

County: Monterey **ACP Division/Segment:** MT - B - S001**NOAA Chart:** 18685**Map Book:** 1055**Decimal Degrees:** 36.81 -121.7843**Site Description:**

Elkhorn Slough is the largest tidal salt marsh system in California outside of San Francisco Bay and is home to a diverse and abundant wildlife community, including a long list of threatened and endangered species. Indigenous peoples resided within the slough; the entire area holds considerable cultural and historic significance. The slough is over seven miles long and connects to the ocean through Moss Landing Harbor. Elkhorn Slough is a saltwater estuary with seasonal freshwater input from winter storms, but twice-daily tides cause almost all of the water exchange in the slough. Currents are particularly swift as they pass through restrictions at Highway 1 as well as the train trestle at Parson's Slough and have deeply scoured channels. Extensive marshes and tidal flats cover 2,500 acres scattered throughout the site. The Union Pacific railway lies near the eastern shoreline and has two trestles crossing smaller sloughs. The Elkhorn Slough National Estuarine Research Reserve is administered by the National Oceanic and Atmospheric Administration. The reserve is managed by the California Department of Fish and Wildlife. The Elkhorn Slough Foundation is a land trustee within the reserve. A substantial portion of the northern and western shore (Elkhorn Ranch) is owned by The David and Lucile Packard Foundation. Site is within the Elkhorn Slough State Marine Conservation Area, Elkhorn Slough State Marine Reserve, and Monterey Bay National Marine Sanctuary. Western snowy plovers nest at the Moss Landing State Wildlife Area Mar-Sep. Caspian terns nest in Parsons Slough Apr-Aug. Over 1,000 brown pelicans have been observed roosting within the slough, particularly on the south-facing bank of the Moss Landing State Wildlife Area. Endangered Santa Cruz long-toed salamanders and threatened California tiger salamanders are present in grassland habitat. Elkhorn Slough harbors the largest concentration of sea otters along the California coast which tend to accumulate near Yampah Marsh. Harbor seals haul out and pup at Seal Bend and other tidal flats. Several sensitive plant species are found throughout the slough, including the grassland near the power plant.

Resources at Risk:*ESI and Habitat:* 10A Salt - and brackish-water marshes

7 Exposed tidal flat

9A Sheltered tidal flats

9B Vegetated low banks

8C Sheltered riprap

6B Riprap

10B Freshwater marshes

List of Resources at Risk:

	Resource Name	Status	Presence	Sensitivity
Amphibians	California red-legged frog	FT, SSC	Year-round	Nov-Mar
Amphibians	California tiger salamander	FE, ST	Year-round	
Amphibians	Santa Cruz long-toed salamander	FE, SE	Year-round	
Birds	California Ridgeway's rail	FE, SE	Year-round	Mar-Aug
Birds	seabird colony		Year-round	Apr-Aug
Birds	Western snowy plover	FT, SSC	Year-round	Mar-Sep
Mammals	Pacific harbor seal	FP	Year-round	Feb-May
Mammals	Southern sea otter	FT, SP	Year-round	
Plants	Choris' popcorn flower	SR	Year-round	
Plants	Eastwood's goldenbush	SR	Year-round	
Plants	fragrant fritillary	SR	Year-round	
Plants	Monterey gilia	FE, ST	Year-round	
Plants	Monterey spineflower	FT	Year-round	
Plants	robust spineflower	FE	Year-round	
Plants	saline clover	SR	Year-round	
Plants	seaside bird's beak	SE	Year-round	
Reptiles	Western pond turtle	SSC	Year-round	May-Aug

FT-Federally Threatened, FE-Federally Endangered, FP-Federally Protected, SE-State Endangered, ST-State Threatened, SP -State Protected, SR-State Rare, SSC-Species of Special Concern, BGEPA-Bald and Golden Eagle Protection Act, SSSP-State Special Status Species

List of Key Contacts:

