

ER P2 / 23 CCR SECTION 5006 - Restore Habitats at Appropriate Elevations

The following text was extracted from the Revised Conceptual Plan (attached) to describe how the project will take site elevations into account:

Tidal Datums and Inundation Frequency

Table 2 lists tidal datums for Dutch Slough from the Feasibility Report. Tidal datums are published by the National Ocean and Atmospheric Administration (NOAA 2003) relative to the mean lower low water (MLLW). PWA (2006) converted tidal datums to the National Geodetic Vertical Datum of 1929 (NGVD) based on water level monitoring in lower Marsh Creek and tidal datum calculations by WWR (NHI 2002). See the Feasibility Report for further description. ESA PWA recommends further assessment of the vertical control used for monitoring of tide levels in Dutch Slough and possibly additional monitoring (for approximately two to four weeks) and elevation surveys if needed to confirm site elevations relative to tide levels.

Table 1. Dutch Slough tidal datums.

	Dutch Slough Tidal Datums	
	Feet MLLW	Feet NGVD
100-year Tide Level	6.8	6.5
Mean Higher High Water (MHHW)	3.44	3.15
Mean High Water (MHW)	2.99	2.70
Mean Sea Level (MSL)	1.77	1.48
Mean Tide Level (MTL)	1.76	1.47
Mean Low Water (MLW)	0.52	0.23
Mean Lower Low Water (MLLW)	0.00	-0.29

Sources: NOAA COOPS (2003), WWR (NHI, 2002), and FEMA (1987)

ESA PWA assessed tidal inundation frequency and duration for high tides to inform high marsh and riparian habitat elevations for the revised concept (see Section 3.3). Table 3 summarizes tidal inundation frequency and duration for elevations above MHHW based on USGS tide data collected in Dutch Slough from December 31, 2000 to March 6, 2002 available from the Interagency Ecological Program website (IEP 2005).

Table 2. Approximate tidal inundation frequency and duration at Dutch Slough.

Elevation (ft NGVD)	Annual inundation frequency (# of times inundated/yr)¹	Average duration of inundation²	Note
5	1	15 min	Proposed high marsh/riparian boundary
4.5	1	3 hr	One tide event exceeded 4.5 and 5 ft NGVD
4	15	1 hr 45 min	
3.5	81	2 hr	
3.2	155	2hr 20 min	MHHW

Notes:

(1) Inundation frequency for the 14-month-long data set is annualized to a 12-month period.

(2) Average duration of inundation is calculated as the total period of inundation for the data set divided by the number of times inundated in the data set.

Habitat Elevations

The habitat elevations used in the revised concept are summarized in Table 4. Note that 5 ft NGVD is used as the boundary between high marsh and riparian, though areas above 4.5 ft NGVD are also expected to support some riparian vegetation given that these areas are tidally inundated only infrequently. The habitat elevations and design for riparian and high marsh areas may be refined during preliminary design.

Table 3. Habitat elevations.

Habitat	Elevation (ft NGVD)		Note
	Bottom	Top	
Riparian/upland	+5.0	NA	
High marsh	+2.0	+5.0	-1.2 to +1.8 ft MHHW
Mid marsh	+1.0	+2.0	-0.5 to +0.5 ft MTL
Low marsh	-0.8	+0.2	-0.5 to +0.5 ft MLLW
Subtidal open water	N/A	-0.8	

The following three figures show the site's existing elevations, how excavation will be done, and final proposed design of the marsh plain, with elevations. The first two figures are from the Draft EIR, the third is from the Supplemental EIR.

