

**2011 ANNUAL EROSION RECONNAISSANCE ENGINEERING REPORT  
SACRAMENTO RIVER BANK PROTECTION PROJECT**

**SACRAMENTO RIVER AND TRIBUTARIES**

**February 2012**

**APPENDIX A – 2011 EROSION SITES TABLES**



**US Army Corps  
of Engineers.**

**SACRAMENTO DISTRICT**

Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
BER_0-8_L	Bear River	0.8	-	L	RD 1001 (Unit 3)	Rio Oso	eroding	2006	334	15	fluvial		none	no	no	2006 - Multiple rotational failures in the berm. Erosion is into the levee toe and lower slope. Tension cracks extensive at top of bank. Cohesive toe creates a bench on which failures occur. 2007 - Still steep bank with some berm with pistol-butted reeds.	No observed change.
BER_1-9_L	Bear River	1.9	-	L	RD 1001 (Unit 3)	Rio Oso	eroding new	2011	432	5	whole bank failure		none	no	no		Large slumped sections of bank.
BER_2-5_L	Bear River	2.5	-	L	RD 1001 (Unit 3)	Rio Oso	eroding new	2011	222	25	whole bank failure		none	no	no		A large section of bank has slumped off, RD has flagging up, appears to be watching.
BER_4-9_R	Bear River	4.9	-	R	RD 784 (Unit 3)	Johnson Ranch	eroding	2009	64	10	fluvial		none	no	no	2009 - Small site which could be repaired with maintenance. Erosion into the levee toe, rock has started to fail.	No observed change.
BER_5-7_L	Bear River	5.7	-	L	RD 1001 (Unit 3)	Bear	eroding	2008	474	20	whole bank failure	fluvial	none	no	no	2008 - Sandy/silty banks with rotational slab failures creating near vertical bank with pop-outs due to tree failures. Narrow berm.	No observed change.
BTC_2-5_R	Butte Creek	-	2.5	R	MA 5 (Unit 2)	Butte Basin	eroding	2008	142	20	whole bank failure		none	no	no	2008 - Sandy non-cohesive bank with rotational/slab failure.	No observed change.
CBD_0-5_L	Colusa Basin Drainage Canal	-	0.5	L	RD 787 (Unit 1)	RD 787	eroding new	2011	611	5	fluvial	tree pop-outs	none	no	no		Large scallops throughout the entire reach. Toe scour due to tree pop-outs, resulting in a steepening slope. The reduced resistive forces plus clay levee may increase the loading. Additional erosion due to human use.
CBD_0-9_L	Colusa Basin Drainage Canal	-	0.9	L	RD 787 (Unit 1)	RD 787	eroding new	2011	968	0	tree pop-outs	fluvial	none	no	no		Large scallops throughout the entire reach. Toe scour due to tree pop-outs, resulting in a steepening slope. The reduced resistive forces plus clay levee may increase the loading.
CBD_19-2_L	Colusa Basin Drainage Canal	-	19.2	L	RD 108 (Unit 1)	Grimes	eroding new	2011	397	0	fluvial	toe scour	none	no	no		Toe scour at the bottom of a steep bank, large sections of the toe are sliding down. Erosion may be due to the upstream bend.
CHC_2-4_L	Cache Creek	-	2.4	L	DWR Cache Creek (Unit 1)	Yolo	critical	2002	218	15	toe scour	fluvial	none	yes	no	Site identified as CRITICAL in 2002. 2006 - Currently constructing a setback levee. New failures present and extensive. Downstream end of the setback levee did not extend far enough. Upstream end was repaired. 2007 - DWR repaired with a setback levee, but the levee did not go far enough downstream.	No observed change.
CHC_2-8_L	Cache Creek	-	2.8	L	DWR Cache Creek (Unit 1)	Yolo	eroding	2002	209	15	toe scour	whole bank failure	none	no	no	2006 - Large new failure. 2008 - Plans for repair currently in the design phase. 2010 - Planned setback levee by CA DWR, 60% design complete, construction planned for 2012.	No observed change. DWR plans to construct a setback levee in 2013.
CHC_3-4_L	Cache Creek	-	3.4	L	DWR Cache Creek (Unit 1)	Yolo	eroding	2002	486	15	toe scour	whole bank failure	none	no	no	2006 - Some significant new erosion, especially fresh upper bank slumping. Still substantial berm. 2010 - Site extended downstream, some new erosion, heavily vegetated and hard to see. Planned setback levee by CA DWR, 60% design complete, construction planned for 2012.	No observed change. DWR plans to construct a setback levee in 2013.
CHC_3-5_R	Cache Creek	-	3.5	R	DWR Cache Creek (Unit 2)	Woodland	eroding	2010	450	15	fluvial	tree pop-outs	none	yes	no	2010 - Large slump on the upper berm, a tree has recently slid down the slope.	Large slumped section and new erosion.
CHC_3-9_L	Cache Creek	-	3.9	L	DWR Cache Creek (Unit 1)	Yolo	critical	2002	429	10	toe scour	whole bank failure	none	yes	no	Site identified as CRITICAL in 2006. 2006 - Some significant new erosion, especially fresh upper bank slumping. Also have a small piping failure due to recent overbank flows. 2007 - Some new minor upper bank slumps. 2010 - Planned setback levee by CA DWR, 100% design complete, construction planned for 2011.	Minor new erosion. DWR plans to construct a setback levee in 2012.

Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
CHC_4-2_L	Cache Creek	-	4.2	L	DWR Cache Creek (Unit 1)	Yolo	critical	2002	728	10	toe scour	whole bank failure	none	no	no	Site identified as CRITICAL in 2006. 2006 - Some significant new erosion, especially fresh upper bank slumping. Also have a small piping failure due to recent overbank flows. 2010 - New erosion, flood fought in early 2010. Planned setback levee by CA DWR, 100% designs complete, construction planned for 2011.	Large sections of the bank have slumped off in the past year.
CHC_5-4_L	Cache Creek	-	5.4	L	DWR Cache Creek (Unit 1)	Yolo	eroding	2009	198	15	whole bank failure	tree pop-outs	none	no	no	2009 - Erosion into the levee slope. 2010 - Minor new erosion.	New erosion and a freshly fallen tree.
CHK_11-7_R	Cherokee Canal		11.7	R	MA 13 (Unit 1)	NONE	eroding new	2011	34	0	eddy scour		none	yes	no		Small erosion pocket, likely caused by the irrigation diversion structure.
CHS_15-9_L	Cache Slough	15.9	-	L	RD 501 (Unit 2)	Ryer Island	eroding	2005	377	3	wave wash		quarry stone on part of the bank in poor condition	yes	no	2005 - Large vertical sections due to wave wash. New stone dumped on the bank with exposed geotextile. Cohesive toe has thin weak stratigraphic unit that is washing out. 2006 - Partially repaired, but 100 ft in the middle of the reach has exposed filter fabric and stone riprap is gone. 2010 - Site extended downstream to include new erosion pocket.	No observed change.
CHS_21-1_R	Cache Slough	21.1	-	R	RD 2060 (Unit 3)	Hastings Tract	eroding new	2011	1158	0	toe scour	wave wash	none	no	no		Several large pockets of erosion from rotational failure. Toe is slumping.
CHS_22-6_R	Cache Slough	22.6	-	R	RD 2060 (Unit 3)	Hastings Tract	eroding	2008	932	0	tree pop-outs	whole bank failure	none	no	no	2008 - Small scour pockets and mid-slope wave wash. 2010 - More vegetation growth, could be fixed through maintenance.	site extended downstream. new erosion.
CHS_22-8_R	Cache Slough	22.8	-	R	RD 2060 (Unit 3)	Hastings Tract	eroding	2007	258	0	wave wash	tree pop-outs	none	no	no	2007 - Geotechnical failure of midside slope and wave wash/scalloping in toe area. Stone revetment upstream and downstream of site. Similar sites are present all along the right bank downstream of this site, most could be repaired with some maintenance. 2010 - Minor new erosion.	No observed change.
CHS_23-0_R	Cache Slough	23.0	-	R	RD 2060 (Unit 3)	Hastings Tract	eroding	2010	348	0	toe scour	tree pop-outs	none	no	no	2010 - Small maintenance site.	No observed change.
CHS_23-6_R	Cache Slough	23.6	-	R	RD 2060 (Unit 3)	Hastings Tract	eroding	2005	799	0	fluvial		none	no	no	Site added in 1997 and removed in 2003. 2005 - Put back in the inventory. 2006 - Stone repair at the middle of the site.	Some rock has been placed at toe in the past year.
DEC_0-9_R	Deer Creek	-	0.9	R	Tehama County (Unit 2)	NONE	eroding	2006	265	15	tree pop-outs	fluvial	none	no	no	2006 - Banks are composed of lithified cobble alluvial soils (relict alluvial fan deposits). Slow erosion of lithified lower bank materials with faster erosion of overlying less cohesive soils resulting in channel "skating" across lithified horizon.	No observed change. The Deer Creek Watershed Conservation Group is planning a reach-wide repair for Deer Creek.
DEC_2-4_L	Deer Creek	-	2.4	L	Tehama County (Unit 1)	NONE	eroding	2006	97	20	whole bank failure		none	no	no	2006 - Erosion along outer bank of a meandering bend that is getting close to the projection of the levee toe. Trees are leaning out into the channel and ready to fall. Whole bank in reach is actively eroding.	New erosion pocket caused by an eddy. The Deer Creek Watershed Conservation Group is planning a reach-wide repair for Deer Creek.
DWS_5-0_L	Deep Water Ship Channel	-	5.0	L	RD 999 (Unit 1)	Clarksburg	eroding	2006	81	200	wave wash		none	no	no	2006 - Slump failure of lower slope. Longitudinal cracks present along the levee slope.	Difficult to see due to overgrown vegetation. A small section of the levee has slumped. Sties DWS 5.0 and DWS 5.01 were combined.
ELC_1-4_L	Elder Creek	-	1.4	L	Tehama County (Unit 4)	NONE	eroding	2006	331	20	whole bank failure	fluvial	none	no	no	2006 - High vertical bank due to mass failures. Thalweg meandering and erosion of bank. Banks are cohesive with non-cohesive gravel horizons.	Foundation is silty-sand with gravel. New slumping at the toe, mass failure continues.
ELC_3-0_R	Elder Creek	-	3.0	R	Tehama County (Unit 5)	NONE	eroding	2006	129	20	fluvial		none	no	no	2006 - Mass failure of this bank due to being along the outside of a bend where erosion and undercutting are the greatest. Low flow is being forced into the toe of this bank by point bar on the opposite side of the creek.	Toe of the bank continues to be undercut.

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ELK_0-2_L	Elk Slough	0.2	-	L	RD 150 (Unit 3)	Merritt Island	eroding	1997	48648	0	whole bank failure	tree pop-outs	cobbles	yes	no	1997 - Most of lower Elk Slough contains high near vertical banks, with erosion into the levee slope. Channel almost appears incised. 2002 - Sites where the levee slope is near vertical and severely eroding. It could fail catastrophically. 2004 - Looks bad in terms of vertical slopes and fallen trees. 2005 - Banks are still over steepened in most places and potentially susceptible to geotechnical failures. 2006 - Both banks are still over steepened in most places and potentially susceptible to geotechnical failures. 2010 - The entire reach is in poor condition, with severely eroding near vertical slopes, needs a regional repair.	Channel banks are still oversteepened with erosion continuing.
ELK_0-2_R	Elk Slough	0.2	-	R	RD 999 (Unit 5)	Clarksburg	eroding	1997	48867	0	whole bank failure	tree pop-outs	none	yes	no	1997 - Most of lower Elk Slough contains high near vertical banks, with erosion into the levee slope. Channel almost appears incised. 2002 - Sites where the levee slope is near vertical and severely eroding. It could fail catastrophically. 2004 - Looks bad in terms of vertical slopes and fallen trees. 2005 - Banks are still over steepened in most places and potentially susceptible to geotechnical failures. 2006 - Both banks are still over steepened in most places and potentially susceptible to geotechnical failures. 2010 - The entire reach is in poor condition, with severely eroding near vertical slopes, needs a regional repair.	Channel banks are still oversteepened with erosion continuing.
FHR_0-6_L	Feather River	0.6	-	L	RD 1001 (Unit 4)	Rio Oso	eroding	1997	900	15	toe scour	fluvial	cobbles on toe in poor condition	no	no	1997- Deposits over top of cobble on the upper slope. 2000 - Old cobble site in poor shape; some toe retreat, but little change; steep bank. 2010 - Site extended upstream due to new toe erosion.	No observed change.
FHR_1-0_L	Feather River	1.0	-	L	RD 1001 (Unit 4)	Rio Oso	eroding	2000	1054	15	toe scour	fluvial	none	yes	no	2000 - Site is relatively stable except for some toe erosion at the upstream end, recommend monitoring the upstream end. 2004 - Some new block failures (10ft deep) at the toe of the upstream end. 2007 - Some minor new slumping at the waterline.	No observed change.
FHR_3-8_L	Feather River	3.8	-	L	RD 1001 (Unit 4)	Rio Oso	eroding	2006	1476	25	fluvial	tree pop-outs	none	no	no	2006 - Sandy, silty bank with intermittent pockets of erosion. Rotational failure and tree pop outs are most of the problem. Some upper slope fluvial erosion. 2010 - Site extended upstream. The lower Feather may benefit from a regional repair.	Site combined with 3.6. Minimal new erosion.
FHR_5-0_L	Feather River	5.0	-	L	RD 1001 (Unit 4)	Rio Oso	eroding	2000	1476	40	fluvial		none	no	yes	2000 - Steep bank off berm with some slumps and fallen trees, continued erosion. 2002 - Site lengthened upstream and downstream due to vertical bank along most of the reach. 2010 - Site extended upstream.	Minimal new erosion.
FHR_5-8_L	Feather River	5.8	-	L	RD 1001 (Unit 4)	Rio Oso	eroding new	2011	996	0	fluvial	whole bank failure	minimal cobbles in poor condition	unknown	no		Large slumped sections on the lower bank.
FHR_6-0_L	Feather River	6.0	-	L	RD 1001 (Unit 4)	Rio Oso	eroding new	2011	358	20	fluvial	whole bank failure	none	no	no		Tall slumping sections. Scour around trees has exposed most of the roots.
FHR_6-6_L	Feather River	6.6	-	L	RD 1001 (Unit 4)	Rio Oso	eroding new	2011	718	5	tree pop-outs	fluvial	cobbles on toe in poor condition	no	no		Erosion pockets from tree popouts. Sections of the lower bank have slumped off.

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FHR_17-8_L	Feather River	17.8	-	L	RD 784 (Unit 2)	Arboga	eroding	2010	1858	35	fluvial	tree pop-outs	none	unknown	yes	2003 - Bank is near vertical. Identified as a Potentially Critical site. 2004 - Eddy flow off downstream end of Modesto formation eroding the fluvial sediments. 2005 - Some new slumping. Actively eroding but berm width is greater than 50 ft. 2006 - Downgraded to regular erosion site. Still actively eroding. Large old rotational failures in high bank on the downstream end. 2008 - Removed from inventory due to wide berm width does not meet criteria for an erosion site. 2010 - Added back to the inventory after 10 ft of bank erosion in the winter 2009 storm. Steep vertical face.	Bank has retreated an additional 2.5 ft from last year. New tree popouts and erosion throughout the site.
FHR_47-5_R	Feather River	47.5	-	R	DWR MA 7 (Unit 1)	Live Oak	eroding new	2011	841	100	toe scour		large quarry stone at the upstream end	yes	no		The toe of the levee has been excavated by the land owner. Small holes throughout the site have been filled with a plaster like substance. Large canal on landside slope and over the levee toe.
GEO_0-3_L	Georgiana Slough	0.3	-	L	RD 563 (Unit 1)	Tyler Island	critical	1997	1907	0	erosion pockets	whole bank failure	quarry stone on part of the bank in good condition	yes	no	1997 - Erosion pockets into the levee toe. 1999 - Some small pockets fixed with rock riprap. 2002 - New "brush boxes" along the bank toe. 2005 - Brush boxes are empty. Some pockets are filled with new stone. 2006 - Some new rock at the downstream end (~100 ft long). Several small pockets of new rock in scallops. Brush boxes in poor to fair condition. 2010 - Site looks a little worse, some toe rock but still has erosion scars at lower to mid slope.	Site upgraded to CRITICAL. Significant new erosion. Erosion scallops are vertical and almost the height of the levee.
GEO_1-7_L	Georgiana Slough	1.7	-	L	RD 563 (Unit 1)	Tyler Island	eroding	1997	1528	5	erosion pockets	wave wash	quarry stone at toe in fair condition	yes	no	1997 - Old damaged rock riprap along the toe. 1999 - Downstream end (400 ft) repaired with rock. 2002 - New rock/concrete rubble section on the downstream end. 2004 - Small pocket repairs at the downstream end. 2005 - Some new bundles in the brush boxes.	No observed change.
GEO_2-0_L	Georgiana Slough	2.0	-	L	RD 563 (Unit 1)	Tyler Island	critical	2009	651	0	erosion pockets	wave wash	none	no	no	2009 - Upgraded to full erosion site. Small scour pockets and mid slope wave wash. 2010 - New rock and freshly fallen trees.	Site upgraded to CRITICAL. Significant new erosion. Rotational failures for the full height of the levee.
GEO_2-5_L	Georgiana Slough	2.5	-	L	RD 563 (Unit 1)	Tyler Island	eroding	1997	353	0	erosion pockets	wave wash	none	no	no	1997 - Erosion pockets into the toe of the levee. 2001 - Staked low fascine walls at the bankline. 2004 - Numerous "Brush Boxes." 2005 - Some new bundles in the brush boxes.	No observed change.
GEO_3-8_L	Georgiana Slough	3.8	-	L	RD 563 (Unit 1)	Tyler Island	critical	1997	2589	0	erosion pockets	wave wash	quarry stone at upstream end	yes	no	1997 - Pockets of erosion into the levee at the water line. Alders are being undercut and rotating out into the channel. Damaged rock at upstream end. 2000 - New minor erosion. 2001 - Staked low fascine walls at bankline. 2002 - New "Brush Boxes" along the bank toe. 2003 - New erosion pockets in the middle of the site. 2005 - Some new bundles in the brush boxes.	Site upgraded to CRITICAL. Significant new erosion. Sites 3.6, 3.7, 3.71, and 4.0 were combined.
GEO_4-3_L	Georgiana Slough	4.3	-	L	RD 563 (Unit 1)	Tyler Island	eroding	1997	1052	0	erosion pockets	wave wash	quarry stone	yes	no	1997 - Pockets of erosion into the levee toe. 1999 - Minor rock riprap and willow bundles place in a couple of spots. 2001 - Staked, low fascine walls at bankline. 2003 - Small unprotected pockets still eroding. 2004 - Numerous brush boxes, some falling apart, some with new bundles. 2005 - Some new brush boxes installed; some boxes are empty. Levee slope and banks still look bad with pocket scallops into the levee slopes.	Erosion continues and the number of pockets is increasing.

