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4.0 RESULTS

4.1 Environmental Setting

The Study Area occurs roughly in the center of the Central Valley within historic flood plains of the Sacramento River and Putah Creek. The Study Area generally slopes to the southeast. Elevations, above mean sea level, on site range from 37 feet along the northwest corner of the site to less than 24 feet at the southeast corner of the site.

The Study Area is highly disturbed. Historical disturbances have occurred from agricultural (i.e., plowing, land leveling, wetland filling and draining) and military development (i.e., placement of fill material, roads, buildings, radio towers). More recently, the disturbances have been from grassland enhancement activities (disking and planting native bunch grasses), park development (occurring in the western half), and demolition activities (occurring in the eastern half).

The western half of the Study Area has large areas developed for the park infrastructure including numerous buildings, roads, archery ranges, and horseshoe pits; and ornamental plantings. In additional, the western half of the site has large areas planted with valley oaks (*Quercus lobata*) which are irrigated.

The main access to the eastern half of the Study Area is from the southeast corner where a paved road, orientated in a northwest-southeast fashion, runs to the center of this half of the site. The central portion of the eastern half of the Study Area site use to contain the main military compound facilities built on roughly 10 foot of fill material. Twenty–five large towers sites are scattered around the main compound facilities. Gravel roads, overgrown by annual grassland plants, radiate from the central complex out to the tower areas. Although the military had removed the communication towers, the guy wires and guy wire anchors (concrete blocks reinforced with rebar) had remained. Many of these concrete anchors were cubical with depths of greater than 5 feet. Each tower was usually supported by five to six guy wires. Yolo County contracted with Delta Oilfield Services, Inc in 2008 to demolish and remove the remaining military infrastructure on site (Scott Lines pers. comm.). During demolition operations, numerous areas including some of the wetlands were disturbed. The most significant disturbances associated with the demolition are the areas where concrete guy wire anchors were excavated. The concrete anchors were removed by excavating the soils along three sides of the concrete, the rolling the concrete out with the used of a large excavator. Four additional types of demolition disturbances were observed on site (ripper ruts, vehicular ruts, debris piles, and heavy equipment operation) and are described below.

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Ripper ruts disturbances were derived from four short (<10 inches in length) rippers used in conjunction with a box scraper attached to a skip loader used to collect down guy wire cables within the tall grass. The rippers seldom penetrated the ground more than six inches in depth. Although extensive in area, the actual disturbances caused by the short rippers are considered temporary. Vehicular ruts were caused by the tracks or tires of heavy equipment and the tires of pickup trucks when the soil was wet or moist. Piles of debris consisting mainly of concrete, but also occasional included cables and metal poles are scattered throughout the eastern portion of the Study Area awaiting removal. Other ground disturbances were generally from the operation of the heavy equipment. A complete list of the wetland disturbance categories are as follows:

B = Bermed
CE = Concrete Excavation
CT = Cattle Trampling
D = Disked
Di = Ditched
DP = Debris piles
HE = Heavy Equipment
P = Planted
PD = Partial Drained
PF = Partially Filled
R = Restored
RR = Ripper Ruts
VR = Vehicular Ruts

The Study Area's climate, geology and soils, hydrology, and habitats/communities are described below.

4.1.1 CLIMATE

The climate of the Study Area is characteristic of Mediterranean regions with cool wet winters and warm dry summers. The average annual temperature is roughly 62° Fahrenheit (F) with high temperatures exceeding 100° F on occasion, with occasional freezing temperatures of short duration. The frost-free growing season is estimated at roughly 280 days (Soil Conservation Service 1972). The Study Area receives annually 16 to 20 inches of precipitation (NRCS SCS 1972), of which almost all is rainfall. Most of the precipitation comes during the late fall, winter, and early spring season (six months); however, occasional thundershowers occur in the warmer months.

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4.1.2 GEOLOGY, LANDFORMS, AND SOILS

According to Helley and Harwood (1985), the Study Area occurs on Holocene alluvium deposits and Holocene basin deposits (Figure 2). The Holocene alluvium consists of un-weathered gravel, sand, and silt. This layer was deposited by present-day streams and river systems draining the Coast Ranges, Klamath Mountains and the Sierra Nevada Range. The Holocene alluvium deposits form natural levees along the main course of the Sacramento River, and they form broad alluvial fans, which act as low surface relief along the western and southwestern side of the Valley. Because of their high organic content, these deposits are dark gray, unlike the alluvium that flanks the channels of smaller streams. The thicknesses of the Holocene alluvium can reach 10 meters. (Helley and Harwood 1985)

Similar to alluvium deposits, the Holocene basin deposits are derived from by present-day streams and river systems. However, they consist of fine-grain silts and clays, in contrast to gravel, sand and silt of the alluvium deposits. These basin deposits provide rich farmland, in an undivided state, especially for rice production. These deposits vary in depth from three feet or so along the Central Valley perimeter to roughly 100 feet in depth in the center of the valley. (Helley and Harwood 1985)

According to the Soil Survey of Yolo County (U.S. Department of Agricultural Natural Resources Conservation Service [USDA NRCS – formally the Soil Conservation Service] 1972), four soil map units occurring on three landforms are present on site (Figure 3 and Table 2).

Brentwood Silty Clay Loam occurs on Alluvial Fan landforms and is considered non hydric with non hydric soil inclusions. Capay Silty Loam occupies Basin Rim landform and is considered a hydric soil with some hydric and non hydric soil inclusions. In contrast to Capay Silty Loam, the Marvin Silty Clay Loam which also occupies the Basin Rim landform is considered a non hydric soil. However, this soil series does have soil inclusions that are hydric and non hydric. Pescadero Silty Clay occurs in the Basin landform and is surrounded by the Basin Rim landform comprised of Capay Silty Loam, the Marvin Silty Clay Loam. Although the Pescadero Silty Clay is considered a non hydric soil it has soil inclusions that are hydric as well as non hydric. (USDA NRCS 1992)

A total of 32 soil pits were excavated with heavy equipment (excavator) in the Study Area (Figure 3). In general, soil test pits confirmed the NRCS (1972) mapping units (Table 3).

Study Area

Geologic Formations

Qb = Basin Deposits, Undivided (Holocene)
Qa = Alluvium (Holocene)

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0 480 960 Feet

Data Sources:

- **Helley and Harwood Geologic Map (1985)**
- **Aerial Photograph Flown March (2010)**

Figure 2. Study Area Geologic Formations