

**Murray Field Obstacles
and Tree Abatement Recommendations**

**Reported by Ethan Coonen
and Natural Resources Management Corporation**

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Figure 1. Aerial image of Murray Field Airport obstacles.

Natural Resources Management Corp. has been asked to assess and report on potential impacts from removing trees from a slough levee, and mitigations or alternative vegetation that could prevent erosion of the levee. On April 7th, 2022, Ethan Coonen, NRM Forester and Arborist, visited the site with Curt Eikerman, the Airport Operation Manager, and Richard Holland, a local landowner. Some trees have become obstacles for aircrafts using the east runway of Murray Fields Airport. The County is required to remove the obstacles and would like to do so without degrading the levee. Richard Holland owns cattle pastures adjacent to levee and is concerned that a tree removal project could cause the levee to erode at an accelerated rate. Recommendations for preventing erosion at the proposed tree removal project are provide below.

There are five clumps of Sitka spruce trees, totaling 10 trees, obscuring the flight path at the Murray Fields Airport. The trees are approximately 35-feet tall and range from 6 to 12-inches in diameter at stump height. Two of the trees are dead. The trees are all growing on the slough edge of the levee except of the northern most tree that is rooted in the center of the levee. The levee is approximately 15-foot wide with a 65% slope to the adjacent pastures, and an approximately 6-foot vertical bank to the slough mud. The bank is overhanging, indicating that erosion of levee by tidal water is already occurring, but appears to be at a slow rate. Except of the slough bank the levee is fully vegetated with grasses, lupin (*Lupinus*), coyote brush (*Baccharis pilularis*), cascara (*Rhamnus purshiana*), plum (*Prunus*), California blackberry (*Rubus ursinus*), and mustard (*Brassica*). The 8 living trees are in poor health; the lower foliage is surviving, and the leaders have new foliage but most of the crowns are void of foliage due to extremely salty winds.

To remove the obstacles to air traffic, the trees should be removed and replaced with low stature vegetation. The following are NRM's recommendations:

- 1) If tree clearing will happen during bird nesting season (February 1 – August 31) than get a qualified biologist to survey for nesting birds no more than 7 days before any clearing.
- 2) Minimum impacts to surrounding vegetation to the greatest extent possible.
- 3) Fell the trees away from the slough to prevent large woody debris from entering the slough. The use of a cable attached from tree trunk to a truck maybe needed to ensure trees fall in the right direction.
- 4) Use a stump grinder or other device to remove as much of the stump and roots as possible without excavating the levee. Remove stump debris from levee to prevent it from entering the slough.
- 5) Remove slash from levee by hauling to designated green waste site, pile and burn once dry, or chip and spread along banks adjacent to pastures. Chips shall be spread so that no area is thicker than 2-inches. Trunk debris can be bucked for firewood or removed with crown slash.
- 6) No tree material or equipment may enter the slough at any point.
- 7) Armor areas of disturbed soil with biodegradable materials. Use biodegradable landscape stakes to secure woven fabric made of jute or coir. Depending on extent of root removal, each site a tree was removed from will need an approximately 6 by 5-foot covering. Stakes should be spaced every 2-feet so each tree removal site will need at least 4-square-yards of fabric and 16 stakes.
- 8) Plant 3 coyote brush (*Baccharis pilularis*) plants for each tree removed. Obtain health plants with at least 1-foot of growth and plant in fall or winter once soil is saturated. Coyote brush can be purchased from Samara Restoration in McKinleyville, CA.
- 9) Monitor the site for erosion and revegetation success. Return to the site each year for at least 3 years to assess if rates of erosion are faster at the tree removal sites than other portions of the levee. Also, assess if the coyote brush plants or other vegetation are colonizing the site successfully. If accelerated rates of erosion are observed, then consult with a civil engineer. If vegetation does not occupy at least 80% of the area by the third year, then consult with a restoration specialist.

For questions regarding this report, please contact Ethan Coonen at Natural Resources Management Corp. (707) 269-1376 Direct; (707) 497-4450 Cell; ecoonen@nrmcorp.com