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Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
GEO_4-5_L	Georgiana Slough	4.5	-	L	RD 563 (Unit 1)	Tyler Island	critical	1997	1395	0	erosion pockets	wave wash	none	yes	no	1997 - Pocket erosion at upstream end and into the levee toe under the Alder trees. 2003 - New brush boxes with wattles on bank. 2004 - No brush boxes. 2005 - Site extended from the downstream side of the bridge. Whole bank is vertical. 2010 - Some minor new erosion.	Site upgraded to CRITICAL. New erosion pockets throughout the site. Sites 4.5, and 4.6 were combined.
GEO_5-3_L	Georgiana Slough	5.3	-	L	RD 563 (Unit 1)	Tyler Island	eroding	1997	3388	0	erosion pockets	wave wash	none	yes	no	1997 - Pocket erosion into the toe of the levee. 2000 - Scallop in banks with small colored flags, biotech rolls present. 2001 - Staked, low fascine walls at bankline. 2003 - Still have visibly bad spots, especially at the upstream end. 2005 - Some new brush bundles in the brush boxes; some with missing bundles. Some boxes too low relative to high tide. 2010 - Site extended upstream.	Minor new erosion.
GEO_6-3_L	Georgiana Slough	6.3	-	L	RD 563 (Unit 1)	Tyler Island	eroding	1997	4136	0	erosion pockets	wave wash	quarry stone and rubble at the toe in poor condition	yes	no	1997 - Deep pockets of erosion and narrow berm. Reach is characterized by lots of pockets into the existing berm and/or levee slope. 1999 - Some pockets filled with rock riprap. 2000 - Exposed fabric. 2001 - Staked, low fascine walls at bankline. 2002 - New spot of rock at upstream end. Some new brush boxes. 2005 - Some stone sliding off the underlying geotextile fabric. Some new brush bundles in the brush boxes; some with missing bundles. Some boxes too low relative to high tide. 2009 - Minimal new erosion, site length extended. 2010 - New erosion on downstream end, site extended downstream.	Sites 6.1, 6.4 and 6.6 were combined. New erosion pockets, site extended to include the erosion in between the old sites.
GEO_6-8_L	Georgiana Slough	6.8	-	L	RD 563 (Unit 1)	Tyler Island	critical	1997	1251	0	wave wash		none	yes	no	1997 - Deep pockets of erosion into a narrow berm just downstream of the rock. 2000 - Scallop in banks with small colored flags, some new biotech rolls in with older rolls in the scallops. 2001 - Staked, low fascine walls at the bankline.	Site upgraded to CRITICAL. Site extended upstream due to new erosion pocket. New tree popouts and new erosion.
GEO_7-0_R	Georgiana Slough	7.0	-	R	RD 556 (Unit 1)	Brannan-Andrus Islands	eroding	1997	774	5	toe scour	wave wash	quarry stone	no	no	1997 - Toe damaged rock. 1999 - One pocket filled with gravel. 2000 - Eroding beach with some biotech rolls and stakes; some gravel on slope. 2001 - Staked, low fascine walls at bankline. 2005 - Stone revetment in between pockets. 2006 - New rock on upper slope behind brush boxes at the upstream end, Stone is sliding off the hard toe.	No observed change.
GEO_7-2_L	Georgiana Slough	7.2	-	L	RD 563 (Unit 1)	Tyler Island	eroding	2009	204	0	wave wash		none	no	no	2009 - Small scallops of erosion into the levee toe behind brush boxes.	Minor new erosion.
GEO_8-3_L	Georgiana Slough	8.3	-	L	RD 563 (Unit 1)	Tyler Island	eroding	1997	565	0	fluvial	whole bank failure	none	no	no	1997 - Narrow eroding berm upstream of existing rock. 2001 - Staked, low fascine walls at bankline.	Minor new erosion. Site extended downstream.
GEO_9-3_L	Georgiana Slough	9.3	-	L	RD 563 (Unit 1)	Tyler Island	eroding	1997	1117	0	toe scour	whole bank failure	quarry stone at toe in poor condition	yes	no	1997 - Loss of rock at toe; pockets of upper berm erosion; very narrow berm width; toe rock problem; erosion pockets in rock. 2002 - New brush boxes at toe of the worst spots. 2005 - Upstream 200 ft removed because of the wide berm. 2006 - Some rock repair pockets behind the brush boxes at the upstream end. 2010 - Some new erosion.	No observed change.
GEO_11-0_L	Georgiana Slough	11.0		L	RD 563 (Unit 1)	Tyler Island	eroding new	2011	144	0	wave wash		none	no	no		Short sections of eroding bank at the waterline and holes in toe of levee.
HAS_7-9_L	Hass Slough	-	7.9	L	RD 2098 (Unit 3)	Moore Tract	eroding new	2011	1918	0	wave wash	toe scour	none	unknown	no		Large vertical erosion pockets and bank slumping.

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HAS_9-7_L	Hass Slough	-	9.7	L	RD 2098 (Unit 4)	Moore Tract	eroding new	2011	1583	0	whole bank failure	bovine scour	none	yes	no		Several scallops of erosion. Erosion primarily due to the weight of cattle on the slope.
KLR_3-0_L	Knights Landing Ridge Cut	-	3.0	L	Knights Landing Ridge Drainage District (Unit 2)	Knights Landing	eroding	2006	1112	0	wave wash		none	no	no	2006 - The whole levee toe area is slowly slumping into the channel (creep) due to dewatering and poor slope soils. Occasional piping in the levee slope evident as well. Pistol-butted trees at the levee toe indicate slow retreat.	Multiple scallops throughout the site and slumping of the toe.
KLR_3-1_L	Knights Landing Ridge Cut	-	3.1	L	Knights Landing Ridge Drainage District (Unit 2)	Knights Landing	eroding	2006	658	0	fluvial		none	no	no	2006 - The whole levee toe area is slowly slumping into the channel (creep) due to dewatering and poor slope soils. Occasional piping in the levee slope evident as well. Pistol-butted trees at the levee toe indicate slow retreat.	Slumping of the levee toe.
KLR_3-5_R	Knights Landing Ridge Cut	-	3.5	R	Knights Landing Ridge Drainage District (Unit 1)	Yolo	eroding new	2011	418	0	toe scour		none	no	no		Toe scour and bank slumping.
KLR_3-7_L	Knights Landing Ridge Cut	-	3.7	L	Knights Landing Ridge Drainage District (Unit 2)	Knights Landing	eroding new	2011	677	0	tree pop-outs	whole bank failure	none	unknown	no		The toe has eroded away and there are a few scallops from bank slumping.
KLR_3-9_R	Knights Landing Ridge Cut	-	3.9	R	Knights Landing Ridge Drainage District (Unit 1)	Yolo	eroding new	2011	366	0	tree pop-outs		none	no	no		Toe erosion and erosion pockets from tree popouts. More tree popouts are expected due to the eroding toe.
KLR_4-7_L	Knights Landing Ridge Cut	-	4.7	L	Knights Landing Ridge Drainage District (Unit 2)	Knights Landing	eroding	2011	1266	0	fluvial		none	no	no		This site is the downstream section of the old KLR 5.3L site. Levee toe is slowly retreating. Cracking on top of the levee may indicate potential mass movement.
KLR_5-8_L	Knights Landing Ridge Cut	-	5.8	L	Knights Landing Ridge Drainage District (Unit 2)	Knights Landing	eroding	2011	2985	0	fluvial		none	yes	no		This site is the upstream section of the old KLR 5.3L site. Levee toe is slowly retreating. Cracking on top of the levee may indicate potential mass movement.
LDS_0-6_R	Lindsey Slough	-	0.6	R	RD 536 (Unit 1)	Lindsey	eroding new	2011	1620	0	toe scour		none	yes	no		Multiple sections of slumping bank.
LDS_0-7_R	Lindsey Slough	0.7	-	R	RD 536 (Unit 1)	Lindsey	eroding new	2011	280	0	tree pop-outs	fluvial	none	no	no		Levee toe is unraveling with large slumping sections. This site is downstream of old bank rock.
LDS_0-8_R	Lindsey Slough	0.8	-	R	RD 536 (Unit 1)	Lindsey	eroding new	2011	86	0	tree pop-outs	fluvial	quarry stone in sections in fair condition	yes	no		Multiple erosion pockets from tree popouts. A smaller erosion pocket in the middle of a failing bank repair. Pump structure at the downstream end may be contributing to the erosion.
LDS_1-9_L	Lindsey Slough	1.9	-	L	RD 2060 (Unit 1)	Hastings Tract	eroding new	2011	358	0	wave wash	fluvial	none	no	no		Multiple erosion pockets. Deep cracks throughout site could lead to further bank failure.
LDS_2-4_L	Lindsey Slough	2.4	-	L	RD 2060 (Unit 1)	Hastings Tract	eroding new	2011	139	0	wave wash	fluvial	none	no	no		Two erosion pockets from rotational failures. Very soft soil.
MUD_4-4_R	Mud Creek	-	4.4	R	Butte County (Unit 1)	NONE	eroding new	2011	300	20	fluvial		none	no	no		Two large erosion scallops at the toe from a rotational failure. Deep cracks along the slope indicate the potential for further failures.
NCC_3-0_R	Natomas Cross Canal	-	3.0	R	RD 1001 (Unit 5)	Rio Oso	eroding	2006	191	40	fluvial		none	no	no	2006 - Noted old saturation slumping of upper levee slope that is into the levee core (near high water line).	Erosion is into the top of the levee. This site is actually located at LM 2.5.
PUC_0-1_L	Putah Creek	-	0.1	L	DWR Putah Creek (Unit 1)	Davis	eroding new	2011	423	0	wave wash		cobbles at toe in fair condition	unknown	no		Old cobble site is unraveling, likely causing the toe of the bank to become unstable.
PUC_7-2_L	Putah Creek	-	7.2	L	DWR Putah Creek (Unit 1)	Davis	eroding new	2011	305	0	whole bank failure	tree pop-outs	none	unknown	no		The toe to mid-bank is slumping. Large tree popouts have furthered the erosion. Slope is slightly steeper than 1:1.
SAC_7-3_L	Sacramento River	7.3	-	L	RD 341 (Unit 2)	Sherman Island	critical	2011	619	0	other	whole bank failure	none	yes	no		Large slump at downstream end. Gully formed from surface runoff from the road. Shallow slumping throughout site.

Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
SAC_7-9_L	Sacramento River	7.9	-	L	RD 341 (Unit 2)	Sherman Island	eroding new	2011	204	0	whole bank failure	wave wash	scattered rock	no	no		Large slump section
SAC_8-0_L	Sacramento River	8.0	-	L	RD 341 (Unit 2)	Sherman Island	eroding	1999	758	0	wave wash	whole bank failure	quarry stone on part of the bank in poor condition	yes	no	1999 - New small slump in eroded bank. 2005 - Reach extended because of vertical bank along the roadway upstream.	More slumping since last year.
SAC_8-2_L	Sacramento River	8.2	-	L	RD 341 (Unit 2)	Sherman Island	eroding new	2011	202	0	whole bank failure	wave wash	none	no	no		Large new erosion pocket probably hidden by vegetation in the past.
SAC_10-8_L	Sacramento River	10.8	-	L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	eroding	2004	820	10	toe scour		cobbles at the toe in fair condition, quarry stone on the outboard berm in good condition	yes	no	2004 - Wave wash pockets approximately 100 ft long with new full bank rock between the pockets. 2005 - Spot repairs, but toe is still eroding in several places. 2006 - Low vertical bank along roadway. 2007 - A PL 84-99 repair was constructed, it cover the majority of the site with the exception of the upstream 150 to 200 ft and the downstream 250 ft, therefore it is being kept in the inventory. 2009 - Minimal new erosion. 2010 - Outboard berm looks good, but the banks are still very steep.	While the outboard berm is protecting against wave wash, bank still has slumping issues.
SAC_11-2_L	Sacramento River	11.2	-	L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	eroding	2008	1228	0	wave wash	whole bank failure	none	yes	no	2008 - Erosion causing vertical bank at the highway on top of levee. The whole bank along the highway should be repaired. 2009 - Minimal new erosion.	Bank continues to slowly erode.
SAC_12-1_L	Sacramento River	12.1	-	L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	eroding	2010	1165	0	whole bank failure	tree pop-outs	none	yes	no	2010 - Small inlet area behind a man-built spit. Bank is slumping and could possibly be fixed with maintenance.	Site continues to worsen.
SAC_13-6_L	Sacramento River	13.6		L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	eroding new	2011	303	0	whole bank failure	wave wash	quarry stone in sections in poor condition	unknown	no		Large section of bank slumped off.
SAC_15-0_L	Sacramento River	15.0	-	L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	eroding	2009	203	0	whole bank failure	fluvial	quarry stone at the toe in fair condition	yes	no	2009 - Tension cracks on road on top of levee. Erosion into the levee slope with large mass failure scallop. 2010 - Site extended further upstream to account for additional erosion. Very steep slope with slumping.	No observed change.
SAC_16-8_L	Sacramento River	16.8	-	L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	critical	2008	591	0	fluvial	wave wash	none	yes	no	2008 - Overstepped levee section with pocket erosion. Plans for repair currently in the design phase. 2010 - Very steep slope with slumps, longitudinal cracking, and overturned trees.	Upgraded to CRITICAL. Sections of vertical slope with highway on top. Heavy vegetation in front of most of the erosion pockets.
SAC_17-2_L	Sacramento River	17.2	-	L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	critical	2009	1001	0	fluvial	whole bank failure	rubble on part of the bank in poor condition	yes	no	2009 - Fluvial erosion, into the levee slope, close to vertical bank with roadway on top. Pilings that were once at the bankline are now 30 ft out. 2010 - Very steep slope with slumps and overturned trees.	Upgraded to CRITICAL. Sections of vertical slope with highway on top. Heavy vegetation in front of most of the erosion pockets. Structures built into the levee on the upstream end.
SAC_18-0_L	Sacramento River	18.0	-	L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	eroding	2009	444	0	wave wash	whole bank failure	quarry stone at the toe in fair condition	yes	no	2009 - Large scallop from rotational failure. One fallen tree and one large tree with half of its root structure exposed.	No observed change.
SAC_18-1_L	Sacramento River	18.1	-	L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	eroding	2009	267	0	fluvial	wave wash	cobbles and rubble at the toe in fair condition	yes	no	2009 - Short reach of vertical bank at the toe. 2010 - Large tree is getting ready to fall in.	No observed change.
SAC_21-5_L	Sacramento River	21.5	-	L	RD 556 (Unit 2)	Brannan-Andrus Islands	eroding	1997	159	5	wave wash		none	no	no	1999 - Downstream 140 ft repaired with rock. 2010 - Lots of woody debris, but no changes to site.	No observed change.
SAC_22-5_L	Sacramento River	22.5	-	L	RD 556 (Unit 2)	Brannan-Andrus Islands	eroding	1997	900	10	fluvial	wave wash	none	yes	no	2002 - Spot rock along berm, but not in the erosion pockets. 2005 - Some new minor stone revetment at the upstream end. Brush boxes present. 2006 - Currently installing new brush in downstream brush boxes. 2007 - Rock in middle portion for about 150 ft. 2010 - Some attempt at repairs but still has pockets of erosion.	No observed change.
SAC_22-7_L	Sacramento River	22.7	-	L	RD 556 (Unit 2)	Brannan-Andrus Islands	eroding	1997	311	0	fluvial	wave wash	none	no	no	1997 - Scallops into berm and very close to levee toe. 2005 - Brush boxes present.	New toe scour and freshly fallen tree.



Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
SAC_23-2_L	Sacramento River	23.2	-	L	RD 556 (Unit 2)	Brannan-Andrus Islands	eroding	1997	589	10	fluvial	wave wash	none	no	no	2000 - Recently fallen cottonwood at the downstream end. 2005 - Empty brush boxes.	A few trees have fallen since last year.
SAC_23-3_L	Sacramento River	23.3	-	L	RD 556 (Unit 2)	Brannan-Andrus Islands	eroding	1997	584	30	fluvial	wave wash	none	no	no	1997 - Few scallops in berm, some getting close to levee toe. 2005 - Brush boxes present.	No observed change.
SAC_24-8_L	Sacramento River	24.8	-	L	RD 556 (Unit 2)	Brannan-Andrus Islands	eroding	1997	783	10	fluvial	wave wash	none	no	no	1997 - Slow erosion of the berm at the waterline; bench below water. 2005 - Brush boxes present. 2010 - Minor new erosion.	No observed change.
SAC_25-2_L	Sacramento River	25.2	-	L	RD 556 (Unit 2)	Brannan-Andrus Islands	eroding	1997	326	5	fluvial	wave wash	none	no	no	1997 - Rock is in poor condition and has failed in many places. Scallops in berm with remnants of old rock in the toe area. 2005 - Brush boxes present.	No observed change.
SAC_26-0_L	Sacramento River	26.0	-	L	RD 556 (Unit 2)	Brannan-Andrus Islands	eroding	1997	1546	0	fluvial	wave wash	none	yes	no	2002 - Two rock sections (150 ft long) at the downstream end. 2005 - Lots of old brush boxes, some with established vegetation in the area behind the boxes. 2006 - Some small spots fixed with stone. 2009 - Minimal new erosion, rock in the middle of the reach may be new.	Minor new erosion at the toe.
SAC_26-3_R	Sacramento River	26.3	-	R	RD 3 (Unit 2)	Grand Island	eroding	2008	472	0	fluvial	wave wash	none	yes	no	2009 - Hole left in levee toe from a fallen tree. Could be repaired under maintenance. 2010 - Minor new erosion.	No observed change.
SAC_27-0_L	Sacramento River	27.0	-	L	RD 554 (Unit 1)	Tyler Island	eroding	2009	504	0	whole bank failure		quarry stone at the toe in fair condition	yes	no	2009 - Tension cracks on road on top of levee. Erosion into the levee slope and mass failure.	No observed change. Difficult to see with the vegetation.
SAC_31-6_R	Sacramento River	31.6	-	R	RD 3 (Unit 2)	Grand Island	eroding	1997	442	0	fluvial		quarry stone	yes	no	1997 - Erosion of supper sandy levee material above the water line, straight reach. 1999 - Small pocket repaired with rock. 2005 - Downstream 400 ft have been repaired.	Site is overgrown with vegetation. No observed change.
SAC_35-4_L	Sacramento River	35.4	-	L	RD 755 (Unit 1)	Courtland	eroding	2003	484	5	eddy scour	wave wash	quarry stone on lower bank ant toe in good condition	yes	no	2003 - Toe and lower slope eroding, rock in water and a few pieces on the slope; rock at upstream and downstream ends. 2005 - Looks a little worse. Two major holes with vertical banks and smaller intermittent pockets in between. Stone is present upstream, downstream, and at toe. 2008 - Repaired at both ends (50 ft of new stone) but middle remains unrepaired.	Site extended downstream to include new scour.
SAC_38-5_R	Sacramento River	38.5	-	R	RD 150 (Unit 2)	Merritt Island	eroding	1997	364	0	fluvial	whole bank failure	quarry stone on the whole bank in fair condition	no	no	1999 - Downstream end (300 ft) repaired with rock. 2010 - Toe erosion, some vertical slopes lower down.	Failing rock repair. Slumping of the lower bank. Minor new erosion.
SAC_41-9_R	Sacramento River	41.9	-	R	RD 999 (Unit 4)	Clarksburg	eroding	1997	1360	0	whole bank failure	wave wash	none	yes	no	1997 - Structural problem rather than erosional, failed cobble at downstream end. 2005 - New brush boxes at waterline for several hundred feet downstream, No toe or bank protection present. 2006 - Some minor new erosion. Brush boxes not working well; most of the brush has floated out. 2007 - Brush boxes have recently been repaired.	No observed change.
SAC_43-1_R	Sacramento River	43.1	-	R	RD 307 (Unit 1)	Borges	eroding new	2011	646	0	tree pop-outs	whole bank failure	quarry stone and cobbles in fair condition	unknown	no		Erosion pockets likely from tree popouts. This site has been in the inventory before and been fixed with emergency bank rock but continues to fail.
SAC_43-2_R	Sacramento River	43.2	-	R	RD 307 (Unit 1)	Borges	eroding	2008	992	0	tree pop-outs	whole bank failure	quarry stone on part of the bank in fair condition	yes	no	2008 - Large rotational failure in bank and well into the levee slope. Could be a significant problem in the next high flow event. 2009 - Minimal new erosion, site extended upstream. 2010 - Minor new erosion.	Tree popout has left a large hole. Large slump area. Rock on the bank is failing in some locations.

Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
SAC_46-7_L	Sacramento River	46.7	-	L	DWR MA 9 (Unit 1)	Sacramento	eroding	2010	162	0	wave wash	wave wash	cobbles on part of the bank in poor condition	yes	no	Site identified by DWR MA and flood fought following the 2010 storm events. 2010 - Railroad on levee, may be an encroachment; DWR flood fought in January 2010. Eroding of the upper and middle bank, lots from people.	Site continues to worsen. More erosion at the toe.
SAC_50-3_L	Sacramento River	50.3		L	DWR MA 9 (Unit 1)	Sacramento	eroding new	2011	89	0	tree pop-outs	none	cobbles at toe in fair condition	no	no		Tree popout at the toe has taken out the rock toe protection.
SAC_52-4_L	Sacramento River	52.4	-	L	DWR MA 9 (Unit 1)	Sacramento	eroding	2004	117	0	eddy scour	whole bank failure	none	unknown	no	2004 - A large tree cave was identified. 2005 - Site repaired. 2010 - At the downstream end of the repair at 52.5, bad transition is inducing further erosion.	Minor new erosion on bank.
SAC_52-7_L	Sacramento River	52.7	-	L	DWR MA 9 (Unit 1)	Sacramento	eroding	2010	158	0	fluvial	tree pop-outs	none	unknown	no	2010 - Small section of slumping, can be fixed with maintenance.	Freshly fallen tree.
SAC_53-8_L	Sacramento River	53.8	-	L	DWR MA 9 (Unit 1)	Sacramento	eroding new	2011	155	15	fluvial	wave wash	none	unknown	no		Erosion into upper and lower slope. There has been significant scour around the tree roots.
SAC_54-8_L	Sacramento River	54.8	-	L	DWR MA 9 (Unit 1)	Sacramento	eroding new	2011	49	0	tree pop-outs	wave wash	cobbles at toe in poor condition	unknown	no		A large tree has fallen behind a larger tree, putting stress on an already compromised tree. Toe erosion due to wave wash.
SAC_55-2_L	Sacramento River	55.2	-	L	DWR MA 9 (Unit 1)	Sacramento	eroding	2003	866	5	fluvial	wave wash	cobbles in fair condition and quarry stone in poor condition	yes	no	Site previously named 55.1. 2003 - Pockets of toe erosion at low flow waterline. 2005 - Site renamed 55.2. Still have pockets of erosion but rock bench at waterline is still present. 2010 - Site extended upstream due to new erosion.	Some of the toe rock has failed. The upper levee slope seems to be slumping.
SAC_55-5_L	Sacramento River	55.5	-	L	DWR MA 9 (Unit 1)	Sacramento	eroding	1997	384	15	whole bank failure		quarry stone	yes	no	1997 - Large cottonwoods on slope. 2003 - Some minor sloughing. 2004 - New sediment deposition on the downstream end. 2007 - New dock was installed without notification to USACE and halted the planned repair due to ROW issues.	No observed change.
SAC_55-7_R	Sacramento River	55.7	-	R	RD 900 (Unit 1)	Southport	eroding	2008	826	0	whole bank failure	wave wash	none	yes	no	2008 - Erosion into levee toe. Over steepened levee slope, worst at the upstream end. 2009 - Near vertical banks from rotational slumping, hidden by vegetation. 2010 - Boat sinking more, may be causing eddy scour around it. Difficult to see the vertical slumps due to dense vegetation.	Minor new erosion at the toe. The paddleboat that was sitting at this site for years has been removed.
SAC_56-5_R	Sacramento River	56.5	-	R	RD 900 (Unit 1)	Southport	eroding	1997	465	10	fluvial	wave wash	none	no	no	1997 - Low berm is contributing to erosion. Old timber pile dikes above water parallel to bank. The upstream mitigation low berm causes a flow separation at the site. 1999 - Some new localized erosion with less than one foot of bank retreat. 2000 - Some new erosion at the upstream end. Fat toe deposits at toe. 2003 - Some new erosion upstream, but have a wide berm.	Minor new erosion at the toe.
SAC_56-6_L	Sacramento River	56.6	-	L	City of Sacramento (Unit 1)	Sacramento	eroding	1997	262	0	fluvial	tree pop-outs	rubble on part of the bank in poor condition	yes	no	1997 - Erosion at pump station, concrete debris and plastic showing. 2000 - Separation scour of bank due to poor transition. 2004 - New large tree pop out; city dumped fill dirt/rock into hole. 2006 - Minor new erosion at top of bank. 2010 - Some new rock placed in tree pop-out	A large tree has fallen and flood fighting was performed by the city on the upper levee slope.
SAC_56-7_R	Sacramento River	56.7	-	R	RD 900 (Unit 1)	Southport	eroding	2007	662	10	fluvial		none	no	no	2007 - Have good berm width with minor toe erosion. Close to the levee toe protection, but levee slope is steep.	New large erosion pocket.
SAC_57-0_R	Sacramento River	57.0	-	R	RD 900 (Unit 1)	Southport	under construction	1997	184	0	fluvial	eddy scour	none	yes	no	1997 - Old timber pile dikes remnant approximately 30 ft out into the channel. Oversized levee section. 1999 - Some additional erosion at water line. 2008 - Plans for setback levee repair (along with 57.2) currently in the design phase.	Setback levee under construction, expected completion in 2012.

Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
SAC_57-2_R	Sacramento River	57.2	-	R	RD 900 (Unit 1)	Southport	under construction	2007	647	0	fluvial		cobbles at the toe in poor condition	yes	no	2007 - Steep levee slope with cobble revetment rolling off the bank and a silty clay toe. 2008 - Plans for setback levee repair currently in the design phase.	Setback levee under construction, expected completion in 2012.
SAC_58-5_L	Sacramento River	58.5	-	L	City of Sacramento (Unit 1)	Sacramento	eroding	2008	386	0	fluvial	whole bank failure	quarry stone at the toe in poor condition	unknown	no	2008 - Oversized levee, should be repaired under maintenance. 2009 - Shallow slumps at the mid bank. 2010 - Some minor erosion at the toe, likely from wave wash. Some new shallow slumps.	One new tree has fallen.
SAC_62-9_R	Sacramento River	62.9	-	R	RD 537 (Unit 1)	West Sacramento	eroding	1997	215	10	erosion pockets	wave wash	rubble on part of the bank in poor condition	yes	no	1997 - This may have been a cobble rehabilitation site to the 1957 cobble that was placed all the way to the I-80 Bridge. 2003 - Site is still very close to the levee and into the levee toe.	One new tree has fallen.
SAC_63-0_R	Sacramento River	63.0	-	R	RD 537 (Unit 1)	West Sacramento	eroding	1997	168	15	erosion pockets		none	yes	no	1997 - Erosion near the downstream corner of the Sacramento Weir. 2000 - Local damage induced by human use.	No observed change.
SAC_71-3_R	Sacramento River	71.3	-	R	RD 1600 (Unit 1)	Elkhorn	eroding	1997	521	25	erosion pockets	wave wash	none	unknown	no	2000 - Very cohesive vertical bank. 2003 - Some minor new erosion. 2006 - Some minor erosion in old pockets. 2009 - Minimal new erosion.	Multiple new erosion pockets and a few new tree popouts.
SAC_74-4_R	Sacramento River	74.4	-	R	RD 1600 (Unit 1)	Elkhorn	eroding	1997	1343	25	toe scour	tree pop-outs	none	unknown	no	1997 - Steep high bank. 2005 - Some small pockets in the low toe near the waterline. 2006 - Minor slope clearing. 2010 - Minor new erosion.	Multiple trees have fallen since last year. Some other trees look ready to fall. Significant new erosion since last year.
SAC_75-3_R	Sacramento River	75.3	-	R	RD 1600 (Unit 1)	Elkhorn	eroding	1997	2752	30	toe scour	whole bank failure	none	yes	no	1997 - Very steep bank. 2005 - Lots of small trees down along the bank at the upstream end. 2006 - Minor new erosion, but slow. 2010 - Almost all of the roots are exposed on the trees, appears ready to fall.	New erosion and tree popouts.
SAC_77-0_R	Sacramento River	77.0	-	R	RD 1600 (Unit 1)	Elkhorn	eroding new	2011	359	15	fluvial		none	yes	no		Large vertical eroded face from a rotational failure just below pump.
SAC_77-7_R	Sacramento River	77.7	-	R	RD 1600 (Unit 1)	Elkhorn	eroding	2006	156	10	eddy scour	tree pop-outs	none	no	no	2006 - Eddy scour off end of rock causing erosion and scour hole near levee. Sandy silt bank with rock on upstream end. 2010 - Trees are leaning more, minor new erosion.	Many of the tree roots have scoured out and trees look ready to fall.
SAC_78-3_L	Sacramento River	78.3	-	L	RD 1000 (Unit 1)	Natomas	eroding	1997	654	15	fluvial	wave wash	none	yes	no	1997 - Very cohesive toe. 2005 - Site was staked and rock was stockpiled along the top of the bank. 2010 - New adjacent levee under construction.	New animal burrow.
SAC_83-9_R	Sacramento River	83.9	-	R	Yolo County Service Area 6 (Unit 1)	Knights Landing	eroding	2006	486	35	tree pop-outs	whole bank failure	none	yes	yes	2006 - Approximately 18 to 20 ft of bank near levee at the corner of the levee and the Fremont Weir. Vertical bank with undercutting/mass failure. 2007 - Staked at top of bank for monitoring.	Site has become significantly worse with more of the toe and lower bank eroded. Many trees have fallen since last year.
SAC_85-4_R	Sacramento River	85.4	-	R	Yolo County Service Area 6 (Unit 1)	Knights Landing	eroding	2009	1025	5	fluvial		cobble on part of the bank in fair condition	yes	no	2009 - Erosion into the levee toe. Some cobbles have been dumped into the erosion pockets. 2010 - Old cobble site starting to unravel.	No observed change.
SAC_86-3_L	Sacramento River	86.3	-	L	RD 1500 (Unit 1)	South Sutter	eroding	2006	3034	30	toe scour		cobbles at the toe in fair condition	yes	yes	2006 - New erosion upstream, new bank failures near levee but still fairly wide berm in most places. 2008 - Large berm, questionable as to if it should remain in the inventory. 2010 - Minor new erosion, old cobble starting to fail.	Cobble continues to unravel and additional slumping.
SAC_86-9_R	Sacramento River	86.9	-	R	Yolo County Service Area 6 (Unit 1)	Knights Landing	eroding	2006	516	25	toe scour	wave wash	none	no	yes	2006 - Short section is into the levee toe, rest is near the levee toe. Mass failure and fluvial erosion of depositional material. Rock at the upstream and downstream ends.	Minor new erosion.
SAC_87-1_L	Sacramento River	87.1	-	L	RD 1500 (Unit 1)	South Sutter	eroding	2010	1239	40	fluvial	wave wash	none	yes	yes	2010 - The upstream end of the repair site at 87.0. Repair did not extend far enough upstream.	New erosion pockets.

