

## The Merced River Alliance Project



**FINAL REPORT, Volume II**

# Biological Monitoring and Assessment

## APPENDICES

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**September 2008**

  
Stillwater Sciences

# **The Merced River Alliance Project Final Report: Volume II**

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**Financial support for this project has been provided by a grant from the CALFED Watershed Program and administered by the California State Water Resources Control Board. For more information or copies of this interim report, please contact:**

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### *Suggested citation*

Stillwater Sciences. 2008. The Merced River Alliance Project Final Report. Volume II: Biological monitoring and assessment report. Appendices. Prepared by Stillwater Sciences, Berkeley, California.

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# APPENDICES

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This section contains supplemental information and supporting documentation for the preliminary results presented in the body of this report.

Several appendices contain large datasets that are better presented in electronic format (MS Excel) for ease of viewing or data use. The appendices with the notation “(Excel)” are available for download at the Merced Alliance project website.

## **Project Website**

In 2004, the UMRWC received CALFED funding, administered by the State Water Resources Control Board, to develop a watershed web portal and digital library for the Merced River. The Merced River watershed website aims to help stakeholders collaborate to benefit the watershed by providing equal access to bibliographic references, databases, GIS layers, maps, photos, projects, contact information for researchers and organizations, as well as other informational resources.

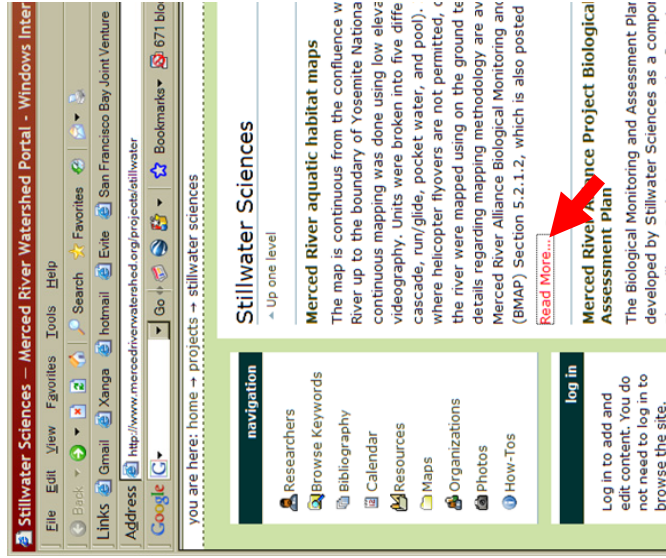
The electronic appendices can be accessed on this website by first navigating to the project homepage at <http://www.mercedriverwatershed.org/projects/stillwater>.

## Accessing Project Data

Project data may be accessed in several ways:

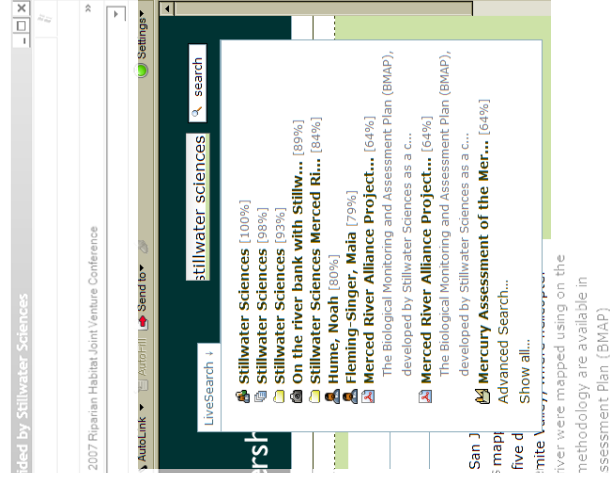
### 1) Hyperlinking from the homepage

From the homepage, there should be hyperlinks to this report and all its components, including the electronic appendices.



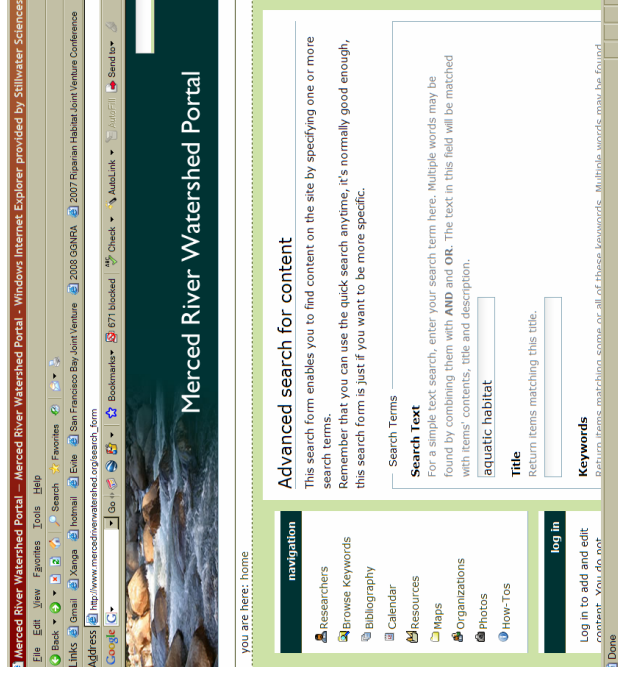
### 2) Quick search

Additionally, you may wish to conduct a quick keyword search using the search function in the upper right-hand corner of the webpage. The quick search will search the entire Merced River Watershed Portal database for files containing your keywords.



### 3) Advanced search

An advanced search option is available at [http://www.mercedriverwatershed.org/search\\_form](http://www.mercedriverwatershed.org/search_form). The advanced search option allows you to query the entire Merced River Watershed Portal database using several criteria.





# **APPENDIX A RESTORATION PROJECTS ON THE MERCED RIVER**

- **Table A-1**            **Compilation of restoration projects on the Upper and Lower Merced River.**
- **Table A-2**            **Summary of biological studies in the Merced ID/CDFG 10-year MOU.**



**Table A-1. Compilation of restoration projects on the upper and lower Merced River.**

Project Name	Location (River Mile) <sup>1</sup>	Agency/ Organization	Type	Project Description	Status	Source
<b>Lower Merced River</b>						
Chinook salmon spawning gravel augmentation	Various	CDFG, CDWR	HAB	Gravel addition to current spawning riffles as well as a new program constructing wing dams out of spawnable gravel.	Started in 1980, ongoing	<a href="mailto:theyne@dfg.ca.gov">theyne@dfg.ca.gov</a>
Merced River Hatchery Project	Merced River Hatchery (RM 51 to 52)	CDFG	HAB	Salmonid spawning rehabilitation site which has evolved into a gravel augmentation site.	Started in 1991, ongoing	<a href="http://www.sjd.water.ca.gov/ri/vermanagement/Completed/projects/merchatch/index.cfm">http://www.sjd.water.ca.gov/ri/vermanagement/Completed/projects/merchatch/index.cfm</a>
Lake McClure Fencing	Lake McClure (RM 56) at Cotton Arm, Western Shore, and Wood Island	MeID	LM	Exclusion of livestock from the fluctuation zone of Lake McClure using fencing and reworking grazing agreements (BLM), increase in stream bank stabilization/protection.	Completed 1993	<a href="http://www.ice.ucdavis.edu/nr/pi/NRPIDescription.asp?ProjectPK=6405">http://www.ice.ucdavis.edu/nr/pi/NRPIDescription.asp?ProjectPK=6405</a>
Magneson Predator Isolation	Gravel Mining 2 Reach (RM 30)	CDFG	HAB	Isolated mining pit from channel to reduce non-native fish predation on juvenile salmon.	Completed 1996	<a href="http://www.sjd.water.ca.gov/ri/vermanagement/Completed/projects/magneson/index.cfm">http://www.sjd.water.ca.gov/ri/vermanagement/Completed/projects/magneson/index.cfm</a>
Merced River Ranch Acquisition	MRR (RM 50.3 to 51.1)	CDFG, CALFED	LM	CDFG acquired the 318 acre Merced River Ranch to use as a source of sand, gravel, and cobble for future restoration projects and as a floodplain habitat restoration site.	Completed 1998	<a href="mailto:theyne@dfg.ca.gov">theyne@dfg.ca.gov</a>
Conceptual Restoration Plan for the Merced River Ranch Acquisition	MRR (RM 50.3 to 51.1)	CDFG	ST, HAB	Plan detailing potential restoration activities at the Merced River Ranch including restoration of channel geometry and spawning habitat, reconnecting the river to the flood plain, and restoring the upper terrace.	Completed 2001	Brady, R.H. 2001. Conceptual Restoration Plan for the Merced River Ranch Acquisition Site, Merced County, California. California State University, Fresno.
The Ratzlaff Reach Project	Ratzlaff Reach within DTR (RM 40.0 to 40.5)	AFRP, CALFED	ST, HAB	Gravel pit elimination/isolation, recontouring and revegetation of floodplain to accommodate 2-to-3 yr flood as a bankfull discharge.	Completed 1999	<a href="http://www.sjd.water.ca.gov/ri/vermanagement/Completed/projects/ratzlaff/index.cfm">http://www.sjd.water.ca.gov/ri/vermanagement/Completed/projects/ratzlaff/index.cfm</a>
The Robinson Reach Project	Robinson Reach within DTR (RM 42 to 44)	AFRP, CALFED	ST, HAB	Floodplain and channel reconstruction via dike and pond removal, with partial return to pre-1997 channel configuration.	Completed 2002	<a href="http://www.sjd.water.ca.gov/ri/vermanagement/Completed/projects/robinson/index.cfm">http://www.sjd.water.ca.gov/ri/vermanagement/Completed/projects/robinson/index.cfm</a>

**Table A-1. Compilation of restoration projects on the upper and lower Merced River.**

Project Name	Location (River Mile) <sup>1</sup>	Agency/Organization	Type	Project Description	Status	Source
Expanded Western Stone Project	Within DTR (RM 40.5 to 42)	CALFED	ST, HAB	Enhance salmonid habitat in deep, confined reach of lower Merced River.	Preliminary design stage	<a href="http://www.sjd.water.ca.gov/rjyermanagement/Current/projects/weststone/index.cfm">http://www.sjd.water.ca.gov/rjyermanagement/Current/projects/weststone/index.cfm</a>
CVPIA Anadromous Fish Restoration Activities	Lower Merced River (RM 0 to 52)	BR, USFWS	HAB	Acquisition of 96,609 acre-ft of water for instream flow to support anadromous fish habitat.	Completed 2001	<a href="http://www.usbr.gov/mp/cvpi/docs_reports/docs/cvpiia_10y_r_progress_final.pdf">http://www.usbr.gov/mp/cvpi/docs_reports/docs/cvpiia_10y_r_progress_final.pdf</a>
Adaptive Management Forum Report	Lower Merced River (RM 0 to 52)	USFWS, CALFED	ST, WM, HAB	Report on the recommendations of the Adaptive Management Forum, initiated to review current restoration project designs in the lower Merced River. Review focused on how to make adaptive management a more comprehensive and active component of future restoration projects.	Completed 2002	<a href="http://www.mercedriverstakeholders.org/MRS/">http://www.mercedriverstakeholders.org/MRS/</a>
Merced River Corridor Restoration Plan Baseline Studies (Phase I)	Lower Merced River (RM 0 to 52)	SWS, CALFED	HAB	Establishment of Merced River Stakeholder Group and technical advisory committee.	Completed 1999	<a href="http://www.mercedriverstakeholders.org">http://www.mercedriverstakeholders.org</a>
Merced River Corridor Restoration Plan Baseline Studies (Phase II)	Lower Merced River (RM 0 to 52)	SWS, CALFED	HAB	Conduct and provide the results of geomorphic and riparian baseline evaluations for the Merced River Corridor Restoration Plan.	Completed 2001	<a href="http://www.delta.dfg.ca.gov/afrp/documents/MercCorr2.pdf">http://www.delta.dfg.ca.gov/afrp/documents/MercCorr2.pdf</a>
Merced River Corridor Restoration Plan (Phase III)	Lower Merced River (RM 0 to 52)	SWS, CALFED	WS	Analyze and quantify current physical and biological conditions and processes. Assess social, institutional, and infrastructural opportunities and constraints to restoration implementation on the Merced River.	Completed 2003	<a href="http://www.delta.dfg.ca.gov/afrp/documents/Mrcrcp.pdf">http://www.delta.dfg.ca.gov/afrp/documents/Mrcrcp.pdf</a>
Merced River Ranch (MRR) (Phase IV)	MRR (RM 50.3 to 51.1)	SWS, CALFED	ST, HAB	Baseline data collection and development of a restoration design plan for Merced River Ranch (RM 50.3 to 51.1) pilot project and Dredger Tailings Reach (RM 45.2 to 52) proposed project.	Completed 2007	Stillwater Sciences, Berkeley, CA <a href="http://www.stillwatersci.com/">http://www.stillwatersci.com/</a>

**Table A-1. Compilation of restoration projects on the upper and lower Merced River.**

Project Name	Location (River Mile) <sup>1</sup>	Agency/Organization	Type	Project Description	Status	Source
Merced River Ranch (MRR) (Phase V)	MRR (RM 50.3 to 51.1)	CALFED	ST, HAB	Implement pilot MRR design.	Proposed	Stillwater Sciences, Berkeley, CA <a href="http://www.stillwatersci.com/">http://www.stillwatersci.com/</a>
Dredger Tailings Reach (DTR) (Phase VI)	DTR (RM 45.2 to 52)	CALFED	ST, HAB	Implement DTR design.	Proposed	Stillwater Sciences, Berkeley, CA <a href="http://www.stillwatersci.com/">http://www.stillwatersci.com/</a>
<b>Upper Merced River</b>						
Cook's Meadow Restoration	Yosemite Valley (RM 118 to 123)	NPS	HAB	Restoration of meadow by installing an elevated boardwalk, removing drainage ditches, and removing non-native plant species	Completed 2000 Phase II in progress	<a href="http://www.nps.gov/yose/planning/projects/cooks.pdf">http://www.nps.gov/yose/planning/projects/cooks.pdf</a>
Happy Isles Bridge Removal	Yosemite Valley (RM 125)	NPS	ST	Removal of Happy Isles Bridge from the Merced River	Completed 2001	<a href="http://www.nps.gov/yose/planning/projects/hibr.pdf">http://www.nps.gov/yose/planning/projects/hibr.pdf</a>
Eagle Creek Restoration	Yosemite Valley (RM 120)	NPS	HAB	Restoration of creek channel, revegetated bank, and changed paths to reduce pedestrian trampling	Completed 2002	<a href="http://www.nps.gov/yose/planning/projects/eaglecr.pdf">http://www.nps.gov/yose/planning/projects/eaglecr.pdf</a>
Happy Isles Fen Restoration	Yosemite Valley (RM 125.25)	NPS	HAB	Restoration of original, slower draining soils, revegetation of the site, installation of fencing to protect newly formed wetland	Completed 2003	<a href="http://www.nps.gov/yose/planning/projects/fen.pdf">http://www.nps.gov/yose/planning/projects/fen.pdf</a>
Remove Lower Cascades Dam	Yosemite Valley (RM 118 to 123)	NPS	WM	Removal of diversion dam from main stem of the Merced River	Completed 2004	<a href="http://www.nps.gov/yose/planning/cascades/">http://www.nps.gov/yose/planning/cascades/</a>
Improve Lower Yosemite Fall Area	Yosemite Valley (RM 122)	NPS	ST	Bridge removal from vicinity of Lower Yosemite Falls, relocation of staff housing from Merced River floodplain	Completed 2005	<a href="http://www.nps.gov/yose/planning/projects/lyf.pdf">http://www.nps.gov/yose/planning/projects/lyf.pdf</a>
Visitor Use and Floodplain Restoration	Yosemite Valley (RM 123-124.3)	NPS	HAB	Restoration of 3 former campsites within floodplain	In progress	<a href="http://www.nps.gov/archive/yose/planning/projects/restorationreport.pdf">http://www.nps.gov/archive/yose/planning/projects/restorationreport.pdf</a>
McCauley Ranch/Crocker Ridge Wilderness Suitability Assessment	YNP western border, near Foresta, CA	NPS	LC	Determination of whether or not two parcels of land qualify for wilderness designation	In progress	<a href="http://www.nps.gov/yose/planning/projects/mcwild.pdf">http://www.nps.gov/yose/planning/projects/mcwild.pdf</a>

**Table A-1. Compilation of restoration projects on the upper and lower Merced River.**

Project Name	Location (River Mile) <sup>1</sup>	Agency/Organization	Type	Project Description	Status	Source
Merced Wild and Scenic River Revised Comprehensive Management Plan	Yosemite National Park (RM 105.5 to headwaters)	NPS	LM	Development of management strategies to comply with Wild and Scenic status of the mainstem and South Fork Merced River	Plan complete, implementation in progress	<a href="http://www.nps.gov/yose/plan/ning/mrp/">http://www.nps.gov/yose/plan/ning/mrp/</a>
Fire Management Plan	Yosemite National Park (RM 105.5 to headwaters)	NPS	LM	Thinning and brush removal in developed parts of park; thinning, controlled burns, and natural fires elsewhere	Plan complete, implementation in progress	<a href="http://www.nps.gov/yose/plan/ning/fire/">http://www.nps.gov/yose/plan/ning/fire/</a>
East Valley Utilities Improvement Plan	Yosemite Valley (RM 118 to 123)	NPS	LM, ST	Consolidation of utility corridors to roadsides and away from streams, rivers, and meadows	Plan complete, implementation in progress	<a href="http://www.nps.gov/yose/plan/ning/ump/">http://www.nps.gov/yose/plan/ning/ump/</a>
South Fork Bridge Replacement	South Fork Merced at Wawona	NPS	ST	Replacement of bridge on South Fork Merced River at Wawona Road	Plan complete, implementation in progress	<a href="http://www.nps.gov/yose/plan/ning/sfbridge/">http://www.nps.gov/yose/plan/ning/sfbridge/</a>
Parkwide Invasive Plant Management Plan	Yosemite National Park (RM 105.5 to headwaters)	NPS	HAB	Plan to manage or remove invasive plants species	Plan in development	<a href="http://www.nps.gov/yose/plan/ning/projects">http://www.nps.gov/yose/plan/ning/projects</a>

<sup>1</sup> River Mile (RM), rather than River Kilometer (RK), designations are reported following USGS convention and will be finalized for the final BAMF. All RM's are derived from the USGS 1:100,000 Digital Land Graph (DLG).

**Key**

- WM - Water management
- HAB - Habitat restoration
- ST - Structural modifications
- FS - Fish screens
- LC - Land classification
- LM - Land management
- NRT - Nature restoration trust
- MeID - Merced Irrigation District
- NPS - National Park Service
- BR - Bureau of Reclamation

**Table A-2. Summary of biological studies in the Merced ID/CDFG 10-year MOU.**

Element Title	Element Purpose	Duration
<b>Adult Chinook Salmon Life Phase (Migration)</b>		
Chinook Salmon Attraction into the Merced River	Evaluate potential benefits of attraction of adult Chinook salmon into the Merced River by flow augmentation	10 years
<b>Adult Chinook Salmon Life Phase (Spawning)</b>		
Annual Salmon Spawning Ground Surveys	To estimate annual abundance and assess biological characteristics of fall Chinook salmon spawning in the Merced River	10 years
Empirical Validation of DFG's Instream Flow Recommendations for Salmon Spawning	To determine if salmon spawning utilization in the Merced River corresponds to the instream flows recommended by DFG to improve spawning habitat	3 years
<b>Chinook Salmon Egg Incubation Life Phase</b>		
Monitoring of Water Temperatures During Salmon Egg Incubation	To monitor and evaluate water temperatures at sites and times when Chinook salmon eggs are incubating in the Merced River and at Merced River Hatchery	10 years
Evaluation of Chinook Salmon Spawning Substrate	To quantify the characteristics of spawning substrate conditions in the Merced River as related to salmon survival	2 years
<b>Chinook Salmon Fry and Juvenile Rearing Life Phase</b>		
Evaluation of the Contribution of the Merced River Hatchery to Catch and Escapement	To quantify the contribution of Merced River Hatchery Chinook salmon production to sport and commercial harvest and spawning escapement	10 years
<b>Chinook Salmon Rearing Life Phase</b>		
Effect of past gravel mining activities and predation of Chinook salmon fry	To assess the effects of past gravel mining in the Merced River and the resultant creation of predatory fish habitat on juvenile salmon	10 years
Empirical Validation of DFG's Instream Flow Recommendations for Juvenile Salmon Rearing	To determine if juvenile salmon rearing utilization in the Merced River corresponds to the instream flows recommended by DFG to improve rearing habitat	3 years
Rearing Habitat Structure Evaluation	To determine if rearing habitat structures placed in the Merced River are beneficial to juvenile salmonids	4 years
Abundance of Natural Salmon Production in the Merced River	To quantify and evaluate the number of outmigrant Chinook salmon leaving the Merced River on a daily basis	10 years
<b>Chinook Salmon Downstream Migration Life Phase</b>		
Determination of Optimal Time and Size at Release for Merced River Hatchery Salmon	To evaluate alternative measures of smoltification for determining appropriate size and time to release hatchery salmon	5 years
Transport Timing of Downstream Migrant Salmon During Pulse Flow Events	To evaluate potential changes in outmigration of timing of young salmon during pulse flow events	6 years
Survival of Salmon Migrating Out of the Merced River	To estimate the survival of outmigrant Chinook salmon leaving the Merced River	10 years

**Table A-2. Summary of biological studies in the Merced ID/CDFG 10-year MOU.**

Element Title	Element Purpose	Duration
<b>Water Temperature Management</b>		
Temperature Management Reconnaissance Study	Compile and summarize pertinent physical project specifications, operating strategies and requirements, related agreements, and existing thermal and flow information and biological monitoring activities.	1 year
Merced River and Reservoir Water Temperature Models	To develop water temperature models for the Merced River and reservoirs to facilitate adaptive management of Merced River water supplies for anadromous fish and other beneficial uses	1 year
Temperature Management Feasibility Study	Develop potential alternatives and recommend one to three alternatives that may improve temperature management for Chinook salmon (a) in the Merced River and (b) at Merced River Hatchery	2 years
Lower Merced River Temperature Management Proposal	Develop a joint MID/Fish and Game proposal, seek and secure funds to design, permit, construct, and operate the preferred temperature management alternative (s)	2 years
<b>Steelhead Assessment</b>		
Compilation of Existing Information on Potential Steelhead Presence in the Merced River	To compile all existing information on steelhead in the Merced River to help guide the MTAC in their decision making.	1 year
Determine Presence of Adult Steelhead in the Merced River	To determine the presence or absence of adult steelhead in the Merced River.	3 years
<b>Watershed Assessment</b>		
Watershed Assessment of the Lower Merced River	To perform an assessment of the Merced River watershed prior to large-scale major river channel alterations	3 years

<sup>1</sup> Source: Vogel 2003



## **APPENDIX B**

# **HISTORICAL FISH DATA**

- **Table B-1** Fish species look-up table for historical data.
- **Table B-2** Fish species historically documented in the lower Merced River.
- **Table B-3** Fish species historically documented in the upper Merced River.



Table B-1. Merced River historical avian data overview.\*

Scientific Name	Common Name	Species Code	Native or Introduced	Anadromous or Resident	Observed in Merced Alliance Surveys
<b>Atherinidae Family</b>					
<i>Menidia beryllina</i>	Inland Silverside	ISS	I	R	
<b>Catostomidae Family</b>					
<i>Catostomus occidentalis</i>	Sucker, Sacramento	SSKR	N	R	X
<b>Centrarchidae Family</b>					
<i>Lepomis gulosus</i>	Warmouth	WAR	I	R	
<i>Lepomis cyanellus</i>	Sunfish, Green	GSF	I	R	X
<i>Lepomis macrochirus</i>	Sunfish, Bluegill	BG	I	R	X
<i>Lepomis microlophus</i>	Sunfish, Redear	RSF	I	R	X
<i>Micropterus coosae</i>	Bass, Redeye	REB	I	R	X
<i>Micropterus dolomieu</i>	Bass, Smallmouth	SMB	I	R	X
<i>Micropterus punctulatus</i>	Bass, Spotted	SPB	I	R	X
<i>Micropterus salmoides</i>	Bass, Largemouth	LMB	I	R	X
<i>Pomoxis annularis</i>	Crappie, White	WCP	I	R	
<i>Pomoxis nigromaculatus</i>	Crappie, Black	BCP	I	R	X
<b>Clupeidae Family</b>					
<i>Alosa sapidissima</i>	American Shad	ASD	I	A	
<i>Dorosoma petenense</i>	Threadfin Shad	TSD	I	R	
<b>Cottidae Family</b>					
<i>Cottus asper</i>	Sculpin, Prickly	PSCP	N	R	X
<i>Cottus sp</i>	Sculpin sp.	SCU	N	R	X
<b>Cyprinidae Family</b>					
<i>Carassius auratus</i>	Goldfish	GF	I	R	X
<i>Cyprinella lutrensis</i>	Red Shiner	RSH	I	R	
<i>Cyprinus carpio</i>	Carp, Common	CARP	I	R	X
<i>Lavinia exilicauda</i>	Hitch	HITCH	N	R	X
<i>Lavinia symmetricus</i> <sup>1</sup>	Roach, California	ROACH	N	R	X
<i>Mylopharodon conocephalus</i>	Hardhead	HH	N	R	X
<i>Notemigonus crysoleucas</i>	Golden Shiner	GSH	I	R	X
<i>Orthodon microlepidotus</i>	Sacramento Blackfish	SBF	N	R	
<i>Pimephales promelas</i>	Fathead Minnow	FHM	I	R	X
<i>Pogonichthys macrolepidotus</i>	Splittail	SPLT	N	R	X
<i>Ptychocheilus grandis</i>	Pikeminnow, Sacramento	SPMW	N	R	X
<b>Ictaluridae Family</b>					
<i>Ameiurus melas</i>	Bullhead, Black	BLBH	I	R	
<i>Ameiurus catus</i>	Catfish, White	WCAT	I	R	X
<i>Ameiurus natalis</i>	Bullhead, Yellow	YBH	I	R	

**Table B-1. Merced River historical avian data overview.\***

Scientific Name	Common Name	Species Code	Native or Introduced	Anadromous or Resident	Observed in Merced Alliance Surveys
<i>Ameiurus nebulosus</i>	Bullhead, Brown	BRBH	I	R	X
<i>Ictalurus punctatus</i>	Catfish, Channel	CCF	I	R	X
<b>Moronidae Family</b>					
<i>Morone saxatilis</i>	Bass, Striped	STB	I	A	X
<b>Percidae Family</b>					
<i>Percina macrolepida</i>	Logperch, Bigscale	BSLP	I	R	X
<b>Petromyzontidae Family</b>					
<i>Lampetra hubbsi</i>	Lamprey, Kern Brook	KBLAM	N	R	X
<i>Lampetra tridentata</i>	Lamprey, Pacific	PLAM	N	A	X
<b>Poeciliidae Family</b>					
<i>Gambusia affinis</i>	Mosquitofish	GAM	I	R	X
<b>Salmonidae Family</b>					
<i>Oncorhynchus mykiss</i>	Trout, Rainbow	RBT	N	R	X
<i>Oncorhynchus mykiss</i>	Steelhead /Trout, Rainbow	STH	N	A	X
<i>Oncorhynchus tshawytscha</i>	Salmon, Chinook	FCS	N	A	X
<i>Salmo trutta</i>	Trout, Brown	BRN	I	R	X
<i>Salvelinus fontinalis</i>	Trout, Brook	BRK	I	R	

\* Data summarized from historical occurrences presented in Tables B-2 and B-3.

<sup>1</sup> Moyle (2002) recognizes eight subspecies of California roach based on a combination of morphology, meristics, and zoogeography. Under this suggested classification scheme, roach found in the Merced River are considered to be Sacramento-San Joaquin roach (*Lavinia symmetricus symmetricus*).

Table B-2. Lower Merced River watershed detailed historical fish data. Approximate river miles (RM) are given in parentheses.

FAMILY Species Common Name	Status		USGS near River Road Bridge <sup>3</sup> (RM 0)	CDFG at Haganan County Park <sup>4</sup> (RM 12)	USGS near Haganan County Park <sup>3</sup> (RM 12)	USGS near McConnell State Park <sup>3</sup> (RM 19)	MeID at Hopeton <sup>5</sup> (RM 40)	USGS near Snelling Diversion Dam <sup>3</sup> (RM 46)	SWS Baseline Bonitoring <sup>6</sup>		CDFG at Merced River Hatchery <sup>7</sup> (RM 52)	MID/CDFG Crocker- Huffman Dam to Merced Falls Dam <sup>8</sup> (RM 52 to 53.4)	MID Lake McSwain to New Exchequer Dam <sup>9</sup> (RM 54.8 to 61)	CNDDDB Occurrences <sup>10</sup>				
	State <sup>1</sup>	Federal <sup>2</sup>							MRR (RM 50 to 51)	DTR (RM 45.3 to 52)				MRR Quad	DTR Quad	Surrounding Quads		
<b>ATHERINIDAE: Silversides</b>																		
Inland Silverside			X	X														
<b>CATOSTOMIDAE: Suckers</b>																		
Sacramento Sucker			X	X		X	X	X	X	X								X
<b>CENTRARCHIDAE: Sunfishes</b>																		
Bluegill			X	X	X	X	X	X										X
Green Sunfish			X	X	X	X	X											X
Redear Sunfish			X	X	X		X											X
Largemouth Bass			X	X	X	X	X		X									X
Smallmouth Bass			X	X	X	X	X											
Redeye Bass				X														
Spotted Bass				X														
Warmouth				X														
White Crappie				X														
Black Crappie			X	X														
<b>CLUPEIDAE: Shad</b>																		
American Shad				X														
Threadfin Shad				X														
<b>COTTIDAE: Sculpin</b>																		
Prickly Sculpin			X	X			X	X										

**Table B-2. Lower Merced River watershed detailed historical fish data.** Approximate river miles (RM) are given in parentheses.

FAMILY Species Common Name	Status		USGS near River Road Bridge <sup>3</sup> (RM 0)	CDFG at Haganan County Park <sup>4</sup> (RM 12)	USGS near Haganan County Park <sup>3</sup> (RM 12)	USGS near McConnell State Park <sup>3</sup> (RM 19)	MeID at Hopeton <sup>5</sup> (RM 40)	USGS near Snelling Diversion Dam <sup>3</sup> (RM 46)	SWS Baseline Bonitoring <sup>6</sup>		CDFG at Merced River Hatchery <sup>7</sup> (RM 52)	MID/CDFG Crocker- Falls Dam <sup>8</sup> (RM 52 to 53.4)	MID Lake McSwain to New Exchequer Dam <sup>9</sup> (RM 54.8 to 61)	CNDDDB Occurrences <sup>10</sup>			
	State <sup>1</sup>	Federal <sup>2</sup>							MRR (RM 50 to 51)	DTR (RM 45.3 to 52)				MRR Quad	DTR Quad	Surrounding Quads	
Sculpin sp.																X	
<b>CYPRINIDAE: Minnows and Carps</b>																	
Hardhead			X	X				X		X						X	
Golden Shiner				X			X										
Fathead Minnow																	
Goldfish			X	X			X										
Red Shiner			X	X													
Sacramento Blackfish			X	X													
Sacramento Pikeminnow (Squawfish)			X	X				X		X						X	
Spittail			X	X													
Common Carp			X	X			X			X							
Hitch			X														
California Roach <sup>11</sup>				X			X			X							X
Black Bullhead				X			X										
Channel Catfish			X	X			X				X						
Brown Bullhead				X													
Yellow Bullhead				X													
White Catfish			X	X			X										X

**Table B-2. Lower Merced River watershed detailed historical fish data.** Approximate river miles (RM) are given in parentheses.

FAMILY Species Common Name	Status		USGS near River Road Bridge <sup>3</sup> (RM 0)	CDFG at Haganan County Park <sup>4</sup> (RM 12)	USGS near Haganan County Park <sup>3</sup> (RM 12)	USGS near McConnell State Park <sup>3</sup> (RM 19)	MeID at Hopeton <sup>5</sup> (RM 40)	USGS near Snelling Diversion Dam <sup>3</sup> (RM 46)	SWS Baseline Bonitoring <sup>6</sup>		CDFG at Merced River Hatchery <sup>7</sup> (RM 52)	MID/CDFG Crocker- Huffman Dam to Merced Falls Dam <sup>8</sup> (RM 52 to 53.4)	MID Lake McSwain to New Exchequer Dam <sup>9</sup> (RM 54.8 to 61)	CNDDDB Occurrences <sup>10</sup>			
	State <sup>1</sup>	Federal <sup>2</sup>							MRR (RM 50 to 51)	DTR (RM 45.3 to 52)				MRR Quad	DTR Quad	Surrounding Quads	
<b>MORONIDAE: Temperate Basses</b>																	
Striped Bass			X	X													
<b>PERCIDAE: Perch</b>																	
Bigscale Logperch			X				X										
<b>POECILIDAE: Mosquitofish</b>																	
Western Mosquitofish			X	X	X		X			X							
<b>PETROMYSONTIDAE: Lampreys</b>																	
Pacific Lamprey				X			X										
Kern Brook Lamprey				X													X
<b>SALMONIDAE: Salmon and trout</b>																	
Steelhead/Rainbow Trout		FT		X			X	X			X	X	X				
Chinook/King Salmon		FPT		X			X			X	X						
Brook Trout													X				

<sup>1</sup> State status: CSC = CDFG species of special concern

<sup>2</sup> Federal status: FT = listed as threatened under the Federal Endangered Species Act

FPT = Proposed for listing under the Federal Endangered Species Act

<sup>3</sup> Data collected as part of the USGS National Water-Quality Assessment (NAWQA), Aquatic Ecology, Cycle I Activities (1991-2001).

<sup>4</sup> Data collected by CDFG. Source: (T. Heyne, pers. comm. 2001)

<sup>5</sup> Data collected from rotary screw traps operated by MeID. Traps operate annually from January through June since 1999. (Source: Natural Resource Sciences, Inc., unpublished data).

- <sup>6</sup> Data collected as part of the Merced Phase IV Project documenting baseline fish and avian conditions at the Merced River Ranch and throughout the Dredger Tailings Reach (Stillwater Sciences 2006).
- <sup>7</sup> CDFG data collected from Merced River Hatchery (2003).
- <sup>8</sup> Information from Merced ID Parks/CDFG.
- <sup>9</sup> Species reported by Merced Irrigation District Parks Department (M. Ardohain, *pers. comm.*, 2005). Kokanee salmon stocked in Lake McClure annually or bi-annually. Rainbow trout stocked by CDFG regularly from Crocker Huffman Dam to Merced Falls Dam, and by MelD in Lake McClure and Lake McSwain. Brook trout stocked by MelD in Lake McSwain for a period of 3 years (years unknown).
- <sup>10</sup> California Natural Diversity Database was queried on March 20, 2005.
- |   |   |   |
|---|---|---|
| MRR Quad (Quads covering MRR)             | = | Snelling  |
| DTR Quads (Quads covering DTR)            | = | Snelling, Merced Falls  |
| Surrounding Quads (Quads surrounding DTR) | = | Cooperstown, La Grange, Penon Blanco Peak, Coulterville, Hornitos, Indian Gulch, Haystack Mountain, Yosemite Lake, Winton, Turlock Lake |
- <sup>11</sup> Moyle (2002) recognizes eight subspecies of California roach based on a combination of morphology, meristics, and zoogeography. Under this suggested classification scheme, roach found in the Merced River are considered to be Sacramento-San Joaquin roach (*Lavinia symmetricus symmetricus*).