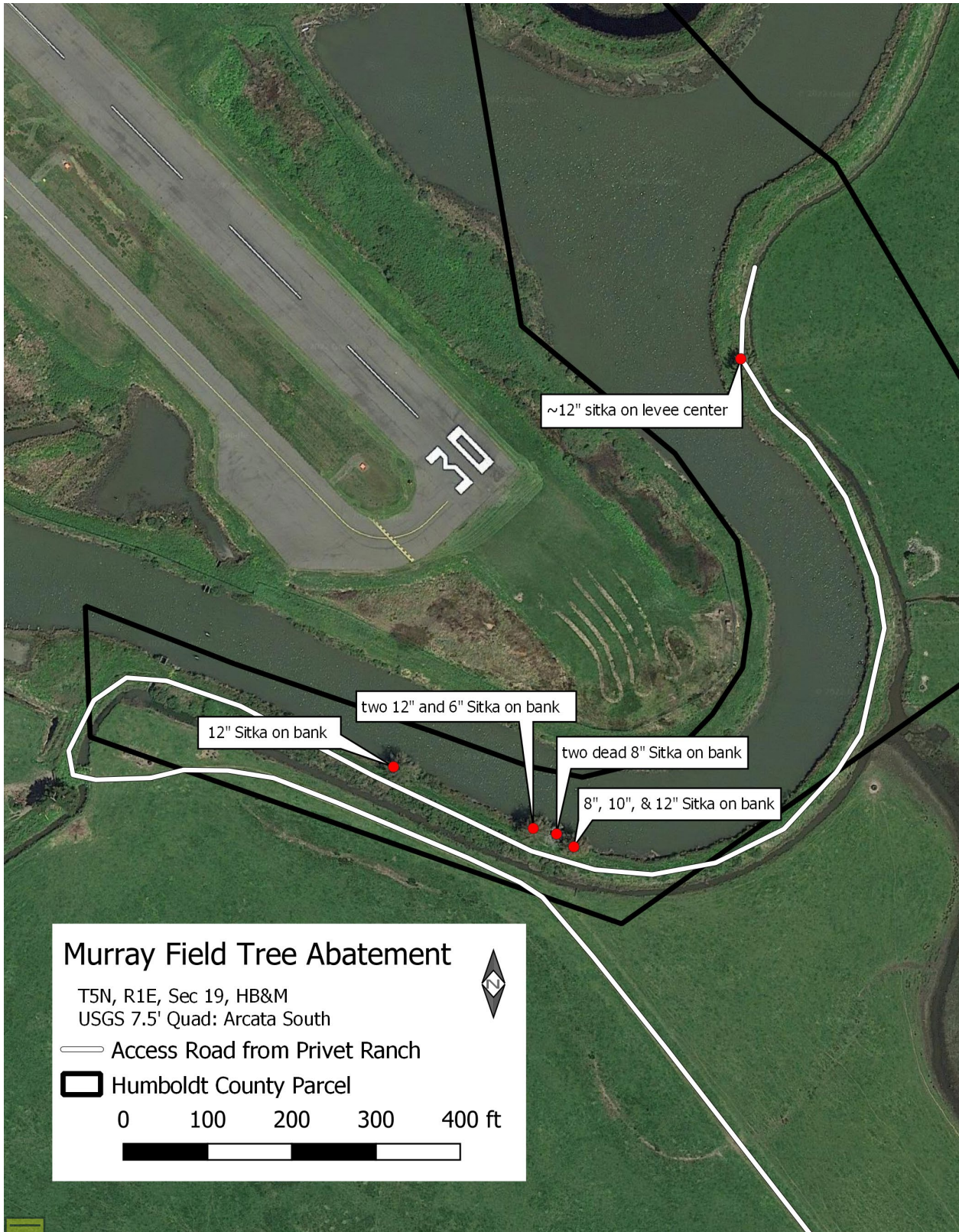


Figure 2. Map of project site with aerial image background and approximate tree sizes.



Photo 1. Example for project site conditions. All the trees, except one, are growing along the levee edge at the top of the slough bank.



Photo 2. Example for project site conditions. All the trees, except one, are growing along the levee edge at the top of the slough bank.



Photo 3. Example of levee edge where erosions is slowly occurring.



Photo 4. Example of access road along top of levee and vegetation colonizing the levee. The access road is mowed once a year.

Table 1. Results from California's Natural Diversity Database with a one-mile search radius from project site.

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank	CDFW Status	Taxonomic Group
<i>Acipenser medirostris</i>	green sturgeon	None	None	G3	S1		SSC	Fish
<i>Spirinchus thaleichthys</i>	longfin smelt	Candidate	Threatened	G5	S1			Fish
<i>Thaleichthys pacificus</i>	eulachon	Threatened	None	G5	S2			Fish
<i>Eucyclogobius newberryi</i>	tidewater goby	Endangered	None	G3	S3			Fish
<i>Eucyclogobius newberryi</i>	tidewater goby	Endangered	None	G3	S3			Fish
<i>Oncorhynchus clarkii clarkii</i>	coast cutthroat trout	None	None	G5T4	S3		SSC	Fish
<i>Entosphenus tridentatus</i>	Pacific lamprey	None	None	G4	S3		SSC	Fish
<i>Oncorhynchus kisutch</i> pop. 2	coho salmon	Threatened	Threatened	G5T2Q	S2			Fish
<i>Oncorhynchus mykiss irideus</i> pop. 16	steelhead	Threatened	None	G5T2T3Q	S2S3			Fish
<i>Lampetra richardsoni</i>	western brook lamprey	None	None	G4G5	S3S4		SSC	Fish
<i>Rana aurora</i>	northern red-legged frog	None	None	G4	S3		SSC	Amphibians
<i>Coturnicops noveboracensis</i>	yellow rail	None	None	G4	S1S2		SSC	Birds
<i>Cicindela hirticollis gravida</i>	sandy beach tiger beetle	None	None	G5T2	S2			Insects
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	None	None	G4	S2		SSC	Mammals
<i>Carex lyngbyei</i>	Lyngbye's sedge	None	None	G5	S3	2B.2		Monocots
<i>Carex praticola</i>	northern meadow sedge	None	None	G5	S2	2B.2		Monocots
<i>Lilium occidentale</i>	western lily	Endangered	Endangered	G1	S1	1B.1		Monocots
<i>Castilleja ambigua</i> var. <i>humboldtiensis</i>	Humboldt Bay owl's-clover	None	None	G4T2	S2	1B.2		Dicots
<i>Spergularia canadensis</i> var. <i>occidentalis</i>	western sand-spurrey	None	None	G5T4	S1	2B.1		Dicots
<i>Chloropyron maritimum</i> ssp. <i>palustre</i>	Point Reyes salty bird's-beak	None	None	G4?T2	S2	1B.2		Dicots
<i>Lathyrus japonicus</i>	seaside pea	None	None	G5	S2	2B.1		Dicots