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Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
SAC_92-8_L	Sacramento River	92.8	-	L	RD 1500 (Unit 1)	South Sutter	eroding	1997	1283	0	fluvial	toe scour	cobbles at the toe in fair condition	yes	no	1997 - Damage to cobble revetment on top left bank and toe damage. 2004 - Site is pretty minor. 2010 - Cobbles continue to deteriorate.	Minor new erosion at the toe.
SAC_95-8_L	Sacramento River	95.8	-	L	RD 1500 (Unit 1)	South Sutter	eroding	1997	911	15	fluvial		rubble on part of the bank in poor condition	yes	no	1997 - No toe on the large upstream rubble (mix of broken concrete, bricks, rock, and steal) - should be replaced. Oversized bank. 2001 - New slump at the downstream end. 2003 - Some minor bank retreat at the downstream end. 2004 - Some new retreat at the downstream end. 2006 - Some new erosion, mainly on the steep slope and scarps. (Pumping station is not part of the erosion site.) 2010 - Minor new erosion.	Minor new erosion at the toe.
SAC_96-2_L	Sacramento River	96.2	-	L	RD 1500 (Unit 1)	South Sutter	eroding	1997	1488	15	fluvial		none	yes	no	2000 - Vertical Modesto Formation bank with mass failure. 2003 - Upstream end has some new bank retreat. 2004 - Upstream end is worse. 2006 - Some new erosion, mainly on the steep slope and scarps. (Pumping station is not part of the erosion site.) 2010 - Some new erosion and deposition at upstream end, definite encroachments.	Minor new erosion at the toe.
SAC_99-0_L	Sacramento River	99.0	-	L	RD 1500 (Unit 1)	South Sutter	eroding	1997	1745	10	fluvial		quarry stone at the toe in fair condition	yes	no	1997 - Intermittent toe failure of the hand placed riprap; failure of toe materials.	No observed change.
SAC_101-3_R	Sacramento River	101.3	-	R	Sacramento River West Side Levee District (Unit 1)	Grimes	eroding	1997	188	25	toe scour	fluvial	cobbles on part of the bank in fair condition	no	no	1997 - Toe damage and loss of cobble revetment and small patch of local damage to the cobble revetment. 2000 - Cohesive vertical toe; revegetation site.	No observed change.
SAC_103-4_L	Sacramento River	103.4	-	L	RD 1500 (Unit 1)	South Sutter	eroding	2006	87	35	overtopping scour		none	no	no	2006 - Eddy flow and overtopping flow collide on the inside of a tight bend. Scour caused by converging flows created large scallop on the inside of a bend. 2007 - Site still looks bad. Would be a good candidate for a setback levee. 2008 - Some new deposition of sand on eddy bar. 2009 - Much of the site has filled in with sand deposition. Continuing to heal. 2010 - New deposition.	There has been some deposition as well as erosion since last year.
SAC_104-0_L	Sacramento River	104.0	-	L	RD 1500 (Unit 1)	South Sutter	eroding	1997	3443	40	fluvial		cobbles at the toe in fair condition	yes	no	1997 - Pocket failures of cobble revetment toe; scallops of rock loss along the bank; irregular bankline developing. 2001 - Small scallops in the toe of the berm. 2005 - Still multiple erosion pockets in the toe. 2006 - Two new small slumps.	Old cobble continue to fail causing minor slumping.
SAC_104-5_L	Sacramento River	104.5	-	L	RD 1500 (Unit 1)	South Sutter	eroding	1997	1424	25	wave wash	fluvial	quarry stone at the toe in fair condition	yes	no	1997 - Cobbles eroded off the clay materials; not much evidence of erosion on the toe; cobble loss on the toe.	Some new minor erosion.
SAC_111-0_R	Sacramento River	111.0	-	R	Sacramento River West Side Levee District (Unit 1)	Grimes	eroding	2009	110	20	toe scour	whole bank failure	cobbles at toe in poor condition	no	no	2009 - Minor erosion, should be repaired under maintenance.	Some new minor erosion at the toe.
SAC_115-9_R	Sacramento River	115.9	-	R	Sacramento River West Side Levee District (Unit 1)	Grimes	eroding	2008	99	30	fluvial		cobbles on part of the bank in fair condition	no	yes	2008 - Slippage of cobbles off hard underlying toe material.	Minor slumping site.
SAC_116-0_L	Sacramento River	116.0	-	L	RD 1500 (Unit 1)	South Sutter	eroding	2000	831	30	fluvial		rubble at the toe in poor condition	no	yes	2000 - Eroding, vertical berm slope over a vertical cohesive toe; slow erosion but getting close to the toe. 2002 - Erosion is getting close to the levee, still eroding with some new small slumps. 2004 - Some minor new erosion. 2006 - Some new erosion, cleaned off older scars and slump faces. 2008 - New, small, partial rotational failure.	Some new minor erosion.

Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
SAC_116-5_L	Sacramento River	116.5	-	L	RD 1500 (Unit 1)	South Sutter	eroding	1997	3392	10	whole bank failure		none	unknown	yes	2003 - New sedimentation and some new small toe scallops at the upstream end; downstream end has some new erosion. 2004 - Some new erosion at the toe and upper bank and some small new rotational failures (mainly minor, except at the downstream end). 2007 - Some new slumps. 2009 - Some new scallops and site was extended upstream. 2010 - New deposition along upstream end of site, however there is also new erosion throughout the site. Site seems to be worsening, and eroding fast. Large habitat for bank swallows.	Some new minor erosion.
SAC_118-0_R	Sacramento River	118.0	-	R	Sacramento River West Side Levee District (Unit 1)	Grimes	eroding	2008	836	10	fluvial	whole bank failure	none	no	no	2008 - Whole bank is eroding, nearly vertical slope with cohesive toe. Bed is very deep along the toe (greater than 30 ft deep at 20 ft from the shore)	Some new minor erosion.
SAC_120-6_L	Sacramento River	120.6	-	L	RD 1660 (Unit 1)	North Sutter	eroding	2011	30	20	fluvial	eddy scour	cobbles at toe at end of site in fair condition	no	no	2009 - Erosion on levee toe where an old cobble site is failing.	Some new minor erosion.
SAC_122-0_R	Sacramento River	122.0	-	R	Sacramento River West Side Levee District (Unit 1)	Grimes	eroding	1997	311	40	whole bank failure	eddy scour	none	no	yes	1997 - Mass failure of the lower cohesive bank and toe. 2000 - Still eroding, steeply dipping foresets in the toe are falling off. 2010 - Some new erosion and some new deposition. Eddy current off the upstream rock.	Still plenty of berm left.
SAC_122-3_R	Sacramento River	122.3	-	R	Sacramento River West Side Levee District (Unit 1)	Grimes	eroding	2002	236	40	toe scour	whole bank failure	none	no	yes	2002 - Upstream end has recent slope failure and exposure of tree roots. 2003 - Some new minor slope erosion with new snags on the bank. 2004 - Appears a little worse. 2005 - Scallop in bank at the upstream end looks worse. 2009 - Minimal new erosion, Berm width is still large, but one large event or one fallen tree and it could go fast. 2010 - New erosion, bank is nearly all vertical from slumping. Site looks bad.	site starting to look bad.
SAC_123-3_L	Sacramento River	123.3	-	L	RD 70 (Unit 2)	North Sutter	eroding	2006	108	30	toe scour	eddy scour	none	no	no	2006 - Erosion into the levee toe. Rock at upstream end has poor transition causing eddy scour. 2010 - Minor new erosion.	Some fresh erosion.
SAC_123-7_R	Sacramento River	123.7	-	R	Sacramento River West Side Levee District (Unit 1)	Grimes	eroding	1997	122	15	toe scour	fluvial	rubble at the toe in poor condition	no	no	1997 - Erosion into the levee section; old concrete rubble loss at toe; transition between the rock upstream and the cobble downstream. 2000 - Cohesive bench with concrete slabs on top; 25 ft deep scour hole on the downstream end.	No observed change.
SAC_125-6_R	Sacramento River	125.6	-	R	Sacramento River West Side Levee District (Unit 1)	Grimes	eroding	2008	415	5	fluvial		cobbles and rubble on the whole bank in fair condition	no	yes	2008 - Slow erosion of the hard toe. 2010 - Cobble rubble is failing, erosion is into the toe of the levee, with vertical slumping.	No observed change.
SAC_125-8_L	Sacramento River	125.8	-	L	RD 70 (Unit 2)	North Sutter	eroding	2008	201	5	fluvial		quarry stone on lower bank ant toe in good condition	no	yes	2005 - Site was repaired. 2009 - Site is at upstream end of the repair site.	Still minor erosion.
SAC_127-9_R	Sacramento River	127.9	-	R	Sacramento River West Side Levee District (Unit 1)	Grimes	eroding	1997	293	35	eddy scour	whole bank failure	none	no	yes	1997 - Major scour off the downstream end of existing rock, creating a scour pocket where the levee starts diverging from the bankline. 2000 - Some minor erosion, 20 ft deep hole at downstream end. 2004 - Small amount of new erosion. 2010 - Bad transition off downstream end of rock revetment, some new erosion.	No observed change.

Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
SAC_130-0_L	Sacramento River	130.0	-	L	RD 70 (Unit 2)	North Sutter	eroding	1997	711	10	fluvial		cobbles at the toe in good condition	yes	yes	1997 - Critical Site - Erosion of cobble site on outside of a bend. Failure caused by erosion of a material from behind the cobbles and cobbles rolling down the slope. Failure is just above the toe levee. Some repairs had been done at the upstream end. 2004 - Some minor new erosion at the top of the berm. 2005 - Trees look okay and the downstream end has some new rock repair. Site is no longer critical. 2006 - No longer critical, some repairs.	No observed change.
SAC_131-8_L	Sacramento River	131.8	-	L	RD 70 (Unit 2)	North Sutter	eroding	2005	665	25	toe scour		none	no	yes	2005 - (known as 132) On inside of bend. Erosion of berm toe. Levee slope is steep. Erosion probably due to eddy scour off upstream cobble. 2009 - Groins may be a good option for repair. 2010 - Scour off the upstream rock, some new erosion.	Site extended downstream.
SAC_133-0_L	Sacramento River	133.0	-	L	RD 70 (Unit 2)	North Sutter	eroding	1997	1106	30	fluvial		cobbles and rubble on the whole bank in fair condition	no	no	1997 - Cobble toe failures. 2000 - Erosion into the levee toe at the downstream end. 2002 - Some fresh erosion at the upstream and downstream end. 2010 - Cobble appears to be at the end of its design life, 1 - 2 ft slump in mid-bank of the cobble, upper cobble is failing.	Some new minor erosion. Cobbles continue fail.
SAC_133-8_L	Sacramento River	133.8	-	L	RD 70 (Unit 2)	North Sutter	eroding	1997	195	15	toe scour		cobbles at toe in fair condition	no	no	1997 - Local toe scour of cobble site, eroded into the levee section. Outside of a moderate receding bend. Some rock rehabilitation performed. 2010 - Failing cobble site	Cobble site starting to unravel.
SAC_136-6_L	Sacramento River	136.6	-	L	RD 70 (Unit 2)	North Sutter	eroding	1997	616	15	fluvial		cobbles at the toe in fair condition	yes	yes	1997 - Toe erosion on a cobble revetment on the outside of a low receding bend.	No observed change.
SAC_136-6_R	Sacramento River	136.6	-	R	Sacramento River West Side Levee District (Unit 1)	Grimes	eroding	2010	556	25	toe scour	fluvial	none	no	yes	2010 - Lower portion of 136.7 that did not extend far enough. Abrupt transition from upstream site.	No observed change.
SAC_138-1_L	Sacramento River	138.1	-	L	RD 70 (Unit 2)	North Sutter	eroding	1997	1308	10	toe scour	fluvial	cobbles at the upstream end in fair condition	yes	yes	1997 - Loss of cobble revetment in levee section. 2004 - New fresh erosion in a short section of the downstream end. 2010 - New deposition on cobbles.	No observed change.
SAC_141-5_R	Sacramento River	141.5	-	R	Sacramento River West Side Levee District (Unit 1)	Colusa Basin	eroding	2010	640	35	toe scour	tree pop-outs	cobbles at toe in fair condition	unknown	no	2010 - Old cobble site starting to unravel at toe.	Cobbles continue to unravel.
SAC_143-5_R	Sacramento River	143.5	-	R	Sacramento River West Side Levee District (Unit 1)	Colusa Basin	eroding new	2011	613	5	fluvial	tree pop-outs	cobbles at toe in fair condition	unknown	no		multiple scallops, one tree pop out. old cobble site starting to unravel
SAC_150-2_L	Sacramento River	150.2	-	L	DWR East Levee Sacramento River (Unit 1)	Butte Basin	eroding	2008	89	10	toe scour	fluvial	cobbles at toe in fair condition	no	yes	2009 - Toe erosion and sliding cobbles.	No observed change.
SAC_151-0_R	Sacramento River	151.0	-	R	DWR MA 1 (Unit 1)	Colusa Basin	eroding	2009	1747	10	fluvial	none	cobbles at the toe in fair condition	no	yes	2009 - Slump in the middle of the section has left a vertical section on the bank. 2010 - Old cobble site unraveling, site extended downstream.	No observed change.
SAC_152-6_L	Sacramento River	152.6	-	L	DWR East Levee Sacramento River (Unit 1)	Butte Basin	eroding	2008	1555	30	whole bank failure	fluvial	none	no	no	2008 - Large rotational/mass failure in the bank with tree slump. 2009 - Minimal new erosion, the tree is leaning further into the river.	Site extended downstream.
SAC_152-8_L	Sacramento River	152.8	-	L	DWR East Levee Sacramento River (Unit 1)	Butte Basin	eroding	2006	299	30	tree pop-outs	fluvial	none	yes	no	2006 - Large rotational/mass failure in the bank with tree slump. Tough clayey toe material. 2007 - Site is between stone revetments with a pump station at the downstream end. 2010 - Erosion is into the levee toe.	Minor new erosion.

Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
SAC_154-0_R	Sacramento River	154.0	-	R	DWR MA 1 (Unit 1)	Colusa Basin	eroding	2010	114	30	eddy scour	fluvial	none	no	yes	2010 - Downstream end of 154.5, needs maintenance, small amount to erosion into the levee toe.	Old cobble site starting to unravel. Some new minor erosion since last year.
SAC_157-7_R	Sacramento River	157.7	-	R	DWR MA 1 (Unit 1)	Colusa Basin	eroding	2004	484	30	toe scour	fluvial	none	no	yes	2004 - Slowly eroding but near vertical with no vegetation to hold it. 2005 - Erosion is close to levee toe but not into the levee section yet. 2010 - Some new toe scour.	No observed change.
SAC_163-0_L	Sacramento River	163.0	-	L	LD 3 (Unit 1)	Butte Basin	eroding	1997	1482	30	fluvial	whole bank failure	rubble	no	yes	2000 - Snags along toe at downstream end; slow erosion. 2001 - A couple of small fresh slumps in the lower bank section. 2006 - Some minor new erosion at the downstream end. 2009 - Some new erosion. 2010 - New toe erosion.	Minor new erosion.
SAC_164-3_R	Sacramento River	164.3	-	R	DWR MA 1 (Unit 1)	Colusa Basin	eroding	2009	1200	10	whole bank failure	toe scour	none	unknown	yes	Erosion site added in 1997 and removed in 2005. 2009 - Site added back in, hard toe with slow moving erosion. Potential geotechnical failure.	Site extended downstream.
SAC_164-7_R	Sacramento River	164.7	-	R	LD 2 (Unit 1)	Colusa Basin	eroding	2009	1117	20	toe scour	whole bank failure	none	no	yes	2009 - Very slow retreat, hard toe, encroaching into the levee projection. 2010 - Slowly eroding.	Site extended downstream.
SAC_168-3_L	Sacramento River	168.3	-	L	LD 3 (Unit 1)	Butte Basin	eroding	1997	545	30	toe scour		none	no	yes	1997 - Erosion of top left bank; eroding downstream of rock section where levee is closest to the bank, approximately 40 to 50 ft of bank retreat, some berm left. 1999 - Some new beach sedimentation at toe. 2000 - Snags in eddy area could induce bank erosion at higher flows. 2002 - Small bar is gone. 2003 - Bar is present and higher. 2004 - Some new deposition on the bank at the upstream end. 2006 - New sand on bar and bank. 2007 - New sand deposition with vegetation colonizing bars between dikes. 2008 - More eddy sedimentation and vegetation on bar along bank. Bank is healing due to retreat of right bank. 2009 - Additional bar sedimentation. 2010 - some deposition at toe, new erosion on opposite bank. Site continues to heal.	No observed change.
SAC_172-0_L	Sacramento River	172.0	-	L	LD 3 (Unit 1)	Butte Basin	eroding	2007	1546	15	toe scour		none	no	yes	2007 - Getting close to the levee. Bank is clayey silt with clayey/silty toe. 2008 - Looks a little worse at the upstream end. 2009 - Some new erosion and slumping. 2010 - Some new erosion upstream of site, actively eroding at low flow. New bank swallow colony noted.	Significant erosion since last year, with an estimated 10 to 15 feet of berm lost. Large sections of the bank have slumped off.
SBP_11-1_L	Sutter Bypass	-	11.1	L	East Levee Sutter Bypass (Unit 1)	Yuba City	eroding new	2011	162	15	wind wave		none	no	no		Small section of the mid levee slope has eroded from wind wave.
STM_15-7_R	Steamboat Slough	15.7	-	R	RD 501 (Unit 1)	Ryer Island	eroding	2008	338	0	whole bank failure		rubble at the toe in poor condition	yes	no	2008 - Overstepped levee section with multiple small pockets of erosion 10 - 20 ft wide.	No observed changes.
STM_18-8_R	Steamboat Slough	18.8	-	R	RD 501 (Unit 1)	Ryer Island	eroding	1999	359	0	fluvial	wave wash	quarry stone at the toe in fair condition	unknown	no	2000 - Slow erosion of lower and mid-slope with rock bench at the low water line.	No observed change.
STM_18-9_R	Steamboat Slough	18.9	-	R	RD 501 (Unit 1)	Ryer Island	eroding	2009	330	0	fluvial	wave wash	quarry stone at the toe in fair condition	unknown	no	2009 - Rock is starting to unravel, probably from a tree pop-out, hard toe.	No observed change.
STM_22-8_R	Steamboat Slough	22.8	-	R	RD 349 (Unit 2)	Sutter Island	eroding	2010	643	0	fluvial	wave wash	none	unknown	no	2010 - Slumping sections on the lower bank, appears to be scouring around the trees.	Soil beach at toe.
STM_23-6_R	Steamboat Slough	23.6	-	R	RD 349 (Unit 2)	Sutter Island	eroding new	2011	768	0	wave wash	tree pop-outs	quarry stone at end in fair condition	no	no		Toe scour at the tidal zone.

Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
STM_23-8_L	Steamboat Slough	23.8	-	L	RD 3 (Unit 1)	Grand Island	critical	2009	144	0	fluvial	wave wash	cobbles at toe in poor condition	no	no	2009 - Slumping at the levee toe , cobbles at the downstream end. 2010 - Very steep new vertical slump, short site, but looked bad.	This site is upgraded to CRITICAL. A section of rock has failed. Significant new erosion, bank is vertical almost to the top of the levee. Levee has a road on top that is used by trucks and heavy farm equipment.
STM_23-9_R	Steamboat Slough	23.9	-	R	RD 349 (Unit 2)	Sutter Island	eroding	1997	168	0	fluvial	wave wash	none	yes	no	1997 - Top right bank has retreated into the levee. Site is between two rock sites. 1999 - Downstream half of the reach repaired with rock. 2000 - Trees leaning into the water. 2010 - Site appears worse.	New erosion at the toe.
STM_24-1_R	Steamboat Slough	24.1	-	R	RD 349 (Unit 2)	Sutter Island	eroding new	2011	55	0	erosion pockets	wave wash	quarry stone at toe in fair condition	no	no		Small scallop caused by erosion and wave wash.
STM_24-7_R	Steamboat Slough	24.7	-	R	RD 349 (Unit 2)	Sutter Island	critical	1997	949	0	fluvial	wave wash	quarry stone on part of the bank in poor condition	yes	no	1997 - Erosion of very sandy levee behind large stand of riparian vegetation on top right bank. Dry ravel of sand. 1999 - Quarry waste rock was dumped down the levee slope; poor repair job; still eroding in places. Eroding at midslope off fabric. 2005 - Length revised, only the middle 150 - 200 ft are eroding. 2006 - Some rock/small material dumped down the bank but it is slowly unraveling. Upstream end is unraveling faster. Steep slope with poor gradation so fines are washing out. 2010 - Lots of overhanging trees and erosion pockets.	This site is upgraded to CRITICAL. Near vertical bank at the downstream end. New erosion at various locations throughout the site.
STM_24-8_L	Steamboat Slough	24.8	-	L	RD 3 (Unit 1)	Grand Island	eroding	2008	773	0	whole bank failure	tree pop-outs	none	no	no	2008 - Area closed sign on bank. Newly fallen trees at both ends and pop outs along the bank. 2010 - Site extended downstream.	New erosion at the toe. More trees popouts.
STM_25-0_L	Steamboat Slough	25.0	-	L	RD 3 (Unit 1)	Grand Island	eroding	1997	264	0	fluvial	tree pop-outs	none	yes	no	1997 - Erosion of sandy levee on top left bank. Site is downstream of a rock section. Large riparian trees on the bank. 1999 - Upstream half of the reach repaired with rock, except for a 30 ft reach at the upstream end. 2001 - Rock repair on the upstream and downstream ends; no revetment at the trees. 2002 - Rock repair is starting to slide off the geotextile at the upstream end. 2005 - One new small tree has fallen. 2006 - 50 ft pocket at the downstream end and at the upstream end with new rock in between. 2007 - Upstream end has been repaired. 2010 - Some minor new erosion.	Minor new erosion.
STM_25-5_R	Steamboat Slough	25.5	-	R	RD 349 (Unit 2)	Sutter Island	eroding	2010	580	3	fluvial	wave wash	quarry stone at toe in fair condition	yes	no	2010 - Small maintenance, erosion into the toe.	Minor new erosion at the toe.
STM_25-8_R	Steamboat Slough	25.8	-	R	RD 349 (Unit 2)	Sutter Island	eroding	2007	243	0	wave wash	fluvial	none	no	no	2007 - Slow erosion, probably due to wave wash and fluvial erosion. Site has likely been here for awhile but was unseen due to boats parked in front.	No observed change.
STM_26-0_L	Steamboat Slough	26.0	-	L	RD 3 (Unit 1)	Grand Island	eroding	1997	311	8	whole bank failure	wave wash	none	yes	no	1997 - Mass failure of berm slope and wave wash erosion. Large trees on top of berm, some failed trees. New area of low rock to on the upstream end. 2000 - Some minor erosion near the downstream end. 2005 - One new small tree has fallen. 2009 - Minimal new erosion. 2010 - Minor new erosion.	No observed change.



Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
STR_24-7_R	Sutter Slough	24.7	-	R	RD 999 (Unit 3)	Clarksburg	eroding	1997	2179	0	toe scour		quarry stone on part of the bank in poor condition	yes	no	1997 - Intermittent over-steepened sections. Large riparian vegetation along the length of the entire reach. Attempts to repair with rock on bank have failed. 1999 - New rock repair at the downstream end. 2002 - Some minor spot repairs. 2009 - Minimal new erosion. 2010 - Appears that fresh rock placed on downstream portion of site. Toe scour and overhanging trees with some overturned.	No observed change.
STR_25-2_R	Sutter Slough	25.2	-	R	RD 999 (Unit 3)	Clarksburg	eroding	2008	694	0	toe scour	tree pop-outs	none	unknown	no	2008 - Over steepened levee section. 2009 - Significant new erosion. 2010 - Minor new erosion.	No observed change.
STR_25-7_R	Sutter Slough	25.7		R	RD 999 (Unit 3)	Clarksburg	eroding new	2011	555	5	toe scour	whole bank failure	none	no	no		Toe scour along length of site and erosion pockets.
STR_26-5_L	Sutter Slough	26.5	-	L	RD 349 (Unit 3)	Sutter Island	eroding	2002	621	0	toe scour	erosion pockets	quarry stone on part of the bank in poor condition	yes	no	2002 - Original rock over geotextile is sliding off and the end is coming unraveled. 2003 - Some minor new erosion on the downstream end. 2004 - Site has gotten worse. Underlined geofabric is exposed. 2005 - Still looks bad with exposed geotextile fabric. 2006 - Still have some new unraveling and exposed fabric. Site lengthened upstream. 2009 - Minimal new erosion. 2010 - geotextile fabric placed since last year, possible flood fight.	No observed changes.
STR_27-3_R	Sutter Slough	27.3	-	R	RD 999 (Unit 3)	Clarksburg	eroding new	2011	992	0	whole bank failure		quarry stone on part of the bank in poor condition	yes	no		Multiple erosion pockets. Some likely from tree popouts.
SMS_9-3_L	Sycamore Slough	-	9.3	L	MA 12 (Unit 1)	Grimes	eroding new	2011	98	0	eddy scour	overtopping scour	cobbles on upper slope in poor condition	yes	no		Erosion occurring upstream and downstream of an irrigation diversion structure.
WAC_2-1_L	Wadsworth Canal	-	2.1	L	DWR Wadsworth Canal (Unit 1)	Yuba City	eroding new	2011	3422	5	whole bank failure		none	yes	no		Whole bank is starting to unravel, with failure from poor soils.
WAC_2-1_R	Wadsworth Canal	-	2.1	R	DWR Wadsworth Canal (Unit 2)	Sutter Town	eroding new	2011	3375	5	whole bank failure		none	yes	no		Whole bank is starting to unravel, with failure from poor soils.
WAC_2-4_L	Wadsworth Canal	-	2.4	L	DWR Wadsworth Canal (Unit 1)	Yuba City	eroding	2010	4602	10	whole bank failure		none	yes	no	2010 - Over steepened levees, some slumping, reach-wide problem.	Still a reach-wide problem.
WAC_2-4_R	Wadsworth Canal	-	2.4	R	DWR Wadsworth Canal (Unit 2)	Sutter Town	eroding	2010	4616	5	whole bank failure		none	yes	no	2010 - Over steepened levees, some slumping, reach-wide problem.	Still a reach-wide problem.
WAC_4-3_R	Wadsworth Canal	-	4.3	R	DWR Wadsworth Canal (Unit 2)	Sutter Town	eroding new	2011	106	0	fluvial		none	no	no		Small erosion pocket.
YAS_1-7_L	Yankee Slough	-	1.7	L	RD 1001 (Unit 2)	Rio Oso	eroding new	2011	147	3	fluvial		none	no	no		New erosion site. Steep eroding slope. Fairly old scarp with vegetation growth.
YOL_0-1_R	Yolo Bypass	-	0.1	R	RD 2035 (Unit 2)	Woodland	eroding	2006	427	0	wave wash	fluvial	none	yes	no	2006 - Wave wash erosion and some saturation slumping occurring. Tension/separation cracks evident in fine grained levee slope materials.	Slumping of the lower toe. New slumped section on downstream end.
YOL_1-2_R	Yolo Bypass	-	1.2	R	RD 2035 (Unit 2)	Woodland	eroding new	2011	215	0	erosion pockets	wave wash	none	no	no		Small sections of slumping, likely from wind wave.
YOL_2-0_R	Yolo Bypass	-	2.0	R	RD 2035 (Unit 2)	Woodland	eroding	2006	267	0	wave wash	fluvial	cobbles	unknown	no	2006 - Wave wash erosion and some saturation slumping occurring. Tension/separation cracks evident in fine grained levee slope materials.	Small sections of slumping lower bank, just downstream of bank rock.
YOL_2-3_R	Yolo Bypass	-	2.3	R	RD 2035 (Unit 2)	Woodland	eroding new	2011	1840	0	wave wash	toe scour	none	no	no		New erosion site. Erosion from wind waves along entire length of the levee toe. Several sections of slumping bank along the toe.

Table A-1. 2011 Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
YOL_2-6_R	Yolo Bypass	-	2.6	R	DWR West Levee Yolo Bypass (Unit 1)	Knights Landing	eroding	2006	827	0	wave wash		none	no	no	2006 - Slow wave wash and general fluvial erosion of the toe area under river cobbles. Erosion is creating a scarp and cobble covered wave-cut bench.	Site appears better than it looked in 2006, but still eroding.
YOL_2-8_R	Yolo Bypass	-	2.8	R	RD 2035 (Unit 2)	Woodland	eroding new	2011	2540	0	wave wash	toe scour	none	no	no		New erosion site. Wave wash erosion and several sections of slumping bank along the toe.
YOL_4-2_R	Yolo Bypass	-	4.2	R	RD 2035 (Unit 2)	Woodland	eroding	2006	1652	0	wave wash		none	no	no	2006 - Wave wash erosion and some saturation slumping occurring. Several small scallops present in lower levee slope/toe due to saturation slumping. Tension/separation cracks evident in fine-grained levee slope materials.	Small pockets of erosion throughout the site. Site formerly called 3.8.
YUB_2-3_L	Yuba River	-	2.3	L	RD 784 (Unit 7)	Linda	under construction	2006	1539	0	toe scour		none	yes	no	2006 - Land owner has removed levee toe and lower slope during plowing and cultivation activities resulting in high, near vertical face at levee toe and exposure of levee core. 2007 - Levee is set back a ways from the channel.	Site currently being repaired under the Upper Yuba Levee Improvement Project by the Three Levees District.
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Table A-2. 2011 Critical Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
CHC_2-4_L	Cache Creek	-	2.4	L	DWR Cache Creek (Unit 1)	Yolo	critical	2002	218	15	toe scour	fluvial	none	yes	no	Site identified as CRITICAL in 2002. 2006 - Currently constructing a setback levee. New failures present and extensive. Downstream end of the setback levee did not extend far enough. Upstream end was repaired. 2007 - DWR repaired with a setback levee, but the levee did not go far enough downstream.	No observed change.
CHC_3-9_L	Cache Creek	-	3.9	L	DWR Cache Creek (Unit 1)	Yolo	critical	2002	429	10	toe scour	whole bank failure	none	yes	no	Site identified as CRITICAL in 2006. 2006 - Some significant new erosion, especially fresh upper bank slumping. Also have a small piping failure due to recent overbank flows. 2007 - Some new minor upper bank slumps. 2010 - Planned setback levee by CA DWR, 100% design complete, construction planned for 2011.	Minor new erosion. DWR plans to construct a setback levee in 2012.
CHC_4-2_L	Cache Creek	-	4.2	L	DWR Cache Creek (Unit 1)	Yolo	critical	2002	728	10	toe scour	whole bank failure	none	no	no	Site identified as CRITICAL in 2006. 2006 - Some significant new erosion, especially fresh upper bank slumping. Also have a small piping failure due to recent overbank flows. 2010 - New erosion, flood fought in early 2010. Planned setback levee by CA DWR, 100% designs complete, construction planned for 2011.	Large sections of the bank have slumped off in the past year.
GEO_0-3_L	Georgiana Slough	0.3	-	L	RD 563 (Unit 1)	Tyler Island	critical	1997	1907	0	erosion pockets	whole bank failure	quarry stone on part of the bank in good condition	yes	no	1997 - Erosion pockets into the levee toe. 1999 - Some small pockets fixed with rock riprap. 2002 - New "brush boxes" along the bank toe. 2005 - Brush boxes are empty. Some pockets are filled with new stone. 2006 - Some new rock at the downstream end (~100 ft long). Several small pockets of new rock in scallops. Brush boxes in poor to fair condition. 2010 - Site looks a little worse, some toe rock but still has erosion scars at lower to mid slope.	Site upgraded to CRITICAL. Significant new erosion. Erosion scallops are vertical and almost the height of the levee.
GEO_2-0_L	Georgiana Slough	2.0	-	L	RD 563 (Unit 1)	Tyler Island	critical	2009	651	0	erosion pockets	wave wash	none	no	no	2009 - Upgraded to full erosion site. Small scour pockets and mid slope wave wash. 2010 - New rock and freshly fallen trees.	Site upgraded to CRITICAL. Significant new erosion. Rotational failures for the full height of the levee.
GEO_3-8_L	Georgiana Slough	3.8	-	L	RD 563 (Unit 1)	Tyler Island	critical	1997	2589	0	erosion pockets	wave wash	quarry stone at upstream end	yes	no	1997 - Pockets of erosion into the levee at the water line. Alders are being undercut and rotating out into the channel. Damaged rock at upstream end. 2000 - New minor erosion. 2001 - Staked low fascine walls at bankline. 2002 - New "Brush Boxes" along the bank toe. 2003 - New erosion pockets in the middle of the site. 2005 - Some new bundles in the brush boxes.	Site upgraded to CRITICAL. Significant new erosion. Sites 3.6, 3.7, 3.71, and 4.0 were combined.
GEO_4-5_L	Georgiana Slough	4.5	-	L	RD 563 (Unit 1)	Tyler Island	critical	1997	1395	0	erosion pockets	wave wash	none	yes	no	1997 - Pocket erosion at upstream end and into the levee toe under the Alder trees. 2003 - New brush boxes with wattles on bank. 2004 - No brush boxes. 2005 - Site extended from the downstream side of the bridge. Whole bank is vertical. 2010 - Some minor new erosion.	Site upgraded to CRITICAL. New erosion pockets throughout the site. Sites 4.5, and 4.6 were combined.
GEO_6-8_L	Georgiana Slough	6.8	-	L	RD 563 (Unit 1)	Tyler Island	critical	1997	1251	0	wave wash		none	yes	no	1997 - Deep pockets of erosion into a narrow berm just downstream of the rock. 2000 - Scallops in banks with small colored flags, some new biotech rolls in with older rolls in the scallops. 2001 - Staked, low fascine walls at the bankline.	Site upgraded to CRITICAL. Site extended upstream due to new erosion pocket. New tree popouts and new erosion.
SAC_7-3_L	Sacramento River	7.3	-	L	RD 341 (Unit 2)	Sherman Island	critical	2011	619	0	other	whole bank failure	none	yes			Large slump at downstream end. Gully formed from surface runoff from the road. Shallow slumping throughout site.