Type	Name/Title	Organization	Phone
C	/Coordinator	Native American Heritage Commission	(916) 373-3710
C	/Coordinator	Northwest Information Center	(707) 588-8455
E	/Manager	CDFW Moss Landing State Wildlife Area	(831) 649-7194
E	/Office	Elkhorn Slough National Estuarine Research Reserv	(831) 728-2822
E	/Duty Phone, 24-hr	Moss Landing Harbor District	(831) 633-2461
O	/Dispatch, 24-hr	Union Pacific Railroad	(888) 877-7267
T	/Emergency Responder, 24-hr	Monterey Bay National Marine Sanctuary	(831) 236-6797
T	/Agency Representative	NOAA National Marine Fisheries Service	(707) 575-6050
T	/Spill Response Coordinator	US Fish and Wildlife Service	(805) 644-1766

C – Cultural, Historic, Archaeological; E – Entry/Owner/Access; O – Other; S – Safety; T – Trustee; X – Exclusion or Security

Additional Site Summary Comments:

Heavy on-water recreational use. Due to its size and complexity, this site includes multiple protection strategies that are illustrated in four diagrams. Figure 1 - Overall site area. Figure 2 - Elkhorn Slough inlet and Moss Landing Harbor (Substrategy 3-310.2). Figure 3 - Parsons Slough inlet at train trestle (Substrategy 3-310.4). Figure 3 - Inlets to Moss Landing State Wildlife Area, Yampah Marsh, Minhoto Marsh, and Hester's Marsh (Substrategy 3-310.5). Figure 4 - Water control structures (Substrategy 3-310.3).

Concerns and Advice to Responders:

Heavy on-water recreational use. Western snowy plovers nest at the Moss Landing State Wildlife Area Mar-Sep. Caspian terns nest in Parsons Slough Apr-Aug. Brown pelicans roost on the south-facing bank of the Moss Landing State Wildlife Area. Endangered Santa Cruz long-toed salamanders and threatened California tiger salamanders are present in grassland habitat. Large population of sea otters, particularly near Yampah Marsh. Harbor seals at Seal Bend and other tidal flats Feb-May. Several sensitive plant species found throughout the slough, including the grassland near the power plant.

Hazard and Restrictions:

Railroad on eastern shoreline with frequent train traffic; crossing at Kirby Park does not have flashing lights or crossarms. Strong tidal current velocity through main channel. Tide conditions may limit vessel access beneath the Highway 1 bridge; maximum air draft 8 feet. Vehicle access to Moss Landing State Wildlife Area via gated gravel road.

Site Strategies:**Site Validation Level: III**

Strategy: 3-310.1 Objective: Deploy boom to contain spill near source.

Strategy: This strategy applies to any location within the slough. Contain the spill as close to the source as possible based upon the location and nature of the spill. Consult tide tables and wind forecasts to determine the potential trajectory of the spill. The equipment listed below would be required in the event of a large spill.

Table of Response Resources

Equipment	Sub-Type	Size	Unit	QTY	Unit	Last Page Update
Boom	Harbor			5700	feet	
Boom	Sorbent			5700	feet	
Anchor	Danforth	43 pound		10		
Anchor	Shore			5		
Vessel	Skiff or Punt			3		
Vessel	Hand-Launchable			2		
Staff				12		

Strategy: 3-310.2 Objective: Deploy boom to protect Elkhorn Slough.

Strategy: See Figures 1 and 2. Pre-set three 43-pound Danforth anchors east of the Highway 1 bridge along the planned deployment. The bottom is sand which ensures proper anchoring. Set a shore anchor on the north side of the slough in the area shown on Figure 1. There is a permanent anchor by the power plant outfall on the south side of the slough. Using the permanent anchor and the temporary shore anchor, deploy one strand of containment boom across the slough. Attach the Danforth anchors to prevent entrainment. If shore anchors are not available there are numerous other places to anchor boom including cypress trees and other permanent structures. Deploy one strand of sorbent boom behind the containment boom. Boats should be launched at the Moss Landing North Harbor launch ramp adjacent to Highway 1. Vessels with maximum air draft of 8 feet will be required to pass under the Highway 1 bridge. Higher profile boats can launch at Kirby Park although not recommended due to narrow channel and small boat ramp. Equipment such as vacuum trucks can be staged in the parking lot adjacent to Highway 1 or in the Moss Landing Wildlife Area.

