

Appendix O Summary of Bridge Descriptions and Avoidance of Jurisdictional Areas

Appendix O – SUMMARY OF BRIDGE DESCRIPTIONS AND AVOIDANCE OF JURISDICTIONAL AREAS

	Bridge Name and Location	Alternative/s	Reach/Drainage System*	Length (m)	Height (m)	Wetland Shading Impact	Positioning Considerations	Impact to Federal and State Jurisdictional Areas
1	MCP/I-15 Interchange	All Alts	Reach 1/DS#2	Multiple Bridges	10-30	Does not cross wetland	MCP/I-15 Interchange will result in the existing I-15 crossing the Bedford Canyon Wash to be widened. No impacts will occur to the waters and wetlands along the crossing. Connectors, ramps and Collector-Distributor roads will all have bridges over the Wash south of the MCP mainline. Interchange alignment cannot be easily moved due to interchange spacing requirements from FHWA and Caltrans.	The abutments and piers will all be out of the jurisdictional waters/wetlands and California Department of Fish and Game (CDFG) streambed and riparian habitat jurisdictional areas. Waters/wetlands will be completely avoided by the bridge placements. Temporary impacts are likely to occur during construction of the bridges.
2	Temescal Canyon Viaduct, 106+80 to 118+04	4, 5, 9	Reach 1/DS#2, DS#4, DS#5, Reach 2/DS#6	1395	6-39	HW Ratio** = 1.35 No Significant Impact	Long bridge sited to avoid wetlands and waters to largest extent possible. Bridge siting also provides good topography fit and allows wildlife crossing opportunities. Bridge is very high over existing terrain to reduce climbing grade up from the Temescal Valley.	Bridge minimizes impacts to jurisdictional waters. No impact to United States Army Corps of Engineers (USACE) jurisdictional areas along Bedford Canyon Wash and Temescal Creek. Pier bents, abutments and fill will completely avoid Temescal Creek and Bedford Canyon Wash. There will be impacts along Cajalco Creek. Waters, wetlands, and CDFG jurisdictional areas cannot be totally avoided since the alignment of Cajalco Creek weaves in and out in the eastern portion of the bridge. Some pier bents and protective revetments will impact waters along Cajalco Creek.
3	River Rock Viaduct, 120+45 to 124+55	4, 5, 9	Reach 2/DS#7	410	6-32	Does not cross wetland	Bridge positioned to minimize impacts to wetlands and waters. Fill and culverts would have been used if wetlands and waters were not a priority.	Bridge completely avoids wetlands, waters, and riparian on the east half of bridge. Pier bents are positioned high on slopes and away from the reaches. Fill from the eastbound off-ramp does impact some waters on the west side of the bridge. Waters and CDFG areas are also impacted near the Estelle Mountain Interchange at the end of drainage system 7.
4	Cajalco Canyon Overcrossing (access to Cajalco Road), 13+85 to 15+45	4, 5, 9	Reach 2/DS#6	160	9-36	HW Ratio = 1.13 No Significant Impact	Bridge provides access to Cajalco Road from MCP Estelle Mountain Interchange. Bridge positioned to cross Cajalco Creek transversely to avoid waters and wetlands impacts while minimizing bridge length. Estelle Mountain IC cannot be moved farther east due to MSHCP prohibitions on interchanges located in public lands or west due to standard interchange spacing requirements. Provides wildlife corridor.	Bridge completely avoids wetlands, waters, and CDFG jurisdictional areas. Pier bents are positioned high on slopes and away from the reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas. There are also no temporary impacts since the steep slope, inaccessible jurisdictional area, and height preclude placing any construction equipment in the jurisdictional area.
5	Eagle Rock Bridge, 132+20 to 133+52	4, 5, 9	Reach 2/DS#6	129	13-35	HW Ratio = 1.85 No Significant Impact	MCP mainline bridge positioned to cross very steep creek transversely to avoid waters and wetlands impacts while minimizing bridge length. Provides good north-south wildlife corridor. Requires a wall to the northeast to ensure abutment fill does not impact jurisdictional areas.	Bridge completely avoids wetlands, waters, and CDFG areas. Pier bents are positioned high on slopes and away from the reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas. There are also no temporary impacts since the steep slope, inaccessible jurisdictional area, and height preclude placing any construction equipment in the jurisdictional area.