Table A-2. 2011 Critical Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
SAC_16-8_L	Sacramento River	16.8	-	L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	critical	2008	591	0	fluvial	wave wash	none	yes	no	2008 - Overstepped levee section with pocket erosion. Plans for repair currently in the design phase. 2010 - Very steep slope with slumps, longitudinal cracking, and overturned trees.	Upgraded to CRITICAL. Sections of vertical slope with highway on top. Heavy vegetation in front of most of the erosion pockets.
SAC_17-2_L	Sacramento River	17.2	-	L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	critical	2009	1001	0	fluvial	whole bank failure	rubble on part of the bank in poor condition	yes	no	2009 - Fluvial erosion, into the levee slope, close to vertical bank with roadway on top. Pilings that were once at the bankline are now 30 ft out. 2010 - Very steep slope with slumps and overturned trees.	Upgraded to CRITICAL. Sections of vertical slope with highway on top. Heavy vegetation in front of most of the erosion pockets. Structures built into the levee on the upstream end.
STM_23-8_L	Steamboat Slough	23.8	-	L	RD 3 (Unit 1)	Grand Island	critical	2009	144	0	fluvial	wave wash	cobbles at toe in poor condition	no	no	2009 - Slumping at the levee toe, cobbles at the downstream end. 2010 - Very steep new vertical slump, short site, but looked bad.	This site is upgraded to CRITICAL. A section of rock has failed. Significant new erosion, bank is vertical almost to the top of the levee. Levee has a road on top that is used by trucks and heavy farm equipment.
STM_24-7_R	Steamboat Slough	24.7	-	R	RD 349 (Unit 2)	Sutter Island	critical	1997	949	0	fluvial	wave wash	quarry stone on part of the bank in poor condition	yes	no	1997 - Erosion of very sandy levee behind large stand of riparian vegetation on top right bank. Dry ravel of sand. 1999 - Quarry waste rock was dumped down the levee slope; poor repair job; still eroding in places. Eroding at midslope off fabric. 2005 - Length revised, only the middle 150 - 200 ft are eroding. 2006 - Some rock/small material dumped down the bank but it is slowly unraveling. Upstream end is unraveling faster. Steep slope with poor gradation so fines are washing out. 2010 - Lots of overhanging trees and erosion pockets.	This site is upgraded to CRITICAL. Near vertical bank at the downstream end. New erosion at various locations throughout the site.
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Table A-3. 2011 New Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
BER_1-9_L	Bear River	1.9	-	L	RD 1001 (Unit 3)	Rio Oso	eroding new	2011	432	5	whole bank failure		none	no	no		Large slumped sections of bank.
BER_2-5_L	Bear River	2.5	-	L	RD 1001 (Unit 3)	Rio Oso	eroding new	2011	222	25	whole bank failure		none	no	no		A large section of bank has slumped off, RD has flagging up, appears to be watching.
CBD_0-5_L	Colusa Basin Drainage Canal	-	0.5	L	RD 787 (Unit 1)	RD 787	eroding new	2011	611	5	fluvial	tree pop-outs	none	no	no		Large scallops throughout the entire reach. Toe scour due to tree pop-outs, resulting in a steepening slope. The reduced resistive forces plus clay levee may increase the loading. Additional erosion due to human use.
CBD_0-9_L	Colusa Basin Drainage Canal	-	0.9	L	RD 787 (Unit 1)	RD 787	eroding new	2011	968	0	tree pop-outs	fluvial	none	no	no		Large scallops throughout the entire reach. Toe scour due to tree pop-outs, resulting in a steepening slope. The reduced resistive forces plus clay levee may increase the loading.
CBD_19-2_L	Colusa Basin Drainage Canal	-	19.2	L	RD 108 (Unit 1)	Grimes	eroding new	2011	397	0	fluvial	toe scour	none	no	no		Toe scour at the bottom of a steep bank, large sections of the toe are sliding down. Erosion may be due to the upstream bend.
CHK_11-7_R	Cherokee Canal		11.7	R	MA 13 (Unit 1)	NONE	eroding new	2011	34	0	eddy scour		none	yes	no		Small erosion pocket, likely caused by the irrigation diversion structure.
CHS_21-1_R	Cache Slough	21.1		R	RD 2060 (Unit 3)	Hastings Tract	eroding new	2011	1158	0	toe scour	wave wash	none	no	no		Several large pockets of erosion from rotational failure. Toe is slumping.
FHR_5-8_L	Feather River	5.8	-	L	RD 1001 (Unit 4)	Rio Oso	eroding new	2011	996	0	fluvial	whole bank failure	minimal cobbles in poor condition	unknown	no		Large slumped sections on the lower bank.
FHR_6-0_L	Feather River	6.0	-	L	RD 1001 (Unit 4)	Rio Oso	eroding new	2011	358	20	fluvial	whole bank failure	none	no	no		Tall slumping sections. Scour around trees has exposed most of the roots.
FHR_6-6_L	Feather River	6.6	-	L	RD 1001 (Unit 4)	Rio Oso	eroding new	2011	718	5	tree pop-outs	fluvial	cobbles on toe in poor condition	no	no		Erosion pockets from tree popouts. Sections of the lower bank have slumped off.
FHR_47-5_R	Feather River	47.5	-	R	DWR MA 7 (Unit 1)	Live Oak	eroding new	2011	841	100	toe scour		large quarry stone at the upstream end	yes	no		The toe of the levee has been excavated by the land owner. Small holes throughout the site have been filled with a plaster like substance. Large canal on landside slope and over the levee toe.
GEO_11-0_L	Georgiana Slough	11.0		L	RD 563 (Unit 1)	Tyler Island	eroding new	2011	144	0	wave wash		none	no	no		Short sections of eroding bank at the waterline and holes in toe of levee.
HAS_7-9_L	Hass Slough	-	7.9	L	RD 2098 (Unit 3)	Moore Tract	eroding new	2011	1918	0	wave wash	toe scour	none	unknown	no		Large vertical erosion pockets and bank slumping.
HAS_9-7_L	Hass Slough	-	9.7	L	RD 2098 (Unit 4)	Moore Tract	eroding new	2011	1583	0	whole bank failure	bovine scour	none	yes	no		Several scallops of erosion. Erosion primarily due to the weight of cattle on the slope.
KLR_3-5_R	Knights Landing Ridge Cut	-	3.5	R	Knights Landing Ridge Drainage District (Unit 1)	Yolo	eroding new	2011	418	0	toe scour		none	no	no		Toe scour and bank slumping.
KLR_3-7_L	Knights Landing Ridge Cut	-	3.7	L	Knights Landing Ridge Drainage District (Unit 2)	Knights Landing	eroding new	2011	677	0	tree pop-outs	whole bank failure	none	unknown	no		The toe has eroded away and there are a few scallops from bank slumping.
KLR_3-9_R	Knights Landing Ridge Cut	-	3.9	R	Knights Landing Ridge Drainage District (Unit 1)	Yolo	eroding new	2011	366	0	tree pop-outs		none	no	no		Toe erosion and erosion pockets from tree popouts. More tree popouts are expected due to the eroding toe.
LDS_0-6_R	Lindsey Slough	-	0.6	R	RD 536 (Unit 1)	Lindsey	eroding new	2011	1620	0	toe scour		none	yes	no		Multiple sections of slumping bank.
LDS_0-7_R	Lindsey Slough	0.7	-	R	RD 536 (Unit 1)	Lindsey	eroding new	2011	280	0	tree pop-outs	fluvial	none	no	no		Levee toe is unraveling with large slumping sections. This site is downstream of old bank rock.
LDS_0-8_R	Lindsey Slough	0.8	-	R	RD 536 (Unit 1)	Lindsey	eroding new	2011	86	0	tree pop-outs	fluvial	quarry stone in sections in fair condition	yes	no		Multiple erosion pockets from tree popouts. A smaller erosion pocket in the middle of a failing bank repair. Pump structure at the downstream end may be contributing to the erosion.

Table A-3. 2011 New Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
LDS_1-9_L	Lindsey Slough	1.9	-	L	RD 2060 (Unit 1)	Hastings Tract	eroding new	2011	358	0	wave wash	fluvial	none	no	no		Multiple erosion pockets. Deep cracks throughout site could lead to further bank failure.
LDS_2-4_L	Lindsey Slough	2.4	-	L	RD 2060 (Unit 1)	Hastings Tract	eroding new	2011	139	0	wave wash	fluvial	none	no	no		Two erosion pockets from rotational failures. Very soft soil.
MUD_4-4_R	Mud Creek	-	4.4	R	Butte County (Unit 1)	NONE	eroding new	2011	300	20	fluvial		none	no	no		Two large erosion scallops at the toe from a rotational failure. Deep cracks along the slope indicate the potential for further failures.
PUC_0-1_L	Putah Creek	-	0.1	L	DWR Putah Creek (Unit 1)	Davis	eroding new	2011	423	0	wave wash		cobbles at toe in fair condition	unknown	no		Old cobble site is unraveling, likely causing the toe of the bank to become unstable.
PUC_7-2_L	Putah Creek	-	7.2	L	DWR Putah Creek (Unit 1)	Davis	eroding new	2011	305	0	whole bank failure	tree pop-outs	none	unknown	no		The toe to mid-bank is slumping. Large tree pop-outs have furthered the erosion. Slope is slightly steeper than 1:1.
SAC_7-3_L	Sacramento River	7.3	-	L	RD 341 (Unit 2)	Sherman Island	critical	2011	619	0	other	whole bank failure	none	yes	no		large slump at downstream end. gully formed from surface runoff from the road. shallow slumping throughout site.
SAC_7-9_L	Sacramento River	7.9	-	L	RD 341 (Unit 2)	Sherman Island	eroding new	2011	204	0	whole bank failure	wave wash	scattered rock	no	no		large slump section
SAC_8-2_L	Sacramento River	8.2	-	L	RD 341 (Unit 2)	Sherman Island	eroding new	2011	202	0	whole bank failure	wave wash	none	no	no		large new erosion pocket probably hidden by vegetation in the past.
SAC_13-6_L	Sacramento River	13.6		L	Brannan-Andrus Levee District (Unit 2)	Brannan-Andrus Islands	eroding new	2011	303	0	whole bank failure	wave wash	quarry stone in sections in poor condition	unknown	no		large section of bank slumped off.
SAC_43-1_R	Sacramento River	43.1		R	RD 307 (Unit 1)	Borges	eroding new	2011	646	0	tree pop-outs	whole bank failure	quarry stone and cobbles in fair condition	unknown	no		Erosion pockets likely from tree popouts. This site has been in the inventory before and been fixed with emergency bank rock but continues to fail.
SAC_50-3_L	Sacramento River	50.3		L	DWR MA 9 (Unit 1)	Sacramento	eroding new	2011	89	0	tree pop-outs	none	cobbles at toe in fair condition	no	no		Tree popout at the toe has taken out the rock toe protection.
SAC_53-8_L	Sacramento River	53.8	-	L	DWR MA 9 (Unit 1)	Sacramento	eroding new	2011	155	15	fluvial	wave wash	none	unknown	no		Erosion into upper and lower slope. There has been significant scour around the tree roots.
SAC_54-8_L	Sacramento River	54.8	-	L	DWR MA 9 (Unit 1)	Sacramento	eroding new	2011	49	0	tree pop-outs	wave wash	cobbles at toe in poor condition	unknown	no		A large tree has fallen behind a larger tree, putting stress on an already compromised tree. Toe erosion due to wave wash.
SAC_77-0_R	Sacramento River	77.0	-	R	RD 1600 (Unit 1)	Elkhorn	eroding new	2011	359	15	fluvial		none	yes	no		Large vertical eroded face from a rotational failure just below pump.
SAC_143-5_R	Sacramento River	143.5	-	R	Sacramento River West Side Levee District (Unit 1)	Colusa Basin	eroding new	2011	613	5	fluvial	tree pop-outs		multiple scallops, one tree pop out. old cobble site starting to unravel	no		
SBP_11-1_L	Sutter Bypass	-	11.1	L	East Levee Sutter Bypass (Unit 1)	Yuba City	eroding new	2011	162	15	wind wave		none	no	no		Small section of the mid levee slope has eroded from wind wave.
STM_23-6_R	Steamboat Slough	23.6	-	R	RD 349 (Unit 2)	Sutter Island	eroding new	2011	768	0	wave wash	tree pop-outs	quarry stone at end in fair condition	no	no		Toe scour at the tidal zone.
STM_24-1_R	Steamboat Slough	24.1	-	R	RD 349 (Unit 2)	Sutter Island	eroding new	2011	55	0	erosion pockets	wave wash	quarry stone at toe in fair condition	no	no		Small scallop caused by erosion and wave wash.
STR_25-7_R	Sutter Slough	25.7		R	RD 999 (Unit 3)	Clarksburg	eroding new	2011	555	5	toe scour	whole bank failure	none	no	no		Toe scour along length of site and erosion pockets.
STR_27-3_R	Sutter Slough	27.3	-	R	RD 999 (Unit 3)	Clarksburg	eroding new	2011	992	0	whole bank failure		quarry stone on part of the bank in poor condition	yes	no		Multiple erosion pockets. Some likely from tree popouts.
SMS_9-3_L	Sycamore Slough	-	9.3	L	MA 12 (Unit 1)	Grimes	eroding new	2011	98	0	eddy scour	overtopping scour	cobbles on upper slope in poor condition	yes	no		Erosion occurring upstream and downstream of an irrigation diversion structure.

Table A-3. 2011 New Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
WAC_2-1_L	Wadsworth Canal	-	2.1	L	DWR Wadsworth Canal (Unit 1)	Yuba City	eroding new	2011	3422	5	whole bank failure		none	yes	no		Whole bank is starting to unravel, with failure from poor soils.
WAC_2-1_R	Wadsworth Canal	-	2.1	R	DWR Wadsworth Canal (Unit 2)	Sutter Town	eroding new	2011	3375	5	whole bank failure		none	yes	no		Whole bank is starting to unravel, with failure from poor soils.
WAC_4-3_R	Wadsworth Canal	-	4.3	R	DWR Wadsworth Canal (Unit 2)	Sutter Town	eroding new	2011	106	0	fluvial		none	no	no		Small erosion pocket.
YAS_1-7_L	Yankee Slough	-	1.7	L	RD 1001 (Unit 2)	Rio Oso	eroding new	2011	147	3	fluvial		none		no		New erosion site. Steep eroding slope. Fairly old scarp with vegetation growth.
YOL_1-2_R	Yolo Bypass	-	1.2	R	RD 2035 (Unit 2)	Woodland	eroding new	2011	215	0	erosion pockets	wave wash	none	no	no		Small sections of slumping, likely from wind wave.
YOL_2-3_R	Yolo Bypass	-	2.3	R	RD 2035 (Unit 2)	Woodland	eroding new	2011	1840	0	wave wash	toe scour	none	no	no		New erosion site. Erosion from wind waves along entire length of the levee toe. Several sections of slumping bank along the toe.
YOL_2-8_R	Yolo Bypass	-	2.8	R	RD 2035 (Unit 2)	Woodland	eroding new	2011	2540	0	wave wash	toe scour	none	no	no		New erosion site. Wave wash erosion and several sections of slumping bank along the toe.
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Table A-4. 2011 Erosion Sites Under Construction

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
SAC_57-0_R	Sacramento River	57.0	-	R	RD 900 (Unit 1)	Southport	under construction	1997	184	0	fluvial	eddy scour	none	yes	no	1997 - Old timber pile dikes remnant approximately 30 ft out into the channel. Oversized levee section. 1999 - Some additional erosion at water line. 2008 - Plans for setback levee repair (along with 57.2) currently in the design phase.	Setback levee under construction, expected completion in 2012.
SAC_57-2_R	Sacramento River	57.2	-	R	RD 900 (Unit 1)	Southport	under construction	2007	647	0	fluvial		cobbles at the toe in poor condition	yes	no	2007 - Steep levee slope with cobble revetment rolling off the bank and a silty clay toe. 2008 - Plans for setback levee repair currently in the design phase.	Setback levee under construction, expected completion in 2012.
YUB_2-3_L	Yuba River	-	2.3	L	RD 784 (Unit 7)	Linda	under construction	2006	1534	0	toe scour		none	yes	no	2006 - Land owner has removed levee toe and lower slope during plowing and cultivation activities resulting in high, near vertical face at levee toe and exposure of levee core. 2007 - Levee is set back a ways from the channel.	Site currently being repaired under the Upper Yuba Levee Improvement Project by the Three Levees District.