**Table B-3. Upper Merced River watershed detailed historical fish data.** Approximate river miles (RM) are given in parentheses.

FAMILY Species Common Name	Status		Lake McSwain <sup>3</sup> (RM 54.8 to 61)	Lake McClure to BLM <sup>4</sup> (RM 61 to 94)	USGS near BMT186, Briceburg <sup>5,6</sup> (RM 91)	USGS near Hwy 140, El Portal <sup>5,6</sup> (RM 107)	USGS near Foresta Rd. Bridge <sup>5,6</sup> (RM 107)	BLM <sup>7</sup> (RM 67.1 to 94.0)	Sierra National Forest <sup>8</sup> (RM 94.0 to 108.5)	Stanislaus National Forest <sup>9</sup> (RM 94.0 to 108.5)	Yosemite National Park <sup>10</sup> (RM 105.5 to headwaters)	USGS near Happy Isle Bridge, Yosemite <sup>5,6</sup> (RM 122)	USGS near Pohono Bridge, Yosemite <sup>5,6</sup> (RM 122)	Tenaya Creek below Mir Lake <sup>6</sup>	Tenaya Creek near Group Camp <sup>6</sup>
	State <sup>1</sup>	Federal <sup>2</sup>													
<b>CATOSTOMIDAE: Suckers</b>															
Sacramento Sucker					X	X	X	X			X	X	X	X	X
<b>CENTRARCHIDAE: Sunfishes</b>															
Bluegill		X		X			X								
Green Sunfish							X								
Largemouth Bass		X		X			X								
Smallmouth Bass				X	X		X								
Spotted Bass			X	X	X		X								
Florida Largemouth Bass															
White Crappie															
Black Crappie		X		X											
<b>CLUPEIDAE: Shad</b>															
Threadfin Shad		X		X											
<b>COTTIDAE: Sculpin</b>															
Riffle Sculpin					X	X	X	X			X				
<b>CYPRINIDAE: Minnows and Carps</b>															
Hardhead											X				
Fathead Minnow															
Sacramento Pikeminnow (squawfish)					X	X	X	X			X				
California Roach <sup>11</sup>							X	X			X				
Channel Catfish		X		X											
Blue Catfish															
White Catfish															

**Table B-3. Upper Merced River watershed detailed historical fish data.** Approximate river miles (RM) are given in parentheses.

FAMILY Species Common Name	Status		Lake McSwain <sup>3</sup> (RM 54.8 to 61)	Lake McClure to BLM <sup>4</sup> (RM 61 to 94)	USGS near BMT186, Briceburg <sup>5,6</sup> (RM 91)	USGS near Hwy 140, El Portal <sup>5,6</sup> (RM 107)	USGS near Foresta Rd. Bridge <sup>5,6</sup> (RM 107)	BLM <sup>7</sup> (RM 67.1 to 94.0)	Sierra National Forest <sup>8</sup> (RM 94.0 to 108.5)	Stanislaus National Forest <sup>9</sup> (RM 94.0 to 108.5)	Yosemite National Park <sup>10</sup> (RM 105.5 to headwaters)	USGS near Happy Isle Bridge, Yosemite <sup>5,6</sup> (RM 122)	USGS near Pohono Bridge, Yosemite <sup>5,6</sup> (RM 122)	Tenaya Creek below Mir Lake <sup>6</sup>	Tenaya Creek near Group Camp <sup>6</sup>
	State <sup>1</sup>	Federal <sup>2</sup>													
<b>Brown Bullhead</b>															
<b>POECILIIDAE: Mosquitofish</b>															
Western Mosquitofish															
<b>SALMONIDAE: Salmon and trout</b>															
Steelhead/Rainbow Trout		FT	X	X	X	X	X	X			X	X	X	X	X
Chinook/King Salmon		FPT		X											
Kokanee Salmon			X	X											
Brown Trout			X	X			X					X	X	X	X
Brook Trout			X								X				
Cutthroat Trout											X				
Golden Trout											X				

<sup>1</sup> State status: CSC = CDFG species of special concern

<sup>2</sup> Federal status: FT = listed as threatened under the Federal Endangered Species Act

FPT = Proposed for listing under the Federal Endangered Species Act

<sup>3</sup> Bacher, D. Flinging flukes for bass and trout at Lake McSwain. The Fish Sniffer Online. 2002. Accessed from [www.fishsniffer.com/dbacher/052402mcswain.html](http://www.fishsniffer.com/dbacher/052402mcswain.html).

<sup>4</sup> Bacher, D. Kokanee thrive as Lake McClure's newest fishery. The Fish Sniffer Online. 2007. Accessed from [www.fishsniffer.com/dacher/070813mcclure.html](http://www.fishsniffer.com/dacher/070813mcclure.html).

<sup>5</sup> Data collected as part of the USGS National Water-Quality Assessment (NAWQA), Aquatic Ecology, Cycle I Activities (1991-2001).

<sup>6</sup> Brown and Short 1999, data collected from 1993-1994. All species found in same upper watershed locations as USGS data<sup>3</sup>, except no riffle sculpin were found at the Briceburg location. Riffle sculpin were only reported for USGS data<sup>3</sup> in Briceburg.

<sup>7</sup> Data collected by the Bureau of Land Management (1979) in the Merced River and tributaries (P. Cranston, *pers. comm.* 2005).

<sup>8</sup> Data collected by the Sierra National Forest (year unknown) in the Merced River and tributaries.

<sup>9</sup> Data collected by the Stanislaus National Forest (year unknown) in the Merced River and tributaries.

<sup>10</sup> Knapp, R. A. 2003. Species reported within the boundaries of Yosemite National Park, not necessarily in the mainstem Merced.

<sup>11</sup> Moyle (2002) recognizes eight subspecies of California roach based on a combination of morphology, meristics, and zoogeography. Under this suggested classification scheme, roach found in the Merced River are considered to be Sacramento-San Joaquin roach (*Lavinia symmetricus symmetricus*).

## **APPENDIX C**

# **HISTORICAL AVIAN DATA**

- **Table C-1**            **Merced River historical avian data overview.**
- **Table C-2**            **Merced River watershed detailed historical avian data.**
- **Figure C-3**           **Palomarin Handbook Appendix 3, parts 4 and 6.**



**Table C-1. Merced River historical avian data overview.\***

FAMILY NAME Species Common Name	Scientific Name	Native (N) or Introduced (I)	Historical Data		Observed in Merced Alliance Surveys
			Lower River	Upper River	
<b>ACCIPITRIDAE: Hawks and Eagles</b>					
Cooper's Hawk	<i>Accipiter cooperii</i>	N		X	X
Northern Goshawk	<i>Accipiter gentilis</i>	N		X	
Sharp-Shinned Hawk	<i>Accipiter striatus</i>	N	X	X	X
Golden Eagle	<i>Aquila chrysaetos</i>	N		X	
Red-Tailed Hawk	<i>Buteo jamaicensis</i>	N	X	X	X
Red-Shouldered Hawk (Red-Bellied Hawk )	<i>Buteo lineatus</i>	N	X		X
Feruginous Hawk	<i>Buteo regalis</i>	N	X		
Swainson's Hawk <sup>12</sup>	<i>Buteo swainsoni</i>	N	X	X	X
Northern Harrier*	<i>Circus cyaneus</i>	N	X	X	
White Tailed Kite (Nesting)	<i>Elanus leucurus</i>	N	X		X
Bald Eagle	<i>Haliaeetus leucocephalus</i>	N	X	X	
Osprey	<i>Pandion haliaetus</i>	N	X	X	X
<b>AEGITHALIDAE: Bushtits</b>					
Common Bushtit	<i>Psaltriparus minimus</i>	N	X	X	X
<b>ALAUDIDAE: Larks</b>					
Horned Lark	<i>Eremophila alpestris</i>	N	X	X	
California Horned Lark	<i>Eremophila alpestris actia</i>	N	X		
<b>ALCEDINIDAE: Kingfishers</b>					
Belted Kingfisher	<i>Ceryle alcyon</i>	N	X	X	X
<b>ANATIDAE: Ducks, Geese, and Swans</b>					
Wood Duck	<i>Aix sponsa</i>	N	X		X
Mallard	<i>Anas platyrhynchos</i>	N	X	X	X
White-Fronted Goose	<i>Anser albifrons</i>	N	X		
Ring-Necked Duck	<i>Aythya collaris</i>	N	X	X	
Bufflehead	<i>Bucephala albeola</i>	N <sup>1</sup>		X	
Common Merganser	<i>Mergus merganser</i>	N <sup>1</sup>		X	X
American Merganser	<i>Mergus merganser americanus</i>	N	X		X
Geese	various		X		
<b>APODIDAE: Swifts</b>					
White-Throated Swift	<i>Aeronautes saxatalis</i>	N		X	X
Vaux's Swift	<i>Chaetura vauxi</i>	N		X	
Black Swift	<i>Cypseloides niger</i>	N		X	
<b>ARDEIDAE: Herons</b>					
Great Egret	<i>Ardea alba</i>	N	X		X
Great Blue Heron	<i>Ardea herodias</i>	N	X	X	X
Green Heron	<i>Butorides virescens</i>	N	X		X

**Table C-1. Merced River historical avian data overview.\***

FAMILY NAME Species Common Name	Scientific Name	Native (N) or Introduced (I)	Historical Data		Observed in Merced Alliance Surveys
			Lower River	Upper River	
Black-Crowned Night-Heron	<i>Nycticorax nycticorax</i>	N	X		
<b>BOMBYCILLIDAE: Waxwings</b>					
Cedar Waxwing	<i>Bombycilly cedrorum</i>	N	X	X	X
<b>PTILOGONATIDAE: Silky Flycatchers</b>					
Phainopepla	<i>Phainopepla nitens</i>	N	X		X
<b>CARDINALIDAE: Buntings</b>					
Lazuli Bunting	<i>Passerina amoena</i>	N	X	X	X
Indigo Bunting	<i>Passerina cyanea</i>	I		X	
Black-Headed Grosbeak <sup>1</sup>	<i>Pheucticus melanocephalus</i>	N	X	X	X
<b>CAPRIMULGIDAE: Nightjars</b>					
Common Nighthawk	<i>Chordeiles minor</i>	N		X	
Lesser Nighthawk (Texas Nighthawk )	<i>Chordeiles acutipennis</i>	N	X		
Common Poorwill	<i>Phalaenoptilus nuttallii</i>	N	X	X	
<b>CATHARTIDAE: New World vultures</b>					
Turkey Vulture	<i>Cathartes aura</i>	N	X	X	X
<b>CERTHIIDAE: Creepers</b>					
Brown Creeper	<i>Certhia americana</i>	N	X	X	X
Blue-Gray Gnatcatcher	<i>Polioptila caerulea</i>	N		X	X
<b>CHARADRIIDAE: Lapwings And plovers</b>					
Killdeer	<i>Charadrius vociferus</i>	N	X	X	X
<b>CINCLIDAE: Dippers</b>					
American Dipper	<i>Cinclus mexicanus</i>	N		X	X
<b>COLUMBIIDAE: Doves</b>					
Band-Tailed Pigeon	<i>Columba fasciata</i>	N		X	
Rock Pigeon	<i>Columba livia</i>	I		X	X
Mourning Dove	<i>Zenaida macroura</i>	N	X	X	X
<b>CORVIDAE: Crows and jays</b>					
Western Scrub-Jay	<i>Aphelocoma californica</i>	N	X	X	X
Scrub Jay	<i>Aphelocoma coerulescens</i>	N	X	X	
American Crow	<i>Corvus brachyrhynchos</i>	N	X		X
Common Raven	<i>Corvus corax</i>	N	X	X	X
Steller's Jay	<i>Cyanocitta stelleri</i>	N		X	X
Clark's Nutcracker	<i>Nucifraga columbiana</i>	N		X	
Yellow-Billed Magpie	<i>Pica nuttallii</i>	N	X		X
<b>EMBERIZIDAE: New World sparrows and Old World buntings</b>					
Rufous-Crowned Sparrow	<i>Aimophila ruficeps</i>	N		X	X
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	N		X	

**Table C-1. Merced River historical avian data overview.\***

FAMILY NAME Species Common Name	Scientific Name	Native (N) or Introduced (I)	Historical Data		Observed in Merced Alliance Surveys
			Lower River	Upper River	
Sage Sparrow (Bell's Sparrow)	<i>Amphispiza belli</i>	N	X	X	
Black-Throated Sparrow	<i>Amphispiza bilineata</i>	N		X	
Lark Sparrow	<i>Chodestes grammacus</i>	N	X	X	
Lutescent Warbler	<i>Helminthophila celata lutescens</i>	N	X		
Dark-Eyed Junco	<i>Junco hyemalis hyemalis</i>	N	X	X	
Shufeldt's Junco	<i>Junco oreganus shufeldti</i>	N		X	
Oregon Junco	<i>Junco oreganus oreganus</i>	N		X	X
Sierra Junco	<i>Junco oreganus thurberi</i>	N	X	X	
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	N	X	X	X
Song Sparrow <sup>1</sup>	<i>Melospiza melodia</i>	N	X	X	X
Modoc Song Sparrow	<i>Melospiza melodia fisherella</i>	N	X		
Heermann's Song Sparrow	<i>Melospiza melodia heermanni</i>	N	X		
Merrill's Song Sparrow	<i>Melospiza melodia merrilli</i>	N	X		
Mountain Song Sparrow	<i>Melospiza melodia montana</i>	N	X		
Rusty Song Sparrow	<i>Melospiza melodia morphna</i>	N	X		
English Sparrow	<i>Passer domesticus</i>	N	X		X
Savannah Sparrow	<i>Passerculus sandwichensis anthinus</i>	N	X	X	
Aleutian Savannah Sparrow	<i>Passerculus sandwichensis sandwichensis</i>	N	X		
Alberta Fox Sparrow	<i>Passerella iliaca</i>	N	X		
Fox Sparrow	<i>Passerella iliaca</i>	N		X	X
Sooty Fox Sparrow	<i>Passerella iliaca fuliginosa</i>	N		X	
Kodiak Fox Sparrow	<i>Passerella iliaca insularis</i>	N		X	
Large (Thick)-Billed Fox Sparrow	<i>Passerella iliaca megarhyncha</i>	N		X	
Valdez Fox Sparrow	<i>Passerella iliaca sinuosa</i>	N	X	X	
Shumigan Fox Sparrow	<i>Passerella iliaca unalaschensis</i>	N	X	X	
Green-Tailed Towhee	<i>Pipilo chlorurus</i>	N		X	
California Towhee	<i>Pipilo crissalis</i>	N	X	X	X
Rufous-Sided Towhee	<i>Pipilo erythrophthalmus</i>	N	X	X	
Brown Towhee	<i>Pipilo fuscus</i>	N		X	
Spotted Towhee	<i>Pipilo maculatus</i>	N	X	X	X
Black-Chinned Sparrow	<i>Spizella atrogularis</i>	N		X	
Brewer's Sparrow	<i>Spizella breweri breweri</i>	N		X	
Western Chipping Sparrow	<i>Spizella passerina arizonae</i>	N	X	X	X
Golden-Crowned Sparrow	<i>Zonotrichia atricapilla</i>	N	X	X	X
White-Crowned Sparrow	<i>Zonotrichia leucophrys oriantha</i>	N	X	X	X
Intermediate Sparrow	<i>Zonotrichia leucophrys intermedia</i>	N	X		

**Table C-1. Merced River historical avian data overview.\***

FAMILY NAME Species Common Name	Scientific Name	Native (N) or Introduced (I)	Historical Data		Observed in Merced Alliance Surveys
			Lower River	Upper River	
<b>FALCONIDAE: Caracaras And Falcons</b>					
Merlin (Pigeon Hawk)	<i>Falco columbarius</i>	N		X	
Prairie Falcon	<i>Falco mexicanus</i>	N		X	
Peregrine Falcon	<i>Falco peregrinus</i>	N		X	
American Kestrel (Sparrow Hawk)	<i>Falco sparverius</i>	N	X	X	X
<b>FRINGILLIDAE: Buntings, finches, grosbeaks, moineaux, Old World finches, roselins, sparrows</b>					
Lawrence's Goldfinch	<i>Carduelis lawrencei</i>	N		X	
Pine Siskin	<i>Carduelis pinus</i>	N	X	X	
Lesser Goldfinch	<i>Carduelis psaltria</i>	N	X	X	X
American Goldfinch	<i>Carduelis tristis</i>	N	X	X	X
Cassin's Finch	<i>Carpodacus cassinii</i>	N		X	X
House Finch (Linnet)	<i>Carpodacus mexicanus</i>	N	X	X	X
Purple Finch	<i>Carpodacus purpureus</i>	N		X	X
California Purple Finch	<i>Carpodacus purpureus californicus</i>	N	X	X	
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	N	X	X	
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	N	X	X	X
Salt Marsh Common Yellowthroat	<i>Geothlypis trichas sinuosa</i>	N	X		X
Blue Grosbeak <sup>1</sup>	<i>Guiraca caerulea</i>	N	X		X
Gray-Crowned Rosy-Finch	<i>Leucosticte tephrocitis</i>	N		X	
Brown-Headed Cowbird	<i>Molothrus ater</i>	N	X	X	X
Red Crossbill	<i>Loxia curvirostra</i>	N		X	
Pine Grosbeak	<i>Pinicola enucleator</i>	N		X	
Western Tanager	<i>Piranga ludoviciana</i>	N	X	X	X
American Redstart	<i>Setophaga ruticilla</i>	N		X	
Siskin	<i>Spinus sp.</i>	N	X		
Western Meadowlark	<i>Sturnella neglecta</i>	N	X	X	X
<b>HIRUNDINIDAE: Swallows and martins</b>					
Cliff Swallow	<i>Hirundo pyrrhonota</i>	N	X	X	X
Barn Swallow	<i>Hirundo rustica</i>	N	X	X	X
Purple Martin	<i>Progne subis</i>	N		X	
Northern Rough Winged Swallow	<i>Stelgidopteryx serripennis</i>	N		X	
Violet-Green Swallow	<i>Tachycineta thalassina</i>	N		X	X
Tree Swallow <sup>1</sup>	<i>Tachycineta bicolor</i>	N	X	X	X
Swallow	various		X		X
<b>ICTERIDAE: Troupials and allies</b>					



**Table C-1. Merced River historical avian data overview.\***

FAMILY NAME Species Common Name	Scientific Name	Native (N) or Introduced (I)	Historical Data		Observed in Merced Alliance Surveys
			Lower River	Upper River	
Red-Winged Blackbird	<i>Agelaius phoeniceus</i>	N	X	X	X
Tricolored Blackbird <sup>1</sup>	<i>Agelaius tricolor</i>	N	X	X	X
Bullock's Oriole	<i>Icterus bullockii</i>	N	X	X	X
Northern Oriole	<i>Icterus galbula</i>	N		X	
Blackbird	various		X		X
Yellow-Headed Blackbird	<i>Xanthocephalus xanthocephalus</i>	N		X	
<b>LANIIDAE: Shrikes</b>					
California Shrike (Loggerhead Shrike)	<i>Lanius ludovicianus gambeli</i>	N	X		
Shrike	<i>Lanius sp.</i>	N	X		
<b>LARIDAE: Gulls and terns</b>					
California Gull	<i>Larus californicus</i>	N		X	
Sabine's Gull	<i>Xema sabini</i>	N		X	
<b>MOTACILLIDAE: Pipits and wagtails</b>					
American Pipit	<i>Anthus rubescens</i>	N	X	X	X
<b>ODONTOPHORIDAE: New World quails</b>					
California Quail	<i>Callipepla californica</i>	N	X	X	X
Mountain Quail	<i>Oreotyx pictus</i>	N		X	
<b>PARIDAE: Chickadees and tits</b>					
Oak Titmouse	<i>Baeolophus inornatus</i>	N	X	X	X
Mountain Chickadee	<i>Parus gambeli</i>	N		X	X
Plain Titmouse	<i>Parus inornatus</i>	N	X	X	
Chestnut-Backed Chickadee	<i>Parus rufescens</i>	N		X	X
<b>PARULIDAE: New World warblers</b>					
Black-Throated Gray Warbler	<i>Dendroica nigrescens</i>	N	X	X	
Yellow-Rumped Warbler	<i>Dendroica coronata</i>	N		X	X
Yellow-Rumped Warbler (Audobon Warbler)	<i>Dendroica coronata auduboni</i>	N	X	X	
Hermit Warbler	<i>Dendroica occidentalis</i>	N		X	X
Yellow Warbler <sup>1</sup>	<i>Dendroica petechia brewsteri</i>	N	X	X	X
Morcom's Yellow Warbler	<i>Dendroica petechia morcomi</i>	N		X	
Townsend's Warbler	<i>Dendroica townsendi</i>	N		X	X
Common Yellowthroat <sup>1</sup>	<i>Geothlypis trichas</i>	N	X	X	X
Chat	<i>Icteria sp.</i>	N	X		
Yellow-Breasted Chat <sup>1</sup>	<i>Icteria virens</i>	N	X	X	X
Macgillivray's Warbler	<i>Oporonis tolmiei</i>	N	X	X	X
Orange-Crowned Warbler	<i>Vermivora celata</i>	N	X	X	X
Nashville Warbler	<i>Vermivora ruficapilla</i>	N		X	X

**Table C-1. Merced River historical avian data overview.\***

FAMILY NAME Species Common Name	Scientific Name	Native (N) or Introduced (I)	Historical Data		Observed in Merced Alliance Surveys
			Lower River	Upper River	
Wilson's Warbler <sup>1</sup>	<i>Wilsonia pusilla</i>	N	X	X	
<b>PELECANIDAE: Pelicans</b>					
Pelicans	<i>Pelecanus sp.</i>		X		
White Pelicans	<i>Pelecanus erythrorhynchos</i>	N	X		
<b>PHALACROCORACIDAE: Cormorants</b>					
Double-Crested Cormorant	<i>Phalacrocorax auritus</i>	N	X		X
<b>PICIDAE: Woodpeckers</b>					
Northern Flicker	<i>Colaptes auratus</i>	N	X	X	X
Pileated Woodpecker	<i>Dryocopus pileatus</i>	N		X	X
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	N	X	X	X
Lewis's Woodpecker	<i>Melanerpes lewis</i>	N	X		
White-Headed Woodpecker	<i>Picooides albolarvatus</i>	N		X	X
Black-Backed Woodpecker	<i>Picooides arcticus</i>	N		X	
Nuttall's Woodpecker	<i>Picooides nuttallii</i>	N	X	X	X
Downy Woodpecker	<i>Picooides pubescens</i>	N	X	X	X
Hairy Woodpecker	<i>Picooides villosus</i>	N		X	X
Red-Breasted Sapsucker	<i>Sphyrapicus ruber</i>	N	X	X	X
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>	N		X	X
<b>PODICIPEDIDAE: Grebes</b>					
Pied-Billed Grebe*	<i>Podilymbus podiceps</i>	N	X	X	X
<b>PROCELLARIIDAE: Petrels and shearwaters</b>					
Buller's Shearwater	<i>Puffinus Bulleri</i>	N	X		
<b>RALLIDAE: Coots and rails</b>					
American Coot	<i>Fulica americana</i>	N	X	X	X
Common Moorhen	<i>Gallinula chloropus</i>	N	X		X
Virginia Rail	<i>Rallus limicola</i>	N	X	X	X
<b>REGULIDAE: Kinglets</b>					
Ruby-Crowned Kinglet	<i>Regulus calendula</i>	N	X	X	X
Golden-Crowned Kinglet	<i>Regulus satrapa</i>	N		X	X
<b>SCOLOPACIDAE: Snipes and sandpipers</b>					
Spotted Sandpiper	<i>Actitis macularia</i>	N		X	X
Rock Sandpiper	<i>Calidris ptilocnemis</i>	N		X	
Common Snipe	<i>Gallinago gallinago</i>	N	X	X	
<b>SITTIDAE: Nuthatches</b>					
Red-Breasted Nuthatch	<i>Sitta canadensis</i>	N		X	X
White-Breasted Nuthatch	<i>Sitta carolinensis</i>	N	X	X	X
Pygmy Nuthatch	<i>Sitta pygmaea</i>	N		X	
<b>STRIGIDAE: Typical Owls</b>					

**Table C-1. Merced River historical avian data overview.\***

FAMILY NAME Species Common Name	Scientific Name	Native (N) or Introduced (I)	Historical Data		Observed in Merced Alliance Surveys
			Lower River	Upper River	
Northern Saw-Whet Owl	<i>Aegolius acadicus</i>	N		X	
Long-Eared Owl	<i>Asio otus wilsonianus</i>	N		X	
Burrowing Owl	<i>Athene cunicularia</i>	N	X	X	
Great Horned Owl	<i>Bubo virginianus</i>	N	X	X	
Northern Pygmy-Owl	<i>Glaucidium gnoma</i>	N		X	
Flammulated Owl	<i>Otus flammeolus</i>	N		X	
Western Screech-Owl	<i>Otus kennicottii</i>	N		X	
Great Gray Owl	<i>Strix nebulosa</i>	N		X	
Spotted Owl	<i>Strix occidentalis</i>	N		X	
<b>STURNIDAE: Starlings</b>					
Northern Mockingbird	<i>Mimus polyglottos</i>	N	X		X
European Starling	<i>Sturnus vulgaris</i>	I	X	X	X
California Thrasher	<i>Toxostoma redivivum</i>	N		X	
<b>TETRAONIDAE: Grouse</b>					
Blue Grouse	<i>Dendragapus obscurus</i>	N		X	
White-Tailed Ptarmigan	<i>Lagopus leucurus</i>	I		X	
<b>THRAUPIDAE: Tanagers</b>					
Western Tanager	<i>Piranga ludoviciana</i>	N	X	X	X
<b>TIMALIIDAE: Babblers</b>					
Pallid Wrentit	<i>Chamaea fasciata henshawi</i>	N		X	
<b>TROCHILIDAE: Hummingbirds</b>					
Black-Chinned Hummingbird	<i>Archilochus alexandri</i>	N	X		X
Anna's Hummingbird	<i>Calypte anna</i>	N	X	X	X
Rufous Hummingbird	<i>Selasphorus rufus</i>	N		X	
Allen's Hummingbird	<i>Selasphorus sasin</i>	N		X	
Calliope Hummingbird	<i>Stellula calliope</i>	N		X	
<b>TROGLODYTIDAE: Wrens</b>					
Canyon Wren	<i>Catherpes mexicanus</i>	N	X	X	X
Western Marsh Wren	<i>Cistothorus palustris plesius</i>	N		X	
Rock Wren	<i>Salpinctes obsoletus</i>	N	X	X	X
Bewick's Wren	<i>Thromanes bewickii</i>	N	X	X	X
House Wren	<i>Troglodytes aedon</i>	N	X	X	X
Winter Wren	<i>Troglodytes troglodytes</i>	N		X	X
<b>TURDIDAE: Thrushes</b>					
American Robin	<i>Turdus migratorius</i>	N	X	X	X
Hermit Thrush	<i>Catharus guttatus</i>	N		X	X
Alaska Hermit Thrush	<i>Catharus guttatus guttatus</i>	N		X	
Dwarf Hermit Thrush	<i>Catharus guttatus nanus</i>	N		X	

**Table C-1. Merced River historical avian data overview.\***

FAMILY NAME Species Common Name	Scientific Name	Native (N) or Introduced (I)	Historical Data		Observed in Merced Alliance Surveys
			Lower River	Upper River	
Sierra Hermit Thrush	<i>Catharus guttatus sequoiensis</i>	N		X	
Swainson's Thrush <sup>1</sup>	<i>Catharus ustulatus</i>	N	X	X	
Varied Thrush	<i>Ixoreus naevius</i>	N	X	X	X
Townsend's Solitaire	<i>Myadestes townsendi townsendi</i>	N		X	
Mountain Bluebird	<i>Sialia currucoides</i>	N		X	
Western Bluebird	<i>Sialia mexicana</i>	N	X	X	
<b>TYRANNIDAE: New World flycatchers</b>					
Olive-Sided Flycatcher	<i>Contopus borealis (cooperi)</i>	N		X	
Western Wood-Pewee	<i>Contopus sordidulus</i>	N		X	X
Pacific-Slope Flycatcher	<i>Empidonax difficilis</i>	N		X	X
Hammond's Flycatcher	<i>Empidonax hammondii</i>	N		X	
Dusky Flycatcher	<i>Empidonax oberholseri</i>	N		X	
Traill's Flycatcher (Willow or Alder Flycatcher)	<i>Empidonax traillii</i>	N		X	
Willow Flycatcher <sup>1</sup>	<i>Empidonax traillii</i>	N	X	X	
Gray Flycatcher	<i>Empidonax wrightii</i>	N		X	
Ash-Throated Flycatcher	<i>Myiarchus cinerascens</i>	N	X	X	X
Black Phoebe	<i>Sayornis nigricans</i>	N	X	X	X
Say's Phoebe	<i>Sayornis saya</i>	N	X	X	X
Western Kingbird	<i>Tyrannus verticalis</i>	N	X	X	X
<b>TYTONIDAE: Barn-owls</b>					
Barn Owl	<i>Tyto alba</i>	N	X		X
<b>VIREONIDAE: Vireos</b>					
Least Bell's Vireo <sup>1</sup>	<i>Vireo bellii pusillus</i>	N	X		
Cassin's Vireo	<i>Vireo cassinii</i>	N	X	X	X
Warbling Vireo <sup>1</sup>	<i>Vireo gilvus</i>	N	X	X	X
Least Vireo	<i>Virio pusillus</i>	N	X		
Hutton's Vireo	<i>Vireo huttoni</i>	N		X	X

\* Data summarized from historical occurrences presented in Table C-2.

<sup>1</sup> One of sixteen riparian-associated focal species, as classified by RHJV (2000).

Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River										Upper River				
	State	Federal <sup>1</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDB Occurrences <sup>6</sup>			MVZ Data <sup>7</sup>		MVZ data <sup>7</sup>	CNDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)	
			MEEA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding	Pre-1940	Post-1940						
<b>ACCIPITRIDAE: Hawks and Eagles</b>																	
Cooper's Hawk	CSC											X		X		X	
Northern Goshawk	CSC											X				X	
Sharp-Shinned Hawk	CSC									X				X		X	
Golden Eagle	CSC	FP														X	
Red-Tailed Hawk			X		X					X				X		X	
Red-Shouldered Hawk (Red-Bellied Hawk)										X							
Feruginous Hawk	CSC									X							
Swainson's Hawk <sup>12</sup>	ST							X						X			
Northern Harrier*	CSC									X				X		X	
White Tailed Kite (Nesting)		FP								X							
Bald Eagle	SE	FT								X				X		X	
Osprey	CSC				X											X	
<b>AEGITHALIDAE: Bushtits</b>																	
Common Bushtit					X							X		X		X	
<b>ALAUDIDAE: Larks</b>																	
Horned Lark	CSC													X		X	
California Horned Lark	CSC								X								
<b>ALCEDINIDAE: Kingfishers</b>																	
Belted Kingfisher					X							X		X		X	
<b>ANATIDAE: Ducks, Geese, and Swans</b>																	
Wood Duck			X											X			
Mallard			X		X							X		X		X	

Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River							Upper River					
	State	Federal <sup>1</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDB Occurrences <sup>6</sup>			MVZ Data <sup>7</sup>	MVZ data <sup>7</sup>	CNDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)
			MEEA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding						
White-Fronted Goose															
Ring-Necked Duck										X					X
Bufflehead															X
Common Merganser															X
American Merganser										X					
Geese										X					
<b>APODIDAE: Swifts</b>															
White-Throated Swift															X
Vaux's Swift	CSC														X
Black Swift															X
<b>ARDEIDAE: Herons</b>															
Great Egret															
Great Blue Heron					X										X
Green Heron					X										
Black-Crowned Night-Heron										X					
<b>BOMBYCILLIDAE: Waxwings</b>															
Phainopepla (Silky Flycatcher)															
Cedar Waxwing										X					X
<b>CARDINALIDAE: Buntings</b>															
Lazuli Bunting															X
Indigo Bunting															X
Black-Headed Grosbeak <sup>12</sup>														X	X
<b>CAPRIMULGIDAE: Nighthawks</b>															

Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River								Upper River				
	State	Federal <sup>2</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDB Occurrences <sup>6</sup>			MVZ Data <sup>7</sup>	MVZ data <sup>7</sup>	CNDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)
			MEFA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding						
Common Nighthawk															X
Lesser Nighthawk (Texas Nighthawk )									X						
Common Poorwill									X						X
<b>CATHARTIDAE: L New World vultures</b>															
Turkey Vulture			X		X	X			X			X			X
<b>CERTHIIDAE: Creepers</b>															
Brown Creeper									X						X
Blue-Gray Gnatcatcher															X
<b>CHARADRIIDAE: Lapwings And plovers</b>															
Killdeer			X		X	X			X			X			
<b>CINCLIDAE: Dippers</b>															
American Dipper												X			X
<b>COLUMBIIDAE: Doves</b>															
Band-Tailed Pigeon												X			X
Rock Pigeon												X			
Mourning Dove									X			X			X
<b>CORVIDAE: Crows and jays</b>															
Western Scrub-Jay			X		X	X									X
Scrub Jay					X	X			X			X			
American Crow			X		X	X									
Common Raven					X				X			X			X
Steller's Jay														X	X
Clark's Nutcracker												X			X

Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River						Upper River							
	State	Federal <sup>1</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDB Occurrences <sup>6</sup>		MVZ Data <sup>7</sup>		MVZ data <sup>7</sup>	CNDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)	
			MEEA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding	Pre-1940	Post-1940					
<b>EMBERIZIDAE: New World sparrows and Old World buntings</b>																
Rufous-Crowned Sparrow													X			
Grasshopper Sparrow												X				
Sage Sparrow (Bell's Sparrow)	CSC								X			X				
Black-Throated Sparrow													X			X
Lark Sparrow									X							
Lutescent Warbler									X							
Dark-Eyed Junco									X			X				X
Shufeldt's Junco												X				
Oregon Junco												X				
Sierra Junco									X			X				
Lincoln's Sparrow									X			X				X
Song Sparrow <sup>12</sup>					X								X			X
Modoc Song Sparrow																
Heermann's Song Sparrow									X							
Merrill's Song Sparrow									X							
Mountain Song Sparrow									X							
Rusty Song Sparrow									X							
English Sparrow									X							
Savannah Sparrow									X				X			X
Aleutian Savannah Sparrow									X							
Alberta Fox Sparrow									X							
Fox Sparrow												X		X		X



Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River							Upper River						
	State <sup>1</sup>	Federal <sup>2</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDDB Occurrences <sup>6</sup>			MVZ Data <sup>7</sup>	MVZ data <sup>7</sup>	CNDDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)	
			MEEA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding							Pre-1940
Sooty Fox Sparrow																
Kodiak Fox Sparrow																
Large (Thick)-Billed Fox Sparrow																
Valdez Fox Sparrow																
Shumigan Fox Sparrow										X						
Green-Tailed Towhee															X	
California Towhee				X											X	
Rufous-Sided Towhee													X			
Brown Towhee													X			
Spotted Towhee				X											X	
Black-Chinned Sparrow															X	
Brewer's Sparrow															X	
Western Chipping Sparrow															X	
Golden-Crowned Sparrow															X	
White-Crowned Sparrow															X	
Intermediate Sparrow																
<b>FALCONIDAE: Caracaras And Falcons</b>																
Merlin (Pigeon Hawk)	CSC													X		
Prairie Falcon	CSC													X		
Peregrine Falcon	SE															X
American Kestrel (Sparrow Hawk)															X	X
<b>FRINGILLIDAE: Buntings, finches, grosbeaks, moineaux, Old World finches, roseolins, sparrows</b>																

Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River							Upper River						
	State <sup>1</sup>	Federal <sup>2</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDB Occurrences <sup>6</sup>			MVZ Data <sup>7</sup>	MVZ Data <sup>7</sup>	MVZ data <sup>7</sup>	CNDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)
			MEEA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding							
Lawrence's Goldfinch																X
Pine Siskin																X
Lesser Goldfinch				X		X								X		X
American Goldfinch				X		X										X
Cassin's Finch											X					X
House Finch (Linnet)				X			X							X		X
Purple Finch																
California Purple Finch											X					
Evening Grosbeak											X					X
Brewer's Blackbird											X					X
Salt Marsh Common Yellowthroat											X					
Blue Grosbeak <sup>12</sup>											X					
Gray-Crowned Rosy-Finch																X
Brown-Headed Cowbird							X				X					X
Red Crossbill											X					X
Pine Grosbeak											X					X
Western Tanager											X				X	X
American Redstart																X
Siskin																
Western Meadowlark														X		X
Cliff Swallow				X							X					
Barn Swallow											X					X
Purple Martin														X		X

Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River								Upper River				
	State <sup>1</sup>	Federal <sup>2</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDB Occurrences <sup>6</sup>		MVZ Data <sup>7</sup>		MVZ data <sup>7</sup>	CNDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)
			MEAs <sup>3</sup> (RM 44.0)	HEPAs <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding	Pre-1940					
Northern Rough Winged Swallow															X
Violet-Green Swallow												X			X
Tree Swallow <sup>12</sup>			X	X	X				X						X
Swallow									X						
<b>ICTERIDAE: Troupials and allies</b>															
Red-Winged Blackbird			X	X	X				X			X			X
Tricolored Blackbird <sup>12</sup>	CSC							X	X						
Bullock's Oriole			X						X			X			X
Northern Oriole												X			
Blackbird									X						
Yellow-Headed Blackbird															X
<b>LANIIDAE: Shrikes</b>															
California Shrike (Loggerhead Shrike)	CSC									X					
Shrike									X						
<b>LARIDAE: Gulls and terns</b>															
California Gull	CSC														X
Sabine's Gull										X					
<b>MOTACILLIDAE: Pipits and wagtails</b>															
American Pipit										X					X
<b>ODONTOPHORIDAE: New World quails</b>															
California Quail			X							X				X	X
Mountain Quail											X		X		X

Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River							Upper River				
	State <sup>1</sup>	Federal <sup>2</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDB Occurrences <sup>6</sup>			MVZ Data <sup>7</sup>	CNDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)
			MEEA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding					
<b>PARIDAE: Chickadees and tits</b>														
Oak Titmouse				X										X
Mountain Chickadee									X					X
Plain Titmouse											X			
Chestnut-Backed Chickadee														X
<b>PARULIDAE: New World warblers</b>														
Black-Throated Gray Warbler														X
Yellow-Rumped Warbler											X			X
Yellow-Rumped Warbler (Audubon Warbler)									X					
Hermit Warbler										X				X
Yellow Warbler <sup>12</sup>	CSC									X				X
Morcom's Yellow Warbler										X				
Townsend's Warbler														X
Common Yellowthroat <sup>12</sup>	CSC			X		X	X							X
Chat														
Yellow-Breasted Chat <sup>12</sup>	CSC													X
Macgillivray's Warbler									X					X
Orange-Crowned Warbler									X		X			X
Nashville Warbler									X					X
Wilson's Warbler <sup>12</sup>									X		X			X
<b>PELECANIDAE: Pelicans</b>														
Pelicans														X
White Pelicans	CSC													X

Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River								Upper River				
	State <sup>1</sup>	Federal <sup>2</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDB Occurrences <sup>6</sup>		MVZ Data <sup>7</sup>		MVZ data <sup>7</sup>	CNDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)
			MEEA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding	Pre-1940					
<b>PHALACROCORACIDAE: Cormorants</b>															
Double-Crested Cormorant		CSC													
<b>PICIDAE: Woodpeckers</b>															
Northern Flicker				X											X
Pileated Woodpecker															X
Acorn Woodpecker															X
Lewis's Woodpecker															
White-Headed Woodpecker															X
Black-Backed Woodpecker															X
Nuttall's Woodpecker				X		X									X
Downy Woodpecker				X											X
Hairy Woodpecker															X
Red-Breasted Sapsucker															X
Williamson's Sapsucker															X
<b>PODICIPEDIDAE: Grebes</b>															
Pied-Billed Grebe*															X
<b>PROCELLARIIDAE: Petrels and shearwaters</b>															
Buller's Shearwater				X											
<b>RALLIDAE: Coots and rails</b>															
American Coot				X		X									X
Common Moorhen						X									
Virginia Rail															X
<b>REGULIDAE: Kinglets</b>															
Ruby-Crowned Kinglet														X	X

Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River							Upper River					
	State	Federal <sup>2</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDB Occurrences <sup>6</sup>			MVZ Data <sup>7</sup>	CNDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)	
			MEEA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding						Pre-1940
<b>SCOLOPACIDAE: Snipes and sandpipers</b>															
Golden-Crowned Kinglet															X
Spotted Sandpiper															X
Rock Sandpiper												X			
Common Snipe									X						X
<b>SITTIDAE: Nuthatches</b>															
Red-Breasted Nuthatch															X
White-Breasted Nuthatch				X											X
Pygmy Nuthatch															X
<b>STRIGIDAE (Typical Owls)</b>															
Northern Saw-Whet Owl															X
Long-Eared Owl		CSC													
Burrowing Owl		CSC							X						
Great Horned Owl															X
Northern Pygmy-Owl															X
Flammulated Owl															X
Western Screech-Owl															X
Great Gray Owl		SE													X
Spotted Owl		CSC	FT												X
<b>STURNIDAE: Starlings</b>															
Northern Mockingbird				X											
European Starling				X										X	
California Thrasher														X	
<b>TETRAONIDAE: Grouse</b>															

Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River							Upper River				
	State	Federal <sup>1</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDB Occurrences <sup>6</sup>			MVZ Data <sup>7</sup>	CNDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)
			MEFA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding					
Blue Grouse														X
White-Tailed Ptarmigan											X			X
<b>THRAUPIDAE: Tanagers</b>														
Western Tanager									X					X
<b>TIMALIIDAE: Babblers</b>														
Pallid Wren											X			X
<b>TROCHILIDAE: Hummingbirds</b>														
Black-Chinned Hummingbird										X				
Anna's Hummingbird					X						X			X
Rufous Hummingbird									X					X
Allen's Hummingbird									X					X
Calliope Hummingbird									X					X
<b>TROGLODYTIDAE: Wrens</b>														
Canyon Wren									X					X
Western Marsh Wren									X					X
Rock Wren				X					X		X			X
Bewick's Wren			X		X				X		X			X
House Wren				X	X				X		X			X
Winter Wren									X					X
<b>TURDIDAE: Thrushes</b>														
American Robin			X						X					X
Hermit Thrush											X			X
Alaska Hermit Thrush									X					
Dwarf Hermit Thrush									X					

Table C-2. Merced River watershed detailed historical avian data.

FAMILY NAME Species Common Name	Listing		Lower River								Upper River				
	State <sup>1</sup>	Federal <sup>2</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDDB Occurrences <sup>6</sup>			MVZ Data <sup>7</sup>	MVZ data <sup>7</sup>	CNDDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)
			MEEA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding						
Sierra Hermit Thrush											X				
Swainson's Thrush <sup>12</sup>										X					X
Varied Thrush										X					
Townsend's Solitaire										X					X
Mountain Bluebird										X		X			X
Western Bluebird										X		X			X
<b>TYRANNIDAE: New World flycatchers</b>															
Olive-Sided Flycatcher															X
Western Wood-Pewee										X		X			X
Pacific-Slope Flycatcher										X					X
Hammond's Flycatcher										X					X
Dusky Flycatcher										X		X			X
Trail's Flycatcher (Willow or Alder Flycatcher)	SE											X			
Willow Flycatcher <sup>12</sup>	SE									X		X			X
Gray Flycatcher															X
Ash-Throated Flycatcher				X	X	X	X			X		X			X
Black Phoebe				X						X		X			X
Say's Phoebe										X		X			
Western Kingbird				X		X				X		X			X
<b>TYTONIDAE: Barn-owls</b>															
Barn Owl										X					
<b>VIREONIDAE: Vireos</b>															
Least Bell's Vireo <sup>12</sup>	SE	FE								X					



**Table C-2. Merced River watershed detailed historical avian data.**

FAMILY NAME Species Common Name	Listing		Lower River							Upper River							
	State <sup>1</sup>	Federal <sup>2</sup>	PRBO Monitoring		SWS Baseline Monitoring <sup>5</sup>		CNDDB Occurrences <sup>6</sup>			MVZ Data <sup>7</sup>		MVZ data <sup>7</sup>	CNDDB Occurrences <sup>8</sup>	BLM <sup>9</sup> (RM 67.1-94.0)	National Forests <sup>10</sup> (RM 94.0 to 105.5)	Yosemite National Park <sup>11</sup> (RM 105.5 to headwaters)	
			MEFA <sup>3</sup> (RM 44.0)	HEPA <sup>4</sup> (RM 47.6)	MERR (RM 50)	HEPA (RM 47.6)	MRR	DTR	Surrounding	Pre-1940	Post-1940						
Cassin's Vireo										X						X	
Warbling Vireo <sup>12</sup>										X				X			X
Least Vireo										X							
Hutton's Vireo												X		X			X

Note: Not all sites are in the riparian corridor

<sup>1</sup> State status: SE = listed as endangered under the California Endangered Species Act

ST = listed as threatened under the California Endangered Species Act

CSC = CDFG species of special concern

<sup>2</sup> Federal status: FE = listed as endangered under the Federal Endangered Species Act

FT = listed as threatened under the Federal Endangered Species Act

FP = Proposed for listing under the Federal Endangered Species Act

<sup>3</sup> Data collected from PRBO 1998 Rapid Assessment. MEFA = Merced Falls Avenue (not on mainstem).

<sup>4</sup> Data collected from Stillwater Sciences 2004 point count surveys (Stillwater Sciences 2006) and PRBO 1998 Rapid Assessment (CPIF 2005); HEPA = Henderson Park (on mainstem).

<sup>5</sup> Data collected as part of the Merced Phase IV Project documenting baseline fish and avian conditions at the Merced River Ranch and throughout the Dredger Tailings Reach (Stillwater Sciences 2006).

<sup>6</sup> California Natural Diversity Database: Searched Rarefinds 3.0.5 for plants and animals by selected USGS quads on March 20, 2005.

<sup>7</sup> Field notes and inventory of collected specimens from the Archives of the Museum of Vertebrate Zoology, UC Berkeley.

<sup>8</sup> California Natural Diversity Database: Searched Rarefinds 3.0.5 for plants and animals by selected USGS quads on April 26, 2005.

<sup>9</sup> BLM (Bureau of Land Management). 1978. Unpublished, untitled data. BLM data from Peggy Cranston, Wildlife Biologist. Totals of birds, mammals, and herpetofauna from Peggy Cranston.

<sup>10</sup> Data collected by the Sierra National Forest (year unknown) and the Stanislaus National Forest (year unknown) in the Merced River and tributaries.

<sup>11</sup> Siegel, R.B. and D.F. DeSante. 2002. Avian inventory of Yosemite National Park (1998-2000): Final Report. The Institute for Bird Populations, Point Reyes Station, California, 100 p.

<sup>12</sup> One of sixteen riparian-associated focal species, as classified by RHJV (2000).

**Part 4: Transect Veg Data****A. Data entry**

- a) Copy the file Z:\data\_structure\palovegtrans.dbf (on Data Central's C: drive) to your local work space. DON'T ENTER DATA INTO THIS ORIGINAL STRUCTURE!
- b) Rename the file veg01.dbf (using the appropriate year)
- c) Open Visual FoxPro, and open the file you just created. Depending on your personal preference, use the APPEND command or the BROWSE command (CTRL-Y adds another record) to add records to the database table.
- d) Back this file up on data central and to a floppy at the end of your work.

**Part 6. Point Count Data****A. Data entry**

1. Remove plastic covers and turn on the computer.
2. At the C:\ prompt type *CD POINTCT*
3. At the C:\POINTCT prompt type *FOXPRO*
4. Push the "CAPS LOCK" key

At this point, you may wish to type *SET BELL OFF*, then *SET CARRY ON* at the command window to make data entry more expedient.

5. At the command window type *DO C:\PROCEDURE\POINTCNT*
6. Select "Enter point count data", then select the file in which you want to enter data
7. Enter data using the following as an example:

<b>SPEC:</b> SOSP	<b>STATE:</b> CA
<b>DATA:</b> VL (S=song, V=visual, C=call; L=less than 50m, G=greater than 50m, F=flyover)	<b>REGION:</b> MARIN
<b>How many? (with same data):</b> 1	<b>STATION:</b> PALO
	<b>DATE:</b> 05/15/98
<b>SITE:</b> 10	<b>VISIT:</b> 1
<b>TIME:</b> 0710	<b>HAB:</b> (Leave blank)
<b>Continue entering data? (Y/N):</b> Y (enter N here if done entering data)	
<b>Enter data, hit escape or page down to append record(s).</b>	

**B. Proofing and making corrections**

1. To proof data, select "Proof a point count database"
2. Select "1" for "Proof 1 transect for data entry errors"
3. Enter transect abbreviation (i.e. PALO) and date (i.e. 05/01/98)
4. Proof data on screen against raw data forms
5. To make corrections, select "Quit" to exit the point count program
6. Open the file you want to correct by typing *USE*, space, and then the file name in the command window (i.e. *USE PALOPC98*)
7. Type *BROWSE* and locate records to be changed, make corrections, and hit the CTRL and END keys at the same time to save the data.

Before adding records that the proof says are missing, browse the data to make sure.

**C. Backing-up**

1. Type *QUIT* to exit FOXPRO
2. Insert Backup disc
3. At the C:\POINTCT prompt, type *copy C:\POINTCT(filename).DBF A:\(filename).DBF*  
Example: *copy C:\POINTCNT\PALOPC98.DBF A:\PALOPC98.DBF*

**Figure C-3. Palomarin Handbook Appendix 3, parts 4 and 6.**

## **APPENDIX D**

# **EXISTING FLOW STATION DATA**

- **Table D-1**      **Merced River temperature and flow stations.**



**Table D-1. Merced River temperature and flow stations.**

Agency <sup>1</sup>	Station Name (Station ID)	River Mile <sup>2</sup>	Latitude	Longitude	Elev. (ft)	Station Data Format	Data Type	Period of Record
<b>Mainstem Merced River</b>								
USGS	Merced R Slough near Newman CA (11273000)	1.5	37.3599	120.9616	59	River Discharge Flow (cfs)	Peak	12/5/1950 - 00/00/1972
						River Discharge Flow (cfs)	Daily	10/01/1941 - 09/30/1972
CDEC	Merced River near Stevinson (MST)	4	37.371	120.9616	82	Mean Daily Flow (cfs)	Daily	3/30/1999 - present
						Water Temperature (deg F)	Daily	07/01/2000 - 08/01/2004
						River Discharge Flow (cfs)	Hourly	05/27/1997 - 08/01/2004
						River Stage (ft)	Hourly	5/13/1997 - present
						Water Temperature (deg F)	Hourly	07/01/2000 - 08/01/2004
USGS	Merced R near Stevinson CA (11272500)	4	37.3708	120.9305	73	River Discharge Flow (cfs)	Peak	5/3/1924 - 12/30/2001
						River Discharge Flow (cfs)	Daily	10/1/1940 - 9/30/2002
USGS	Merced R near Livingston (11271500)	16	37.3913	120.7871	82	River Discharge Flow (cfs)	Peak	6/5/1922 - 2/23/1944
						River Discharge Flow (cfs)	Daily	4/1/1922 - 2/29/1944
CDWR	Merced River at Cressy (CRS)	27	37.425	120.663	165	River Discharge Flow (cfs)	Daily	3/30/1999 - present
						Water Temperature (deg F)	Daily	10/23/2000 - present
						River Discharge Flow (cfs)	Hourly	3/20/1997 - present
						River Stage (ft)	Hourly	3/20/1997 - present
						Water Temperature (deg F)	Hourly	10/23/2000 - present
USGS	Merced R at Shaffer Bridge near Cressy (11271290)	32	37.4541	120.6088	341	River Discharge Flow (cfs)	Daily	10/1/1965 - 9/30/2004
						Mean Daily Flow (cfs)	Daily	3/30/1998 - present
CDEC	Merced River near Snelling (MSN)	45	37.502	120.451	260	River Discharge Flow (cfs)	Hourly	04/22/1998 - present
						River Stage (ft)	Hourly	4/22/1998 - present
CDEC	Merced River below Merced Falls (MMF)	53	37.522	120.331	310	River Discharge Flow (cfs)	Hourly	06/18/1998 - present
						River Stage (ft)	Hourly	5/13/1997 - present
USGS	Northside Canal at Merced Falls (11270800)	53.5	37.5227	120.3344	394	River Discharge Flow (cfs)	Daily	10/1/1986 - 9/30/1994
						Reservoir Elevation (ft)	Hourly	05/28/1997 - present
Merced Co	Merced Falls Forebay (MFF)	53.5	37.523	120.329		Reservoir Storage (ft)	Hourly	06/18/1998 - present

Table D-1. Merced River temperature and flow stations.

Agency <sup>1</sup>	Station Name (Station ID)	River Mile <sup>2</sup>	Latitude	Longitude	Elev. (ft)	Station Data Format	Data Type	Period of Record
USGS	Merced R near Merced Falls (MRC)	53.5	37.522	120.331	311	Full Natural Flow (af)		1/1/1988 - present
						Full Natural Flow (af)		10/1/1900 - present
						Monthly Flow Volume (af)		10/1/1964 - present
USGS	Merced R below Merced Falls Dam near Snelling CA (11270900)	53.5	37.5216	120.3324	341	River Discharge Flow (cfs)	Peak	1/31/1911 - 6/18/2007
						River Discharge Flow (cfs)	Daily	4/1/1901 - 9/30/2007
USGS	McSwain Powerhouse near Snelling CA (11270610)	54	37.5213	120.3099	443.6	River Discharge Flow (cfs)	Daily	10/1/1973 - 9/30/2002
Merced Co	Lake McSwain (MCS)	55	37.52	120.309	425	Reservoir Storage (af)	Monthly	07/01/1966 - present
						Reservoir Storage (af)	Hourly	06/18/1998 - present
						Reservoir, Schedule Release (cfs)	Event	10/01/1995 - present
MeID	Merced Main Canal (MMC)	60	37.57	120.27		Diversion Canal Flow (af)		5/1/1993 - 9/1/1995
USGS	Exchequer Powerhouse at Exchequer CA (11269700)	61	37.5835	120.2757	181	River Discharge Flow (cfs)	Daily	10/1/1973 - 9/30/2002
						River Discharge Flow (cfs)	Daily	4/7/1902 - 8/20/1964
						River Discharge Flow (cfs)	Peak	4/1/1901 - 9/30/1964
						Incremental Precipitation (in)	Daily	01/09/1989 - present
Merced CO	New Exchequer - Lake McClure (EXC)	61.5	37.585	120.27		Reservoir Elevation (ft)	Daily	01/01/1985 - present
						Reservoir Inflow (cfs)	Daily	01/02/1994 - present
						Reservoir Outflow, cfs	Daily	10/03/1993 - present
						Reservoir Storage (af)	Daily	01/01/1985 - present
						Reservoir Storage Change (af)	Daily	10/04/1993 - present
						Reservoir Top Conserve Storage (af)	Daily	10/20/2000 - present
						Reservoir Outflow (cfs)	Event	05/14/1997 - 07/22/1998

Table D-1. Merced River temperature and flow stations.

Agency <sup>1</sup>	Station Name (Station ID)	River Mile <sup>2</sup>	Latitude	Longitude	Elev. (ft)	Station Data Format	Data Type	Period of Record
Merced CO	Lake McClure (MCR)	61.5	37.584	120.267	876	Lake Computed Evaporation (af)	Monthly	03/01/1995 - present
						Reservoir Storage (af)	Monthly	10/01/1965 - present
USGS	Merced R at Bagby Ca (11268500)	77	37.611	120.1316	780	River Discharge Flow (cfs)	Peak	4/6/1923 - 11/24/1965
						River Discharge Flow (cfs)	Daily	10/1/1922 - 9/30/1966
CDEC	Merced River near Briceburg (MBB)	90	37.599	119.978	1150	River Discharge Flow (cfs)	Hourly	06/09/1999 - present
						River Stage (ft)	Hourly	06/07/1999 - present
USGS	Merced near Briceburg (11268200)	94	37.6358	119.9332	3868	River Discharge Flow (cfs)	Peak	5/7/1966 - 5/28/1974
						River Discharge Flow (cfs)	Daily	10/1/1965 - 10/8/1974
USGS <sup>3</sup>	Merced R at Pohono Bridge near Yosemite CA (11266500)	116	37.7169	119.6663	3862	River Discharge Flow (cfs)	Real-time	Current Conditions
						River Discharge Flow (cfs)	Peak	6/10/1917 - 5/18/2002
						River Discharge Flow (cfs)	Daily	10/1/1916 - 9/30/2002
USGS	Merced R at Yosemite CA (11265500)	122	37.7438	119.5902	4050	River Stage (ft)	Real-time	Current Conditions
						River Discharge Flow (cfs)	Peak	06/02/1912 - 06/09/1917
USGS <sup>4</sup>	Merced R at Happy Isles Bridge Nr Yosemite CA (11264500)	125	37.732	119.558	4017	River Discharge Flow (cfs)	Daily	04/01/1912 - 03/30/1917
						River Discharge Flow (cfs)	Real-time	Current Conditions
USGS <sup>4</sup>	Merced R at Happy Isles Bridge Nr Yosemite CA (11264500)	125	37.732	119.558	4017	River Stage (ft)	Real-time	Current Conditions
						River Discharge Flow (cfs)	Peak	06/07/1916 - 05/31/2002
<b>South Fork Merced River</b>								
USGS	SF Merced at Wawona CA (11267300)	Approx. 22 (S Fork)	37.5388	119.6621	3968	River Discharge Flow (cfs)	Peak	12/23/1955 - 6/2/1975
						River Discharge Flow (cfs)	Daily	10/1/1958 - 9/30/1968
USGS	SF Merced at Wawona CA (11267500)	--	37.5416	119.6732	3960	River Discharge Flow (cfs)	Peak	04/01/1912 - 05/13/1921
						River Discharge Flow (cfs)	Daily	10/01/1911 - 9/30/1921
USGS	SF Merced R near El Portal CA (11268000)	100	37.6513	119.8855	4053	River Discharge Flow (cfs)	Peak	11/19/1950 - 6/11/1975
						River Discharge Flow (cfs)	Daily	4/1/1951 - 10/7/1975

**Table D-1. Merced River temperature and flow stations.**

Agency <sup>1</sup>	Station Name (Station ID)	River Mile <sup>2</sup>	Latitude	Longitude	Elev. (ft)	Station Data Format	Data Type	Period of Record
<b>Merced River Tributaries</b>								
USGS	Maxwell C at Coulterville CA (11269300)	9mi up trib, 3.5mi up N fork	37.716	120.1899	886	River Discharge Flow (cfs)	Peak	2/8/1960 - 1/13/1980
						River Discharge Flow (cfs)	Daily	10/1/1959 - 9/30/1980
USGS	Dry C near Snelling CA (11271320)	12mi up Dry Ck	37.5549	120.4632	322	River Discharge Flow (cfs)	Peak	4/21/1967 - 2/15/1992
						River Discharge Flow (cfs)	Daily	10/1/1966 - 9/30/1992
USGS	Yosemite C at Yosemite CA (11266000)	122	37.7455	119.5954	3963	River Discharge Flow (cfs)	Peak	06/02/1912 - 06/12/1918

<sup>1</sup> CDEC, Merced Co, MeID, and CDWR data from <http://cdec.water.ca.gov/cgi-progs/queryForm?url=staSearch>; USGS data from: <http://nwis.waterdata.usgs.gov/ca/nwis/inventory/>

<sup>2</sup> River Mile (RM), rather than River Kilometer (RK), designations are reported following USGS convention. All River Miles are derived from the USGS 1:100,000 Digital Land Graph (DLG).

<sup>3</sup> Same as CDEC data station POH.

<sup>4</sup> Same as CDEC data station HIB.



## **APPENDIX E**

# **EXAMPLE DATA SHEETS**

- **Figure E-1**            **On-the-ground habitat mapping data sheet.**
- **Figure E-2**            **Fish survey data sheet.**
- **Figure E-3**            **Benthic macroinvertebrate (BMI) survey data sheet.**
- **Figure E-4**            **BMI sample chain of custody form.**
- **Figure E-5**            **Avian variable circular plot point count data form.**
- **Figure E-6**            **Avian point count vegetation form.**
- **Figure E-7**            **YSI calibration and maintenance log.**



STREAM HABITAT TYPING SURVEY DATA (Merced Alliance)												
Stream/Reach _____						Page _____ of _____						
Team: _____						Date _____						
UTM: (E) _____ NAD 27 (Habitat unit # _____ : U/S or D/S)												
UTM: (N) _____												
Habitat Unit #												
Habitat Type <sup>1</sup>	LGR RUN PLP	HGR POW MCP	CAS SCP	LGR RUN PLP	HGR POW MCP	CAS SCP	LGR RUN PLP	HGR POW MCP	CAS SCP	LGR RUN PLP	HGR POW MCP	CAS SCP
Length (ft)												
Est. Avg. Width (ft)												
Est. Avg. Depth (ft)												
Max. Depth (ft)												
Significant Cover? <sup>2</sup>	INSIGNIF VEG		BLDR WOOD	INSIGNIF VEG		BLDR WOOD	INSIGNIF VEG		BLDR WOOD	INSIGNIF VEG		BLDR WOOD
<b>SUBSTRATE COMPOSITION</b>												
Dominant Substrate	BED	BLD	COB	BED	BLD	COB	BED	BLD	COB	BED	BLD	COB
	GRV	SND	SLT	GRV	SND	SLT	GRV	SND	SLT	GRV	SND	SLT
Subdominant Substrate	BED	BLD	COB	BED	BLD	COB	BED	BLD	COB	BED	BLD	COB
	GRV	SND	SLT	GRV	SND	SLT	GRV	SND	SLT	GRV	SND	SLT
Dominant Bank Substrate	BED	BLD	COB	BED	BLD	COB	BED	BLD	COB	BED	BLD	COB
	GRV	SND	SLT	GRV	SND	SLT	GRV	SND	SLT	GRV	SND	SLT
Time/Temp (C)												
Landmarks or photos												
Large Woody Debris <sup>3</sup> within bankfull width	Diameter		Length	Diameter		Length	Diameter		Length	Diameter		Length
	#	class	class	#	class	class	#	class	class	#	class	class
No. of LWD Pieces within wetted width												
Comments / Observations: Fish? Wildlife? Amphibs? Backwater or side chan. amphib habitat? Riparian? Landmarks, Photo #s, Etc.												

<sup>1</sup> LGR:Low Gradient Riffle, HGR:High Gradient Riffle (>4%), CAScade, RUN, POW:Pocket Water, Pools: PLP=Plunge, MCP=Mid-Channel, SCP=Scour  
The minimum unit length should be 1x active channel width, unless there is something notable or unique about it.

<sup>2</sup> Note if cover is a significant or dominant feature of the unit:  
(e.g., logs in stream, lots of boulders, >25% surface area has instream or low overhanging vegetation, etc.) Q/C initials: \_\_\_\_\_

<sup>3</sup> Criteria for LWD is: any downed wood within bankfull width of channel = or > than 1/2 bankfull width.  
Size classes: 6-12", 12-24", 24-36", or 36"+ x 3-10', 10-25', 25-50', 50-75', 75'+ (ie. 6 | 25 = 6-12", 25-50')

Figure E-1. On-the-ground habitat mapping data sheet.



Stillwater Sciences ~ Merced Alliance Aquatic Bioassessment Datasheet												
Site ID			Date/Time				Staff					
Site Description; Comments; Sample Summary												
GPS Coordinates												
Start:							End:					
Photographs												
Start:							End:					
Reach Length (m)			Gradient (%)		Width Measurements & Average (m)				Physical Habitat Score			
pH (ntu)			Specific Conductivity m/s		Temperature °C				Dissolved Oxygen (mg/l, % saturation)			
Transect	Habitat	Canopy (%)	Depth (ft)	Velocity (ft/s)	Embed (%)	Macrophyte (%)	FOM (%)	Fine (%)	Gravel (%)	Cobble (%)	Boulder (%)	Bedrock (%)
A												
B												
C												
D												
E												
F												
G												
H												
I												
J												
K												
1												
2												

Figure E-3. Benthic macroinvertebrate (BMI) survey data sheet.

Sample Information			# Jars	Date Collected	Time collected	County/Drainage	Stream Name	Picker Initials	Taxonomist Initials
Site Code	Rif #	Transect #							

Chain of Custody		
Relinquished By	Received By	Date

Figure E-4. BMI sample chain of custody form.







## YSI 85 QA/QC Schedule

YSI unit: \_\_\_\_\_ Name: \_\_\_\_\_

**Pre-Calibration Checklist**

Conductivity \_\_\_\_\_ Expiration: \_\_\_\_\_ Date: \_\_\_\_\_

Barometric Pressure: \_\_\_\_\_ Project/Task: \_\_\_\_\_

Site: \_\_\_\_\_ Crew Initials: \_\_\_\_\_

**Instrument Calibration:**

Altitude: \_\_\_\_\_

Parameter	Date last svc'd	Pre-cal observed value	Expected Value ("Cal")	Observed value
Cond (µS/cm)				
DO (%)				
DO (mg/L)				
Temp (°C)				

**Notes:**

- 1 Run Sonde for 15 min after changing DO membrane or re-surfacing and re-calibrate within 6-8 hrs.
- 2 To check DO probe, turn off unit, wait 60 seconds, power up to Run. Observe DO %, should begin as a positive number over 100%, decreasing with every 4-second re-sampling, stable within 60-120 seconds

**Pre-sample Run Checklist:**

Parameter	Observed	Digits Required	Digit Mult.
DO YSI 85 (mg/L)			
Temp (°C)			
DO Winkler titration (mg/L) #1			
DO Winkler titration (mg/L) #2			
DO Winkler titration (mg/L) #3			

---

**End of sample Run Checklist:**

Altitude: \_\_\_\_\_

Date: \_\_\_\_\_ Name: \_\_\_\_\_

Parameter	Observed	Digits Required	Digit Mult.
DO YSI 85 (mg/L)			
Temp (°C)			
DO Winkler titration (mg/L) #1			
DO Winkler titration (mg/L) #2			
DO Winkler titration (mg/L) #3			

Figure E-7. YSI calibration and maintenance log.



## **APPENDIX F**

# **SAMPLING PERMITS**

- **Figure F-1**                      **Stillwater Sciences Section 10 fish sampling permit.**
- **Figure F-2**                      **Point Reyes Bird Observatory capture permit.**



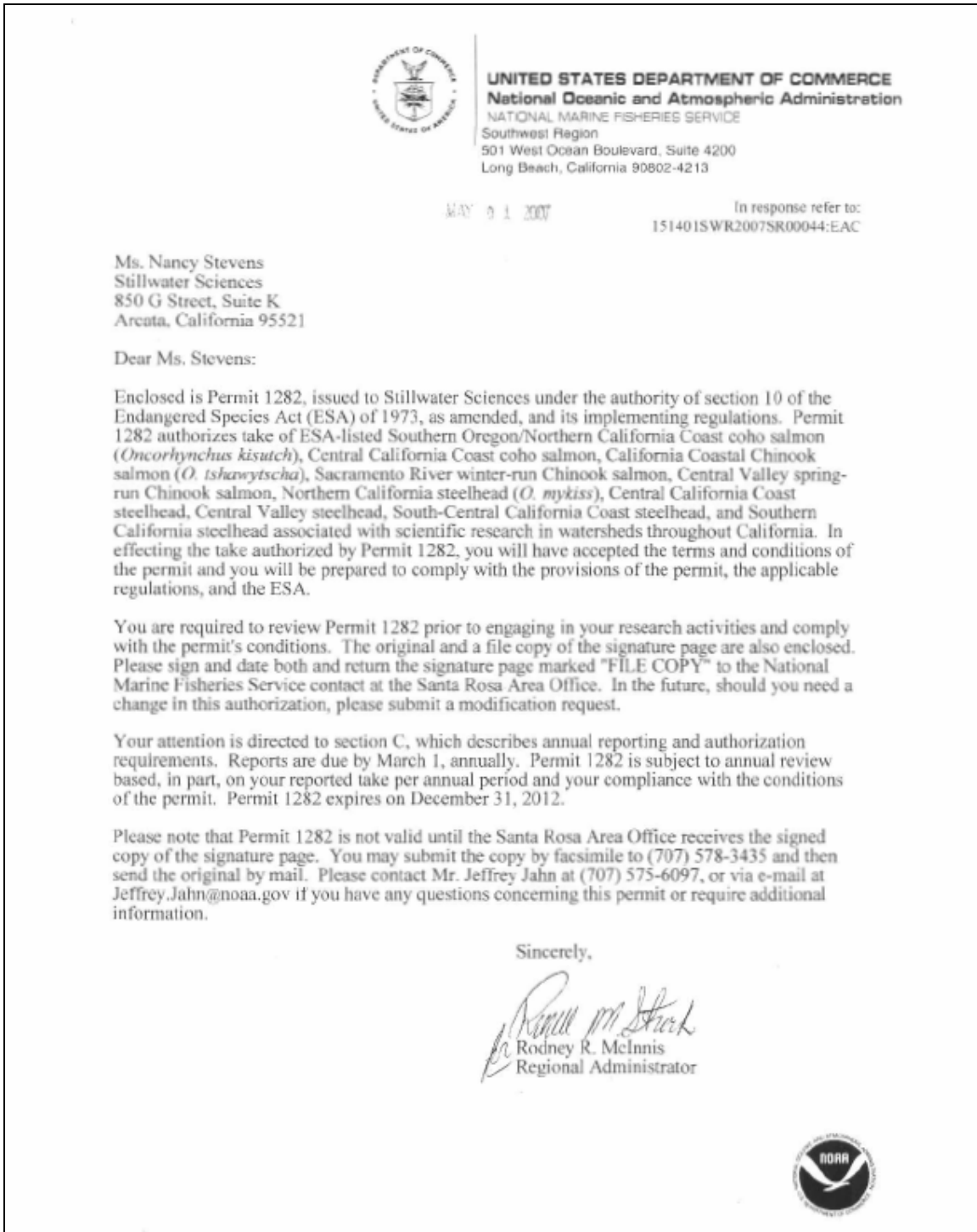


Figure F-1. Stillwater Sciences Section 10 fish sampling permit.

ENDANGERED SPECIES ACT SECTION 10 PERMIT FOR TAKE OF LISTED SPECIES

Permit Number: 1282  
Permit Type: Research  
Expiration Date: December 31, 2012  
Reporting Period: January 1 through December 31  
Annual Reports Due: March 1

Permit Holder:  
 Stillwater Sciences  
 850 G Street, Suite K  
 Arcata, California 95521

Primary Contact:  
 Ms. Nancy Stevens  
 (707) 822-9607 extension 225  
 (707) 822-9608 FAX  
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Investigators:  
 Nick Bauer  
 Lauren Dusek  
 Elizabeth Gilliam  
 Noah Hume  
 Anthony J. Keith  
 Neil Lassetre  
 Russell Liebig  
 Maya Hayden  
 Sharon Kramer  
 Krista Orr  
 Ann-Marie Osterback  
 Ryan Peek  
 William Sears  
 Maia Singer  
 Matthew Sloat  
 Wayne Swaney  
 Scott Wilcox

Authorization:  
 This authorization is subject to the provisions of the Endangered Species Act (ESA) of 1973 (16 U.S.C. \* 1531-1543) as amended, the National Marine Fisheries Service (NMFS) regulations governing ESA-listed species permits (50 CFR Parts 222-226), and the conditions set forth hereinafter.

Stillwater Sciences (Stillwater) is hereby authorized to take Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*), Central California Coast (CCC) coho salmon, California Coastal (CC) Chinook salmon (*O. tshawytscha*), Sacramento River winter-run (SRWR) Chinook salmon, Central Valley spring-run (CVSR) Chinook salmon, Northern California (NC) steelhead (*O. mykiss*), CCC steelhead, Central Valley (CV) steelhead, South-Central California Coast (S-CCC) steelhead, and Southern California (SC) steelhead, (henceforth referred to as "ESA-listed salmonids"), all listed under the ESA, for scientific research purposes, as cited in the permit holder's applications. Take numbers are listed by category in section A of this permit.

**Figure F-1 (cont'd). Stillwater Sciences Section 10 fish sampling permit.**

Background:

This is original Permit 1282. This permit authorizes Stillwater non-lethal take of juvenile and adult ESA-listed salmonids associated with 11 research projects throughout California. This permit also authorizes unintentional mortalities of juvenile ESA-listed salmonids associated with research activities. The research goals for which ESA-listed salmonids may be taken include: (1) to contribute to the general body of scientific knowledge pertaining to the biology and ecology of ESA-listed salmonids; (2) to evaluate past resource management and habitat restoration actions; and (3) to guide future resource management and habitat restoration actions to provide maximum benefit to ESA-listed salmonid populations and habitat. The 11 research projects that are authorized by this permit are described in detail below, including the locations, times, and manner by which ESA-listed salmonids may be taken. Some projects have been organized into two or more studies, as described below.

*Project 1: Santa Paula Creek Salmonid Surveys* will evaluate SC steelhead distribution, population abundance, and habitat utilization in Santa Paula Creek, a tributary to Santa Clara River, in Ventura County, California. The purpose of Project 1 is to provide baseline information to guide habitat restoration and the remediation of fish passage barriers on mainstem Santa Paula Creek.

*Study 1a: Juvenile Salmonid Electrofishing*

Juvenile SC steelhead may be captured (by backpack electrofishing) during September through May, anesthetized (optional), and handled (identified, measured, weighed). After sampling, all ESA-listed salmonids will be allowed to recover fully and will be released back into the habitat unit from which they were taken.

*Study 1b: Juvenile Salmonid Downstream Migrant Trapping*

A single downstream migrant trap (rotary screw trap, pipe-trap, or fyke-net trap) may be operated annually January through June in lower mainstem Santa Paula Creek. Juvenile SC steelhead may be captured, anesthetized (optional), and handled (identified, measured, weighed). A subset of captured juvenile SC steelhead may be marked using fin-clips, allowed to recover fully, and released upstream of the trap for recapture. All other juvenile ESA-listed salmonids will be allowed to recover fully and will be released downstream of the trap.

In addition to the conditions detailed in sections B and D of this permit, Stillwater shall adhere to the following conditions during the implementation of *Project 1: Santa Paula Creek Salmonid Surveys*:

1. The downstream migrant trap (rotary screw trap, pipe-trap, or fyke-net trap) shall be checked a minimum of two times per day. The trap shall incorporate sufficient opportunities for adult SC steelhead to pass both upstream and downstream of the trap unhindered. The downstream migrant trap shall be closed to fish or removed from the stream during high flows.
2. Fin-clips that are collected from juvenile ESA-listed salmonids, as well as any tissues that are collected from juvenile ESA-listed salmonids that are unintentionally killed during research activities, shall be made available to NMFS upon request.

*Project 2: Tidewater Goby Surveys* will evaluate ESA-listed salmonid and tidewater goby (*Eucyclogobius newberryi*) distribution, population abundance, and habitat utilization in numerous coastal lagoons and estuarine habitats from Del Norte County, California to Monterey County, California. Sampling may occur up to twice annually July through October at any of the following locations: Tillas Slough and Lake Earl/Lake Tolowa in Del Norte County; Stone

**Figure F-1 (cont'd). Stillwater Sciences Section 10 fish sampling permit.**

*Project 8: Merced River Alliance Project Monitoring* will assess non-listed fish populations as well as ESA-listed salmonid distribution, population abundance, habitat utilization, and habitat quality in the lower Merced River in Merced County, California. Sampling may occur at a limited number of survey sites in the lower Merced River (from the San Joaquin River confluence to Crocker-Huffman Dam at approximately river mile (RM) 54) during April through October. Juvenile CV steelhead may be captured (by backpack electrofishing, boat electrofishing, or seine), anesthetized (optional), and handled (identified, measured, weighed). Adult CV steelhead may be captured (by backpack electrofishing, boat electrofishing, or seine), and handled (identified, measured, weighed). After sampling, all ESA-listed salmonids will be allowed to recover fully and will be released back into the habitat unit from which they were taken.

In addition to the conditions detailed in sections B and D of this permit, Stillwater shall adhere to the following conditions during the implementation of *Project 8: Merced River Alliance Project Monitoring*:

1. Backpack electrofishing and boat electrofishing may not be utilized more than a total of 7 days per reporting period (January 1 through December 31), with no more than 2 days consecutively.
2. During April through May:  
From RM 32.5 to RM 52, boat electrofishing is PROHIBITED, except at Ratzlaff and Robinson/Western Stone Reaches.
3. During September through October:  
From RM 32.5 to RM 52, boat electrofishing is PROHIBITED.  
Backpack electrofishing is permitted on stream margins EXCEPT in the vicinity of the following high-use salmonid spawning riffles: RM 45.38, RM 46.37, RM 47.99, RM 50.81, RM 51.56, RM 51.91, and RM 51.92.

**Figure F-1 (cont'd). Stillwater Sciences Section 10 fish sampling permit.**



<p style="text-align: center;"><b>TYPE SUBPERMIT STATION</b></p> <p>TYPE PERMITTEE:</p> <p style="text-align: center;"><b>J</b></p> <p><b>WOOD</b>  <b>PRBO</b>  <b>4990 SHORELINE HIGHWAY</b>  <b>STINSON BEACH CA 94970 9701</b></p>	<p style="text-align: center;"><b>U.S. DEPARTMENT OF THE INTERIOR</b>  <b>U.S. GEOLOGICAL SURVEY</b>  <b>BIOLOGICAL RESOURCES DIVISION</b>  <b>BIRD BANDING LABORATORY</b>  <b>12100 BEECH FOREST ROAD</b>  <b>STE - 4037</b>  <b>LAUREL, MARYLAND 20709-4037</b>  <b>Telephone - 301 - 487 - 5780</b></p> <p style="text-align: center;"><b>FEDERAL BIRD MARKING AND SALVAGE PERMIT</b></p> <p>Under the provisions of Regulations issued under the Migratory Bird Treaty Act of July 3, 1918 (40 Stat. 750) as amended or the Bald Eagle Act of June 6, 1949 (54 Stat. 256) as amended, the person named herein is authorized to capture, for scientific banding or marking purposes, those migratory birds described herein or to salvage birds found dead or accidentally killed during normal banding activities.</p> <p>This authorization is subject to the terms, exceptions and restrictions expressed herein or otherwise applicable and is further subject to any applicable Territorial, State, or Federal Regulations.</p> <p style="text-align: right;">This Permit is invalid unless accompanied by any required State permits or licenses.</p> <p style="text-align: right;"><i>Stephanie Schenk</i>          Director, Bird Banding Lab          (Mar. 1997)</p>	<p>Special Provisions:  <b>AUTHORIZED TO TRAP, NET, BAND, MARK AND TAKE FEATHER SAMPLES ONLY AS DIRECTED BY: POINT REYES BIRD OBSERVATORY GEOFFREY B. GEISEL 4970 SHORELINE HWY STINSON BEACH CA 94970 9701</b></p> <p>Authorized to Use Mist Nets: <b>YES</b> Maximum Number: <b>NA</b></p>
<p>Permit Number: <b>09316-DU</b> Action: <b>REVISE</b> Action Date: <b>09/13/05</b> Valid Until: <b>08/31/2006</b></p> <p>Authorized to Band the Following Species:  <b>ALL SPECIES EXCEPT WATERFOWL, EAGLES OR ENDANGERED/THREATENED SPECIES</b></p> <p>Authorized to Capture or Mark Birds in the Following States:  <b>*CA *</b></p>	<p style="text-align: center;"><b>GENERAL CONDITIONS</b></p> <p>1. The holder of this permit is not authorized to capture or possess migratory birds for any reason other than banding birds for a period of more than 24 hours except the holder shall keep records of disposition of banded birds for a period of five years and shall be reported to the Bird Banding Laboratory upon request.</p> <p>2. The holder of this permit shall keep records accounting for the use of all bands received. Periodic reports covering the use of these bands shall be submitted to the Bird Banding Laboratory in accordance with instructions received therefrom. The holder of this permit shall keep records of disposition of returned birds for a period of five years and shall be reported to the Bird Banding Laboratory upon request.</p> <p>3. The holder of this permit shall not sell, exchange, or transfer bands to unauthorized banders or the general public. All transfers to authorized banders must be communicated to the Bird Banding Laboratory prior to the transfer of bands. Any unused bands remaining when this permit is voluntarily returned, revoked, or expired must be returned to the Bird Banding Laboratory.</p> <p>4. The holder of this permit shall, at all reasonable hours, allow any authorized representative of the U.S. Geological Survey or the U.S. Fish and Wildlife Service to inspect the premises where operations authorized by this permit are conducted and shall allow such representatives to inspect all records relating to such operations.</p> <p>5. This permit may be SUSPENDED or REVOKED by the Director of the U.S. Geological Survey or his authorized representative if the holder fails to comply with any of the provisions of this permit or if the permittee fails to promptly report any suspension or revocation of this permit as required. This permit is, at all times, subject to suspension or revocation at the discretion of the Director.</p>	<p>of the Director or his representative.</p> <p>6. This permit is not transferable and must be carried upon the person of the permittee when exercising the authorizations granted herein.</p> <p>7. All traps, nets or other capture devices shall bear a TAG or LABEL showing the name, address and permit number of the permittee or the trapping area shall be adequately marked with POSTERS provided by the Bird Banding Laboratory. The permittee's name, address and permit number shall be legibly displayed on such posters.</p> <p>8. This permit DOES NOT authorize the capture of any birds on any property, public or private without the CONSENT OF THE OWNER OR CUSTODIAN THEREOF.</p> <p>9. Unless specifically noted on the reverse or in an attached "letter of authorization" from the Bird Banding Laboratory, the following ARE NOT AUTHORIZED:</p> <p>a. The USE OF ANY BAND, clip, paint, ink, signal-sending device or any marking device other than the official numbered leg bands issued by the Bird Banding Laboratory.</p> <p>b. The USE OF BIRD NETS or traps similar to the Italian bird net or the Japanese mist net for the purpose of capturing of birds.</p> <p>c. The use of TRANQUILIZING DRUGS OR OTHER CHEMICALS for the purpose of capturing birds.</p> <p>d. Trapping for or disturbing the nests or nestlings, for the purpose of banding or marking of species designated by the Secretary of the Interior as "ENDANGERED."</p> <p>e. The handling of any PREVIOUSLY BANNED BIRD in any manner which may, based on the file in the Bird Banding Laboratory, be determined to be a bird or which may alter that bird's survival potential behavior or other normal characteristics.</p>

Figure F-2. Point Reyes Bird Observatory capture permit.



## **APPENDIX G**

# **NEW AQUATIC HABITAT MAPPING DATA**

- **Table G-1**      **Comparison of remotely mapped aquatic habitat types (fall 2005) to aquatic habitat types sampled during seasonal fish surveys (summer and fall 2006).**



**Table G-1. Comparison of remotely mapped aquatic habitat types (fall 2005) to aquatic habitat types sampled during seasonal fish surveys (summer and fall 2006).\***

Reach	LGR		HGR		CAS		Run		POW		MCP		LSP		GLD		PLP		Backwater <sup>3</sup>		Margin <sup>3</sup>	
	RFL <sup>1</sup>	SS <sup>2</sup>	RFL <sup>1</sup>	SS <sup>2</sup>	RFL <sup>1</sup>	SS <sup>2</sup>	RFL <sup>1</sup>	SS <sup>2</sup>	RFL <sup>1</sup>	SS <sup>2</sup>	RFL <sup>1</sup>	SS <sup>2</sup>	RFL <sup>1</sup>	SS <sup>2</sup>	RFL <sup>1</sup>	SS <sup>2</sup>	RFL <sup>1</sup>	SS <sup>2</sup>	RFL <sup>1</sup>	SS <sup>2</sup>	RFL <sup>1</sup>	SS <sup>2</sup>
CON	0%	0%	0%	0%	0%	0%	77%	43%	0%	0%	7%	7%	16%	7%	0%	0%	0%	0%	N/A	7%	N/A	36%
ENC	0%	0%	0%	0%	0%	0%	87%	47%	0%	0%	2%	0%	10%	26%	0%	0%	0%	0%	N/A	5%	N/A	21%
GM2	2%	7%	0%	0%	0%	0%	38%	14%	0%	7%	43%	16%	0%	0%	0%	0%	0%	0%	N/A	14%	N/A	14%
GM1	17%	10%	0%	0%	0%	0%	39%	25%	0%	0%	27%	10%	17%	0%	0%	0%	0%	5%	N/A	15%	N/A	35%
DTR	24%	21%	0%	0%	0%	0%	37%	29%	0%	0%	33%	14%	6%	0%	0%	0%	0%	0%	N/A	14%	N/A	21%
MF	12%	33%	0%	0%	0%	0%	7%	33%	0%	0%	77%	0%	0%	0%	0%	0%	3%	0%	N/A	0%	N/A	33%
UF3	24%	25%	2%	0%	0%	0%	27%	38%	0%	0%	42%	21%	3%	4%	2%	4%	0%	0%	N/A	0%	N/A	8%
UF2	20%	38%	5%	8%	0%	0%	40%	38%	0%	0%	33%	15%	1%	0%	1%	0%	0%	0%	N/A	0%	N/A	0%
UF1	42%	33%	5%	8%	0%	0%	12%	17%	0%	0%	35%	25%	0%	8%	6%	8%	0%	0%	N/A	0%	N/A	0%
LB	9%	24%	8%	0%	3%	0%	9%	29%	7%	10%	51%	19%	10%	10%	0%	5%	3%	5%	N/A	0%	N/A	0%
YV	6%	18%	0%	0%	0%	0%	26%	36%	0%	0%	41%	0%	27%	36%	0%	9%	0%	0%	N/A	0%	N/A	0%

\* Aquatic habitat types are defined in Table 5-2; Reach descriptions are provided in Table 5-3.

<sup>1</sup> RFL = Relative frequency (by length) of mapped habitat types for fall 2005 remote coarse-scale aquatic habitat mapping effort.

<sup>2</sup> SS = Relative frequency (by occurrence) of sampled habitat types for 2006 fish surveys.

<sup>3</sup> Margin and backwater habitats were not mapped during the fall 2005 coarse-scale aquatic habitat mapping effort.



## **APPENDIX H**

# **NEW FISH DATA**

- **Table H-1** Fish species lookup table for new data.
- **Table H-2** Principal components analysis (PCA) code look up table.
- **Table H-3** Complete fish survey results (Excel).
- **Table H-4** Complete fish water quality data (Excel).
- **Table H-5** Environmental variable correlation matrix.
- **Figures H-6** Box and whisker charts for a) temperature, b) dissolved oxygen (mg/L), c) dissolved oxygen (%), d) conductivity , and e) turbidity measurements during fish surveys.





Table H-1. Fish species lookup table for new data.

Scientific Name	Common Name	Species Code	Native or Introduced	Anadromous or Resident	Observed in Historical Data
<b>Catostomidae Family</b>					
<i>Catostomus occidentalis</i>	Sucker, Sacramento	SSKR	N	R	Y
<b>Centrarchidae Family</b>					
<i>Lepomis cyanellus</i>	Sunfish, Green	GSF	I	R	Y
<i>Lepomis gibbosus</i>	Sunfish, Pumpkinseed	PSSF	I	R	N
<i>Lepomis macrochirus</i>	Sunfish, Bluegill	BG	I	R	Y
<i>Lepomis microlophus</i>	Sunfish, Redear	RSF	I	R	Y
<i>Micropterus coosae</i>	Bass, Redeye	REB	I	R	Y
<i>Micropterus dolomieu</i>	Bass, Smallmouth	SMB	I	R	Y
<i>Micropterus punctulatus</i>	Bass, Spotted	SPB	I	R	Y
<i>Micropterus salmoides</i>	Bass, Largemouth	LMB	I	R	Y
<i>Pomoxis nigromaculatus</i>	Crappie, Black	BCP	I	R	Y
<b>Cottidae Family</b>					
<i>Cottus asper</i>	Sculpin, Prickly	PSCP	N	R	Y
<i>Cottus gulosus</i>	Sculpin, Riffle	RSCP	N	R	N
<b>Cyprinidae Family</b>					
<i>Carassius auratus</i>	Goldfish	GF	I	R	Y
<i>Cyprinus carpio</i>	Carp, Common	CARP	I	R	Y
<i>Lavinia exilicauda</i>	Hitch	HITCH	N	R	Y
<i>Lavinia symmetricus</i> <sup>1</sup>	Roach, California	ROACH	N	R	Y
<i>Mylopharodon conocephalus</i>	Hardhead	HH	N	R	Y
<i>Notemigonus crysoleucas</i>	Golden Shiner	GSH	I	R	Y
<i>Pogonichthys macrolepidotus</i>	Splittail	SPLT	N	R	Y
<i>Ptychocheilus grandis</i>	Pikeminnow, Sacramento	SPMW	N	R	Y
<i>Ptychocheilus grandis</i> / <i>Mylopharodon conocephalus</i>	Pikeminnow/ Hardhead	SPMW/H H	N	R	Y
<b>Ictaluridae Family</b>					
<i>Ameiurus catus</i>	Catfish, White	WCAT	I	R	Y
<i>Ameiurus nebulosus</i>	Bullhead, Brown	BRBH	I	R	Y
<i>Ictalurus punctatus</i>	Catfish, Channel	CCF	I	R	Y
<b>Moronidae Family</b>					
<i>Morone saxatilis</i>	Bass, Striped	STB	I	A	Y
<b>Percidae Family</b>					
<i>Percina macrolepida</i>	Logperch, Bigscale	BSLP	I	R	Y
<b>Petromyzontidae Family</b>					
<i>Lampetra hubbsi</i>	Lamprey, Kern Brook	KBLAM	N	R	Y

**Table H-1. Fish species lookup table for new data.**

Scientific Name	Common Name	Species Code	Native or Introduced	Anadromous or Resident	Observed in Historical Data
<i>Lampetra tridentata</i>	Lamprey, Pacific	PLAM	N	A	Y
<b>Poeciliidae Family</b>					
<i>Gambusia affinis</i>	Mosquitofish	GAM	I	R	Y
<b>Salmonidae Family</b>					
<i>Oncorhynchus mykiss</i>	Trout, Rainbow	RBT	N	R	Y
<i>Oncorhynchus mykiss</i>	Steelhead/Trout, Rainbow	STH	N	A	Y
<i>Oncorhynchus tshawytscha</i>	Salmon, Chinook	FCS	N	A	Y
<i>Salmo trutta</i>	Trout, Brown	BRN	I	R	Y

\* Data summarized from historical occurrences presented in Table H-3

<sup>1</sup> Moyle (2002) recognizes eight subspecies of California roach based on a combination of morphology, meristics, and zoogeography. Under this suggested classification scheme, roach found in the Merced River are considered to be Sacramento-San Joaquin roach (*Lavinia symmetricus symmetricus*).

**Table H-2. Principal components analysis (PCA) code look up table.**

<b>Variable</b>	<b>Code</b>
Cover	cover
Aquatic vegetation	aq
Cobble	cob
Boulder	bld
Habitat	hab
Run/pool/glide habitats	rpg
Low-gradient riffle	lgr
Average depth	dep_avg
Maximum depth	dep_max
Specific conductivity	conc_cm
Average turbidity (NTU)	ntu_avg
Temperature (°C)	temp
Dissolved oxygen (%)	DO_pct

**Table H-3. Complete fish survey results.**

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

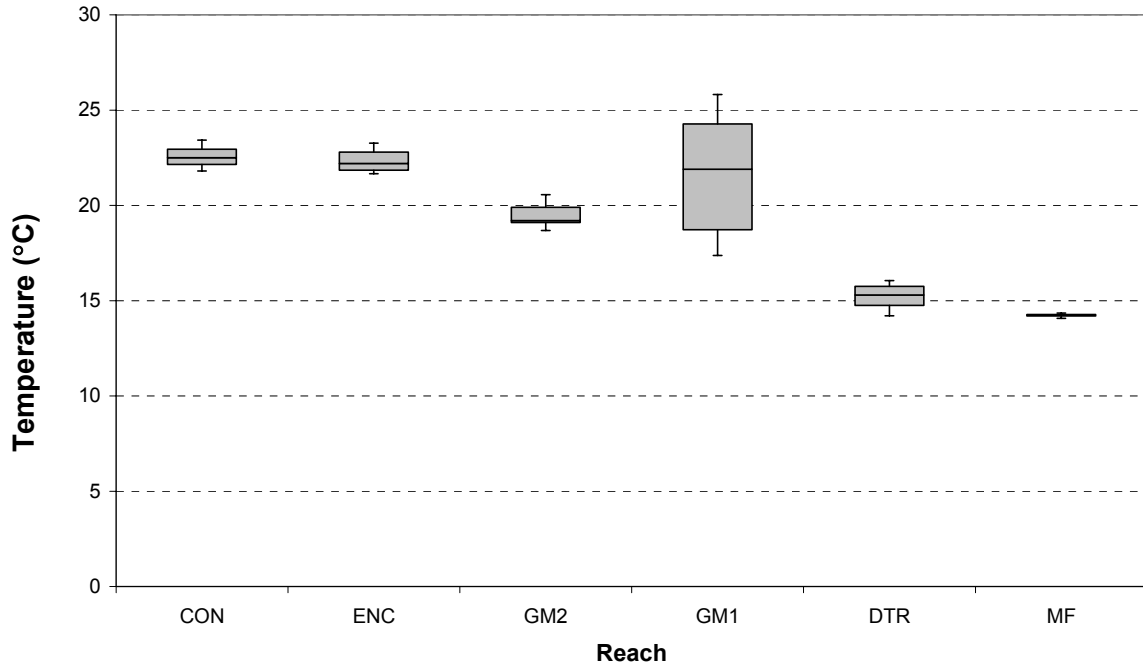
**Table H-4. Complete fish water quality data.**

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

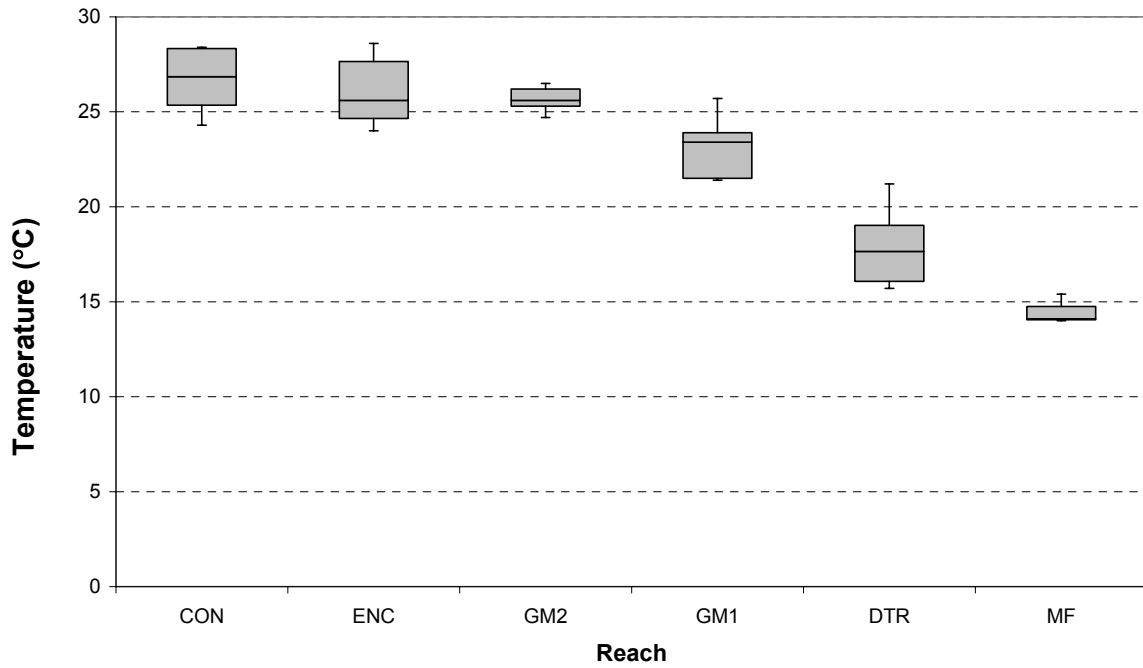
**Table H-5. Environmental variable correlation matrix.**

	DO_mg	cond_c	temp	ph	ntu_avg	hab_lgr	hab_edge	hab_rpg	sub_silt	sub_cob	cov_bld	cov_wood	cov_aq	cov_none	dep_avg	dep_max
DO_mg	1.00	-0.36	-0.18	-0.07	-0.07	-0.02	-0.07	0.11	-0.06	0.04	-0.01	0.32	-0.08	-0.01	0.22	0.19
cond_c	-0.36	1.00	0.11	-0.37	0.47	-0.20	0.19	-0.13	-0.41	-0.41	0.04	-0.27	-0.29	0.14	-0.36	-0.39
temp	-0.18	0.11	1.00	0.56	0.26	-0.12	0.09	-0.04	0.08	-0.27	-0.20	-0.12	0.33	-0.21	0.05	0.13
ph	-0.07	-0.37	0.56	1.00	0.24	-0.08	0.05	-0.03	-0.27	-0.21	-0.08	0.04	0.18	-0.15	-0.06	0.09
ntu_avg	-0.07	0.47	0.26	0.24	1.00	-0.14	0.11	0.02	-0.19	-0.26	0.03	-0.10	-0.09	-0.02	-0.04	0.05
hab_lgr	-0.02	-0.20	0.09	-0.08	-0.14	1.00	-0.21	-0.36	-0.25	0.47	0.50	-0.13	-0.29	0.26	-0.26	-0.25
hab_edge	-0.02	-0.20	-0.12	-0.08	-0.14	1.00	-0.21	-0.36	0.15	-0.30	-0.23	-0.29	0.30	-0.20	-0.41	-0.42
hab_rpg	0.11	-0.13	-0.04	-0.03	0.02	-0.36	-0.65	1.00	-0.19	0.05	-0.02	0.36	-0.23	0.12	0.50	0.54
sub_silt	-0.06	-0.41	0.08	-0.27	-0.19	-0.25	0.15	-0.19	1.00	-0.23	-0.23	-0.11	0.45	-0.37	0.29	0.19
sub_cob	0.04	-0.41	-0.27	-0.21	-0.26	0.47	-0.30	0.05	-0.23	1.00	0.64	-0.21	-0.32	0.27	0.08	-0.08
cov_bld	-0.01	0.04	-0.20	-0.08	0.03	0.50	-0.23	-0.02	-0.23	0.64	1.00	-0.07	-0.28	0.06	0.02	-0.05
cov_wood	0.32	-0.27	-0.12	0.04	-0.10	-0.13	-0.29	0.36	-0.11	-0.07	-0.07	1.00	-0.04	-0.18	0.26	0.41
cov_aq	-0.08	-0.29	0.33	0.18	-0.09	-0.29	0.30	-0.23	0.45	-0.32	-0.28	-0.04	1.00	-0.78	0.21	0.20
cov_none	-0.01	0.14	-0.21	-0.15	-0.02	0.26	-0.20	0.12	-0.37	0.27	0.06	-0.18	-0.78	1.00	-0.29	-0.30
dep_avg	0.22	-0.36	0.05	-0.06	-0.04	-0.26	-0.41	0.50	0.29	0.08	0.02	0.26	0.21	-0.29	1.00	0.88
dep_max	0.19	-0.39	0.13	0.09	0.05	-0.25	-0.42	0.54	0.19	-0.08	-0.05	0.41	0.20	-0.30	0.88	1.00

**i) Summer 2006**

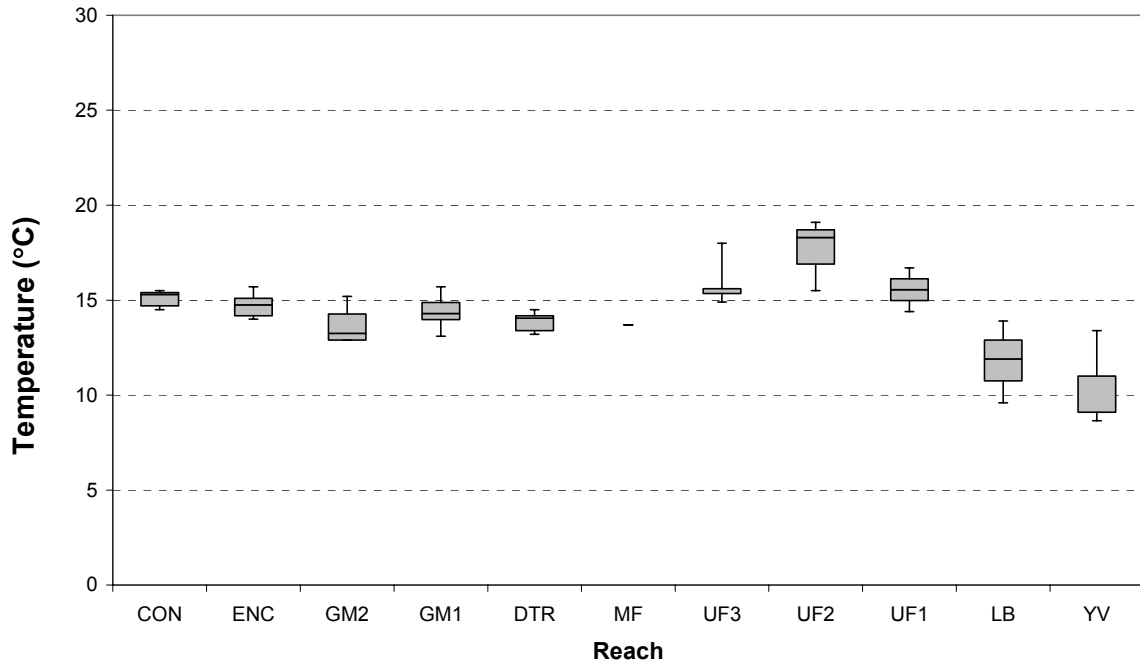


**ii) Summer 2007**



**Figure H-6a. Box and whisker charts for temperature measurements during fish surveys.**

iii) Fall 2006



iv) Fall 2007

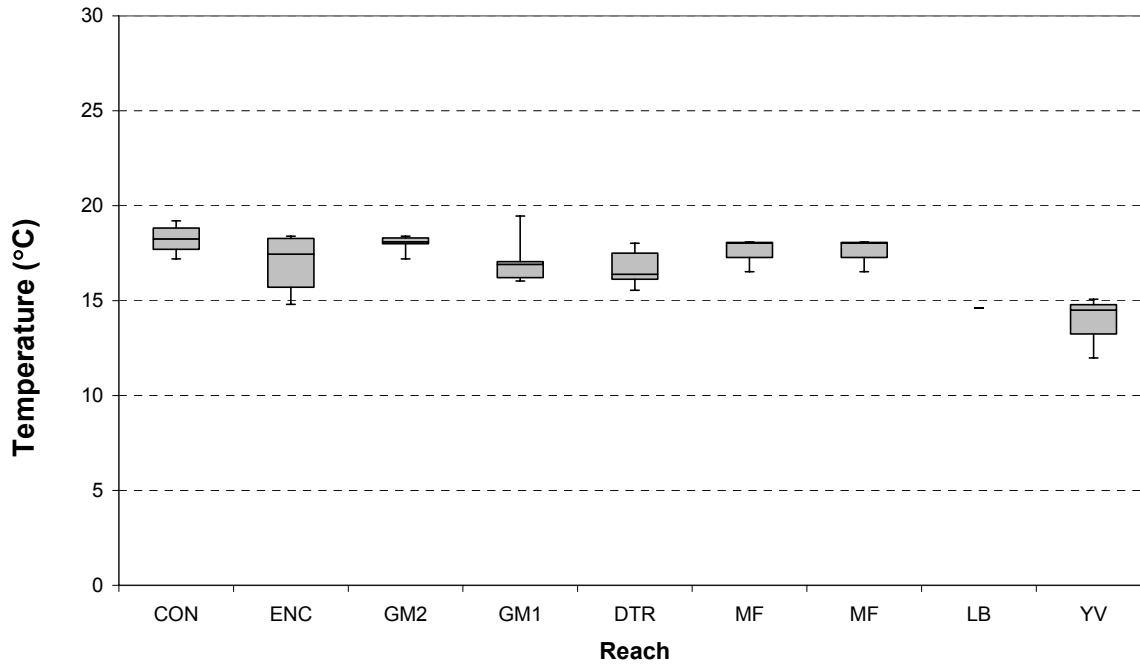
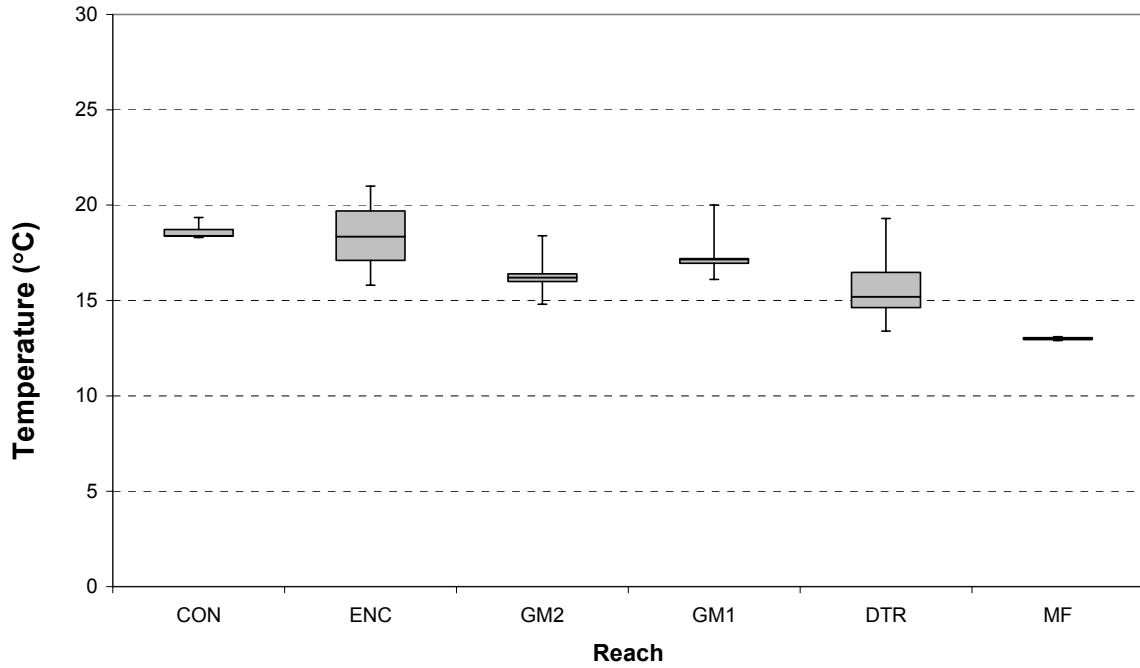