Table of Response Resources

Equipment	Sub-Type	Size	Unit	QTY	Unit	Last Page Update
Boom	Harbor			1400	feet	<i>Strategy Updated: Last Test: 1/19/2018</i>
Boom	Sorbent			1400	feet	
Anchor	Danforth	43 pound		4		
Anchor	Shore			2		
Vessel	Skiff or Punt			2		
Staff				6		

Strategy: 3-310.3 Objective: Close all water control structures in Elkhorn Slough.

Strategy: See Figure 4. Contact the Elkhorn Slough Reserve and Moss Landing Wildlife Area manager and request that staff close all water control structures. Contact county communications (911) to inform of spill and direct staff to close water control structures.

Table of Response Resources

Last Page Update

Strategy: 3-310.4 Objective: Deploy boom to protect Parsons Slough.

Strategy: See Figures 1 and 3. At the Parsons Slough trestle crossing, deploy approximately 400 feet of boom to the west of the trestle in a shallow chevron formation. Due to potential current under trestle and risk of entrainment a secondary deeper chevron formation may be deployed to ensure full containment of product released. Use a collection pocket in apex of boom. This strategy may require using a skiff that can be hand-carried over the levy if booming is necessary on the east side of the trestle. Oil collection will be conducted on-water or from the rail line using a high-rail skimmer. If access restricts equipment operations boom can be moved south into a modified chevron allowing more efficient skimming operations from shore-based strategies.

Table of Response Resources

Equipment	Sub-Type	Size	Unit	QTY	Unit	Last Page Update
Boom	Harbor			800	feet	<i>Strategy Updated:</i> <i>Last Test: 1/19/2018</i>
Boom	Sorbent			800	feet	
Anchor	Danforth	43 pound		4		
Vessel	Skiff or Punt			1		
Vessel	Hand-carried			1		
Staff				4		

Strategy: 3-310.5 Objective: Deploy boom to protect marsh areas and side channels.

Strategy: See Figures 1 and 3. The specific shoreline protection strategies will depend on tide stage and oil movement but may include using deflection booms and lining the shoreline with sorbent boom. Primary areas of concern are Moss Landing State Wildlife Area, Yampah Marsh, Minhoto Marsh, and Hester's Marsh.

Table of Response Resources

Equipment	Sub-Type	Size	Unit	QTY	Unit	Last Page Update
Boom	Harbor			1400	feet	
Boom	Sorbent			1400	feet	
Anchor	Danforth	43 pound		8		
Vessel	Skiff or Punt			2		
Staff				4		

Logistics:

Directions: Moss Landing North Harbor (2486 CA-1, Moss Landing, CA 95039); over 200 parking spaces. Moss Landing South Harbor (7881 Sandholdt Rd, Moss Landing, CA 95039); over 200 parking spaces. Kirby Park (Kirby Rd, Watsonville, CA 95076); 60 parking spaces. Elkhorn Slough National Estuarine Research Reserve office (1700 Elkhorn Rd, Watsonville, CA 95076); 72 parking spaces.

Land Access: Access to Moss Landing State Wildlife Area through gated CDFW property (2375 CA-1, Moss Landing, CA 95039). Access to Minhoto Marsh and Hester's Marsh through Moonglow Dairy property (357 Dolan Rd, Moss Landing, CA 95039). Access to Yampah Marsh and Parsons Slough from Via Tanques Rd. (36.806289°, -121.749075°). Hiking trails throughout slough originate at the Elkhorn Slough National Estuarine Research Reserve.

On-Water Limitations: Launch ramps in Moss Landing North Harbor. Launch ramp for small vessels at Kirby Park. Tide conditions may limit vessel access beneath the Highway 1 bridge, maximum air draft 8 feet.

Facilities, Staging Areas, Command Posts, Available Equipment: Moss Landing Harbor parking lots may be suitable for staging areas (north lot 3.8 acres, south lot 3 acres). Moss Landing Power Plant conference room may be available for use as a command post. Restrooms at Moss Landing North Harbor and South Harbor. Portable toilet at Kirby Park.

Communications Problems: None.

Additional Operational Comments:







