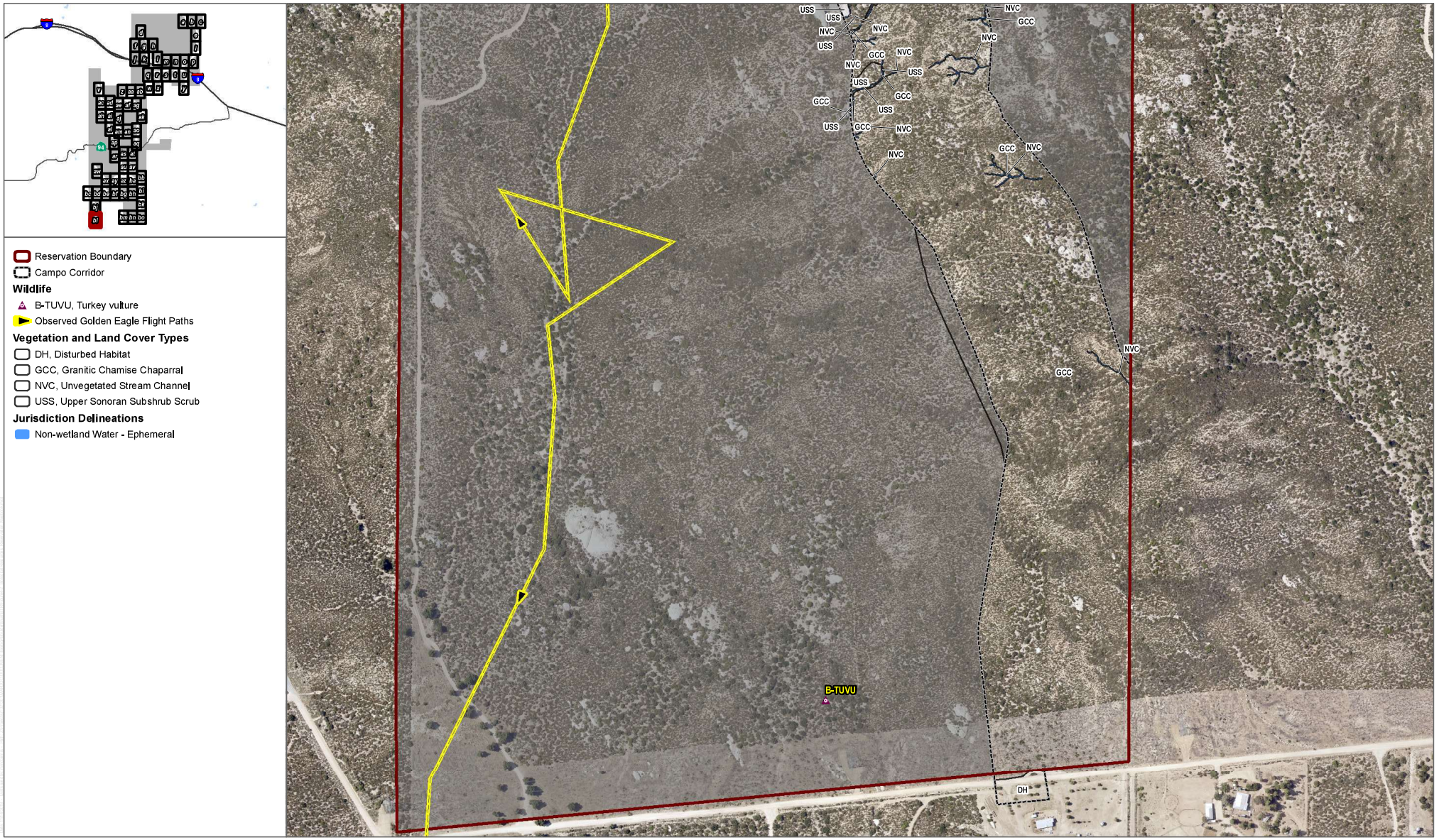

SOURCE: Source: SANGIS 2017

DUDEK

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FIGURE 4-2bI

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

DUDEK

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FIGURE 4-2bm

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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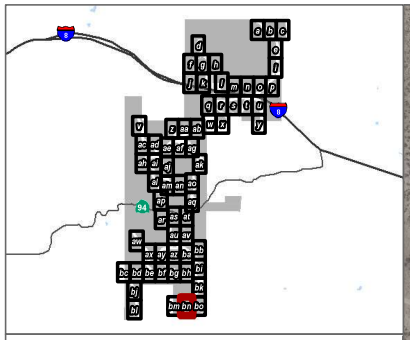

Reservation Boundary
Campo Corridor

Vegetation and Land Cover Types

DH, Disturbed Habitat
GCC, Granitic Chamise Chaparral

SOURCE: Source: SANGIS 2017

DUDEK

0 162.5 325 Feet

FIGURE 4-2bn

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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SOURCE: Source: SANGIS 2017

DUDEK

FIGURE 4-2bo

Vegetation Communities and Landcovers - Reservation

Biological Resources Technical Report For the Campo Wind Project with Boulder Brush Facilities

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