Figure H-6a (cont'd). Box and whisker charts for temperature measurements during fish surveys.

v) Spring 2007



vi) Spring 2008

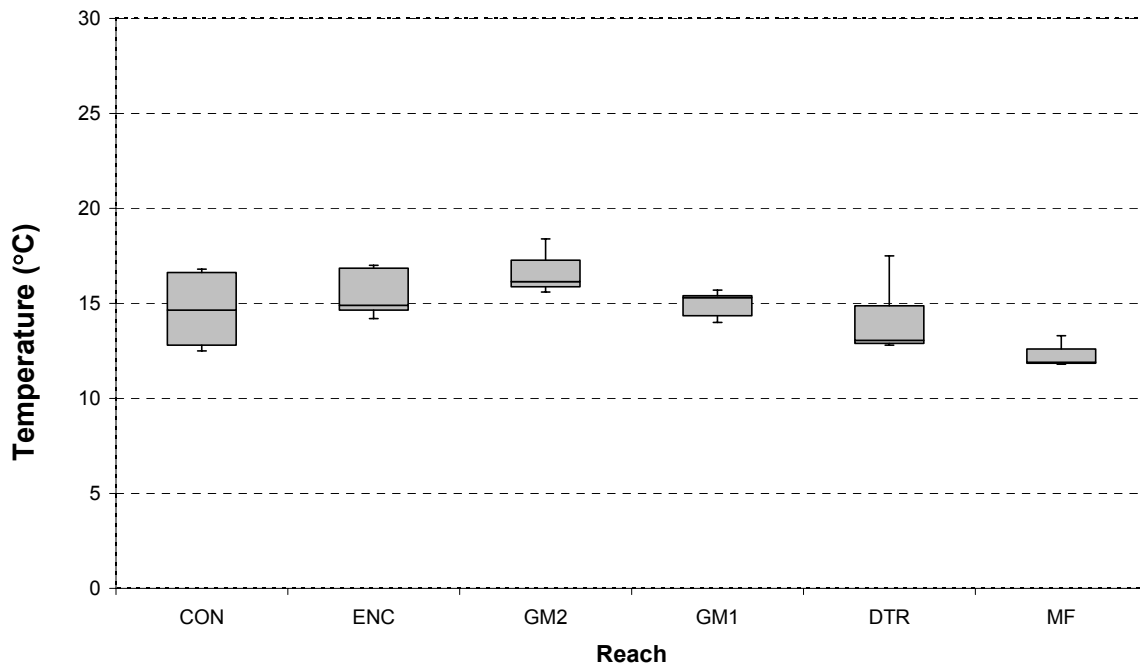
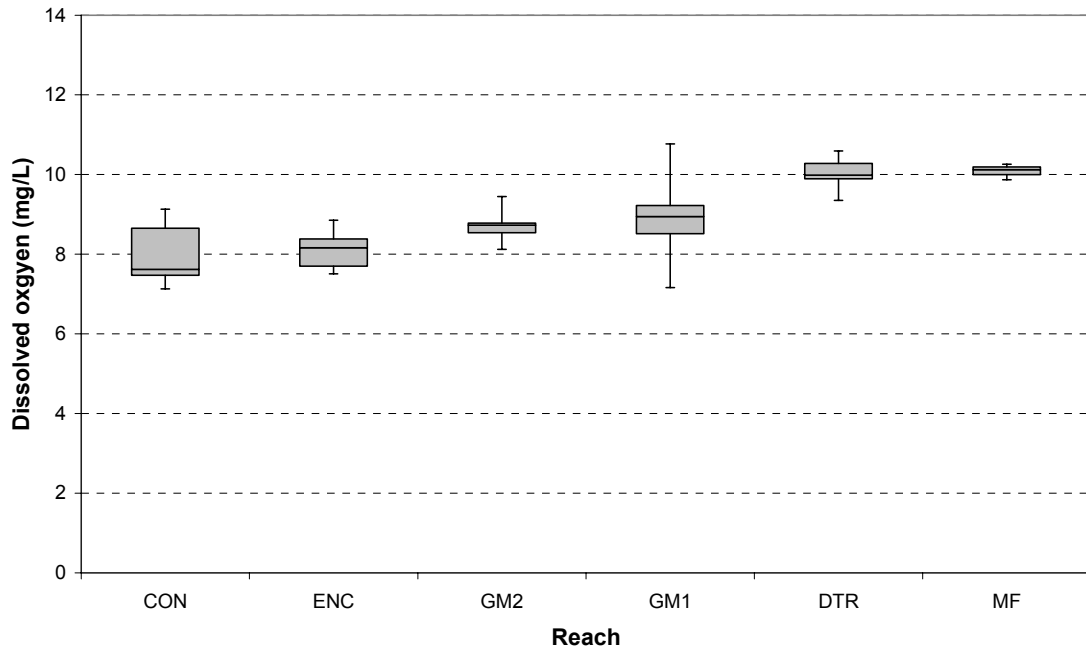


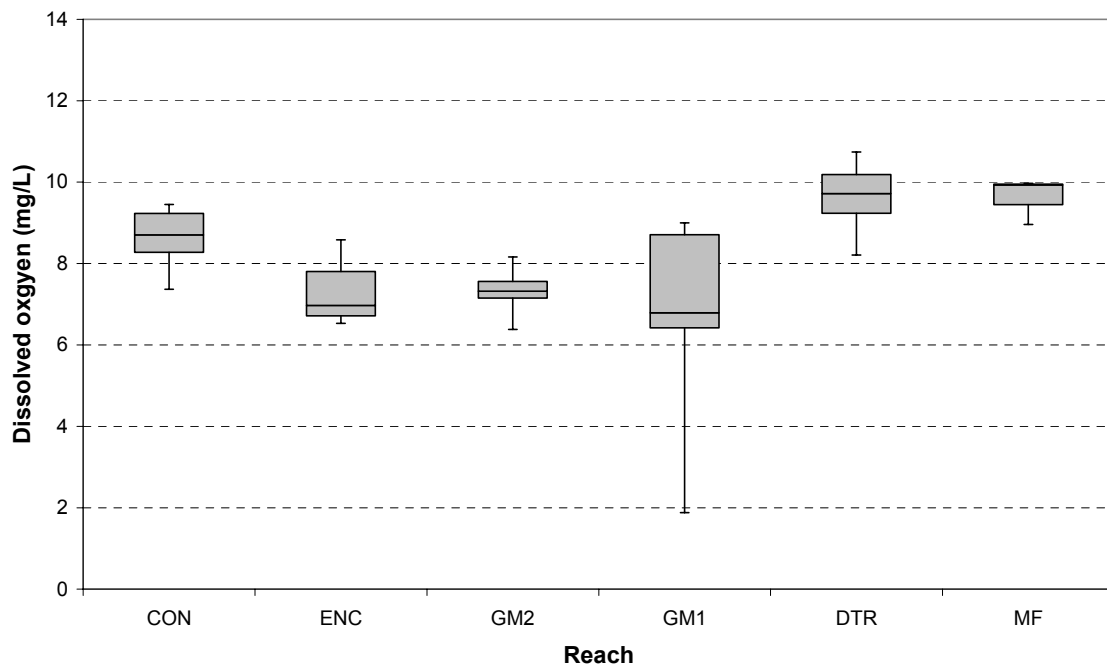
Figure H-6a (cont'd). Box and whisker charts for temperature measurements during fish surveys.



**i) Summer 2006**

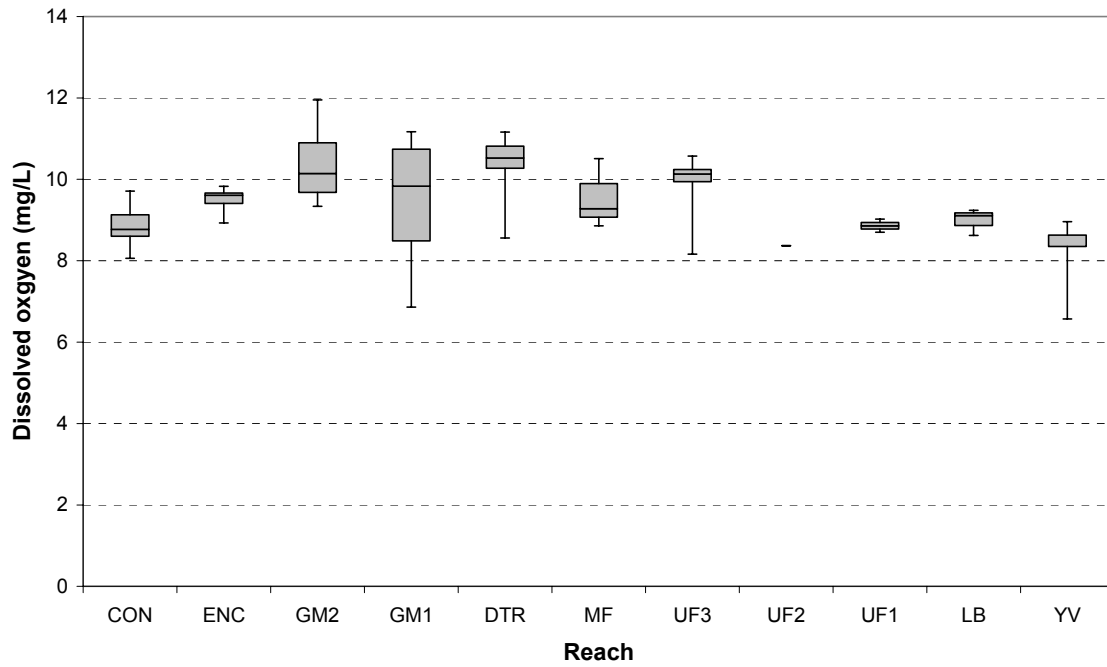


**ii) Summer 2007**



**Figure H-6b. Box and whisker charts for dissolved oxygen (mg/L) measurements during fish surveys.**

iii) Fall 2006



iv) Fall 2007

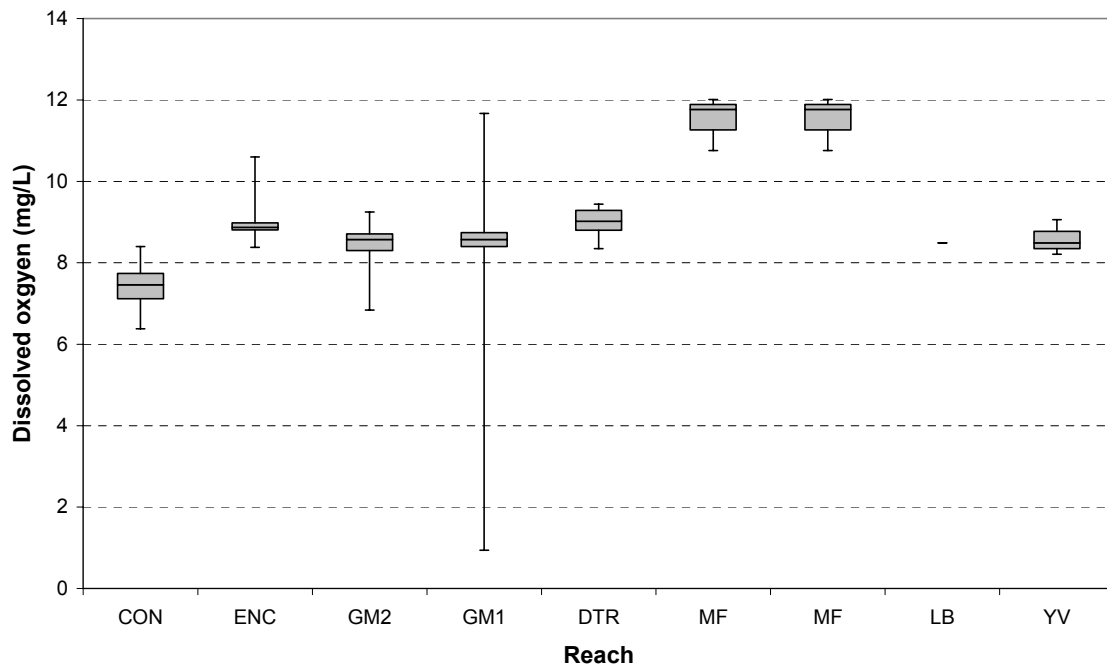
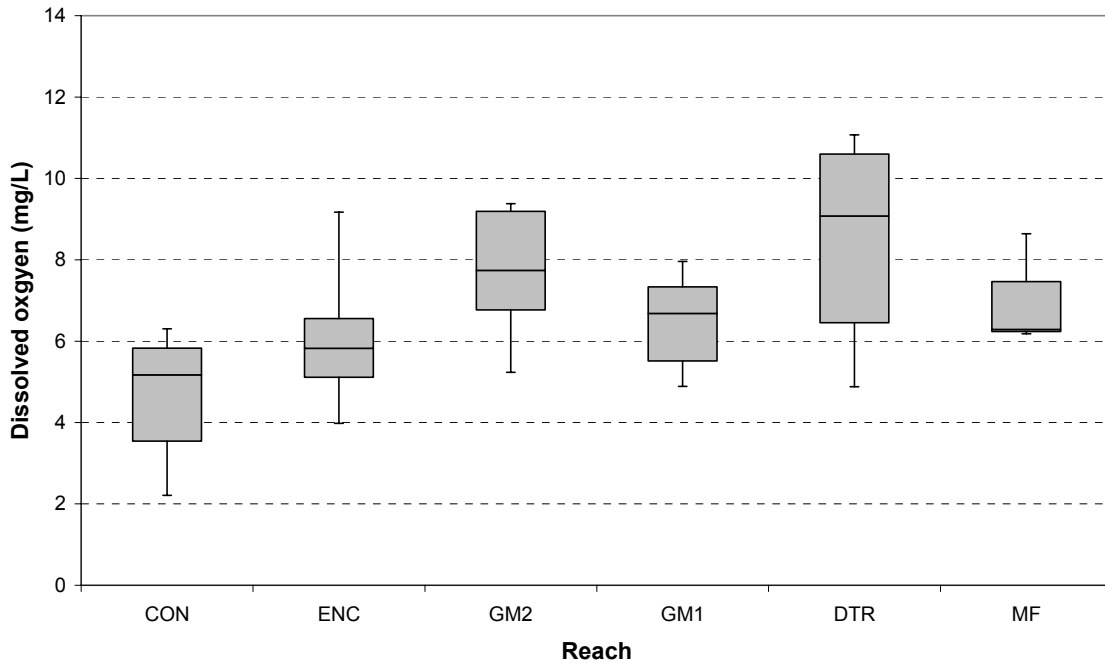


Figure H-6b (cont'd). Box and whisker charts for dissolved oxygen (mg/L) measurements during fish surveys.

v) Spring 2007



vi) Spring 2008

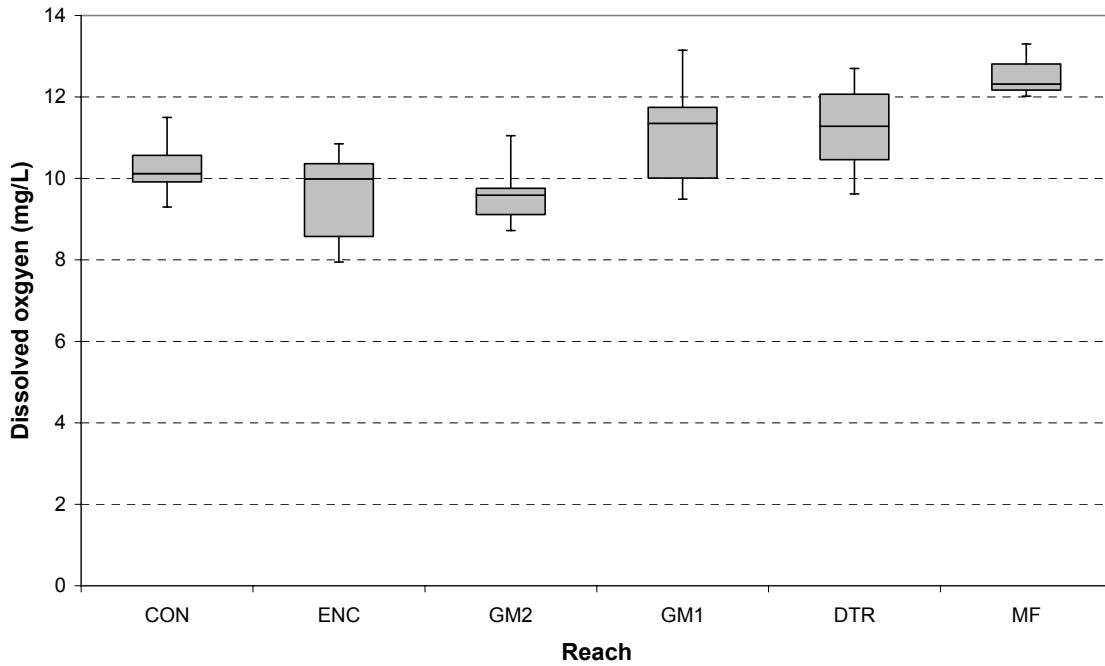
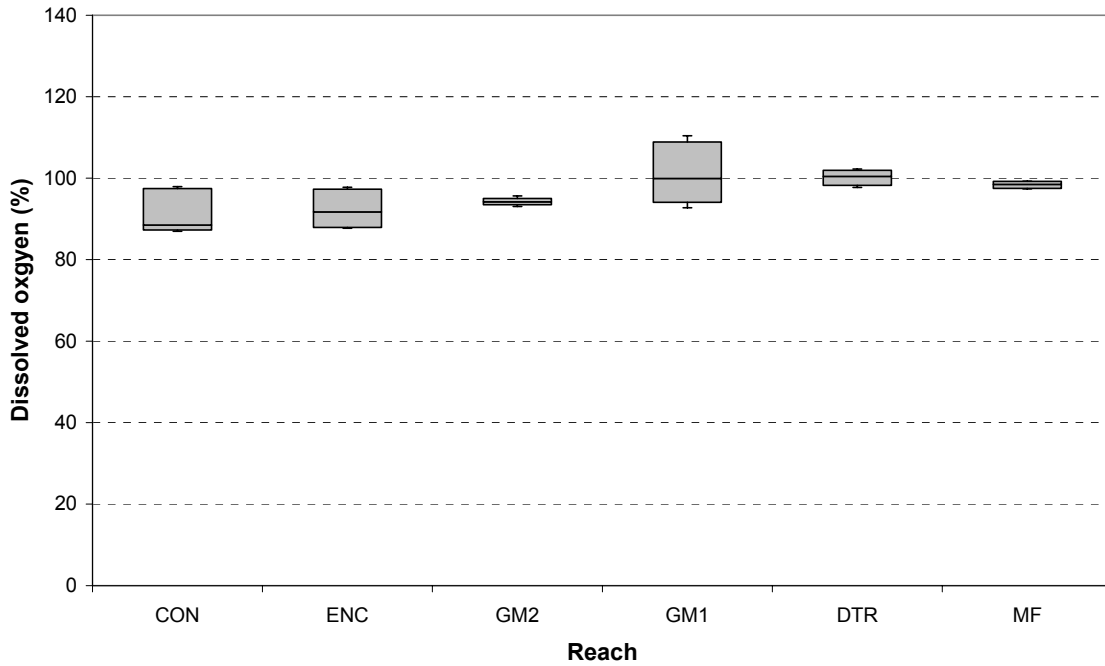
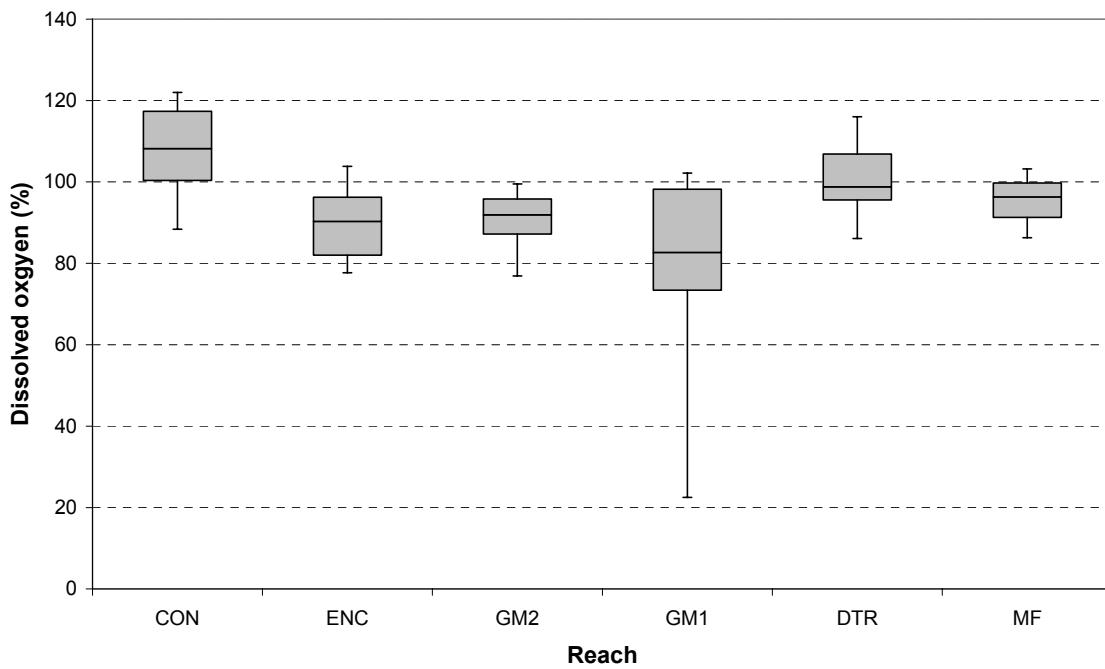


Figure H-6b (cont'd). Box and whisker charts for dissolved oxygen (mg/L) measurements during fish surveys.

**i) Summer 2006**

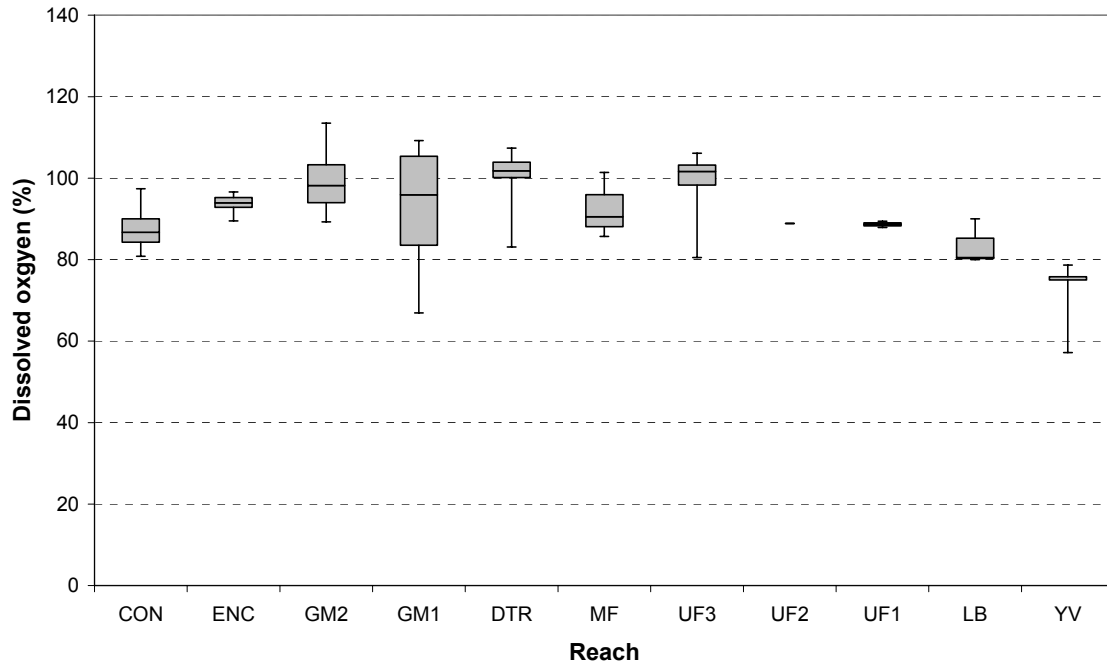


**ii) Summer 2007**



**Figure H-6c. Box and whisker charts for dissolved oxygen (%) measurements during fish surveys.**

iii) Fall 2006



iv) Fall 2007

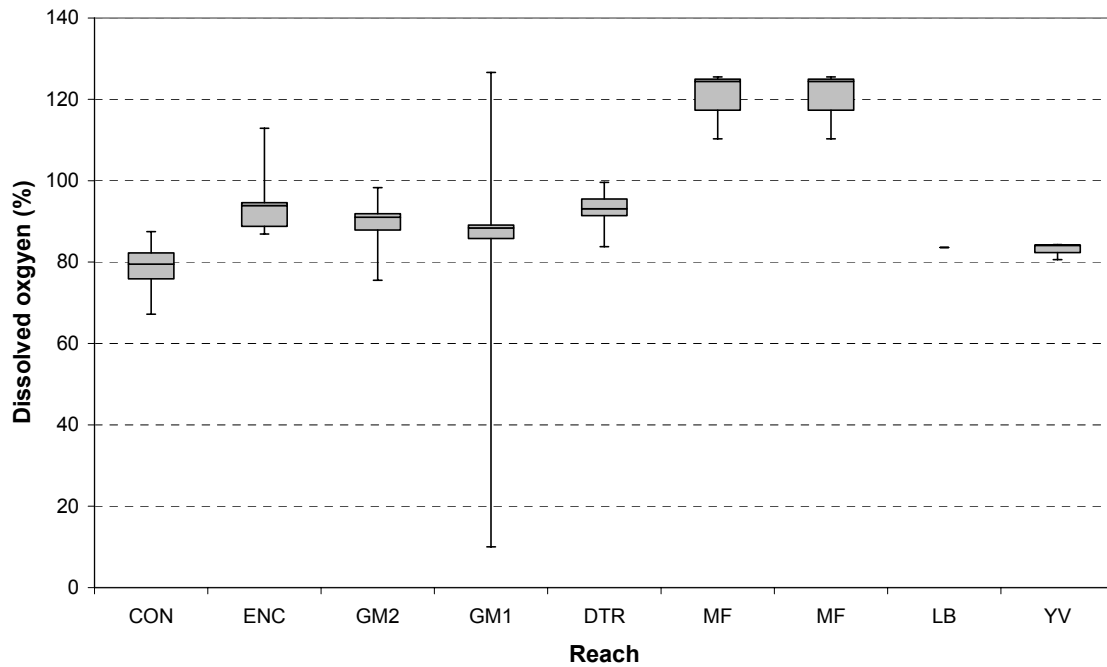
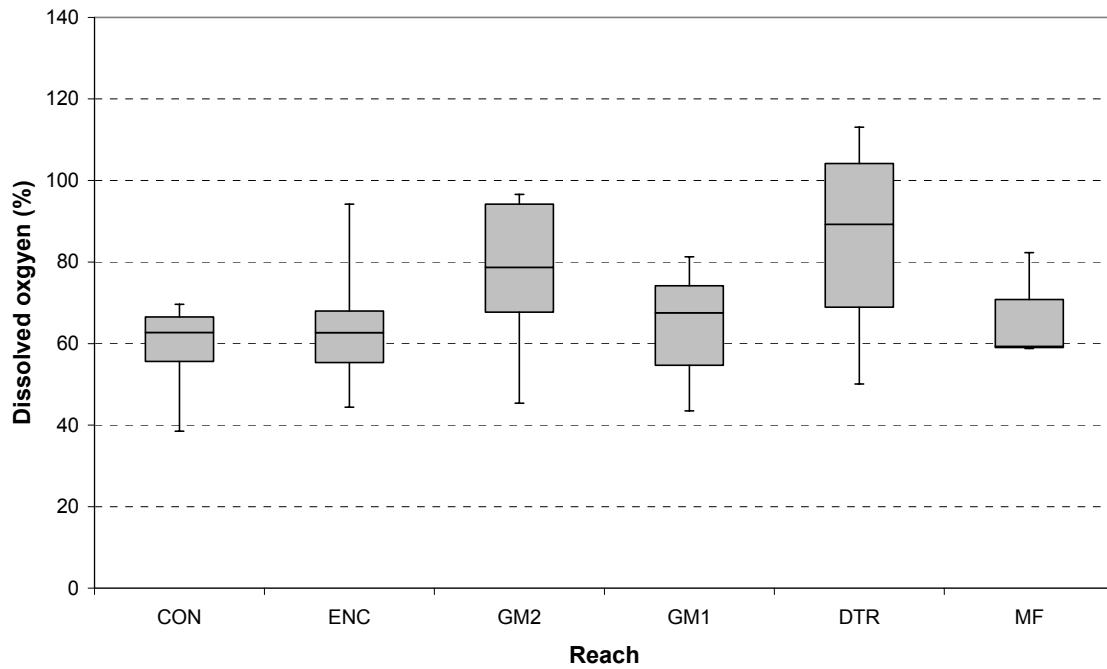


Figure H-6c (cont'd). Box and whisker charts for dissolved oxygen (%) measurements during fish surveys.

v) Spring 2007



vi) Spring 2008

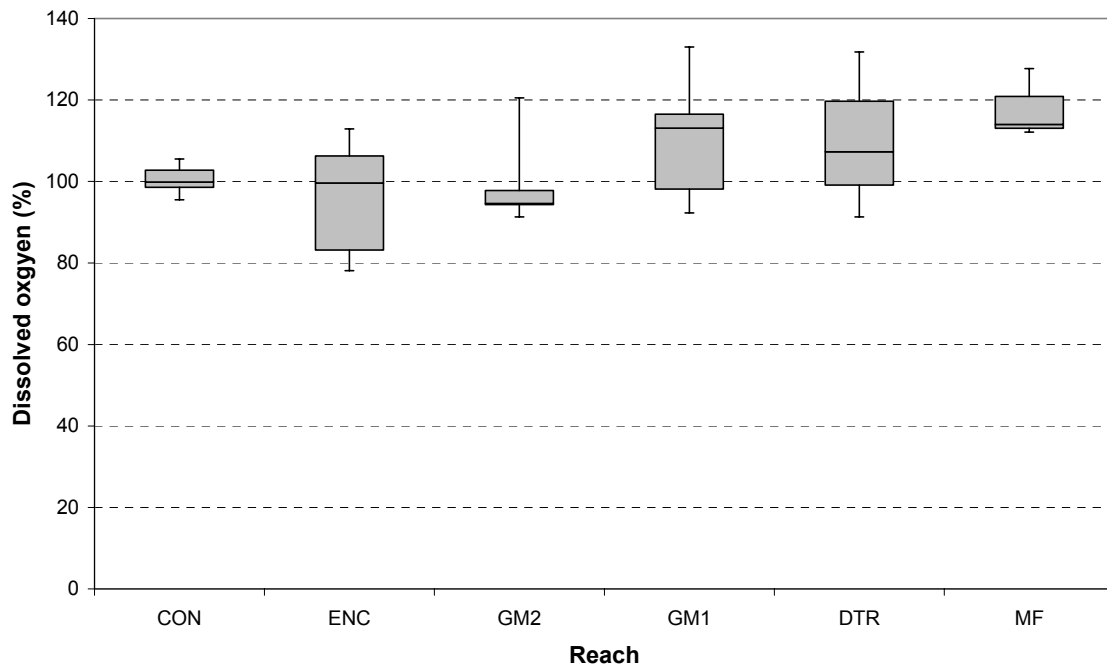
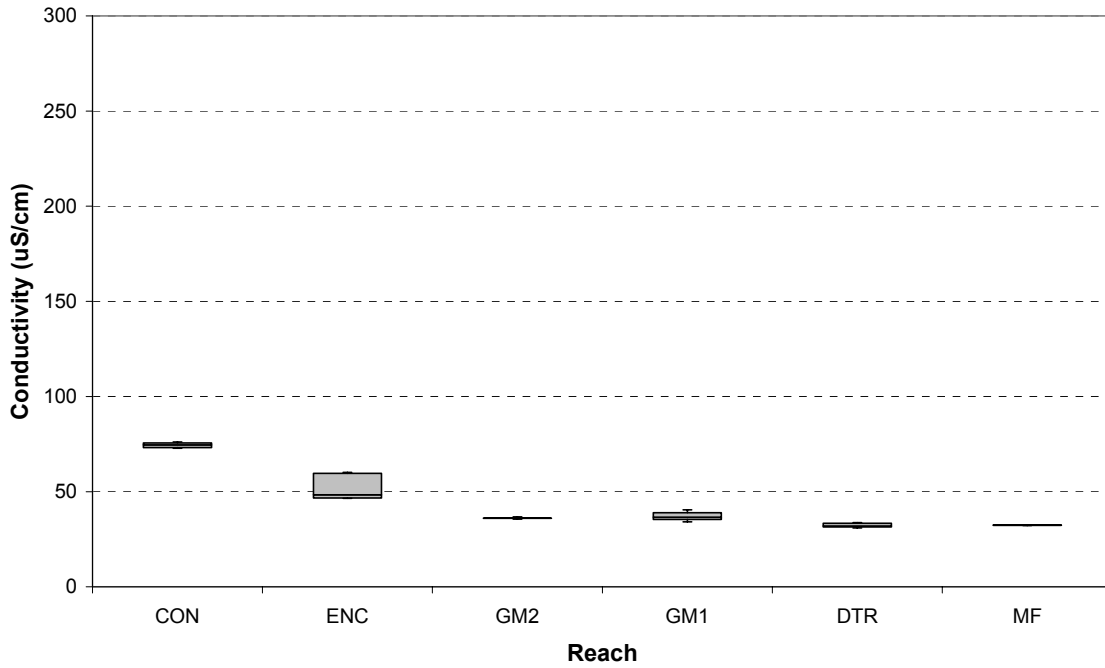
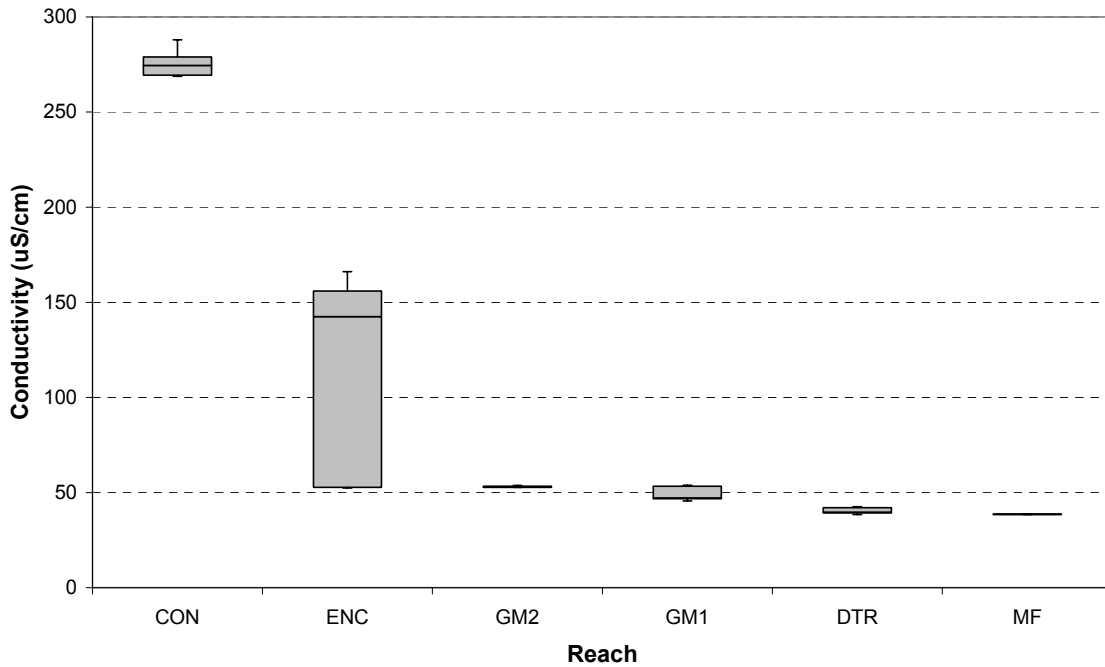


Figure H-6c (cont'd). Box and whisker charts for dissolved oxygen (%) measurements during fish surveys.