6	Farley Bridge 156+00 to 157+60	4, 5, 9	Reach 2/ DS#18	160	20-22	Does not cross wetland	MCP mainline bridge positioned to cross a creek. Bridge provides a wildlife crossing for either side of the creek in the flat. Provides a good north-south wildlife corridor to and from the plateau.	Bridge completely avoids wetlands, waters and CDFG areas. Pier bents are positioned away from the jurisdictional areas. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas.
7	Black Rock Bridge, 159+00 to 160+85	4, 5, 9	Reach 2/ DS#16	186	7-20	HW Ratio = 0.37 Moderate potential to impact underlying vegetation.	MCP mainline bridge positioned to cross to cross a wide vegetated creek. Bridge provides a wildlife crossing for either side of the creek. Provides a good north-south wildlife corridor to and from the plateau.	Bridge completely avoids wetlands, waters and CDFG areas. Pier bents are positioned away from the reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas.
8	Olsen Creek Bridge, 164+75 to 165+85	4, 5, 9	Reach 2/ DS#19	110	6-9	Does not cross wetland	MCP mainline bridge positioned to cross to cross a creek. Bridge provides a wildlife crossing for either side of the creek in the flat. Provides a good north-south wildlife corridor to and from the plateau.	Bridge completely avoids wetlands, waters and CDFG areas. Pier bents are positioned away from the reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas.
9	South Lake Mathews Viaduct, 179+36 to 187+40	9	Reach 2/DS Misc.	804	5-23	Does not cross wetland	MCP mainline bridge positioned to cross very steep drop. Bridge avoids waters while ensuring a very large wildlife corridor. Bridge selected in lieu of an embankment and culvert to avoid waters and avoid direct impacts of fill on the existing Metropolitan Reserve.	Bridge completely avoids wetlands, waters, and CDFG. Pier bents are positioned away from the reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas.
10	Descanso Viaduct, 199+06 to 200+90	9	Reach 3/DS#21	184	10-32	HW Ratio = 2.22 No Significant Impact	MCP mainline bridge positioned to cross steep valley. Bridge avoids waters and wetlands and provides a wildlife corridor. Bridge positioning avoids waters to maximum extent to enable a crossing of the valley while turning the alignment up the steep valley parallel to the DS#21.	Bridge completely avoids wetlands, waters, and CDFG areas along the main tributary. Ephemeral waters are impacted to the west of the bridge. Pier bents are positioned on slopes and away from the main reach. Ephemeral waters leading into the wetlands and main tributary are impacted somewhat. There is no fill, abutments, piers, or riprap in any of the jurisdictional wetland or waters areas on the main tributary.

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11	Gavilan Viaduct, 273+30 to 276+10	9	Reach 3/DS#26	258	15-30	HW Ratio = 2.78 No Significant Impact	MCP mainline bridge positioned to Cross Gavilan Valley and Road. Bridge avoids main tributary waters and wetlands while crossing perpendicular to the creek. Alignment avoids significant cultural resources to the south while providing a good fit for the terrain. Bridge also provides a natural wildlife corridor.	Bridge completely avoids wetlands and waters along the main tributary. Ephemeral waters are impacted to the east of the bridge. Pier bents are positioned on slopes and away from the main reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional wetland or waters areas on the main tributary.
12	Juniper Viaduct Far South, 301+93 to 303+87	9	Reach 3/DS#29	196	3-35	Does not cross wetland	MCP mainline bridge positioned to cross a U-shaped valley. Bridge crosses jurisdictional areas perpendicularly. Alignment provides only cost-effective way of crossing major ridgeline. Bridge avoids waters while ensuring a large wildlife corridor.	Bridge completely avoids wetlands and waters. Pier bents are positioned high on slopes and away from the reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas including CDFG areas.