Table A-5. 2011 Repaired or Removed Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
BTC_3-8_L	Butte Creek	-	3.8	L	MA 5 (Unit 1)	Butte Basin	remove	2008	202	35	whole bank failure		none	no	no	2008 - Sandy non-cohesive bank with rotational/slab failure with large tree at toe leaning over channel. 2010 - May not qualify as erosion site, if site appears better next year then consider removing.	The erosion is not into the projection of the levee slope, site removed.
BTC_9-6_L	Butte Creek	-	9.6	L	MA 5 (Unit 1)	Butte Basin	repaired	2008	88	0	eddy scour		quarry stone on whole bank in fair condition	yes	no	2008 - Eddy scour from high flow over structure on left bank (at end of irrigation channel). Structure also marks the break in the left bank levee section.	Rock has been placed on the slope within the past year. Status changed to repaired.
CHK_14-0_L	Cherokee Canal	-	14.0	L	MA 13 (Unit 2)	NONE	remove	2006	183	0	toe scour	pipng	none	no	no	2006 - Fire break maintenance at toe of levee has cut into the toe area of the levee resulting in over steepening of the lower slope which allows the lower slope to slide/slump.	Heavily vegetated with grass, however there does not appear to be any erosion, possibly repaired since 2006. Site is removed from the inventory.
CHK_21-9_L	Cherokee Canal	-	21.9	L	MA 13 (Unit 2)	Butte Basin	remove	2006	1902	0	fluvial		none	no	no	2006 - Flow along the levee toe has eroded out the lower slope. Levee material is silts and clay.	The soil has been replaced in the eroded area and no longer qualifies as a site.
ELC_4-1_L	Elder Creek	-	4.1	L	Tehama County (Unit 4)	NONE	repaired	2006	301	10	fluvial	whole bank failure	quarry stone in good condition	no	no	2006 - Overtopping flows caused erosion of the upper levee slope. Hay bales were recently placed along the top to control overtopping flow and erosion.	This site was repaired under the PL84-99 program with quarry stone.
GEO_11-2_R	Georgiana Slough	11.2	-	R	RD 556 (Unit 1)	Brannan-Andrus Islands	repaired	2010	167	0	tree pop-outs	fluvial	quarry stone on lower bank in good condition	yes	no	2010 - Site may have been missed previously when viewed at high tide. Hole from tree pop-out. Steep vertical face, erosion of levee toe.	Rock placed over the erosion by locals since last year.
FHR_7-0_L	Feather River	7.0	-	L	RD 1001 (Unit 4)	Rio Oso	repaired	2000	413	5	fluvial		cobbles on toe in fair condition	no	no	2000 - Some active toe erosion of a damaged old cobble site. 2005 - Small amount of additional erosion at the waterline. 2008 - Plans for repair currently in the design phase. 2010 - Old deteriorating cobble site. Fresh fallen tree.	Site was under construction during the field visit. Site was completed in January 2012.
KLR_0-2_R	Knights Landing Ridge Cut	-	0.2	R	Knights Landing Ridge Drainage District (Unit 1)	Yolo	remove	2006	1403	0	fluvial	whole bank failure	none	no	no	2006 - Significant wave wash erosion and saturation slumping of the lower levee slope and toe. Tension and separation cracks evident in the middle and upper levee slope indicate potential for mass slumping of the levee slope.	The erosion at this site is minor and the levee crown is oversized, therefore the erosion is not into the projection of the levee slope. This site is removed from the inventory.
KLR_4-2_L	Knights Landing Ridge Cut	-	4.2	L	Knights Landing Ridge Drainage District (Unit 2)	Knights Landing	remove	2006	388	10	fluvial	overtopping scour	none	no	no	2006 - The whole levee toe area is slowly slumping into the channel (creep) due to dewatering and poor slope soils. Pistol-butted trees at the levee toe indicate slow retreat.	Even though the levee is over steepened there is no apparent erosion. Site is removed.
KLR_5-3_L	Knights Landing Ridge Cut	-	5.3	L	Knights Landing Ridge Drainage District (Unit 2)	Knights Landing	remove	2006	8394	0	fluvial		none	no	no	2006 - Channel bank forms levee toe. Levee toe/bank has slowly been retreating. In places, there are 6 to 8 ft scarps.	The middle portion of this site is not eroding. This site is removed and the upstream and downstream ends have been made individual sites.
LAR_10-0_L	Lower American River	10.0	-	L	American River Flood Control District (Unit 4)	Sacramento	repaired	2006	491	10	toe scour	whole bank failure	quarry stone on lower bank and toe in good condition	no	no	2003 - Site was identified as critical and repaired, however the repair was vandalized. 2006 - Added back to the inventory. The brush box repair was burned. 2007 - Vegetation is not colonizing or taking root. 2010 - There is a partial fix on downstream end, fresh rock and fenced vegetation.	Site was under construction during the field visit. Site was completed in January 2012.
LAR_10-6_L	Lower American River	10.6	-	L	American River Flood Control District (Unit 4)	Sacramento	repaired	2006	288	15	whole bank failure	toe scour	none	no	no	2006 - Steep, near vertical slope with a recently fallen tree. Bank is very high so failure is into the slope of the levee. There is a cohesive outcrop in the toe and has the potential for "skating." 2010 - Fresh slumping observed, site extended downstream.	Site was under construction during the field visit. Site was completed in January 2012.

Table A-5. 2011 Repaired or Removed Erosion Sites

Site Name	Waterway	River Mile	Levee Mile	Bank	Maintaining Agency	Damage Basin	Status	Year Added	Erosion Length	Berm Width	Erosion Mechanism (Primary)	Erosion Mechanism (Secondary)	Revetment Details	Encroachment at Site	Bank Swallow Habitat	Site History	2011 Field Notes
SAC_60-1_L	Sacramento River	60.1	-	L	American River Flood Control District (Unit 5)	Sacramento	repaired	2010	1276	0	toe scour	wave wash	quarry stone in good condition	yes	no	1997 - Eroding bank downstream of large snag pile, failed concrete rubble in the upper bank, eroding toe. 1999 - Downstream end is still eroding. 2000 - Mid-bank erosion caused by old city intake tower just upstream causing eddy scour. 2003 - Upgraded to a CRITICAL site. 2005 - Site repaired with building of an oversized levee and minor bank repair. 2010 - Site added back into the inventory after significant erosion over the last few years. The erosion has extended past the oversized levee section.	Repaired by the American River Flood Control District.
SAC_66-6_R	Sacramento River	66.6	-	R	RD 537 (Unit 1)	Elkhorn	remove	2010	394	0	tree pop-outs	fluvial	quarry stone at the toe in fair condition	no	no	2010 - There is a setback levee built in the 1960s by the local RD, but it was never officially recognized as a replacement for original levee. Near vertical banks with old large scarps. Slumping at the toe. Status depends on recognition of the setback levee.	contact county about erosion problem near road.
SAC_77-2_L	Sacramento River	77.2	-	L	RD 1000 (Unit 1)	Natomas	repaired	1997	677	30	fluvial		rubble on part of the bank in poor condition	yes	no	1997 - Levee section problem at irrigation pump; levee veers away from river on the downstream end. 2005 - Site was staked and rock was stockpiled along the top of the bank. 2006 - Minor new erosion. 2010 - New adjacent levee is under construction.	New erosion. Site was under construction during the field visit. Site was completed in January 2012.
SAC_78-8_L	Sacramento River	78.8	-	L	RD 1000 (Unit 1)	Natomas	remove	1997	590	35	fluvial		none	yes	no	1997 - Slow retreat exposing cottonwood roots, does not look as though there has been any retreat behind the upstream end of the rock; concrete rubble section in the middle of the site. 2001 - Not moving due to cohesive toe. 2005 - Site was staked and rock was stockpiled along the top of the bank. 2010 - New adjacent levee under construction.	This site is removed since a pump structure is being built over the site.
SAC_93-9_L	Sacramento River	93.9	-	L	RD 1500 (Unit 1)	South Sutter	remove	2008	53	32	eddy scour		cobbles under deposition in fair condition	no	no	2010 - Small site, could be repaired with maintenance.	Fresh large deposition has filled in a big portion of the site. Site no longer qualifies and is removed.
SAC_132-9_R	Sacramento River	132.9	-	R	Sacramento River West Side Levee District (Unit 1)	Grimes	remove	2006	604	30	fluvial		cobbles at the toe in poor condition	yes	no	2006 - Erosion of depositional material over cobbles. 2007 - Erosion of depositional material over cobbles. 2010 - New deposition observed.	Deposition has continued. The toe is no longer eroding, a beach has formed at the toe and vegetation is growing. Site has stabilized and no longer qualifies, this site is removed from the inventory.
STM_23-2_L	Steamboat Slough	23.2	-	L	RD 3 (Unit 1)	Grand Island	repaired	2000	181	0	tree pop-outs	fluvial	rubble at the toe in fair condition	yes	no	2000 - High vertical eroding bank; lots of vegetation. Debris and concrete rubble on the downstream end. 2001 - Undercut at toe of bank on the downstream end of the riprap. 2006 - New rock along toe downstream of the dock.	The lower bank has been repaired with rock. There is a large clump of trees at the top of the levee with severely exposed roots. Trees may popout in the near future and be added back in as a site.
WSB_0-2_L	Willow Slough Bypass	-	0.2	L	RD 2035 (Unit 3)	Woodland	remove	2006	1498	0	whole bank failure		none	no	no	2006 - (Mislabelled as 0.6) Wave wash erosion of non-cohesive upper levee slope is undermining road pavement. Coarse-grained levee core is exposed and material is sloughing out from under the road.	No apparent erosion. Erosion noted and shown in 2006 is no longer there, possibly repaired. Site removed since it no longer qualifies.
WSB_0-7_L	Willow Slough Bypass	-	0.7	L	Willow Slough Bypass (Unit 1)	Woodland	remove	2006	2096	0	wave wash		none	no	no	2006 - (Mislabelled as 2.2) Significant wave wash erosion is present at mid slope and forming wave-cut bench. Levee surface materials are silt and clay.	No apparent erosion. Erosion noted and shown in 2006 is no longer there, possibly repaired. Site removed since it no longer qualifies.
WSB_6-9_R	Willow Slough Bypass	-	6.9	R	Willow Slough Bypass (Unit 2)	Davis	remove	2006	672	0	whole bank failure		none	no	no	2006 - Wave wash erosion of levee slope is creating a wave-cut bench and scarp.	No apparent erosion. Erosion noted and shown in 2006 is no longer there, possibly repaired. Site removed since it no longer qualifies.
YOL_2-5_R	Yolo Bypass	-	2.5	R	DWR West Levee Yolo Bypass (Unit 1)	Knights Landing	repaired	2006	183	0	wave wash		none	no	no	2006 - Worst erosion is at the upstream end of recently installed rock. Filter fabric is exposed.	Erosion noted in 2006 has been repaired with quarry stone. Site is repaired.
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Table A-6. Site Coordinates

Erosion Site	Midpoint Longitude	Midpoint Latitude	Upstream Longitude	Upstream Latitude	Downstream Longitude	Downstream Latitude
Bear River RM 0.8 L	-121.563829	38.946887	-121.563565	38.947297	-121.564094	38.946477
Bear River RM 1.9 L	-121.550088	38.954670	-121.549528	38.955070	-121.550592	38.954227
Bear River RM 2.5 L	-121.545109	38.964300	-121.544967	38.964583	-121.545228	38.964010
Bear River RM 4.9 R	-121.515924	38.981335	-121.515848	38.981400	-121.515999	38.981271
Bear River RM 5.7 L	-121.501971	38.982655	-121.501144	38.982737	-121.502797	38.982572
Butte Creek LM 2.5 R	-121.846480	39.544201	-121.846366	39.544374	-121.846595	39.544028
Colusa Basin Drainage Canal LM 0.5 L	-121.731554	38.795508	-121.732566	38.795268	-121.730627	38.795931
Colusa Basin Drainage Canal LM 0.9 L	-121.737290	38.795808	-121.738902	38.796225	-121.735647	38.795486
Colusa Basin Drainage Canal LM 19.2 L	-121.985893	39.017122	-121.986374	39.017516	-121.985411	39.016727
Cache Creek LM 2.4 L	-121.797524	38.732760	-121.797893	38.732836	-121.797154	38.732685
Cache Creek LM 2.8 L *	-121.793352	38.734119	-121.793713	38.734067	-121.792992	38.734171
Cache Creek LM 3.4 L *	-121.785157	38.732292	-121.784965	38.732942	-121.785231	38.731626
Cache Creek LM 3.5 R	-121.759860	38.722740	-121.759736	38.722138	-121.759588	38.723294
Cache Creek LM 3.9 L *	-121.780993	38.727914	-121.781673	38.728165	-121.780359	38.727600
Cache Creek LM 4.2 L *	-121.775653	38.727197	-121.776921	38.727261	-121.774435	38.726903
Cache Creek LM 5.4 L	-121.760499	38.723200	-121.760561	38.722933	-121.760436	38.723467
Cherokee Canal LM 11.7 R	-121.759880	39.442780	-121.759851	39.442821	-121.759908	39.442738
Cache Slough RM 15.9 L	-121.655760	38.199637	-121.655638	38.200146	-121.655881	38.199128
Cache Slough RM 21.1 R	-121.698141	38.263102	-121.698868	38.264585	-121.697423	38.261616
Cache Slough RM 22.6 R	-121.713677	38.279342	-121.714633	38.280377	-121.712722	38.278306
Cache Slough RM 22.8 R	-121.716568	38.281805	-121.716817	38.282100	-121.716319	38.281510
Cache Slough RM 23.0 R	-121.718143	38.283704	-121.718471	38.284105	-121.717814	38.283302
Cache Slough RM 23.6 R	-121.723987	38.287305	-121.724806	38.288192	-121.723168	38.286418
Deer Creek LM 0.9 R	-122.024224	39.967965	-122.023828	39.968165	-122.024620	39.967766
Deer Creek LM 2.4 L	-122.031545	39.962817	-122.031421	39.962910	-122.031670	39.962724
Deep Water Ship Channel LM 5.0 L	-121.597755	38.437401	-121.597707	38.437506	-121.597803	38.437296
Elder Creek LM 1.4 L	-122.163643	40.051787	-122.164179	40.051596	-122.163106	40.051979
Elder Creek LM 3.0 R	-122.140408	40.054850	-122.140578	40.054730	-122.140238	40.054970
Elk Slough RM 0.2 L	-121.542874	38.376738	-121.522896	38.413893	-121.583014	38.335366
Elk Slough RM 0.2 R	-121.543481	38.377097	-121.523156	38.414157	-121.583615	38.335616
Feather River RM 0.6 L	-121.629030	38.794424	-121.629903	38.795455	-121.628156	38.793394
Feather River RM 1.0 L	-121.632588	38.799520	-121.633050	38.800920	-121.631939	38.798165
Feather River RM 3.8 L	-121.635119	38.834200	-121.634128	38.836966	-121.636371	38.831498
Feather River RM 5.0 L	-121.630177	38.849956	-121.629482	38.851909	-121.630873	38.848004
Feather River RM 5.8 L	-121.622276	38.862715	-121.621388	38.863946	-121.623316	38.861558
Feather River RM 6.0 L	-121.620465	38.865145	-121.620168	38.865606	-121.620813	38.864706
Feather River RM 6.6 L	-121.615950	38.873246	-121.615380	38.874113	-121.616504	38.872373
Feather River RM 17.8 L	-121.578620	39.007030	-121.579766	39.009366	-121.579143	39.004549
Feather River RM 47.5 R	-121.633543	39.333120	-121.633908	39.334240	-121.633178	39.332000
Georgiana Slough RM 0.3 L	-121.585523	38.129949	-121.588337	38.131126	-121.582266	38.130368
Georgiana Slough RM 1.7 L	-121.598166	38.141793	-121.599677	38.143519	-121.596986	38.139918
Georgiana Slough RM 2.0 L	-121.600007	38.146765	-121.599433	38.147537	-121.600581	38.145994
Georgiana Slough RM 2.5 L	-121.594215	38.151008	-121.593650	38.150820	-121.594780	38.151196
Georgiana Slough RM 3.8 L	-121.591501	38.156351	-121.587427	38.156987	-121.591129	38.152919
Georgiana Slough RM 4.3 L	-121.585737	38.158921	-121.585056	38.160261	-121.586543	38.157625