**i) Summer 2006**

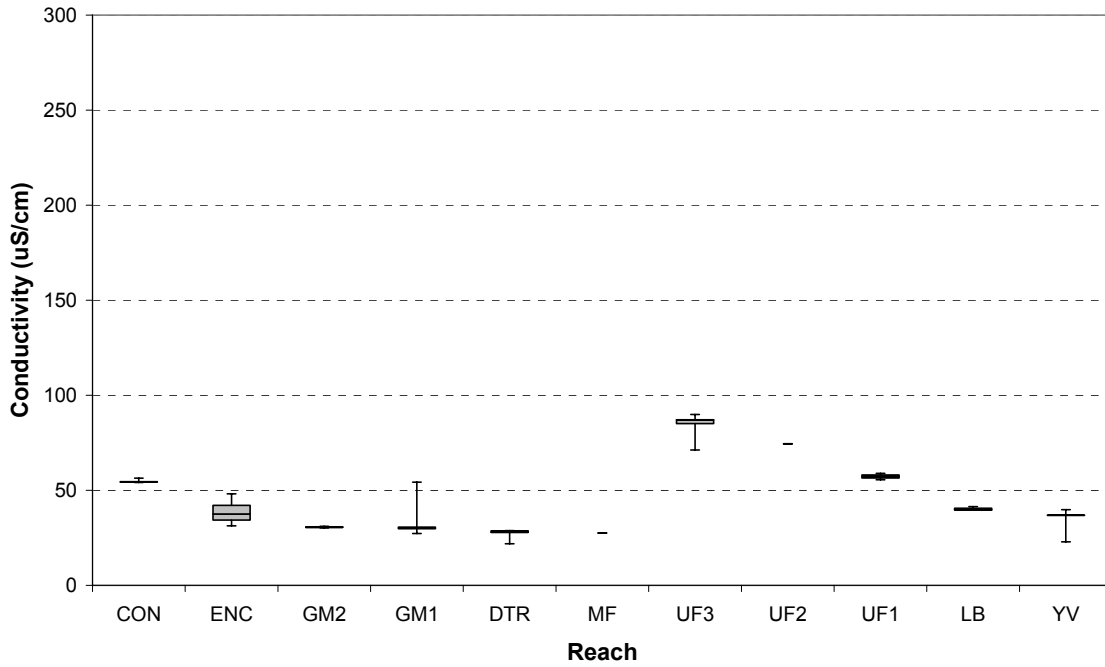


**ii) Summer 2007**



**Figure H-6d. Box and whisker charts for conductivity measurements during fish surveys.**

iii) Fall 2006



iv) Fall 2007

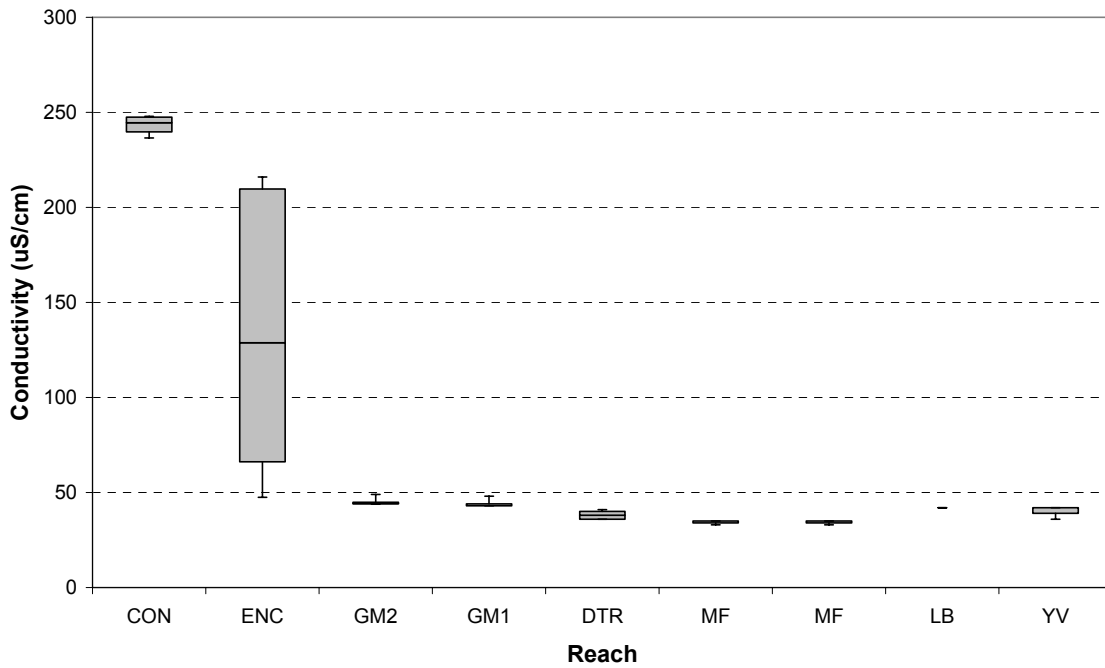
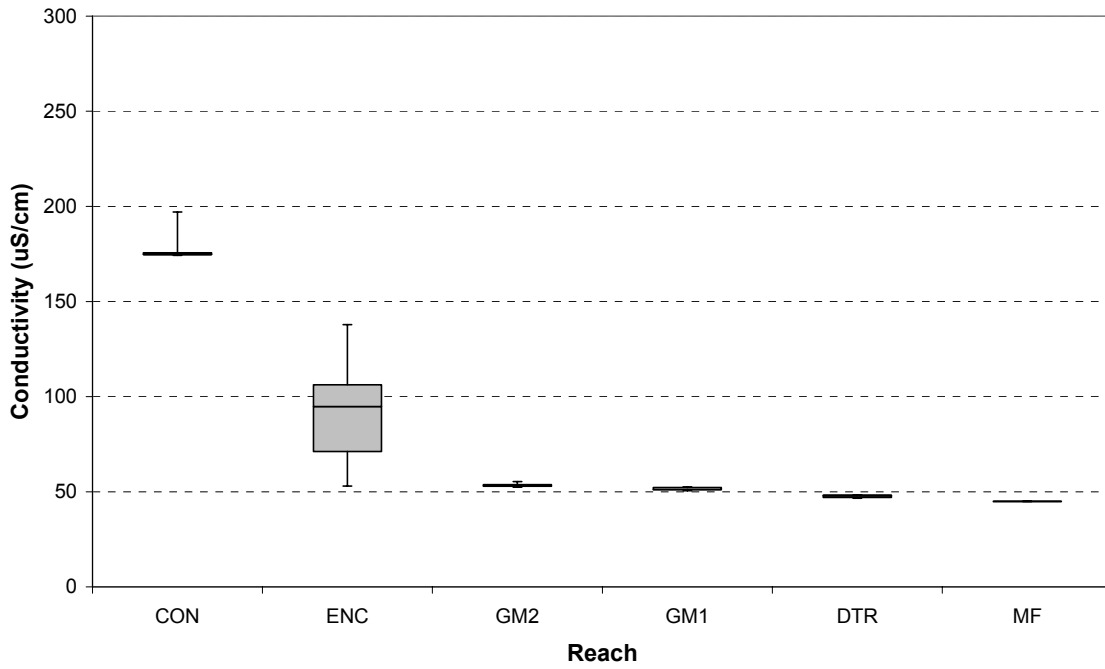


Figure H-6d (cont'd). Box and whisker charts for conductivity measurements during fish surveys.



v) Spring 2007



vi) Spring 2008

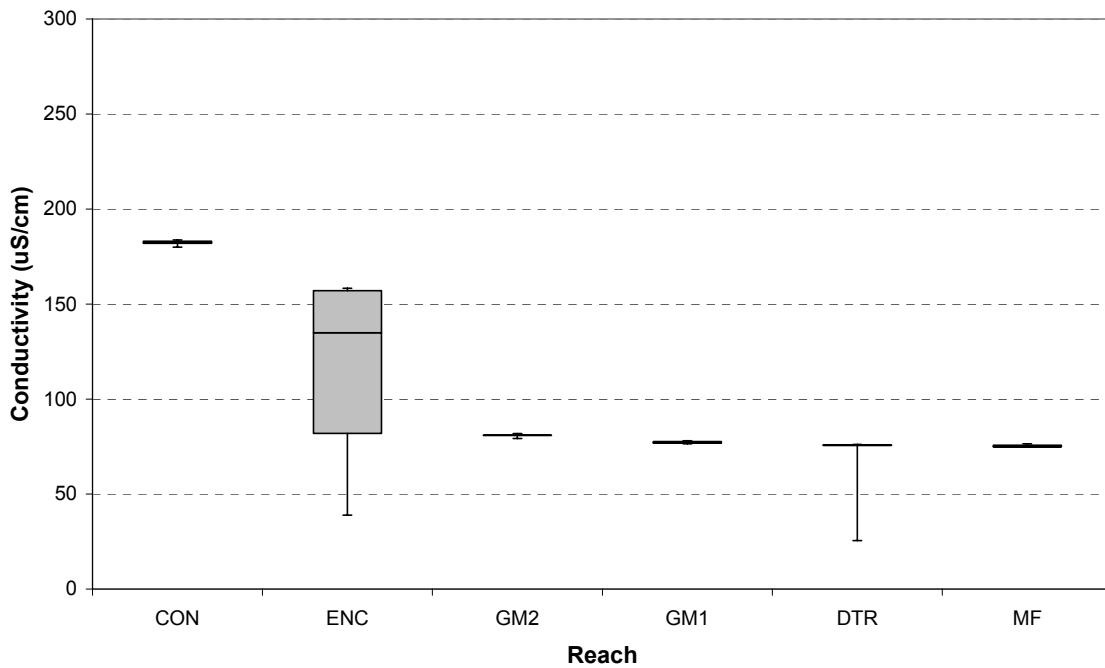
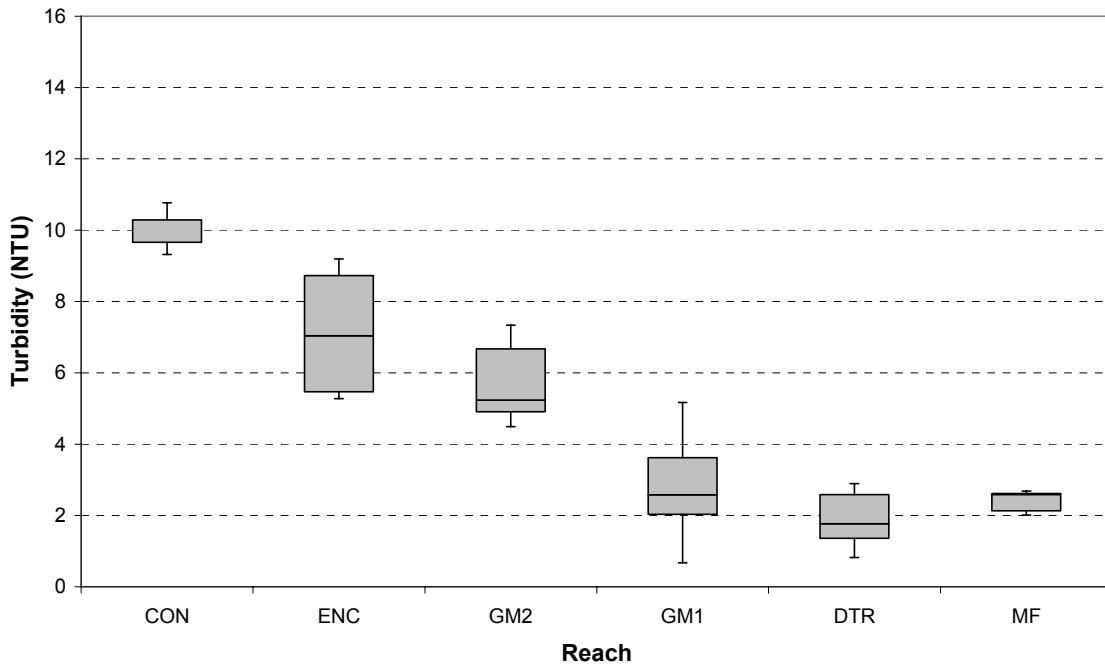
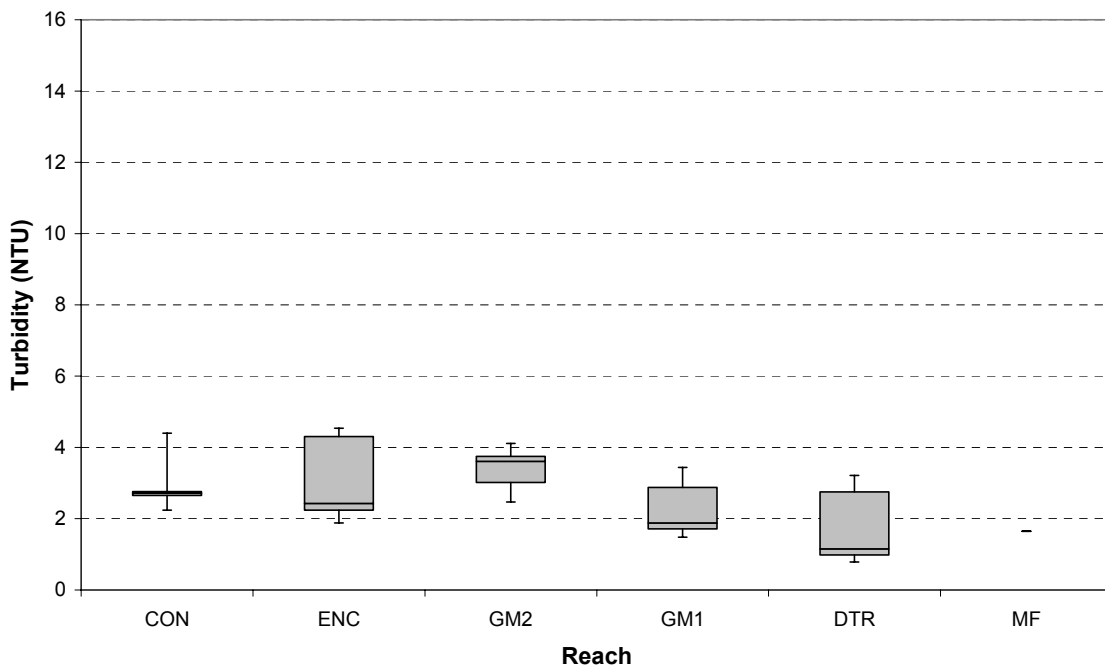


Figure H-6d (cont'd). Box and whisker charts for conductivity measurements during fish surveys.

**i) Summer 2006**

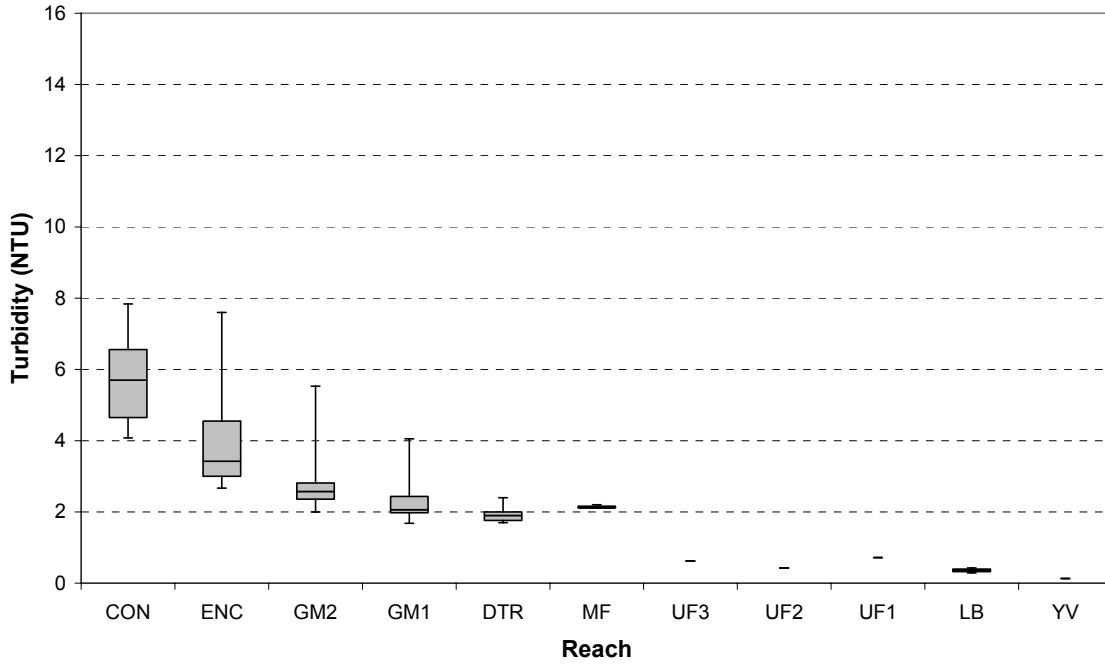


**ii) Summer 2007**



**Figure H-6e. Box and whisker charts for turbidity measurements during fish surveys.**

iii) Fall 2006



iv) Fall 2007

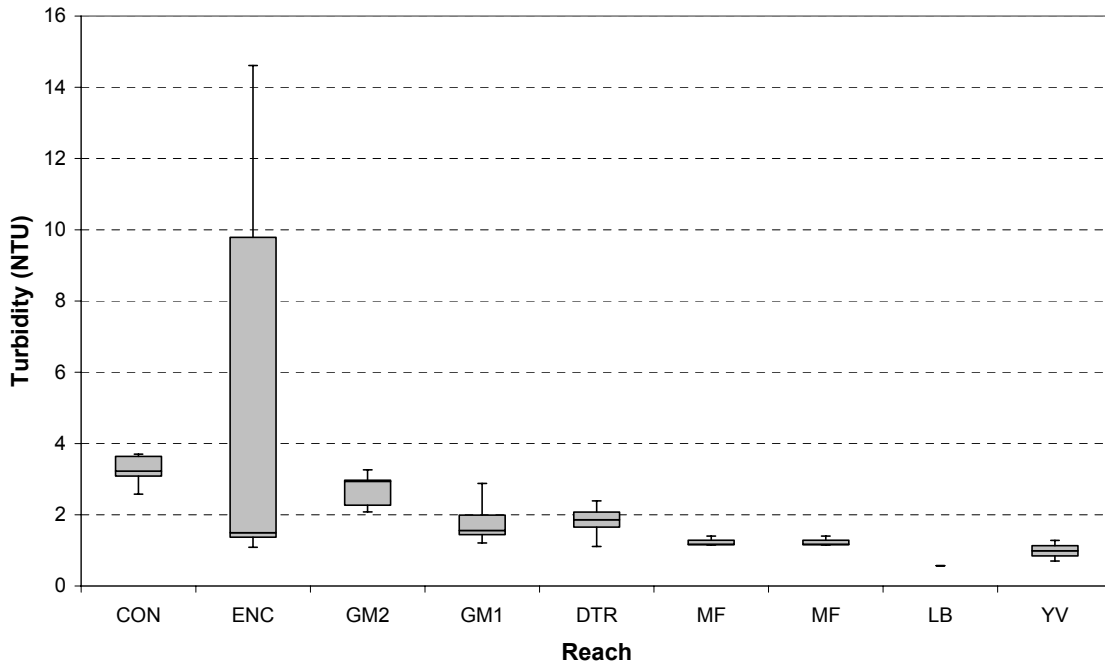
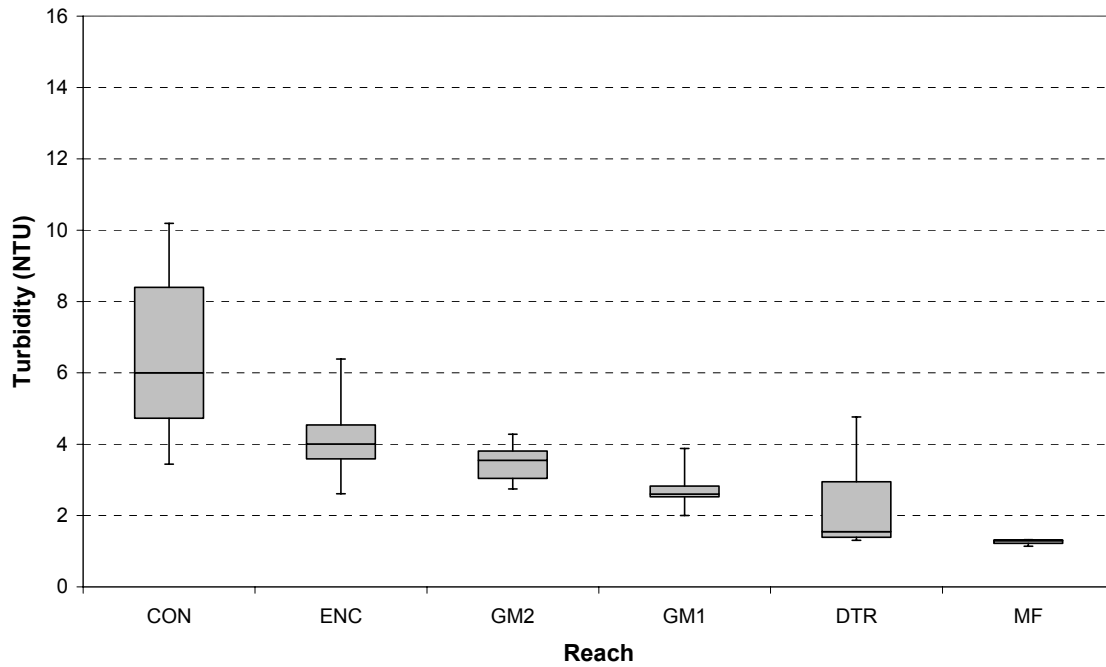


Figure H-6e (cont'd). Box and whisker charts for turbidity measurements during fish surveys.

v) Spring 2007



vi) Spring 2008

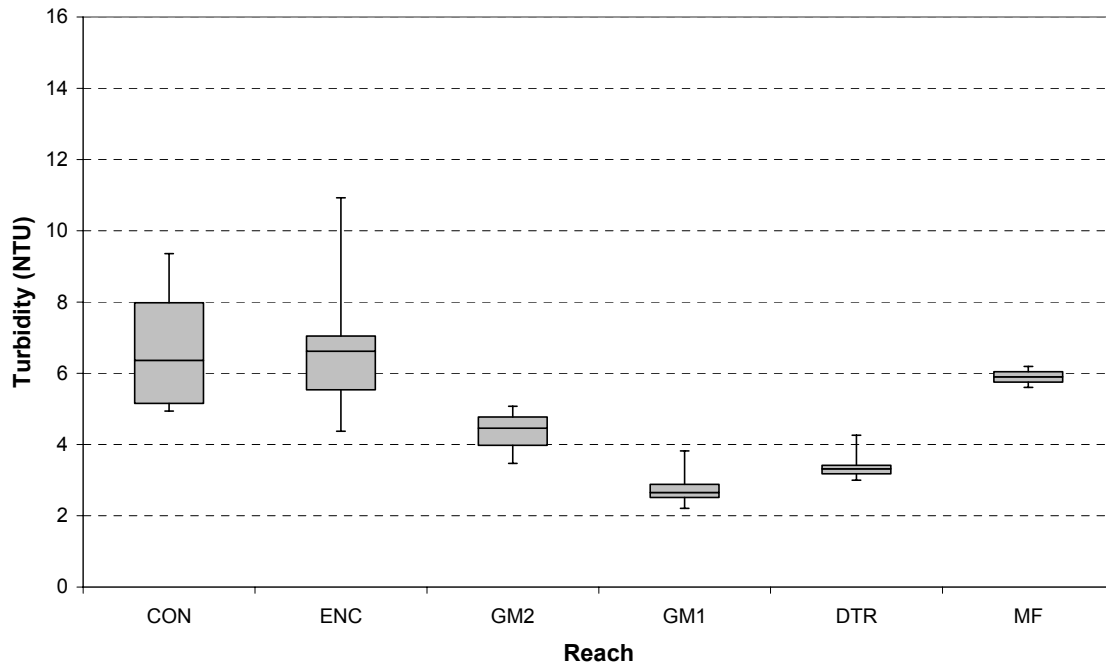


Figure H-6e (cont'd). Box and whisker charts for turbidity measurements during fish surveys.

# **APPENDIX I**

## **NEW BENTHIC MACROINVERTEBRATE DATA**

- **Table I-1**                      **Site locale and dimensions.**
- **Table I-2**                      **Benthic macroinvertebrate (BMI) survey dates.**
- **Tables I-3a-d**                  **Taxa lists (Excel).**
- **Tables I-4a-c**                  **Metrics (Excel).**
- **Table I-5**                      **Physical habitat assessment scores (Excel).**
- **Table I-6**                      **Water quality data (Excel).**
- **Tables I-7a-d**                  **Physical habitat data by transect (Excel).**
- **Tables I-8a-d**                  **Substrate data by transect and sample point (Excel).**
- **Appendix I-9**                  **CDFG QC reports for 2006 and 2007 samples.**



Table I-1. Site locale and dimensions.

Monitoring Site Code	Monitoring Site Start		Monitoring Site End		Elevation (ft)	Reach Length (m)	Average Wetted Width (m) <sup>1</sup>				Gradient	Comments
	Eastings	Northing	Eastings	Northing			Fall 2006	Spring 2007	Fall 2007			
<b>Lower Merced River</b>												
CON-B1	680761	4135764	681069	4135563	60	500	30	--	--	22	0.12%	--
CON-B2	681474	4136816	681953	4136725	60	500	39	26	35	35	0.12%	Private property (crab trap site)
ENC-B1	685859	4136742	686101	4136633	75	500	25	--	25	25	0.12%	upstream of Hatfield Road (crab trap site); boulder = riprap
ENC-B2	690759	4138044	691256	4137897	75	500	30	30	24	24	0.67%	Private property (crab trap site)
ENC-B3	691737	4138515	692108	4138873	80	500	31	--	20	20	0.49%	Private property (boulder=riprap)
ENC-B4	697969	4140623	698318	4141044	90	500	26	--	23	23	0.12%	Downstream of I99 about 2 RM
ENC-B5	703042	4143862	703242	4144091	90	500	45	23	20	20	0.06%	
GM2-B1	705521	4144894	705844	4144681	100	500	104	--	80	80	0.12%	Private property; 30m downstream of Santa Fe bridge
GM2-B2	709359	4146511	709631	4146781	110	500	24	32	27	27	0.55%	--
GM2-B3	711006	4147626	711495	4147855	120	500	32	--	31	31	0.24%	Oakdale Rd. bridge
GM1-B1	715280	4149843	715679	4149965	150	500	40	--	31	31	0.18%	--
GM1-B2	717224	4149826	717624	4149789	165	500	200	41	64	64	0.12%	--
GM1-B3	725037	4153267	725323	4153778	255	500	32	34	43	43	0.00%	Downstream of Snelling Rd. bridge and wing dam
DTR-B1	725728	4154261	725784	4154824	240	500	32	28	22	22	0.49%	Private property
DTR-B2	727414	4155858	727996	4155819	260	500	70	--	63	63	0.12%	Henderson Park=top of reach, work downstream
DTR-B3	729931	4155287	730410	4155434	280	500	45	23	42	42	0.37%	Cuneo Fishing Site
DTR-B4	731521	4155485	732099	4155463	290	500	60	36	43	43	0.43%	Diverison at CDFG Hatchery
MF-B1	735274	4155146	735522	4155605	320	500	48	56	47	47	0.06%	Private property
<b>Upper Merced River</b>												
UF3-B1	756613	4165411	757047	4165647	830	500	24	32	45.2	45.2	0.61%	upstream of Bagby Recreation area

Table I-1. Site locale and dimensions.

Monitoring Site Code	Monitoring Site Start		Monitoring Site End		Elevation (ft)	Reach Length (m)	Average Wetted Width (m) <sup>1</sup>			Gradient	Comments
	Eastings	Northing	Eastings	Northing			Fall 2006	Spring 2007	Fall 2007		
UF3-B2	761818	4167616	762211	4167786	1025	500	20	--	18	2.13%	downstream of Rail Road Flat campground
UF3-B3	763089	4167362	763358	4167053	1025	500	17	16	26	4.50%	upstream of Rail Road Flat campground
UF3-B4	766509	4165348	766751	4165760	1150	500	31	--	23	3.05%	Below Bridge at Briceburg
UF2-B1	768424	4167065	768625	4167525	1165	500	27	26	28	1.52%	upstream from Briceburg Bridge
UF2-B2	770052	4169331	770515	4169605	1215	500	24	--	22	5.18%	3 miles upstream from Briceburg Bridge, just downstream from Slate Creek Bridge, work downstream
UF2-B3	771297	4173299	771673	4173467	1370	500	21	--		1.83%	from bridge at Briceburg drove 5.8 miles upstream
UF2-B4	773492	4172916	773462	4173426	1420	500	19	28	22	2.44%	Just downstream of first bridge at detour/slide, work downstream
UF1-B1	775585	4172680	775788	4173048	1450	500	30	--	27	1.22%	0.6 miles upstream from South Fork Merced Bridge
UF1-B2	777160	4172706	777610	4172833	1500	500	25	22	24	1.22%	McCelendon Beach Area, Incline Rd. d/s of dirt flat & dry gulch
UF1-B3	778889	4173703	779198	4174100	1570	500	28	27	26	1.83%	--
LB-B1	784841	4174812	785323	4174912	2000	500	23	--	20	6.10%	Yosemite View Lodge ~RM109
LB-B2	789279	4179044	789454	4179499	3300	500	18	--	22	4.88%	4.5 miles upstream of Yosemite View Lodge
LB-B3	789730	4179981	790110	4180188	3400	500	17	22	22	1.22%	park at picnic area, work upstream
LB-B4	791833	4179833	792324	4179773	3660	500	25	--	35	8.54%	in YNP on Hwy 140 1.3 miles upstream from tamarack/cascade creek crossing



Table I-1. Site locale and dimensions.