13	Masoncrest Far South, 311+26 to 311+77	9	Reach 3/DS#31	59	8-16	Does not cross wetland	MCP mainline bridge positioned to cross steep valley. Bridge avoids waters and allows a north-south large wildlife corridor. Bridge selected in lieu of an embankment and culvert due to the sensitivity of waters.	Bridge completely avoids wetlands, waters, and CDFG areas along the main tributary. Pier bents are positioned on slopes and away from the main reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional wetland or waters areas on the main tributary.
14	Perris Valley Storm Drain, 197+40 to 200+10 (alt 9), 198+25 to 200+43 (alts 5, 7), 186+80 to 221+000 (alts 4, 6)	5, 7, 9, 4, 6	Reach 6/DS#60	273, 213, 3417	4-10	HW Ratio = 0.46 Moderate potential to impact underlying vegetation.	MCP mainline bridge for Rider and Placentia Alternatives 5, 7 and 9 positioned to cross the Perris Valley Storm Drain. Bridge is aligned to cross the drain at a near-perpendicular crossing to reduce length and minimize waters/wetlands impacts. Bridge also aligned to minimize impacts to local community and to ensure the interchange at Evans meets Caltrans standards. Bridge for Alternatives 4 and 6 includes a section that is directly adjacent to the west side of the Perris Valley Storm Drain and then crosses the Perris Drain near Placentia Avenue. For Alternatives 4 and 6 a 3,417 m (11,210 ft) long bridge is proposed in this area to avoid impacting the floodplain. Approximately 240 m (656 ft) of the bridge is crossing over the Perris Drain.	Bridge for Alternatives 4, 6, 5, 7, and 9 minimizes impacts to wetlands, waters, and CDFG areas along the Perris Valley Drain. All abutments are located outside of the channel and jurisdictional areas. . Some pier bents will impact wetlands, waters and CDFG areas within the Perris Valley Storm Drain.
15	San Jacinto River/Lakeview Nuevo, 272+83 to 286+00	All Alts	Reach 7/ DS#61, DS#62, DS#63	1317	4-13	HW Ratio = 0.38 Moderate potential to impact underlying vegetation.	MCP mainline bridge crossing the San Jacinto River. Bridge is over 1,300 m long to completely avoid waters/wetlands impacts while also ensuring that flows downstream are not retained and that flows upstream do not back up. A small bridge and embankment would have been proposed except for concerns about the waters and wetlands in the area. The entire floodplain is crossed by the bridge. Bridge also provides excellent wildlife crossing opportunities for the MSHCP linkage of the San Jacinto.	Bridge completely avoids wetlands, waters, and CDFG areas while crossing the river floodplain. Pier bents will be placed outside all jurisdictional federal and state areas. All abutments and pier bents are located outside of the waters and wetlands.
16	MCP/SR-79 Interchange, San Jacinto South	All Alts	Reach 8/DS#64	Multiple Bridges	10-25	Unknown	MCP/SR-79 interchange crosses wetlands and waters on the south side of the MCP mainline alignment. Crossings are a combination of bridges and embankment for the southern connectors with SR-79. This interchange is sited to optimize Caltrans spacing requirements between the next SR-79 Interchanges at Gilman Springs and Sanderson. Aligning MCP along the Colorado Aqueduct reduces disruption to land use and local circulation.	Waters/wetlands cannot be completely avoided due to the density of ramps and connectors in the area. Connectors and ramps on the southwest quadrant of the interchange impact waters, wetlands, and CDFG areas.
17	San Jacinto River Viaduct/City of San Jacinto	All Alts	Reach 8/DS#66, DS#67	390	5-13	Unknown	SR-79 bridge crossing the San Jacinto River. Current viaduct will be lengthened to 400 m long and will be widened to the west. Viaduct required to allow transition from MCP connectors to SR-79 alignment.	Viaduct will minimize impacts to waters/wetlands within the San Jacinto River mainline. Pier bents will be placed in line where they are currently located within the San Jacinto River. Wetlands south of the river along the existing Sanderson Avenue embankment will be impacted by bridge pier bents and scour protection.