Table A-6. Site Coordinates

Erosion Site	Midpoint Longitude	Midpoint Latitude	Upstream Longitude	Upstream Latitude	Downstream Longitude	Downstream Latitude
Georgiana Slough RM 4.5 L	-121.583906	38.162663	-121.583092	38.164462	-121.584807	38.160888
Georgiana Slough RM 5.3 L	-121.579780	38.172318	-121.579747	38.176861	-121.581616	38.167959
Georgiana Slough RM 6.3 L	-121.569339	38.182415	-121.563296	38.185479	-121.576292	38.181359
Georgiana Slough RM 6.8 L	-121.559882	38.186930	-121.558442	38.188216	-121.561667	38.185968
Georgiana Slough RM 7.0 R	-121.558615	38.188977	-121.557729	38.189775	-121.559413	38.188121
Georgiana Slough RM 7.2 L	-121.556957	38.189705	-121.556686	38.189886	-121.557227	38.189524
Georgiana Slough RM 8.3 L	-121.543413	38.200333	-121.542571	38.200733	-121.544249	38.199925
Georgiana Slough RM 9.3 L	-121.536757	38.212829	-121.537778	38.214133	-121.535436	38.211737
Georgiana Slough RM 11.0 L	-121.530221	38.227051	-121.530010	38.226946	-121.530432	38.227157
Hass Slough LM 7.9 L	-121.727984	38.296971	-121.728621	38.299606	-121.725433	38.294858
Hass Slough LM 9.7 L	-121.740309	38.322397	-121.740254	38.324587	-121.740183	38.320240
Knights Landing Ridge Cut LM 3.0 L	-121.692733	38.756425	-121.693048	38.757925	-121.692653	38.754899
Knights Landing Ridge Cut LM 3.1 L	-121.693932	38.759370	-121.694686	38.760053	-121.693359	38.758587
Knights Landing Ridge Cut LM 3.5 R	-121.695580	38.758901	-121.696063	38.759332	-121.695158	38.758432
Knights Landing Ridge Cut LM 3.7 L	-121.700968	38.766406	-121.701023	38.767336	-121.700608	38.765522
Knights Landing Ridge Cut LM 3.9 R	-121.701790	38.764455	-121.702074	38.764905	-121.701434	38.764037
Knights Landing Ridge Cut LM 4.7 L	-121.704799	38.776764	-121.706195	38.778115	-121.703685	38.775271
Knights Landing Ridge Cut LM 5.8 L	-121.720407	38.789481	-121.724091	38.792395	-121.716724	38.786566
Lindsey Slough LM 0.6 R	-121.759072	38.251666	-121.760165	38.249615	-121.757979	38.253717
Lindsey Slough RM 0.7 R	-121.707173	38.246153	-121.707609	38.245981	-121.706737	38.246326
Lindsey Slough RM 0.8 R	-121.708466	38.245624	-121.708605	38.245581	-121.708327	38.245667
Lindsey Slough RM 1.9 L	-121.724788	38.257026	-121.724823	38.257517	-121.724753	38.256535
Lindsey Slough RM 2.4 L	-121.732188	38.257272	-121.732423	38.257319	-121.731953	38.257224
Mud Creek LM 4.4 R	-121.895348	39.773613	-121.895078	39.773969	-121.895618	39.773257
Natomas Cross Canal LM 3 R	-121.574791	38.804041	-121.574529	38.804206	-121.575053	38.803877
Putah Creek LM 0.1 L	-121.631392	38.522540	-121.631519	38.521968	-121.631356	38.523119
Putah Creek LM 7.2 L	-121.752293	38.517398	-121.752824	38.517355	-121.751778	38.517362
Sacramento River RM 7.3 L	-121.729412	38.080448	-121.728341	38.080370	-121.730483	38.080526
Sacramento River RM 7.9 L	-121.707931	38.086348	-121.707786	38.086603	-121.708114	38.086110
Sacramento River RM 8.0 L	-121.706830	38.089586	-121.706684	38.090620	-121.707127	38.088572
Sacramento River RM 8.2 L	-121.706380	38.094869	-121.706367	38.095148	-121.706393	38.094590
Sacramento River RM 10.8 L	-121.688058	38.128697	-121.687468	38.129722	-121.688646	38.127672
Sacramento River RM 11.2 L	-121.685939	38.139779	-121.685346	38.141399	-121.686531	38.138158
Sacramento River RM 12.1 L	-121.682604	38.150303	-121.682201	38.151867	-121.682790	38.148711
Sacramento River RM 13.6 L	-121.670849	38.166188	-121.670684	38.166583	-121.671014	38.165794
Sacramento River RM 15.0 L	-121.652160	38.172656	-121.651821	38.172580	-121.652499	38.172733
Sacramento River RM 16.8 L	-121.618335	38.163094	-121.617323	38.162959	-121.619312	38.163334
Sacramento River RM 17.2 L	-121.614535	38.162666	-121.612800	38.162641	-121.616263	38.162828
Sacramento River RM 18.0 L	-121.601141	38.164993	-121.600477	38.165303	-121.601804	38.164682
Sacramento River RM 18.1 L	-121.599713	38.165722	-121.599345	38.165945	-121.600080	38.165498
Sacramento River RM 21.5 L	-121.557677	38.200436	-121.557606	38.200646	-121.557749	38.200225
Sacramento River RM 22.5 L	-121.557119	38.212347	-121.557197	38.213581	-121.557042	38.211112
Sacramento River RM 22.7 L	-121.556754	38.218528	-121.556689	38.218951	-121.556819	38.218104
Sacramento River RM 23.2 L	-121.555664	38.224042	-121.555641	38.224850	-121.555687	38.223233

Table A-6. Site Coordinates

Erosion Site	Midpoint Longitude	Midpoint Latitude	Upstream Longitude	Upstream Latitude	Downstream Longitude	Downstream Latitude
Sacramento River RM 23.3 L	-121.555568	38.227402	-121.555502	38.228202	-121.555605	38.226601
Sacramento River RM 24.8 L	-121.545449	38.240586	-121.544106	38.240401	-121.546791	38.240772
Sacramento River RM 25.2 L	-121.538299	38.239158	-121.537765	38.239006	-121.538845	38.239265
Sacramento River RM 26.0 L	-121.526560	38.238323	-121.523932	38.238784	-121.529188	38.237862
Sacramento River RM 26.3 R	-121.520169	38.239867	-121.519361	38.239983	-121.520989	38.239870
Sacramento River RM 27.0 L	-121.511309	38.245619	-121.510878	38.246222	-121.511740	38.245017
Sacramento River RM 31.6 R	-121.565835	38.295244	-121.566295	38.295730	-121.565376	38.294757
Sacramento River RM 35.4 L	-121.558477	38.342812	-121.557706	38.343071	-121.559163	38.342426
Sacramento River RM 38.5 R	-121.523192	38.371418	-121.523316	38.371909	-121.523069	38.370928
Sacramento River RM 41.9 R	-121.523977	38.416039	-121.525083	38.417692	-121.522871	38.414387
Sacramento River RM 43.1 R	-121.533117	38.430842	-121.533200	38.431726	-121.533035	38.429957
Sacramento River RM 43.2 R	-121.532283	38.433529	-121.531159	38.434560	-121.532978	38.432287
Sacramento River RM 46.7 L	-121.503409	38.464664	-121.503448	38.464885	-121.503370	38.464443
Sacramento River RM 50.3 L	-121.553446	38.490989	-121.553540	38.491086	-121.553352	38.490892
Sacramento River RM 52.4 L	-121.542946	38.515242	-121.542755	38.515300	-121.543136	38.515184
Sacramento River RM 52.7 L	-121.540443	38.515841	-121.540174	38.515887	-121.540713	38.515794
Sacramento River RM 53.8 L	-121.523125	38.520787	-121.523072	38.520996	-121.523261	38.520606
Sacramento River RM 54.8 L	-121.527517	38.531453	-121.527445	38.531489	-121.527589	38.531417
Sacramento River RM 55.2 L	-121.521637	38.533644	-121.520263	38.534144	-121.523010	38.533143
Sacramento River RM 55.5 L	-121.516597	38.536396	-121.516107	38.536756	-121.517087	38.536036
Sacramento River RM 55.7 R	-121.514988	38.539557	-121.514059	38.540425	-121.515916	38.538689
Sacramento River RM 56.5 R	-121.514203	38.550705	-121.514423	38.551319	-121.513983	38.550090
Sacramento River RM 56.6 L	-121.512463	38.551923	-121.512590	38.552268	-121.512336	38.551578
Sacramento River RM 56.7 R	-121.515008	38.553391	-121.515263	38.554277	-121.514752	38.552504
Sacramento River RM 57.0 R	-121.516753	38.557956	-121.516859	38.558194	-121.516647	38.557717
Sacramento River RM 57.2 R	-121.517784	38.559755	-121.518376	38.560512	-121.517191	38.558998
Sacramento River RM 58.5 L	-121.512615	38.572673	-121.512166	38.573069	-121.513063	38.572277
Sacramento River RM 62.9 R	-121.553033	38.601148	-121.553250	38.601388	-121.552815	38.600907
Sacramento River RM 63.0 R	-121.553756	38.601904	-121.553909	38.602101	-121.553603	38.601708
Sacramento River RM 71.3 R	-121.634025	38.683407	-121.634219	38.684106	-121.633830	38.682707
Sacramento River RM 74.4 R	-121.606732	38.719531	-121.606414	38.721351	-121.607423	38.717770
Sacramento River RM 75.3 R	-121.605187	38.732425	-121.604153	38.736110	-121.605844	38.728684
Sacramento River RM 77.0 R	-121.594088	38.755713	-121.594024	38.756186	-121.594206	38.755246
Sacramento River RM 77.7 R	-121.594987	38.765010	-121.595049	38.765219	-121.594926	38.764801
Sacramento River RM 78.3 L	-121.598326	38.773714	-121.598865	38.774507	-121.597788	38.772921
Sacramento River RM 83.9 R	-121.668284	38.759131	-121.669103	38.758948	-121.667500	38.759390
Sacramento River RM 85.4 R	-121.685821	38.763174	-121.687567	38.763486	-121.684038	38.763313
Sacramento River RM 86.3 L	-121.686757	38.773276	-121.685841	38.777282	-121.690553	38.770390
Sacramento River RM 86.9 R	-121.687835	38.779772	-121.688238	38.780407	-121.687432	38.779137
Sacramento River RM 87.1 L	-121.688964	38.783470	-121.690033	38.784936	-121.688033	38.781962
Sacramento River RM 92.8 L	-121.728987	38.839779	-121.726857	38.840347	-121.730205	38.838464
Sacramento River RM 95.8 L	-121.750723	38.871270	-121.752059	38.870581	-121.749330	38.871853
Sacramento River RM 96.2 L	-121.754627	38.869649	-121.757108	38.869139	-121.752237	38.870474
Sacramento River RM 99.0 L	-121.783522	38.859564	-121.784057	38.861899	-121.783771	38.857239

Table A-6. Site Coordinates

Erosion Site	Midpoint Longitude	Midpoint Latitude	Upstream Longitude	Upstream Latitude	Downstream Longitude	Downstream Latitude
Sacramento River RM 101.3 R	-121.813305	38.874981	-121.813592	38.875109	-121.813018	38.874854
Sacramento River RM 103.4 L	-121.803304	38.901096	-121.803225	38.901199	-121.803382	38.900993
Sacramento River RM 104.0 L	-121.795324	38.900219	-121.790677	38.902721	-121.801175	38.901337
Sacramento River RM 104.5 L	-121.790873	38.905920	-121.792796	38.906697	-121.790298	38.904041
Sacramento River RM 111.0 R	-121.840667	38.954186	-121.840774	38.954312	-121.840560	38.954060
Sacramento River RM 115.9 R	-121.797738	38.997760	-121.797891	38.997824	-121.797584	38.997696
Sacramento River RM 116.0 L	-121.801884	39.000587	-121.802889	39.001413	-121.800898	38.999745
Sacramento River RM 116.5 L	-121.810213	39.005465	-121.815926	39.006072	-121.805024	39.003301
Sacramento River RM 118.0 R	-121.825055	39.015450	-121.824230	39.016401	-121.825880	39.014499
Sacramento River RM 120.6 L	-121.837602	39.044293	-121.837626	39.044330	-121.837578	39.044256
Sacramento River RM 122.0 R	-121.839092	39.063615	-121.839335	39.063997	-121.838927	39.063209
Sacramento River RM 122.3 R	-121.843276	39.066086	-121.843602	39.066287	-121.842950	39.065886
Sacramento River RM 123.3 L	-121.857820	39.069226	-121.857995	39.069166	-121.857646	39.069286
Sacramento River RM 123.7 R	-121.867117	39.066952	-121.867322	39.066901	-121.866913	39.067004
Sacramento River RM 125.6 R	-121.895034	39.078826	-121.895317	39.079351	-121.894656	39.078340
Sacramento River RM 125.8 L	-121.891415	39.080644	-121.891065	39.080686	-121.891760	39.080583
Sacramento River RM 127.9 R	-121.904193	39.100448	-121.904320	39.100836	-121.903981	39.100084
Sacramento River RM 130.0 L	-121.909484	39.121625	-121.910121	39.122459	-121.909152	39.120684
Sacramento River RM 131.8 L	-121.935606	39.131470	-121.936521	39.132040	-121.934690	39.130900
Sacramento River RM 133.0 L	-121.934434	39.143010	-121.932652	39.142403	-121.936119	39.143775
Sacramento River RM 133.8 L	-121.918465	39.142429	-121.918333	39.142676	-121.918598	39.142181
Sacramento River RM 136.6 L	-121.938317	39.173134	-121.938745	39.173912	-121.937925	39.172344
Sacramento River RM 136.6 R	-121.939913	39.173905	-121.940427	39.174555	-121.939419	39.173245
Sacramento River RM 138.1 L	-121.934427	39.191796	-121.935783	39.193219	-121.934199	39.190038
Sacramento River RM 141.5 R	-121.988329	39.194746	-121.988621	39.195595	-121.987905	39.193931
Sacramento River RM 143.5 R	-121.998592	39.213739	-121.999641	39.213869	-121.997543	39.213608
Sacramento River RM 150.2 L	-122.003396	39.271401	-122.003497	39.271494	-122.003295	39.271307
Sacramento River RM 151.0 R	-122.017884	39.265351	-122.020682	39.266315	-122.014925	39.265730
Sacramento River RM 152.6 L	-122.017182	39.281886	-122.016113	39.283853	-122.018221	39.279910
Sacramento River RM 152.8 L	-122.015449	39.284933	-122.015208	39.285298	-122.015690	39.284568
Sacramento River RM 154.0 R	-122.023530	39.297733	-122.023728	39.297714	-122.023354	39.297811
Sacramento River RM 157.7 R	-122.029696	39.332082	-122.029953	39.332716	-122.029440	39.331447
Sacramento River RM 163.0 L	-122.002847	39.397993	-122.003522	39.399959	-122.002451	39.395982
Sacramento River RM 164.3 R	-122.009001	39.409474	-122.009238	39.411111	-122.008763	39.407837
Sacramento River RM 164.7 R	-122.010111	39.416169	-122.010369	39.417689	-122.009853	39.414649
Sacramento River RM 168.3 L	-121.994098	39.454662	-121.994300	39.455394	-121.993896	39.453930
Sacramento River RM 172.0 L	-121.985049	39.506376	-121.986562	39.508117	-121.985301	39.504388
Sutter Bypass LM 11.1 L	-121.726869	39.024617	-121.726929	39.024835	-121.726808	39.024399
Steamboat Slough RM 15.7 R	-121.643606	38.189703	-121.643160	38.190001	-121.643917	38.189311
Steamboat Slough RM 18.8 R	-121.609844	38.212085	-121.609760	38.212573	-121.609928	38.211596
Steamboat Slough RM 18.9 R	-121.608439	38.214456	-121.608129	38.214838	-121.608750	38.214075
Steamboat Slough RM 22.8 R	-121.590581	38.262409	-121.589481	38.262510	-121.591690	38.262533
Steamboat Slough RM 23.6 R	-121.588750	38.272909	-121.588745	38.273854	-121.589424	38.271998
Steamboat Slough RM 23.8 L	-121.589906	38.277428	-121.589773	38.277595	-121.590039	38.277261

Table A-6. Site Coordinates

Erosion Site	Midpoint Longitude	Midpoint Latitude	Upstream Longitude	Upstream Latitude	Downstream Longitude	Downstream Latitude
Steamboat Slough RM 23.9 R	-121.589734	38.278807	-121.589615	38.279017	-121.589854	38.278597
Steamboat Slough RM 24.1 R	-121.589440	38.279994	-121.589443	38.280069	-121.589438	38.279919
Steamboat Slough RM 24.7 R	-121.583949	38.287434	-121.583823	38.288727	-121.585026	38.286475
Steamboat Slough RM 24.8 L	-121.583053	38.290635	-121.582993	38.291695	-121.583092	38.289575
Steamboat Slough RM 25.0 L	-121.582647	38.293031	-121.582554	38.293386	-121.582741	38.292675
Steamboat Slough RM 25.5 R	-121.581935	38.298157	-121.581571	38.298897	-121.582176	38.297384
Steamboat Slough RM 25.8 R	-121.579949	38.302086	-121.579707	38.302358	-121.580093	38.301772
Steamboat Slough RM 26.0 L	-121.577777	38.302765	-121.577357	38.303035	-121.578241	38.302544
Sutter Slough RM 24.7 R	-121.604727	38.292606	-121.605648	38.295505	-121.604343	38.289634
Sutter Slough RM 25.2 R	-121.602068	38.299952	-121.601118	38.300542	-121.603056	38.299402
Sutter Slough RM 25.7 R	-121.599290	38.305798	-121.598646	38.306366	-121.599933	38.305229
Sutter Slough RM 26.5 L	-121.591790	38.314605	-121.591433	38.315407	-121.592259	38.313836
Sutter Slough RM 27.3 R	-121.586737	38.324346	-121.585925	38.325592	-121.588226	38.323667
Sycamore Slough LM 9.3 L	-122.021950	39.158091	-122.021950	39.158226	-122.021950	39.157957
Wadsworth Canal LM 2.1 L	-121.746188	39.137798	-121.742939	39.141757	-121.749526	39.133887
Wadsworth Canal LM 2.1 R	-121.746475	39.137915	-121.743260	39.141814	-121.749781	39.134064
Wadsworth Canal LM 2.4 L	-121.738229	39.147555	-121.734390	39.153095	-121.742609	39.142235
Wadsworth Canal LM 2.4 R	-121.738437	39.147581	-121.734611	39.153150	-121.742847	39.142254
Wadsworth Canal LM 4.3 R	-121.727961	39.168798	-121.727905	39.168937	-121.728016	39.168659
Yankee Slough LM 1.7 L	-121.494578	38.969690	-121.494327	38.969740	-121.494829	38.969640
Yolo Bypass LM 0.1 R	-121.671627	38.672416	-121.671727	38.673227	-121.671513	38.672069
Yolo Bypass LM 1.2 R	-121.668984	38.659758	-121.669028	38.660050	-121.668940	38.659465
Yolo Bypass LM 2.0 R	-121.666519	38.648530	-121.666653	38.648881	-121.666385	38.648178
Yolo Bypass LM 2.3 R	-121.663708	38.643163	-121.665088	38.645319	-121.661877	38.640997
Yolo Bypass LM 2.6 R	-121.658286	38.635775	-121.660247	38.638730	-121.655863	38.632783
Yolo Bypass LM 2.8 R	-121.663303	38.724945	-121.662041	38.725505	-121.664564	38.724385
Yolo Bypass LM 4.2 R	-121.646748	38.620263	-121.648201	38.622224	-121.645296	38.618302
Yuba River LM 2.3 L	-121.515700	39.152028	-121.513920	39.153613	-121.517481	39.150442