Monitoring Site Code	Monitoring Site Start		Monitoring Site End		Elevation (ft)	Reach Length (m)	Average Wetted Width (m) <sup>1</sup>			Gradient	Comments
	Easting	Northing	Easting	Northing			Fall 2006	Spring 2007	Fall 2007		
LB-B5	794336	4179622	794619	4179847	3880	500	17	18	18	4.27%	upstream of Pohono Bridge in YNP
YV-B1	799730	4182423	800093	4182583	3950	500	16	24	24	1.22%	Below Sentinel Bridge
YV-B2	801599	4182581	801936	4182529	3960	500	23	--	21	1.22%	Below Stoneman Bridge and Above Housekeeping Camp (limited to 400m length between camp and bridge)
YV-B3	803026	4182345	803395	4182052	3990	500	18	16	16	1.22%	Below Happy Isles Bridge
GB-B1	803369	4181738	803416	4181273	4020	500	20	--	22	3.05%	Above Happy Isles Bridge ~50m upstream (end = 500m upstream of Happy Isles Bridge)

<sup>1</sup> Flow data is available in table I-7.

Table I-2. Benthic macroinvertebrate (BMI) survey dates.

Monitoring Site Code	Fall 2006 Sample Date	Spring/Summer 2007 Sample Date	Fall 2007 Sample Date
<b>Lower Merced River</b>			
CON-B1	09/13/06	--	09/11/07
CON-B2	09/25/06	05/28/07	09/11/07
ENC-B1	09/22/06	--	09/05/07
ENC-B2	09/22/06	05/30/07	09/06/07
ENC-B3	09/22/06	--	09/06/07
ENC-B4	09/21/06	--	09/10/07
ENC-B5	09/14/06	05/30/07	10/17/07
GM2-B1	09/21/06	--	09/14/07
GM2-B2	09/14/06	05/30/07	09/14/07
GM2-B3	09/27/06	--	09/13/07
GM1-B1	09/13/06	--	09/07/07
GM1-B2	09/15/06	05/29/07	09/07/07
GM1-B3	09/20/06	05/29/07	10/18/07
DTR-B1	09/20/06	05/29/07	10/18/07
DTR-B2	09/20/06	--	10/18/07
DTR-B3	09/19/06	06/05/07	09/12/07
DTR-B4	09/19/06	06/05/07	09/12/07
MF-B1	09/26/06	05/31/07	10/19/07
<b>Upper Merced River</b>			
UF3-B1	9/26/2006	05/31/07	10/05/07
UF3-B2	10/5/2006	--	10/02/07
UF3-B3	10/5/2006	07/17/07	10/02/07
UF3-B4	10/6/2006	--	10/01/07
UF2-B1	10/9/2006	07/17/07	10/02/07
UF2-B2	10/11/2006	--	10/02/07
UF2-B3	10/11/2006	--	10/02/07
UF2-B4	10/11/2006	07/18/07	10/03/07
UF1-B1	10/10/2006	--	10/03/07
UF1-B2	10/9/2006	07/18/07	09/30/07
UF1-B3	10/6/2006	07/18/07	09/30/07
LB-B1	10/6/2006	--	10/04/07
LB-B2	10/11/2006	--	10/04/07
LB-B3	10/11/2006	07/19/07	10/04/07
LB-B4	10/10/2006	--	10/04/07
LB-B5	10/10/2006	07/19/07	09/30/07
YV-B1	10/10/2006	07/20/07	10/03/07
YV-B2	10/10/2006	--	10/03/07
YV-B3	10/8/2006	07/20/07	09/29/07
GB-B1	10/7/2006	--	09/29/07

<sup>1</sup> Sites marked with an -- were not sampled during Spring/Summer 2007 sampling event. Per study plan, only half of BMI sites sampled then.

**Tables I-3a-d. Taxa lists.**

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

**Tables I-4a-c. Metrics.**

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

**Table I-5. Physical habitat assessment scores.**

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

**Table I-6. Water quality data.**

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

**Tables I-7a-d. Physical habitat data by transect.**

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

**Tables I-8a-d. Substrate data by transect and sample point.**

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

**Appendix I-9. CDFG QC reports for 2006 and 2007 samples.****BioAssessment Services**

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24988 Elus Ravine Road, Suite 108  
Folsom, CA 95630

E-mail: [bioassess@comcast.net](mailto:bioassess@comcast.net)  
Phone: (916) 838-3846

August 26, 2008

Krista Orr  
Stillwater Sciences  
279 Cousteau Place, Suite 400  
Davis, CA 95616

Dear Krista,

Results of internal and external quality control (QC) for the benthic macroinvertebrate (BMI) component of Merced River Alliance Project (MRAP) have been completed. These results included a total of 18 voucher samples evaluated for taxonomic and enumeration accuracy and conformance to standard taxonomic effort (STE) as specified in the Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT). External QC of the voucher collections was conducted by the Aquatic Bioassessment Laboratory, the results of which were submitted to you in two reports: "BAS Merced River 2006 QC Report" and "BAS Merced River 2007 QC Report". In addition, internal QC consisted of evaluating 17 remnant samples for organism recovery. A remnant sample is the inorganic and organic debris remaining after removal of BMIs. Standard operating procedures, maintained by BioAssessment Services, indicates that organism recovery from remnant samples should be less than 10 percent of the total organisms subsampled.

The cover letter of the 2006 QC report indicates that five samples were submitted instead of the six actually submitted and evaluated as indicated in subsequent sections of the report. Since the MRAP was initiated prior to the development of the SAFIT STE, the 2006 QC report provided recommendations for converting from the California Aquatic Macroinvertebrate Laboratory Network's STE to the current SAFIT STE. The original taxonomist made the appropriate changes to the taxa list to reflect the current SAFIT STE. In addition, the 2006 QC report indicated one systematic taxonomic error involving a dragonfly larva incorrectly identified as *Orthemis ferruginea*. The original taxonomist agreed with the QC taxonomist's identification of *Macromia*, and made the appropriate changes to vial labels and the taxonomic list. Both 2006 and 2007 QC reports indicated several taxonomic discrepancies, usually involving immature individuals, between the original taxonomist and the QC taxonomist but these were not of a magnitude to warrant extensive corrective action. Since one of the discrepancies involving an immature perlodid stonefly (2007 QC report) is in the process of being rectified, all immature perlodid stoneflies with contrasting, transverse pigment bands were named "*Cultus/Osobenus*" in the taxonomic list. The QC taxonomist identified several incidental errors that were not systematic.

Results of internal QC of subsampling efficiency indicated a mean recovery of organisms from the remnant samples of 3.7 percent with a standard deviation of 2.5 percent. The range of recovery was 0.6 percent to 9.2 percent.



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June 5, 2007

Tom King  
Bioassessment Services  
24988 Blue Ravine Road, Suite 108  
Folsom, CA 95630

Dear Tom,

Attached are the results of my QC analysis of 5 samples submitted from the Merced 2006 project. The results are presented in five summary tables. This QC analysis was performed in accordance to the Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT)'s Standard Taxonomic Effort Document (STE) 28 November 2006 version (Richards and Rogers, 2006). A note accompanying the samples to be analyzed stated that the project was originally processed according to the previous version of the STE. I have included notes below to show where the two documents disagree.

Overall taxonomy was good and performed in accordance with the SAFIT Level I standards with the following exceptions.

There were four instances of "tagalong" organisms. We define these as specimens accidentally included in a vial of organisms of another taxon. These are marked as "Probable sorting error" in the attached Listing of Taxonomic Discrepancies file.

The following involve differences between the 2003 version of the STE and the present version. In all these cases, the names used in this data have followed the 2003 standards. I list these for your information. *Skwala parallela* (Frison) has been shown to be an invalid name (Zwick, 1989). This name appeared in the spreadsheet of the data, but not on the vial label. There are three species of *Helicopsyche* known from California. Based on distribution, your specimens are probably *Helicopsyche borealis* (Hagen), but the larvae have not been formally described for all three species. The identity of the asian clam found in western North America has not been determined. For that reason, the ABL follows the standard of using *Corbicula* sp. instead of *Corbicula fluminea* (Müller) or *Corbicula fluminalis* (Müller). Finally, the mayfly nymphs identified as *Leucrocuta* are actually *Ecdyonurus criddlei* (McDunnough). The few specimens with intact cerci have intercalary hairs forming a definite fringe. This character is absent in *Leucrocuta*. Characters of the labrum will separate the taxon from *Nixe*.

A damaged hygrobatid mite was found in the vial of *Limnesia*. Since both *Atractides* and *Hygrobatas* were correctly identified elsewhere, I suspect this is a sorting error rather than a misidentification. A

*Mideopsis* mite was found in a vial of *Torrenticola*. There are no accessory sclerites associated with the dorsal shield of *Mideopsis*, but two pairs for *Torrenticola* (Smith et al., 2001).

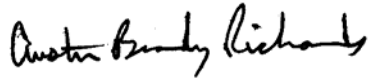
The Diptera larva originally identified as Cyclorrhaphous/Brachycera is a Cecidomyiidae larva – a terrestrial taxon. The ventral spatulate sclerite is diagnostic (Gagne, 1981).

A *Probezzia* larva was misidentified as *Bezzia/Palpomyia*. Since *Bezzia/Palpomyia* was identified correctly elsewhere, I suspect this was a simple oversight. The uniform cervical collar for *Bezzia/Palpomyia*, the arrangement and length of the anal setae and the relative head length to width are all characters which will separate the two taxa (Glukova, 1979; Courtney et al, 1996).

Specimens of *Macromia* were misidentified as *Orthemis ferruginea* (Fabricius). *Orthemis* nymphs have a rounded swelling between the eyes, but *Macromia* has a prominent frontal horn. *Macromia* nymphs have relatively longer legs as well. Needham, Westfall and May (2000) give additional characters for separating the Macromiidae from the Libellulidae.

I welcome any questions or comments you may have concerning this report.

Sincerely,



Brady Richards

Austin Brady Richards  
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## Comparative Taxonomic Listing of all Submitted Samples

Samples submitted by Bioassessment Services for Project: Merced 2006

Report prepared by Brady Richards, CDFG ABL-Chico, 6/5/2007

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
BAS-2380							
		1	Acentrella	15		15	Acentrella
		2	Baetis	106		106	Baetis
		2	Baetis	106		1	Acentrella
		3	Blepharicera	7	L	7	Blepharicera
		4	Blephariceridae	2	P	2	Blephariceridae
		5	Caecidotea	10		10	Caecidotea
		6	Centroptilum	2		2	Centroptilum
		7	Chironomini	40	L	40	Chironomini
		8	Crangonyx	7		7	Crangonyx
		9	Ephemerellidae	1		1	Ephemerellidae
		10	Ferrissia	5		5	Ferrissia
		11	Glossosoma	6	L	6	Glossosoma
		12	Gyraulus	11		11	Gyraulus
		13	Heptagenia	4		4	Heptagenia
		14	Heptageniidae	4		4	Heptageniidae
		15	Hyalella	13		13	Hyalella
		16	Hydropsyche	118	L	118	Hydropsyche
		17	Hydroptila	6	L	6	Hydroptila
		18	Leucocuta	9		9	Ecdyonurus criddlei
		19	Lymnaeidae	1		1	Lymnaeidae
		20	Menetus	4		4	Menetus
		21	Nectopsyche	1	L	1	Nectopsyche
		22	Neoplasta	1	L	1	Neoplasta
		23	Oligochaeta	56		53	Oligochaeta
		24	Orthoclaadiinae	10	L	10	Orthoclaadiinae
		25	Petrophila	7	L	7	Petrophila
		26	Physa/Physella	10		10	Physa/Physella
		27	Planariidae	4		4	Planariidae
		28	Prostoma	3		3	Prostoma



<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
	BAS-2380						
		29	Simulium	5	L	5	Simulium
		30	Sperchon	2		2	Sperchon
		31	Tanytarsini	11	L	11	Tanytarsini
		32	Tricorythodes	8		8	Tricorythodes
		33	Wiedemannia	1	L	1	Wiedemannia

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
	BAS-2384						
		1	Baetis	109		109	Baetis
		2	Blepharicera	18	L	18	Blepharicera
		3	Blephariceridae	1	P	1	Blephariceridae
		4	Caecidotea	8		8	Caecidotea
		5	Chironomini	134	L	133	Chironomini
		6	Crangonyx	1		1	Crangonyx
		7	Fallceon quilleri	4		4	Fallceon quilleri
		8	Hydropsyche	141	L	141	Hydropsyche
		9	Isoperla	1		1	Isoperla
		10	Lepidostoma	1	L	1	Lepidostoma
		11	Leucrocuta	19		19	Ecdyonurus criddlei
		12	Menetus	2		2	Menetus
		13	Oligochaeta	2		1	Oligochaeta
		14	Orthoclaadiinae	17	L	17	Orthoclaadiinae
		15	Physa/Physella	1		1	Physa/Physella
		16	Planariidae	7		7	Planariidae
		17	Simulium	19	L	19	Simulium
		18	Sperchon	2		2	Sperchon
		19	Tanytarsini	6	L	6	Tanytarsini
		20	Tricorythodes	9		9	Tricorythodes
		21	Wormaldia	1	L	1	Wormaldia

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
	BAS-2391						
		1	Acari	2		2	Acari
		2	Amphipoda	1		1	Amphipoda
		3	Atractides	1		1	Atractides
		4	Baetis	2		2	Baetis
		5	Centroptilum	25		25	Centroptilum
		6	Chironomini	78	L	78	Chironomini
		7	Coenagrionidae	1		1	Coenagrionidae
		8	Corbicula fluminea	3		3	Corbicula
		9	Cyclorrhaphous/Bra chycera	1	L	1	Cecidomyiidae
		10	Dubiraphia	1	A	1	Dubiraphia
		11	Ephemerella	1		1	Ephemerella
		12	Fallceon quilleri	44		45	Fallceon quilleri
		13	Heptagenia	4		4	Heptagenia
		14	Hetaerina americana	3		3	Hetaerina americana
		15	Hyalella	1		1	Hyalella
		16	Hydropsyche	6	L	6	Hydropsyche
		17	Hydroptila	13	L	12	Hydroptila
		18	Hygrobates	7		7	Hygrobates
		19	Lebertia	8		8	Lebertia
		20	Lymnaeidae	1		1	Lymnaeidae
		21	Menetus	2		2	Menetus
		22	Nectopsyche	5	L	5	Nectopsyche
		23	Oligochaeta	159		149	Oligochaeta
		24	Orthoclaadiinae	10	L	10	Orthoclaadiinae
		25	Physa/Physella	2		2	Physa/Physella
		26	Turbellaria	1		1	Turbellaria
		27	Prostoma	2		2	Prostoma
		28	Simulium	90	L	90	Simulium
		29	Sperchon	1		1	Sperchon
		30	Tanypodinae	9	L	9	Tanypodinae

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
	BAS-2391	31	Tanytarsini	14	L	14	Tanytarsini
		32	Tricorythodes	2		2	Tricorythodes

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
	BAS-2399						
		1	Baetis	59		59	Baetis
		2	Blepharicera	3	L	3	Blepharicera
		3	Blephariceridae	1	P	1	Blephariceridae
		4	Cheumatopsyche	17	L	17	Cheumatopsyche
		5	Chimarra	19	L	19	Chimarra
		6	Chironomini	22	L	22	Chironomini
		7	Corydalus	4	L	4	Corydalus
		8	Dipheter hageni	12		12	Dipheter hageni
		9	Empididae	1	P	1	Empididae
		10	Epeorus	35		35	Epeorus
		11	Glossosoma	1	L	1	Glossosoma
		12	Helicopsyche borealis	1	L	1	Helicopsyche
		13	Hemerodromia	1	L	1	Hemerodromia
		14	Heptageniidae	12		11	Heptageniidae
		15	Hesperoperla	6	L	6	Hesperoperla
		16	Hydropsyche	41	L	41	Hydropsyche
		17	Isoperla	1		1	Isoperla
		18	Microcylloepus	2	L	2	Microcylloepus
		19	Microcylloepus	2	A	2	Microcylloepus
		20	Neotrichia	4	L	4	Neotrichia
		21	Optioservus	4	L	4	Optioservus
		22	Optioservus	2	A	2	Optioservus
		23	Ordobrevia nubifera	1	A	1	Ordobrevia nubifera
		24	Orthoclaadiinae	2	L	2	Orthoclaadiinae
		25	Psephenus falli	2	L	2	Psephenus falli
		26	Pteronarcys	5		5	Pteronarcys
		27	Rhithrogena	49		49	Rhithrogena
		28	Simulium	104	L	104	Simulium
		29	Skwala	9		9	Skwala
		30	Sweltsa	1		1	Sweltsa
		31	Tanypodinae	8	L	8	Tanypodinae

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
	BAS-2399						
		32	Torrenticola	1		1	Torrenticola
		33	Wormaldia	36	L	36	Wormaldia
		34	Zaitzevia	4	L	4	Zaitzevia
		35	Zaitzevia	38	A	38	Zaitzevia

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
	BAS-2405						
		1	Acentrella	5		5	Acentrella
		2	Arctopsyche	1	L	1	Arctopsyche
		3	Atractides	1		1	Atractides
		4	Baetis	56		56	Baetis
		5	Bezzia/ Palpomyia	1		1	Probezzia
		6	Blepharicera	3	L	3	Blepharicera
		7	Calineuria californica	2		2	Calineuria californica
		8	Callibaetis	1		1	Callibaetis
		9	Centroptilum	5		5	Centroptilum
		10	Cheumatopsyche	31	L	30	Cheumatopsyche
		11	Chimarra	2	L	2	Chimarra
		12	Chironomini	34	L	34	Chironomini
		13	Dipheter hageni	2		2	Dipheter hageni
		14	Drunella spinifera	2		2	Drunella spinifera
		15	Epeorus	14		14	Epeorus
		16	Ephemerella	2		2	Ephemerella
		17	Ferrissia	3		3	Ferrissia
		18	Helicopsyche borealis	65	L	65	Helicopsyche
		19	Hesperoperla	2		2	Hesperoperla
		20	Hydropsyche	21	L	21	Hydropsyche
		21	Isoperla	12		12	Isoperla
		22	Lebertia	2		2	Lebertia
		23	Limnesia	12		12	Limnesia
		23	Limnesia	12		1	Hygrobatidae
		24	Microcylloepus	1	L	1	Microcylloepus
		25	Microcylloepus	1	A	1	Microcylloepus
		26	Mystacides	1	L	1	Mystacides
		27	Neotrichia	6	L	6	Neotrichia
		28	Oecetis	15	L	15	Oecetis
		29	Optioservus	18	L	18	Optioservus
		30	Optioservus	2	A	3	Optioservus

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
	BAS-2405	31	Orthemis ferruginea	2		2	Macromia
		31	Orthemis ferruginea	2	L	1	Cheumatopsyche
		32	Orthoclaadiinae	18	L	18	Orthoclaadiinae
		33	Paraleptophlebia	3		3	Paraleptophlebia
		34	Procloeon	32		30	Procloeon
		35	Prostoma	1		1	Prostoma
		36	Protoptila	1	L	1	Protoptila
		37	Psephenus falli	9	L	9	Psephenus falli
		38	Rhithrogena	20		20	Rhithrogena
		39	Rhyacophila	5	L	5	Rhyacophila
		40	Simulium	19	L	19	Simulium
		41	Skwala parallela	4		4	Skwala
		41	Skwala parallela	4	L	1	Hydropsyche
		41	Skwala parallela	4	L	1	Oligochaeta
		42	Sperchon	3		3	Sperchon
		43	Tanytarsini	8	L	8	Tanytarsini
		44	Torrenticola	20		19	Torrenticola
		44	Torrenticola	20		1	Mideopsis
		45	Tricorythodes	2		2	Tricorythodes
		46	Wormaldia	7	L	7	Wormaldia
		47	Zaitzevia	18	L	18	Zaitzevia
		48	Zaitzevia	18	A	18	Zaitzevia



Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
	BAS-2427			0	x	0	
		1	Agapetus	4	L	4	Agapetus
		2	Ameletus	1		1	Ameletus
		3	Arctopsyche	1	L	1	Arctopsyche
		4	Atherix pachypus	1	L	1	Atherix pachypus
		5	Atractides	1		1	Atractides
		6	Baetis	59		59	Baetis
		7	Bezzia/ Palpomyia	1	L	1	Bezzia/Palpomyia
		8	Calineuria californica	1		1	Calineuria californica
		9	Capniidae	2		2	Capniidae
		10	Centroptilum	2		2	Centroptilum
		11	Chironomini	49	L	51	Chironomini
		12	Cinygmula	10		10	Cinygmula
		13	Drunella spinifera	5		5	Drunella spinifera
		14	Ephemerella	179		179	Ephemerella
		15	Eubrianax edwardsii	1	L	1	Eubrianax edwardsii
		16	Hemerodromia	5	L	5	Hemerodromia
		17	Hydropsyche	4	L	4	Hydropsyche
		18	Hygrobates	2		2	Hygrobates
		19	Isoperla	1		1	Isoperla
		20	Lebertia	15		15	Lebertia
		21	Lepidostoma	6	L	6	Lepidostoma
		22	Mystacides	1	L	1	Mystacides
		23	Neophylax	6	L	6	Neophylax
		24	Oligochaeta	10		10	Oligochaeta
		25	Optioservus	17	L	17	Optioservus
		26	Optioservus	10	A	10	Optioservus
		27	Orthoclaadiinae	32	L	32	Orthoclaadiinae
		28	Osobenus yakimae	1		1	Osobenus yakimae
		29	Paraleptophlebia	3		3	Paraleptophlebia
		30	Pisidium	1		1	Pisidium

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
	BAS-2427						
		31	Rhithrogena	9		9	Rhithrogena
		32	Simulium	25	L	25	Simulium
		33	Sperchon	8		8	Sperchon
		34	Sweltsa	6		6	Sweltsa
		35	Tanypodinae	11	L	11	Tanypodinae
		36	Tanytarsini	5	L	5	Tanytarsini
		37	Tipula	1	L	1	Tipula
		38	Torrenticola	2		2	Torrenticola
		39	Zaitzevia	4	L	4	Zaitzevia
		40	Zaitzevia	1	A	1	Zaitzevia

## Listing of Enumeration Discrepancies

Samples submitted by Bioassessment Services for Project: Merced 2006

Report prepared by Brady Richards, CDFG ABL-Chico, 6/5/2007

Minor Counting Discrepancies									
Sample #	Vial #	Original ID	# Counted Original	QC	Difference (Original - QC)				
<b>BAS-2380</b>	2	Baetis	106	107	-1				
	23	Oligochaeta	56	53	3				
<b>BAS-2384</b>	5	Chironomini	134	133	1				
	13	Oligochaeta	2	1	1				
<b>BAS-2391</b>	12	Falliceon quilleri	44	45	-1				
	17	Hydroptila	13	12	1				
	23	Oligochaeta	159	149	10				
<b>BAS-2399</b>	14	Heptageniidae	12	11	1				
	10	Cheumatopsyche	31	30	1				
<b>BAS-2405</b>	23	Limnesia	12	13	-1				
	30	Optioservus	2	3	-1				
	31	Orthemis ferruginea	2	3	-1				
<b>BAS-2427</b>	34	Proclleon	32	30	2				
	41	Skwala parallela	4	6	-2				
	11	Chironomini	49	51	-2				

## Listing of Taxonomic Discrepancies

Samples submitted by Bioassessment Services for Project: Merced 2006

Report prepared by Brady Richards, CDFG ABL-Chico, 6/5/2007

Sample #	Vial #	Original ID	Final ID	QC Final ID	Taxonomic level of dispute	# Organisms	Comments
<b>BAS-2380</b> Disputed ID	18	Leucrocuta	Ecdyonurus criddlei		Genus	9	This disputed ID also represents a difference in taxonomic precision.
Probable sorting error							
<b>BAS-2384</b> Disputed ID	2	Baetis	Acentrella		Genus	1	
	11	Leucrocuta	Ecdyonurus criddlei		Genus	19	This disputed ID also represents a difference in taxonomic precision.
<b>BAS-2391</b> Original ID not in Master Taxa List	9	Cyclorhaphous/Brachycera				Cecidomyiidae	1
Original ID more precise	8	Corbicula fluminea	Corbicula				3
<b>BAS-2399</b> Original ID more precise	12	Helicopsyche borealis	Helicopsyche				1

Sample #	Vial #	Original ID	Final ID	QC Final ID	Taxonomic level of dispute	# Organisms	Comments
BAS-2405 Disputed ID	5	Bezzia/ Palpomyia	Probezzia		Genus complex	1	This disputed ID also represents a difference in taxonomic precision.
	23	Limnesia	Hygrobatidae		Family	1	This disputed ID also represents a difference in taxonomic precision.
	31	Orthemis ferruginea	Macromia		Family	2	This disputed ID also represents a difference in taxonomic precision.
	44	Torrenticola	Mideopsis		Family	1	
	41	Skwala parallela	Skwala			4	
	31	Orthemis ferruginea	Cheumatopsyche		Order	1	This disputed ID also represents a difference in taxonomic precision.
	41	Skwala parallela	Oligochaeta			1	
	41	Skwala parallela	Hydropsyche			1	
	18	Helicopsyche borealis	Helicopsyche			65	
	7	Bezzia/ Palpomyia	Bezzia/ Palpomyia			1	

**BAS-2427**  
QC ID not in Master Taxa List

## Summary of Taxonomic and Enumeration Discrepancies

Samples submitted by Bioassessment Services for Project: Merced 2006

Report prepared by Brady Richards, CDFG ABL-Chico, 6/5/2007

Sample #	Total Taxa	Taxonomic Discrepancies						Counting Discrepancies			
		Disputed ID		<u>Taxonomic Precision</u> Relative to QC				<u>Major</u>		<u>Minor</u>	
		<i>f</i> *	<i>n</i> **	More precise <i>f</i>	Less <i>n</i>	More precise <i>f</i>	Less <i>n</i>	<i>f</i>	<i>d</i> ***	<i>f</i>	<i>d</i>
BAS-2380	33	1	9	-	-	-	-	-	-	2	4
BAS-2384	21	1	19	-	-	-	-	-	-	2	2
BAS-2391	32	-	-	1	3	-	-	-	-	3	12
BAS-2399	32	-	-	1	1	-	-	-	-	1	1
BAS-2405	48	4	5	1	65	-	-	-	-	6	8
BAS-2427	38	-	-	-	-	-	-	-	-	1	2

\* = the frequency of occurrence of the discrepancy, in number of samples

\*\* = the number of organisms affected (by QC Lab counts) *n*

\*\*\* = the sum total of (absolute value of) differences in counts *d*

*f*

***QC Report - Disputed ID's only***

Samples submitted by Bioassessment Services for Project: Merced 2006

Report prepared by Brady Richards, CDFG ABL-Chico, 6/5/2007

<b><i>Sample #</i></b>	<b><i>Vial</i></b>	<b><i>Original ID</i></b>	<b><i>QC ID</i></b>	<b><i>comments</i></b>
BAS-2380	18	Leucrocuta	Ecdyonurus criddlei	This disputed ID also represents a difference in taxonomic precision.
BAS-2384	11	Leucrocuta	Ecdyonurus criddlei	This disputed ID also represents a difference in taxonomic precision.
BAS-2405	5	Bezzia/ Palpomyia	Probezzia	This disputed ID also represents a difference in taxonomic precision.
	23	Limnesia	Hygrobatidae	This disputed ID also represents a difference in taxonomic precision.
	31	Orthemis ferruginea	Macromia	This disputed ID also represents a difference in taxonomic precision.
	44	Torrenticola	Mideopsis	



DEPARTMENT OF FISH AND GAME  
AQUATIC BIOASSESSMENT LABORATORY-CHICO  
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July 30, 2008

Tom King  
Bioassessment Services  
24988 Blue Ravine Road, Suite 108  
Folsom, CA 95630

Dear Tom,

Attached are the results of my QC analysis of 12 samples submitted from the Merced River 2007 project. The results are presented in five summary tables. This QC analysis was performed in accordance to the Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT)'s Standard Taxonomic Effort Document (STE) 28 November 2006 version (Richards and Rogers, 2006).

There were three instances of "tagalong" organisms. These are defined as specimens accidentally included in a vial of organisms of another taxon and are marked as "Probable sorting error" in the attached Listing of Taxonomic Discrepancies file.

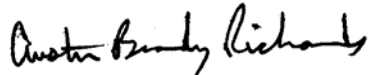
A perlodid nymph originally identified as *Osobenus yakimae* (Hoppe) is most likely *Cultus*. This specimen is too immature to run through the keys in Stewart and Stark (2002), but the ABL has been using the name *Cultus* for early instar nymphs with the "two-tone" color pattern as seen in this specimen. We have been doing this after seeing a number of larger series with multiple instars – from early instars to fully mature, identifiable nymphs.

A caddis larva originally identified as *Neophylax* is, in my opinion, more likely an *Oligophlebodes* instead. This specimen is immature so the specimen may not key correctly in Wiggins (1996) and Morse and Holzenthal (2008). However, I've noticed that immature *Neophylax* still have a pronounced anterior emargination of the mesonotum. In very early instars, the mesonotum consists of multiple, distinct sclerites which are organized in the same general shape as in later instars. This specimen matches up with a more mature *Oligophlebodes* found in another sample. Other specimens of *Neophylax* were also correctly identified in other samples so I suspect this represents a minor error.



I welcome any questions or comments you may have concerning this report.

Sincerely,



Austin Brady Richards  
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Chico, CA 95929-0555  
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#### Literature Cited

Morse, J. C. and R. W. Holzenthal (2008). Chapter 18: Trichoptera Genera. An introduction to the aquatic insects of North America, fourth edition, xvi + 1158 pp. + 39 color plates. R. W. Merritt, K. W. Cummins and M. B. Berg. Dubuque, Iowa, Kendall/Hunt Publishing Company: 481-552.

Richards, A. B. and D. C. Rogers. (2006). "Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT) List of Freshwater Macroinvertebrate Taxa from California and Adjacent States including Standard Taxonomic Effort Levels. Version: 28 November 2006." Retrieved 11 May 2007, from <http://www.waterboards.ca.gov/swamp/safit.html>

Stewart, K. W. and B. P. Stark (2002). Nymphs of North American stonefly genera (Plecoptera). Columbus, Ohio, The Caddis Press.

Wiggins, G. B. (1996). Larvae of the North American caddisfly genera (Trichoptera). Toronto, University of Toronto Press.