18	Temescal Canyon Viaduct, General Plan, 106+80 to 124+00	6, 7	Reach 1/DS#2, DS#4, DS#5, Reach 2/DS#6 and DS#7	1720	8-32	HW Ratio = 1.08 No Significant Impact	Long bridge sited to meet Riverside County General Plan. Alignment follows General Plan to meet requirements to be covered under the MSHCP. Bridge siting also provides good topography fit and allows wildlife crossing opportunities. Bridge is very high over existing terrain to reduce climbing grade from the Temescal Valley.	No impact to USACE jurisdictional areas along Bedford Canyon Wash and Temescal Creek. Pier bents abutments and fill will completely avoid Temescal Creek and Bedford Canyon Wash. Due to the alignment of Cajalco Creek weaving in and out of the bridge, impacts to jurisdictional areas cannot be avoided and some pier bents and protective revetments will impact waters and CDFG jurisdictional areas along Cajalco Creek and DS#6.
19	General Plan, 127+20 to 128+80	6, 7	Reach 2/DS#6	165	12-28	HW Ratio = 1.14 No Significant Impact	Bridge positioned to minimize impacts to wetlands and waters. Fill and culverts would have been proposed if wetlands and waters were not a priority.	Bridge completely avoids wetlands, waters, and CDFG jurisdictional areas. Pier bents are positioned on slopes and away from the reach. No fill or abutments in jurisdictional areas.

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20	Cajalco Canyon Overcrossing, General Plan South, two bridges, 26+65 to 28+10, and 26+65 to 31+55	6, 7	Reach 2/DS#6	145 and 461	6-42	HW Ratio = 1.13 No Significant Impact	Bridge provides access to Cajalco Road from MCP Estelle Mountain Interchange. Bridge positioned to cross Cajalco Creek perpendicularly to avoid waters and wetlands impacts while minimizing bridge length. Estelle Mountain IC cannot be moved farther east due to MSHCP prohibitions on interchanges located in public lands and not west due to interchange spacing requirements. Provides wildlife corridor.	Bridge completely avoids wetlands, waters, and CDFG areas. Pier bents are positioned high on slopes and away from the reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas. There are also no temporary impacts since the steep slope, inaccessible jurisdictional area, and height preclude placing any construction equipment in the jurisdictional area.
21	General Plan South, 145+05 to 146+50	6, 7	Reach 2/DS#11, DS#13	147	6-13	HW Ratio = 0.97 No Significant Impact	MCP mainline bridge positioned to cross two steep creeks. Alignment is locked in to meet the General Plan and MSHCP criteria. MCP crossing the west creek has a longitudinal skew angle. Provides good north-south wildlife corridor.	Bridge piers completely avoid wetlands, waters, and CDFG areas. Both the east and west crossing impacts water due to the location of the abutments.
22	General Plan South, 216+80 to 218+85	6, 7	Reach 4/DS#46, DS#47, DS#48	207	3-9	HW Ratio = 0.83 No Significant Impact	MCP mainline bridge positioned to cross two creeks. Alignment is locked in to meet General Plan and MSHCP criteria. Crossing the west creek has a longitudinal skew angle. The easternmost crossing is a near perpendicular crossing. Provides good north-south wildlife corridor.	Bridge completely avoids wetlands, waters, and CDFG areas for the east crossing. The west crossing impacts waters and CDFG areas due to the abutment.
23	General Plan South, 265+45 to 266+85	6, 7	Reach 5/DS#52	140	2-5	HW Ratio = 0.27 High potential to impact underlying vegetation.	MCP General Plan South mainline bridge positioned to cross existing wetland area. Alignment is locked in to meet the General Plan and MSHCP criteria. Alignment is adjacent to Metropolitan Water District's (Metropolitan) Cajalco Dam. Provides a north-south wildlife corridor. Crossing would be an embankment if not for concern about waters and wetlands.	Bridge piers do impact existing wetlands and CDFG riparian habitat. Bridge span cannot be lengthened since bridge is too low to increase span length.
24	General Plan North, 128+00 to 132+00	6, 7	Reach 9/DS#68	400	4-20	Does not cross wetland	MCP General Plan North bridge positioned to cross deep ravine complex. Alignment is locked in to meet the General Plan and MSHCP criteria. Alignment is adjacent to Metropolitan's Cajalco Dam. Provides an east-west wildlife corridor.	No impact to existing waters. Bridge piers will avoid waters and wetlands and CDFG jurisdictional areas.