1. Existing elevations on the Dutch Slough project site.

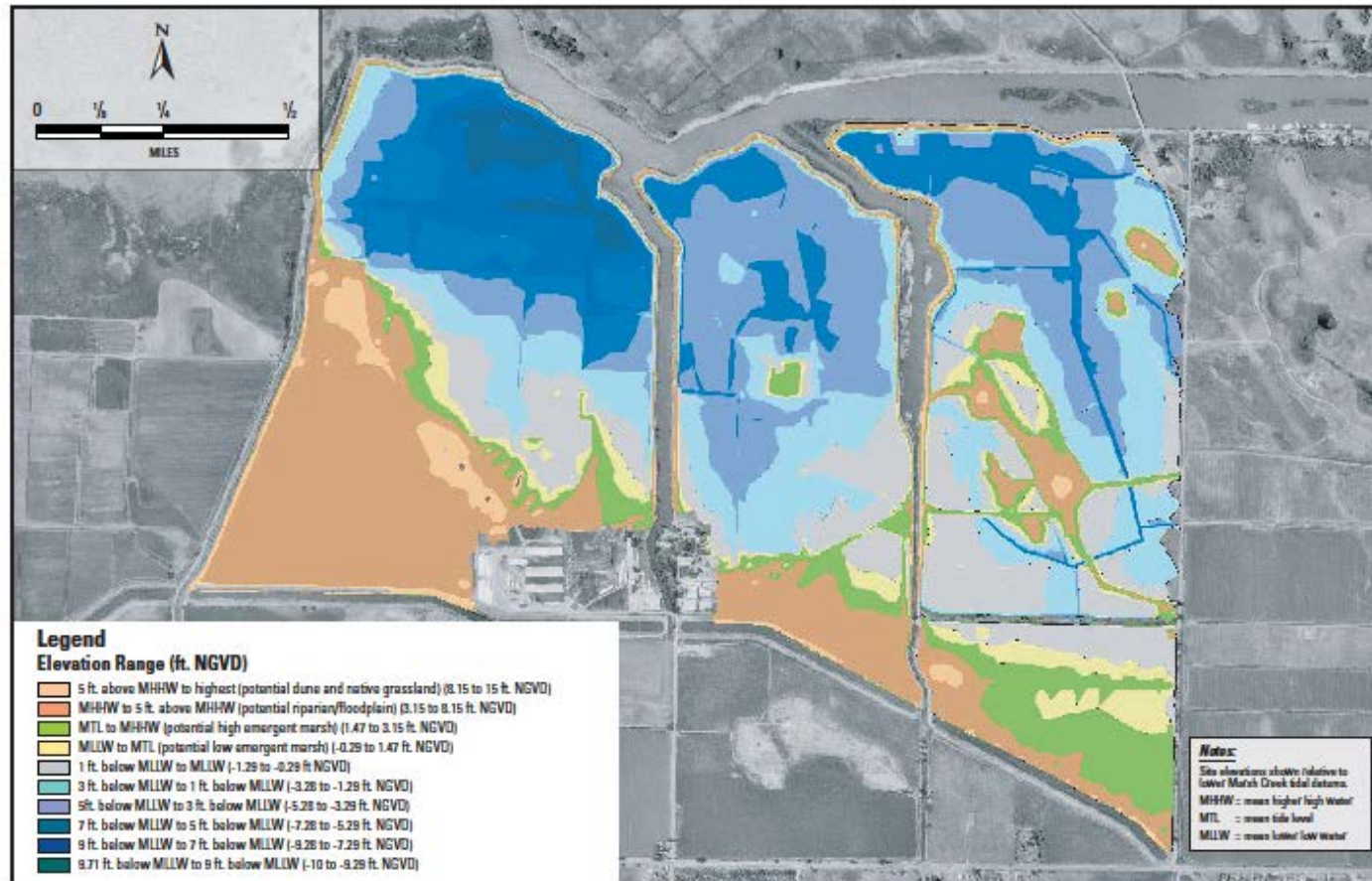
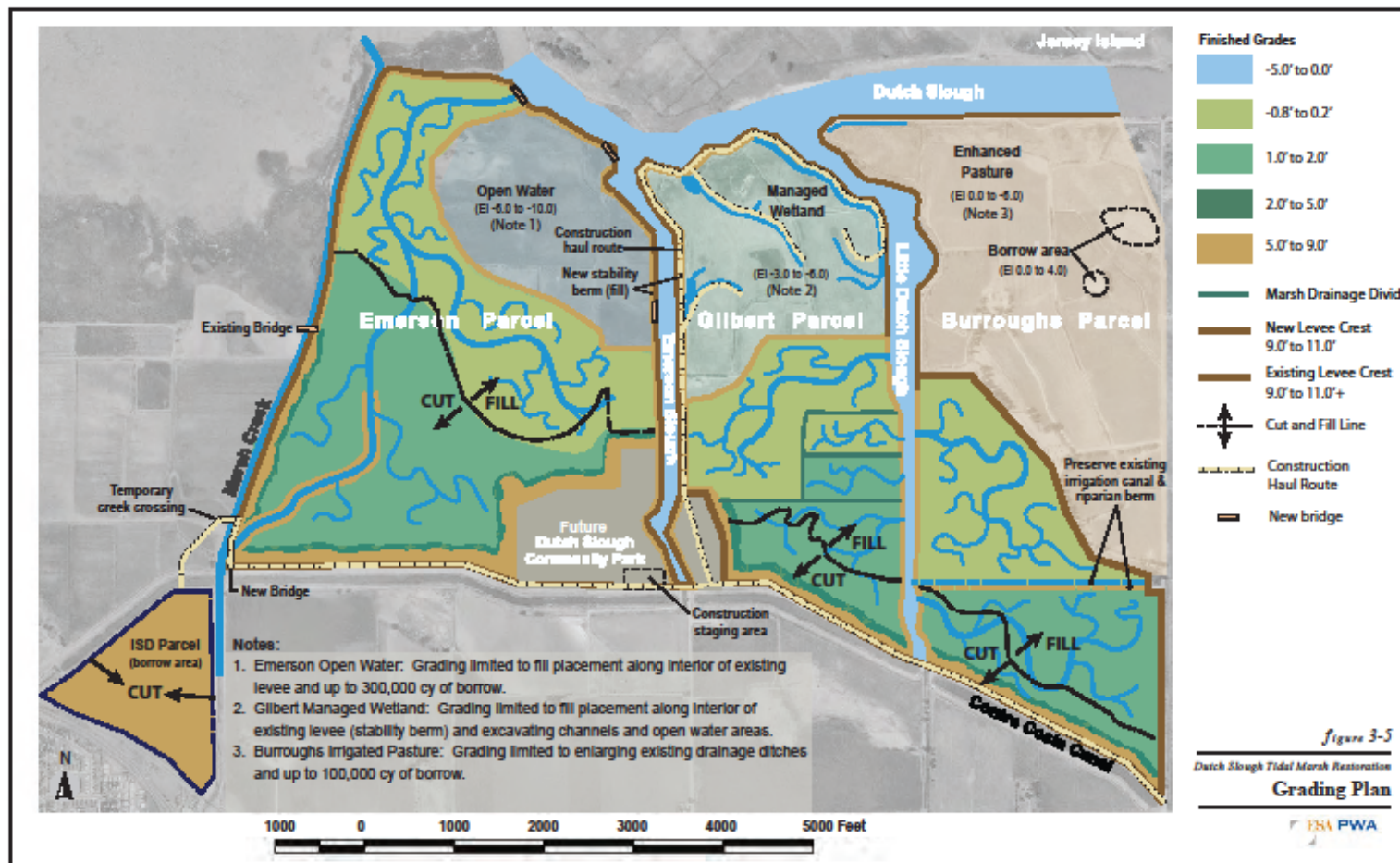


Figure 2-3

Dutch Slough Restoration Project Site Elevations

Sources: Carlson, Beebe, & Gibson, Siegel, USGS

2. How project constr
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3. Proposed project (MLLW, -0.3 feet NGVD) for mid n create beneficial