25	General Plan North, 145+00 to 146+50	6, 7	Reach 9/DS#70	150	4-8	HW Ratio = 0.32 Moderate potential to impact underlying vegetation.	MCP General Plan North bridge positioned to cross ravine complex. Alignment is locked in to meet the General Plan and MSHCP criteria. Alignment is adjacent to Metropolitan's Cajalco Dam. Provides a north-south wildlife corridor. Alignment would be fill with culvert instead of bridge except for concern for waters.	Bridge abutment and piers will impact waters and CDFG riparian.
26	General Plan North, 149+60 to 153+20	6, 7	Reach 9/DS#71	360	4-10	Does not cross wetland	MCP General Plan North bridge positioned to cross ravine complex. Alignment is locked in to meet the General Plan and MSHCP criteria. Segment would be fill with culvert if not for waters concerns. Provides a north-south wildlife corridor.	Bridge abutment and piers will impact waters and CDFG riparian. Bridge is positioned longitudinally with stream so bridge piers will impact the streambed.
27	General Plan North, 157+80 to 159+25	6, 7	Reach 9/DS#72	145	4-12	Does not cross wetland	MCP General Plan North bridge positioned to cross stream. Alignment crosses stream longitudinally. Alignment is locked in to meet the General Plan and MSHCP criteria. Provides a north-south wildlife corridor.	Bridge abutment and piers will impact waters and CDFG riparian. Bridge is positioned somewhat longitudinally with stream so bridge piers will impact the streambed.
28	General Plan North, 265+75 to 266+05	6, 7	Reach 5/DS#51	30	8	HW Ratio = 0.93 No Significant Impact	MCP General Plan North existing bridge expanded by two lanes to cross outlet for Cajalco Dam. Alignment as determined in the General Plan and MSHCP criteria.	Bridge widens existing bridge. Abutment and piers will not impact waters and CDFG riparian. Bridge is positioned perpendicular to stream so that bridge piers will not impact the streambed.
29	South Lake Mathews Viaduct, 179+30 to 184+82	4, 5	Reach 2/DS Misc.	530	5-23	Does not cross wetland	MCP mainline bridge positioned to cross very steep drop. Bridge avoids waters while ensuring a very large wildlife corridor. Bridge selected in lieu of an embankment and culvert to avoid waters and avoid direct impacts of fill on the existing Metropolitan Reserve.	Bridge completely avoids wetlands, waters, and CDFG. Pier bents are positioned away from the reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas.
30	Lake Mathews South, 222+25 to 223+05	4, 5	Reach 4/DS#46	80	4-10	HW Ratio = 0.56 Low potential to impact underlying vegetation.	MCP mainline bridges and frontage road bridge positioned to cross small stream. Bridge crosses jurisdictional areas perpendicularly. Alignment positioned to be on southern edge of Metropolitan Reserve to minimize impacts. Bridge avoids waters and wetlands while ensuring a wildlife corridor.	Bridge completely avoids wetlands, waters, and CDFG riparian. Pier bents are positioned away from the reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas.
31	Lake Mathews South, 223+10 to 224+15	4, 5	Reach 4/DS#47	102	4-7	HW Ratio = 0.56 Low potential to impact underlying vegetation.	MCP mainline bridge positioned to cross small stream. Bridge crosses jurisdictional areas perpendicularly. Alignment positioned to be on southern edge of Metropolitan Reserve to minimize impacts. Bridge avoids waters and wetlands while ensuring a wildlife corridor. Frontage road bridge crosses jurisdictional areas longitudinally.	Mainline bridges completely avoid wetlands, waters, and CDFG riparian. Pier bents are positioned away from the reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas. Frontage road bridge will impact waters/wetlands and CDFG riparian.

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32	Lake Mathews South, 225+70 to 226+45	4, 5	Reach 4/DS#48	75	4-7	Does not cross wetland	MCP mainline bridge positioned to cross small stream. Bridge crosses jurisdictional areas perpendicularly. Alignment positioned to be on southern edge of Metropolitan Reserve to minimize impacts. Bridge avoids waters and wetlands while ensuring a wildlife corridor. Frontage road bridge crosses jurisdictional areas longitudinally.	Mainline and frontage road bridges completely avoid wetlands, waters, and CDFG riparian. Pier bents are positioned away from the reach. There is no fill, abutments, piers, or riprap in any of the jurisdictional areas. Frontage road bridge will not impact waters/wetlands and CDFG riparian.
33	Lake Mathews South, 265+45 to 266+85	4, 5	Reach 5/DS#52	140	2-5	HW Ratio = 0.56 Low potential to impact underlying vegetation.	MCP mainline bridge positioned to cross wetlands. Bridge crosses jurisdictional areas perpendicularly. Alignment positioned to be on southern edge of Metropolitan Reserve to minimize impacts.	Mainline bridges impact waters, wetlands, and CDFG riparian. Pier bents must be positioned in jurisdictional areas.
34	Mead Valley, 271+75 to 274+30	4, 5,6,7	Reach 5/DS#53	258	3-10	HW Ratio = 0.56 Low potential to impact underlying vegetation.	MCP mainline bridge positioned to cross stream. Bridge crosses jurisdictional areas perpendicularly. Alignment positioned to allow Cajalco Road to handle local traffic, and MCP is positioned to allow alignment to use southern edge of Metropolitan Reserve to minimize impacts.	Mainline bridges do not impact waters/wetlands and CDFG riparian. Pier bents positioned in jurisdictional areas.
35	Mead Valley, 268+40 to 269+55	4, 5,6,7	Reach 5/DS Misc.	114	3	Does not cross wetland	MCP mainline bridge positioned to cross open channel. Bridge crosses jurisdictional areas. Bridge used instead of embankment to reduce impacts to the wetland area. Bridge length restricted since clearance does not allow deeper stringers.	Mainline bridges do not impact waters, wetlands, and CDFG riparian. Abutments and pier bents positioned outside of jurisdictional areas.
36	Mead Valley, 294+65 to 295+52	4, 5,6,7	Reach 5/DS#55	94	3	HW Ratio = 0.28 High potential to impact underlying vegetation.	MCP mainline bridge positioned to cross low wetland area near Cajalco Creek. Bridge crosses jurisdictional areas. Bridge used instead of embankment to reduce impacts to the wetland area. Bridge length restricted since clearance does not allow deeper stringers.	Mainline bridges do impact waters, wetlands, and CDFG riparian. Abutments and pier bents positioned in jurisdictional areas.
37	Mead Valley, 309+45 to 310+95	4, 5,6,7	Reach 5/DS#56	148	2-7	HW Ratio = 0.56 Low potential to impact underlying vegetation.	MCP mainline bridge positioned to cross Cajalco Creek. Alignment crosses the Creek perpendicularly. No abutments or bridge piers are positioned in the jurisdictional areas.	Mainline bridges do not impact waters/wetlands and CDFG riparian.
38	Mead Valley, 324+15 to 325+40	4, 5,6,7	Reach 5/DS#54	125	9	Does not cross wetland	MCP mainline bridge positioned to cross realigned and channeled Cajalco Creek Bridge. Bridge piers are positioned in the realigned channel. Channel required since Cajalco Creek flows parallel with the mainline MCP.	Mainline bridges do impact waters/wetlands and CDFG riparian. Pier bents are positioned in the realigned channel. Existing Cajalco Creek is channeled.
39	Wildlife Crossings - Combined wildlife and undercrossing drainage culverts	All Alts	All are located between I-15 and I-215. Additional crossing between Lakeview Nuevo and San Jacinto	Varies, 85-125	3-7.7	Not relevant	Selected culverts positioned to carry drainage under MCP have been expanded to provide wildlife crossings. Openings are in excess of 6 m in diameter, providing improved waters benefits from small culverts.	

Source: Jacobs Civil Engineering, 2007 and LSA 2007.

* Reach/Drainage System = geographic portion of study area, as discussed in the May 2007(Revised February 2008) MCP Jurisdictional Delineation.

** HW ratio = height to width ratio. The effects on vegetation from shading for MCP was conducted according to SanClements (2003).