## Comparative Taxonomic Listing of all Submitted Samples

Samples submitted by Bioassessment Services for Project: Merced River 2007

Report prepared by Brady Richards, CDFG ABL-Chico, 7/30/2008

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
Tom King	BAS-2608						
		1	Camelobaetidius	5		5	Camelobaetidius
		2	Centroptilum	37		37	Centroptilum
		3	Chironomini	15	L	15	Chironomini
		4	Corbicula	30		30	Corbicula
		5	Enallagma	1		1	Enallagma
		6	Fallceon quilleri	100		100	Fallceon quilleri
		7	Ferrissia	3		3	Ferrissia
		8	Gyrinus	5	L	5	Gyrinus
		9	Heptagenia	13		13	Heptagenia
		10	Heptageniidae	7		7	Heptageniidae
		11	Hydropsyche	41	L	41	Hydropsyche
		12	Hydroptila	15	L	15	Hydroptila
		13	Hygrobates	22		22	Hygrobates
		14	Lebertia	7		7	Lebertia
		15	Nectopsyche	36	L	35	Nectopsyche
		16	Oligochaeta	19		19	Oligochaeta
		17	Orthoclaadiinae	16	L	16	Orthoclaadiinae
		18	Ostracoda	4		4	Ostracoda
		19	Physa	3		3	Physa
		20	Serratella	8		8	Serratella
		21	Simulium	75	L	75	Simulium
		22	Sperchon	8		8	Sperchon
		23	Tanypodinae	15	L	15	Tanypodinae
		24	Tanytarsini	19	L	19	Tanytarsini
		25	Tricorythodes	10		10	Tricorythodes
		26	Turbellaria	1		1	Turbellaria

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2633						
		1	Acentrella	5		5	Acentrella
		2	Antocha	5	L	5	Antocha
		3	Arctopsyche	5	L	5	Arctopsyche
		4	Baetis	53		53	Baetis
		5	Calineuria californica	1		1	Calineuria californica
		6	Cheumatopsyche	17	L	17	Cheumatopsyche
		7	Chimarra	1	L	1	Chimarra
		8	Chironomini	10	L	10	Chironomini
		9	Dipheter hageni	4		4	Dipheter hageni
		10	Drunella spinifera	2		2	Drunella spinifera
		11	Ecdyonurus criddlei	2		2	Ecdyonurus criddlei
		12	Epeorus	61		61	Epeorus
		13	Glossosoma	6	L	7	Glossosoma
		14	Helicopsyche	4	L	4	Helicopsyche
		15	Hesperoperla	1		1	Hesperoperla
		16	Hydropsyche	21	L	21	Hydropsyche
		17	Neotrichia	6	L	6	Neotrichia
		18	Ophiogomphus	1		1	Ophiogomphus
		19	Optioservus	6	L	6	Optioservus
		20	Orthoclaadiinae	4	L	4	Orthoclaadiinae
		21	Polycentropus	2	L	2	Polycentropus
		22	Protoptila	1	L	1	Protoptila
		23	Protzia	2		2	Protzia
		24	Psephenus falli	4	L	4	Psephenus falli
		25	Pteronarcys	1		1	Pteronarcys
		26	Rhyacophila	12	L	12	Rhyacophila
		27	Serratella	8		8	Serratella
		28	Simulium	3	L	3	Simulium
		29	Skwala	2		2	Skwala
		30	Sperchon	2		2	Sperchon
		31	Suwallia	1		1	Suwallia

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2633	32	Tanytarsini	3	L	3	Tanytarsini
		33	Torrenticola	1		1	Torrenticola
		34	Turbellaria	1		1	Turbellaria
		35	Wormaldia	3	L	3	Wormaldia
		36	Zaitzevia	19	L	19	Zaitzevia

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2636						
		1	Acentrella	24		24	Acentrella
		2	Antocha	2	L	2	Antocha
		3	Atractides	1		1	Atractides
		4	Atrichopogon	1	L	2	Atrichopogon
		5	Baetis	91		91	Baetis
		6	Blepharicera	1	L	1	Blepharicera
		7	Blephariceridae	1	P	1	Blephariceridae
		8	Cheumatopsyche	4	L	4	Cheumatopsyche
		9	Chironomini	9	L	9	Chironomini
		10	Diamesinae	10	L	10	Diamesinae
		11	Dicosmoecus	18	L	18	Dicosmoecus
		12	Dipheter hageni	1		1	Dipheter hageni
		13	Drunella spinifera	1		1	Drunella spinifera
		14	Ecdyonurus criddlei	2		2	Ecdyonurus criddlei
		15	Epeorus	40		40	Epeorus
		16	Glossosoma	1	L	1	Glossosoma
		17	Hesperoperla	1		1	Hesperoperla
		18	Hydropsyche	21	L	21	Hydropsyche
		19	Hygrobates	5		5	Hygrobates
		20	Lebertia	2		2	Lebertia
		21	Limnesia	2		2	Limnesia
		22	Maruina lanceolata	1	L	9	Maruina lanceolata
		23	Mideopsis	1		1	Mideopsis
		24	Neoplasta	2	L	2	Neoplasta
		25	Neotrichia	3	L	3	Neotrichia
		26	Oecetis	2	L	2	Oecetis
		27	Ophiogomphus	1		1	Ophiogomphus
		28	Optioservus	4	L	4	Optioservus
		29	Orthoclaadiinae	19	L	19	Orthoclaadiinae
		30	Paraleptophlebia	1		1	Paraleptophlebia
		31	Protzia	6		6	Protzia

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2636	32	Psephenus falli	6	L	6	Psephenus falli
		33	Pteronarcys	1		1	Pteronarcys
		34	Rhyacophila	1	L	1	Rhyacophila
		35	Serratella	9		9	Serratella
		36	Simulium	5	L	5	Simulium
		37	Skwala	10		10	Skwala
		38	Sperchon	6		6	Sperchon
		39	Torrenticola	11		11	Torrenticola
		40	Tricorythodes	1		1	Tricorythodes
		41	Turbellaria	1		1	Turbellaria
		42	Wormaldia	2	L	2	Wormaldia
		43	Zaitzevia	16	L	16	Zaitzevia

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2646						
		1	Agapetus	1	L	1	Agapetus
		2	Ameletus	7		7	Ameletus
		3	Antocha	2	L	2	Antocha
		4	Arctopsyche	3	L	3	Arctopsyche
		5	Atherix pachypus	13	L	13	Atherix pachypus
		6	Atractides	2		2	Atractides
		7	Attenella	19		19	Attenella
		8	Baetis	31		31	Baetis
		9	Calineuria californica	2		2	Calineuria californica
		10	Centroptilum	2		2	Centroptilum
		11	Drunella doddsii	2		2	Drunella doddsii
		12	Drunella spinifera	3		3	Drunella spinifera
		13	Epeorus	17	L	1	Lepidostoma
		13	Epeorus	17		17	Epeorus
		14	Heptageniidae	4		4	Heptageniidae
		15	Hydropsyche	2	L	2	Hydropsyche
		16	Hygrobates	3		3	Hygrobates
		17	Lebertia	2		2	Lebertia
		18	Lepidostoma	30	L	30	Lepidostoma
		19	Neophylax	2	L	2	Oligophlebodes
		20	Optioservus	1	L	1	Optioservus
		21	Paraleptophlebia	1		1	Paraleptophlebia
		22	Perlinodes aurea	2		2	Perlinodes aurea
		23	Polycentropus	1	L	1	Polycentropus
		24	Pteronarcys	1		1	Pteronarcys
		25	Rhithrogena	4		4	Rhithrogena
		26	Serratella	1		1	Serratella
		27	Simulium	1	L	1	Simulium
		28	Skwala	2		2	Skwala
		29	Sperchon	3		3	Sperchon
		30	Tanypodinae	1	L	1	Tanypodinae

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2646	31	Tanytarsini	1	L	1	Tanytarsini
		32	Torrenticola	16		16	Torrenticola
		33	Zaitzevia	6	L	6	Zaitzevia



<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2696						
		1	Acentrella	7		7	Acentrella
		2	Baetis	120		130	Baetis
		3	Blephariceridae	1	P	1	Blephariceridae
		4	Caecidotea	4		1	Caecidotea
		5	Centroptilum	10		10	Centroptilum
		6	Chironomini	7	L	7	Chironomini
		7	Corbicula	2		2	Corbicula
		8	Crangonyx	12		12	Crangonyx
		9	Ecdyonurus criddlei	15		15	Ecdyonurus criddlei
		10	Fallceon quilleri	7		7	Fallceon quilleri
		11	Hyaella	2		2	Hyaella
		12	Hydropsyche	70	L	71	Hydropsyche
		13	Hydroptila	1	L	1	Hydroptila
		14	Hygrobates	2		2	Hygrobates
		15	Lebertia	17		17	Lebertia
		16	Limnesia	2		2	Limnesia
		17	Lymnaeidae	1		1	Lymnaeidae
		18	Menetus	1		1	Menetus
		19	Mystacides	2	L	2	Mystacides
		20	Nectopsyche	1	L	1	Nectopsyche
		21	Oligochaeta	10		8	Oligochaeta
		22	Ordobrevia nubifera	1	L	1	Ordobrevia nubifera
		23	Orthoclaadiinae	14	L	14	Orthoclaadiinae
		24	Ostracoda	7		7	Ostracoda
		25	Pisidium	4		4	Pisidium
		26	Prostoma	4		4	Prostoma
		27	Protoptila	3	L	3	Protoptila
		28	Serratella	5		5	Serratella
		29	Simulium	7	L	7	Simulium
		30	Sperchon	4		4	Sperchon
		31	Tanypodinae	4	L	4	Tanypodinae

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2696	32	Tanytarsini	14	L	14	Tanytarsini
		33	Tricorythodes	79		78	Tricorythodes
		33	Tricorythodes	79		1	Serratella
		34	Turbellaria	35		34	Turbellaria
		35	Wormaldia	30	L	29	Wormaldia

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2700						
		1	Atractides	1		1	Atractides
		2	Baetis	85		89	Baetis
		3	Blepharicera	3	L	3	Blepharicera
		4	Caecidotea	13		13	Caecidotea
		5	Centroptilum	2		2	Centroptilum
		6	Chironomini	47	L	47	Chironomini
		7	Crangonyx	17		17	Crangonyx
		8	Ecdyonurus criddlei	6		6	Ecdyonurus criddlei
		9	Fallceon quilleri	5		5	Fallceon quilleri
		10	Ferrissia	3		3	Ferrissia
		11	Glossosoma	4	L	4	Glossosoma
		12	Hyaella	2		2	Hyaella
		13	Hydropsyche	107	L	107	Hydropsyche
		14	Lebertia	1		1	Lebertia
		15	Lepidostoma	2	L	2	Lepidostoma
		16	Malenka	1		1	Malenka
		17	Menetus	3		3	Menetus
		18	Mystacides	1	L	1	Mystacides
		19	Neoplasta	1	L	1	Neoplasta
		20	Oligochaeta	1		1	Oligochaeta
		21	Orthoclaadiinae	44	L	44	Orthoclaadiinae
		22	Ostracoda	8		8	Ostracoda
		23	Petrophila	1	L	1	Petrophila
		24	Polycentropus	2	L	2	Polycentropus
		25	Serratella	7		7	Serratella
		26	Simulium	4	L	4	Simulium
		27	Sperchon	4		4	Sperchon
		28	Sphaeriidae	2		2	Sphaeriidae
		29	Tanypodinae	5	L	5	Tanypodinae
		30	Tanytarsini	30	L	30	Tanytarsini
		31	Tricorythodes	68		68	Tricorythodes

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2700	32	Turbellaria	30		30	Turbellaria
		33	Wormaldia	1	L	1	Wormaldia

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2706						
		1	Argia	4		4	Argia
		2	Baetis	5		5	Baetis
		3	Bezzia/ Palpomyia	1	L	1	Bezzia/ Palpomyia
		4	Blepharicera	1	L	1	Blepharicera
		5	Centroptilum	1		1	Centroptilum
		6	Cheumatopsyche	1	L	1	Cheumatopsyche
		7	Chimarra	3	L	3	Chimarra
		8	Chironomini	31	L	31	Chironomini
		9	Cloeodes excogitatus	1		1	Cloeodes excogitatus
		10	Dasyhelea	1	L	1	Dasyhelea
		11	Dubiraphia	1	L	1	Dubiraphia
		12	Epeorus	4		4	Epeorus
		13	Fallceon quilleri	1		1	Fallceon quilleri
		14	Hesperoperla	1		1	Hesperoperla
		15	Hydropsyche	9	L	9	Hydropsyche
		16	Hydroptila	2	L	2	Hydroptila
		17	Libellulidae	2		2	Libellulidae
		18	Microcylloepus	10	L	10	Microcylloepus
		19	Mideopsis	1		1	Mideopsis
		20	Neumania	1		1	Neumania
		21	Oecetis	1	L	1	Oecetis
		22	Ophiogomphus	3		3	Ophiogomphus
		23	Optioservus	2	L	2	Optioservus
		24	Orthoclaadiinae	20	L	20	Orthoclaadiinae
		25	Ostracoda	33		32	Ostracoda
		26	Paracloeodes minutus	1		1	Paracloeodes minutus
		27	Physa	1		1	Physa
		28	Polycentropus	1	L	1	Polycentropus
		29	Prostoma	4		4	Prostoma
		30	Rhithrogena	3		3	Rhithrogena
		31	Simulium	263	L	264	Simulium

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2706	31	Simulium	263	L	1	Orthoclaadiinae
		32	Tanypodinae	50	L	49	Tanypodinae
		33	Tanytarsini	12	L	12	Tanytarsini
		34	Torrenticola	2		2	Torrenticola
		35	Tricorythodes	8		8	Tricorythodes
		36	Turbellaria	2		2	Turbellaria
		37	Zaitzevia	2	L	2	Zaitzevia

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2709						
		1	Acentrella	1		1	Acentrella
		2	Blepharicera	1	L	1	Blepharicera
		3	Brechmorhoga mendax	2		2	Brechmorhoga mendax
		4	Cheumatopsyche	2	L	2	Cheumatopsyche
		5	Chimarra	13	L	13	Chimarra
		6	Fallceon quilleri	7		7	Fallceon quilleri
		7	Hydropsyche	18	L	18	Hydropsyche
		8	Hydroptila	1	L	1	Hydroptila
		9	Microcylloepus	5	L	5	Microcylloepus
		10	Optioservus	1	L	1	Optioservus
		11	Orthoclaadiinae	16	L	16	Orthoclaadiinae
		12	Physa	6		6	Physa
		13	Rhithrogena	3		3	Rhithrogena
		14	Serratella	1		1	Serratella
		15	Simulium	430	L	430	Simulium
		16	Tanytarsini	4	L	4	Tanytarsini
		17	Tricorythodes	3		3	Tricorythodes
		18	Turbellaria	1		1	Turbellaria
		19	Zaitzevia	6	L	6	Zaitzevia

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2718						
		1	Acentrella	2		2	Acentrella
		2	Argia	3		3	Argia
		3	Baetis	18		18	Baetis
		4	Brechmorhoga mendax	4		4	Brechmorhoga mendax
		5	Centroptilum	3		3	Centroptilum
		6	Cheumatopsyche	6	L	6	Cheumatopsyche
		7	Chimarra	1	L	1	Chimarra
		8	Chironomini	10	L	10	Chironomini
		9	Cloeodes excogitatus	12		12	Cloeodes excogitatus
		10	Coenagrionidae	1		1	Coenagrionidae
		11	Dasyhelea	31	L	31	Dasyhelea
		12	Dipheter hageni	3		3	Dipheter hageni
		13	Empididae	1	P	1	Empididae
		14	Epeorus	1		1	Epeorus
		15	Fallceon quilleri	8		8	Fallceon quilleri
		16	Helicopsyche	62	L	62	Helicopsyche
		17	Hetaerina americana	1		1	Hetaerina americana
		18	Hydropsyche	2	L	2	Hydropsyche
		19	Hydroptila	48	L	48	Hydroptila
		20	Hygrobates	1		1	Hygrobates
		21	Menetus	1		1	Menetus
		22	Microcylloepus	6	L	6	Microcylloepus
		23	Mideopsis	3		3	Mideopsis
		24	Mystacides	5	L	5	Mystacides
		25	Neotrichia	1	L	1	Neotrichia
		26	Oecetis	5	L	5	Oecetis
		27	Oligochaeta	4		4	Oligochaeta
		28	Ophiogomphus	1		1	Ophiogomphus
		29	Optioservus	17	L	17	Optioservus
		30	Orthoclaadiinae	25	L	25	Orthoclaadiinae



<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2718	31	Paracloeodes minutus	22		22	Paracloeodes minutus
		32	Pisidium	4		4	Pisidium
		33	Polycentropus	2	L	2	Polycentropus
		34	Procloeon	3		3	Procloeon
		35	Prostoma	13		13	Prostoma
		36	Psephenus falli	21	L	21	Psephenus falli
		37	Rhithrogena	3		3	Rhithrogena
		38	Serratella	11		11	Serratella
		39	Simulium	4	L	4	Simulium
		40	Sperchon	2		2	Sperchon
		41	Stenocolus scutellaris	1	L	1	Stenocolus scutellaris
		42	Tanypodinae	31	L	31	Tanypodinae
		43	Tanytarsini	5	L	5	Tanytarsini
		44	Torrenticola	37		37	Torrenticola
		45	Tricorythodes	21		21	Tricorythodes
		46	Turbellaria	5		5	Turbellaria
		47	Zaitzevia	28	L	28	Zaitzevia

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2738						
		1	Acentrella	2		2	Acentrella
		2	Antocha	1	P	1	Antocha
		3	Baetis	52		52	Baetis
		4	Centroptilum	15		15	Centroptilum
		5	Cheumatopsyche	2	L	2	Cheumatopsyche
		6	Chironomini	48	L	48	Chironomini
		7	Cinygmula	11		11	Cinygmula
		8	Cloeodes excogitatus	4		4	Cloeodes excogitatus
		9	Dipheter hageni	7		7	Dipheter hageni
		10	Drunella spinifera	2		2	Drunella spinifera
		11	Epeorus	6		6	Epeorus
		12	Ephemerella	9		9	Ephemerella
		13	Helicopsyche	2	L	2	Helicopsyche
		14	Hesperoperla	1		1	Hesperoperla
		15	Hydropsyche	9	L	9	Hydropsyche
		16	Hydroptila	1	L	1	Hydroptila
		17	Hygrobates	1		1	Hygrobates
		18	Isoperla	2		2	Isoperla
		19	Lebertia	4		4	Lebertia
		20	Lepidostoma	3	L	3	Lepidostoma
		21	Narpus	1	L	1	Narpus
		22	Neophylax	1	L	1	Neophylax
		23	Oecetis	10	L	10	Oecetis
		24	Oligochaeta	44		44	Oligochaeta
		25	Ophiogomphus	3		3	Ophiogomphus
		26	Optioservus	137	L	137	Optioservus
		27	Ordobrevia nubifera	1	A	1	Ordobrevia nubifera
		28	Orthoclaadiinae	12	L	12	Orthoclaadiinae
		29	Paraleptophlebia	8		8	Paraleptophlebia
		30	Perlinodes aurea	5		5	Perlinodes aurea
		31	Pisidium	1		1	Pisidium

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2738	32	Procloeon	16		16	Procloeon
		33	Rhithrogena	3		3	Rhithrogena
		34	Simulium	2	L	2	Simulium
		35	Skwala	13		14	Skwala
		36	Sweltsa	3		3	Sweltsa
		37	Tanypodinae	11	L	11	Tanypodinae
		38	Tanytarsini	13	L	13	Tanytarsini
		39	Torrenticola	3		3	Torrenticola
		40	Zaitzevia	30	L	30	Zaitzevia

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2747						
		1	Ameletus	3		3	Ameletus
		2	Baetis	10		10	Baetis
		3	Calineuria californica	2		2	Calineuria californica
		4	Capniidae	2		2	Capniidae
		5	Chironomini	34	L	34	Chironomini
		6	Cinygmula	29		29	Cinygmula
		7	Claassenia sabulosa	2		2	Claassenia sabulosa
		8	Doroneuria baumanni	3		3	Doroneuria baumanni
		9	Epeorus	8		8	Epeorus
		10	Ephemerella	47		47	Ephemerella
		11	Hemerodromia	1	L	1	Hemerodromia
		12	Hydropsyche	2	L	2	Hydropsyche
		13	Hydroptila	5	L	5	Hydroptila
		14	Isoperla	1		1	Isoperla
		15	Lebertia	6		6	Lebertia
		16	Lepidostoma	2	L	2	Lepidostoma
		17	Micrasema	6	L	6	Micrasema
		18	Neophylax	3	L	3	Neophylax
		19	Oligochaeta	28		28	Oligochaeta
		20	Optioservus	35	L	38	Optioservus
		21	Ordobrevia nubifera	1	A	1	Ordobrevia nubifera
		22	Orthoclaadiinae	144	L	145	Orthoclaadiinae
		23	Paraleptophlebia	2		2	Paraleptophlebia
		24	Perlinodes aurea	1		1	Perlinodes aurea
		25	Protzia	1		1	Protzia
		26	Rhithrogena	20		20	Rhithrogena
		27	Serratella	2		2	Serratella
		28	Simulium	16	L	16	Simulium
		29	Skwala	2		2	Skwala
		30	Sperchon	4		4	Sperchon

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2747	31	Sweltsa	2		9	Sweltsa
		32	Tanypodinae	4	L	4	Tanypodinae
		33	Tanytarsini	44	L	44	Tanytarsini
		34	Torrenticola	1		1	Torrenticola
		35	Zaitzevia	22	L	22	Zaitzevia
		36	Zapada	1		1	Zapada

Taxonomist	Sample no.	Vial no.	Original ID	Original Count	Stage	ABL Count	ABL ID
Tom King	BAS-2752			0	x	0	
		1	Ameletus	7		7	Ameletus
		2	Antocha	2	L	2	Antocha
		3	Arctopsyche	6	L	6	Arctopsyche
		4	Atherix pachypus	12	L	12	Atherix pachypus
		5	Baetis	34		34	Baetis
		6	Bezzia/ Palpomyia	3	L	3	Bezzia/ Palpomyia
		7	Caloparyphus/Euparyphus	1	L	1	Caloparyphus/Euparyphus
		8	Chironomini	2	L	2	Chironomini
		9	Cinygmula	30		30	Cinygmula
		10	Cloeodes excogitatus	1		1	Cloeodes excogitatus
		11	Dixa	9	L	9	Dixa
		12	Drunella doddsii	3		3	Drunella doddsii
		13	Drunella spinifera	1		1	Drunella spinifera
		14	Epeorus	8		8	Epeorus
		15	Ephemerella	83		83	Ephemerella
		16	Glossosoma	20	L	20	Glossosoma
		17	Heptageniidae	6		6	Heptageniidae
		18	Hydropsyche	13	L	13	Hydropsyche
		19	Hygrobates	16		16	Hygrobates
		20	Ironodes	4		4	Ironodes
		21	Lebertia	6		6	Lebertia
		22	Lepidostoma	56	L	56	Lepidostoma
		23	Limonia	1	L	1	Limonia
		24	Malenka	1		1	Malenka
		25	Maruina lanceolata	1	L	2	Maruina lanceolata
		26	Micrasema	12	L	12	Micrasema
		27	Mystacides	2	L	2	Mystacides
		28	Neophylax	4	L	4	Neophylax
		29	Oligochaeta	6		6	Oligochaeta

<b>Taxonomist</b>	<b>Sample no.</b>	<b>Vial no.</b>	<b>Original ID</b>	<b>Original Count</b>	<b>Stage</b>	<b>ABL Count</b>	<b>ABL ID</b>
Tom King	BAS-2752	30	Oligophlebodes	1	L	1	Oligophlebodes
		31	Optioservus	7	L	7	Optioservus
		32	Orthoclaadiinae	30	L	31	Orthoclaadiinae
		33	Osobenus yakimae	1		1	Cultus
		34	Paraleptophlebia	8		8	Paraleptophlebia
		35	Perlidae	1		1	Perlidae
		36	Protzia	1		1	Protzia
		37	Rhithrogena	13		13	Rhithrogena
		38	Simulium	42	L	42	Simulium
		39	Sperchon	2		2	Sperchon
		40	Sweltsa	1		1	Sweltsa
		41	Tanypodinae	4	L	4	Tanypodinae
		42	Tanytarsini	21	L	21	Tanytarsini
		43	Torrenticola	5		5	Torrenticola
		44	Zaitzevia	8	L	8	Zaitzevia

## Listing of Enumeration Discrepancies

Samples submitted by Bioassessment Services for Project: Merced River 2007

Report prepared by Brady Richards, CDFG ABL-Chico, 7/30/2008

Minor Counting Discrepancies		Sample #	Vial #	Original ID	# Counted Original	QC	Difference (Original - QC)
	<b>BAS-2608</b>	15		Nectopsyche	36	35	1
	<b>BAS-2633</b>	13		Glossosoma	6	7	-1
	<b>BAS-2636</b>	4		Atrichopogon	1	2	-1
		22		Maruina lanceolata	1	9	-8
	<b>BAS-2646</b>	13		Epeorus	17	18	-1
	<b>BAS-2696</b>	2		Baetis	120	130	-10
		4		Caecidotea	4	1	3
		12		Hydropsyche	70	71	-1
		21		Oligochaeta	10	8	2
		34		Turbellaria	35	34	1
		35		Wormaldia	30	29	1
	<b>BAS-2700</b>	2		Baetis	85	89	-4
	<b>BAS-2706</b>	25		Ostracoda	33	32	1
		31		Simulium	263	265	-2
		32		Tanypodinae	50	49	1
	<b>BAS-2738</b>	35		Skwala	13	14	-1
	<b>BAS-2747</b>	20		Optioservus	35	38	-3
		22		Orthocladiinae	144	145	-1
		31		Sweltsa	2	9	-7
	<b>BAS-2752</b>	25		Maruina lanceolata	1	2	-1
		32		Orthocladiinae	30	31	-1



## Listing of Taxonomic Discrepancies

Samples submitted by Bioassessment Services for Project: Merced River 2007

Report prepared by Brady Richards, CDFG ABL-Chico, 7/30/2008

Sample #	Vial #	Original ID	Final ID	QC Final ID	Taxonomic level of dispute	# Organisms	Comments
<b>BAS-2646</b> Disputed ID	19	Neophylax		Oligophleboles	Genus	2	
Probable sorting error				Lepidostoma	Order	1	
<b>BAS-2696</b> Probable sorting error	33	Tricorythodes		Serratella	Family	1	
<b>BAS-2706</b> Probable sorting error	31	Simulium		Orthoclaadiinae	Family	1	This disputed ID also represents a difference in taxonomic
precision.							
<b>BAS-2752</b> Disputed ID	33	Osobenus yakimae		Cultus	Genus	1	This disputed ID also represents a difference in taxonomic
precision.							

## Summary of Taxonomic and Enumeration Discrepancies

Samples submitted by Bioassessment Services for Project: Merced River 2007

Report prepared by Brady Richards, CDFG ABL-Chico, 7/30/2008

Sample #	Total Taxa	Taxonomic Discrepancies						Counting Discrepancies			
		Disputed ID		Taxonomic Precision Relative to QC				Major		Minor	
		<i>f</i> *	<i>n</i> **	More precise <i>f</i>	Less <i>n</i>	More precise <i>f</i>	Less <i>n</i>	<i>f</i>	<i>d</i> ***	<i>f</i>	<i>d</i>
BAS-2608	26	-	-	-	-	-	-	-	-	1	1
BAS-2633	36	-	-	-	-	-	-	-	-	1	1
BAS-2636	43	-	-	-	-	-	-	-	-	2	9
BAS-2646	33	1	2	-	-	-	-	-	-	1	1
BAS-2696	35	-	-	-	-	-	-	-	-	6	18
BAS-2700	33	-	-	-	-	-	-	-	-	1	4
BAS-2706	37	-	-	-	-	-	-	-	-	3	4
BAS-2709	19	-	-	-	-	-	-	-	-	-	-
BAS-2718	47	-	-	-	-	-	-	-	-	-	-
BAS-2738	40	-	-	-	-	-	-	-	-	1	1
BAS-2747	36	-	-	-	-	-	-	-	-	3	11
BAS-2752	44	1	1	-	-	-	-	-	-	2	2

\* = the frequency of occurrence of the discrepancy, in number of samples

\*\* = the number of organisms affected (by QC Lab counts) *n*

\*\*\* = the sum total of (absolute value of) differences in counts *d*

*f*

***QC Report - Disputed ID's only***

Samples submitted by Bioassessment Services for Project: Merced River 2007

Report prepared by Brady Richards, CDFG ABL-Chico, 7/30/2008

<b><i>Sample #</i></b>	<b><i>Vial</i></b>	<b><i>Original ID</i></b>	<b><i>QC ID</i></b>	<b><i>comments</i></b>
BAS-2646	19	Neophylax	Oligophlebodes	
BAS-2752	33	Osobenus yakimae	Cultus	This disputed ID also represents a difference in taxonomic precision.



## **APPENDIX J**

# **NEW AVIAN DATA**

- **Table J-1**            **Site codes, approximate river mile, number of points per site and dates for all visits to sites showing all methods, 2006–2008 (Excel).**
- **Table J-2**            **List of all species detected (and scientific names) in taxonomic order using all methods, 2006-08.**
- **Table J-3**            **Average avian species diversity, species richness, total number of individuals, and species relative abundance by point and by site using 2006-2007 point count data (Excel).**
- **Table J-4**            **Breeding season species unique to each watershed and species detected in both lower and upper watersheds, 2006-07.**
- **Table J-5**            **Breeding season species list by monitoring site from point count surveys, 2006-2007 (Excel).**
- **Table J-6**            **All raptor detections and breeding observations during point count surveys in 2006-2007 (Excel).**
- **Table J-7**            **Total number of individuals detected of each species, average species richness, and average species diversity by monitoring site for fall area search surveys, 2006-2007 (Excel).**
- **Table J-8**            **Total number of individuals detected of each species, average species richness, and average species diversity by monitoring site for winter area search surveys, 2006-2008 (Excel).**



**Table J-1. Site codes, approximate river mile, number of points per site and dates for all visits to sites showing all methods, 2006–2008.**

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

**Table J-2. List of all species detected (and scientific names) in taxonomic order using all methods, 2006-08.**

Species	Scientific name	Found in historical data (Y/N)
Pied-billed Grebe	<i>Podilymbus podiceps</i>	Y
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Y
American Bittern	<i>Botaurus lentiginosus</i>	N
Great Blue Heron	<i>Ardea herodias</i>	Y
Great Egret	<i>Ardea alba</i>	Y
Snowy Egret	<i>Egretta thula</i>	N
Green Heron	<i>Butorides virescens</i>	Y
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	Y
Turkey Vulture	<i>Cathartes aura</i>	Y
Canada Goose	<i>Branta canadensis</i>	N
Wood Duck	<i>Aix sponsa</i>	Y
Gadwall	<i>Anas strepera</i>	N
American Wigeon	<i>Anas americana</i>	N
Mallard	<i>Anas platyrhynchos</i>	Y
Northern Pintail	<i>Anas acuta</i>	N
Common Goldeneye	<i>Bucephala clangula</i>	N
Common Merganser	<i>Mergus merganser</i>	Y
Osprey	<i>Pandion haliaetus</i>	Y
White-tailed Kite	<i>Elanus leucurus</i>	Y
Sharp-shinned Hawk	<i>Accipiter striatus</i>	Y
Cooper's Hawk	<i>Accipiter cooperii</i>	Y
Northern Goshawk	<i>Accipiter gentilis</i>	Y
Red-shouldered Hawk	<i>Buteo lineatus</i>	Y
Swainson's Hawk	<i>Buteo swainsoni</i>	Y
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Y
Golden Eagle	<i>Aquila chrysaetos</i>	Y
American Kestrel	<i>Falco sparverius</i>	Y
Ring-necked Pheasant	<i>Phasianus colchicus</i>	N
Mountain Quail	<i>Oreortyx pictus</i>	Y
California Quail	<i>Callipepla californica</i>	Y
Virginia Rail	<i>Rallus limicola</i>	Y
Common Moorhen	<i>Gallinula chloropus</i>	Y
American Coot	<i>Fulica americana</i>	Y
Killdeer	<i>Charadrius vociferus</i>	Y
Greater Yellowlegs	<i>Tringa melanoleuca</i>	N
Spotted Sandpiper	<i>Actitis macularius</i>	Y
Forster's Tern	<i>Sterna forsteri</i>	N



**Table J-2. List of all species detected (and scientific names) in taxonomic order using all methods, 2006-08.**

Species	Scientific name	Found in historical data (Y/N)
Rock Pigeon	<i>Columba livia</i>	Y
Band-tailed Pigeon	<i>Columba fasciata</i>	Y
Mourning Dove	<i>Zenaida macroura</i>	Y
Great Horned Owl	<i>Bubo virginianus</i>	Y
White-throated Swift	<i>Aeronautes saxatalis</i>	Y
Black-chinned Hummingbird	<i>Archilocus alexandri</i>	Y
Anna's Hummingbird	<i>Calypte anna</i>	Y
Rufous Hummingbird	<i>Selasphorus rufus</i>	Y
Belted Kingfisher	<i>Ceryle alcyon</i>	Y
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	Y
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	Y
Nuttall's Woodpecker	<i>Picoides nuttallii</i>	Y
Downy Woodpecker	<i>Picoides pubescens</i>	Y
Hairy Woodpecker	<i>Picoides villosus</i>	Y
White-headed Woodpecker	<i>Picoides albolarvatus</i>	Y
Black-backed Woodpecker	<i>Picoides arcticus</i>	Y
Northern Flicker	<i>Colaptes auratus</i>	Y
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Y
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Y
Western Wood-Pewee	<i>Contopus sordidulus</i>	Y
Willow Flycatcher	<i>Empidonax traillii</i>	Y
Dusky Flycatcher	<i>Empidonax oberholseri</i>	Y
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	Y
Black Phoebe	<i>Sayornis nigricans</i>	Y
Say's Phoebe	<i>Sayornis saya</i>	Y
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	Y
Western Kingbird	<i>Tyrannus verticalis</i>	Y
Cassin's Vireo	<i>Vireo cassinii</i>	Y
Hutton's Vireo	<i>Vireo huttoni</i>	Y
Warbling Vireo	<i>Vireo gilvus</i>	Y
Steller's Jay	<i>Cyanocitta stelleri</i>	Y
Western Scrub-Jay	<i>Aphelocoma californica</i>	Y
Yellow-billed Magpie	<i>Pica nuttalli</i>	Y
American Crow	<i>Corvus brachyrhynchos</i>	Y
Common Raven	<i>Corvus corax</i>	Y
Tree Swallow	<i>Tachycineta bicolor</i>	Y
Violet-green Swallow	<i>Tachycineta thalassina</i>	Y

**Table J-2. List of all species detected (and scientific names) in taxonomic order using all methods, 2006-08.**

Species	Scientific name	Found in historical data (Y/N)
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Y
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	Y
Barn Swallow	<i>Hirundo rustica</i>	Y
Mountain Chickadee	<i>Poecile gambeli</i>	Y
Chestnut-backed Chickadee	<i>Poecile rufescens</i>	Y
Oak Titmouse	<i>Baeolophus inornatus</i>	Y
Bushtit	<i>Psaltriparus minimus</i>	Y
Red-breasted Nuthatch	<i>Sitta canadensis</i>	Y
White-breasted Nuthatch	<i>Sitta carolinensis</i>	Y
Brown Creeper	<i>Certhia americana</i>	Y
Rock Wren	<i>Salpinctes obsoletus</i>	Y
Canyon Wren	<i>Catherpes mexicanus</i>	Y
Bewick's Wren	<i>Thryomanes bewickii</i>	Y
House Wren	<i>Troglodytes aedon</i>	Y
Winter Wren	<i>Troglodytes troglodytes</i>	Y
Marsh Wren	<i>Cistothorus palustris</i>	Y
American Dipper	<i>Cinclus mexicanus</i>	Y
Golden-crowned Kinglet	<i>Regulus satrapa</i>	Y
Ruby-crowned Kinglet	<i>Regulus calendula</i>	Y
Western Bluebird	<i>Sialia mexicana</i>	Y
Swainson's Thrush	<i>Catharus ustulatus</i>	Y
Hermit Thrush	<i>Catharus guttatus</i>	Y
American Robin	<i>Turdus migratorius</i>	Y
Wrentit	<i>Chamaea fasciata</i>	Y
Northern Mockingbird	<i>Mimus polyglottos</i>	Y
European Starling	<i>Sturnus vulgaris</i>	Y
American Pipit	<i>Anthus rubescens</i>	Y
Cedar Waxwing	<i>Bombycilla cedrorum</i>	Y
Orange-crowned Warbler	<i>Vermivora celata</i>	Y
Nashville Warbler	<i>Vermivora ruficapilla</i>	Y
Yellow Warbler	<i>Dendroica petechia</i>	Y
Yellow-rumped Warbler	<i>Dendroica coronata</i>	Y
Black-throated Gray Warbler	<i>Dendroica nigrescens</i>	Y
Townsend's Warbler	<i>Dendroica townsendi</i>	Y
Hermit Warbler	<i>Dendroica occidentalis</i>	Y
MacGillivray's Warbler	<i>Oporornis tolmiei</i>	Y
Common Yellowthroat	<i>Geothlypis trichas</i>	Y

**Table J-2. List of all species detected (and scientific names) in taxonomic order using all methods, 2006-08.**

Species	Scientific name	Found in historical data (Y/N)
Wilson's Warbler	<i>Wilsonia pusilla</i>	Y
Yellow-breasted Chat	<i>Icteria virens</i>	Y
Western Tanager	<i>Piranga ludoviciana</i>	Y
Spotted Towhee	<i>Pipilo maculatus</i>	Y
California Towhee	<i>Pipilo crissalis</i>	Y
Chipping Sparrow	<i>Spizella passerina</i>	Y
Fox Sparrow	<i>Passerella iliaca</i>	Y
Song Sparrow	<i>Melospiza melodia</i>	Y
Lincoln's Sparrow	<i>Melospiza lincolni</i>	Y
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	Y
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	Y
Oregon Junco	<i>Junco h. oregonus</i>	Y
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	Y
Blue Grosbeak	<i>Passerina caerulea</i>	Y
Lazuli Bunting	<i>Passerina amoena</i>	Y
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Y
Tricolored Blackbird	<i>Agelaius tricolor</i>	Y
Western Meadowlark	<i>Sturnella neglecta</i>	Y
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>	Y
Great-tailed Grackle	<i>Quiscalus mexicanus</i>	N
Brown-headed Cowbird	<i>Molothrus ater</i>	Y
Hooded Oriole	<i>Icterus cucullatus</i>	N
Bullock's Oriole	<i>Icterus bullockii</i>	Y
Purple Finch	<i>Carpodacus purpureus</i>	Y
Cassin's Finch	<i>Carpodacus cassinii</i>	Y
House Finch	<i>Carpodacus mexicanus</i>	Y
Red Crossbill	<i>Loxia curvirostra</i>	Y
Lesser Goldfinch	<i>Carduelis psaltria</i>	Y
Lawrence's Goldfinch	<i>Carduelis lawrencei</i>	Y
American Goldfinch	<i>Carduelis tristis</i>	Y
House Sparrow	<i>Passer domesticus</i>	N

**Table J-3. Average avian species diversity, species richness, total number of individuals, and species relative abundance by point and by site using 2006-2007 point count data.** Data includes all detections within 50 m, excluding juveniles and fly-overs. The relative abundance of the 70 most abundant species is presented.

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

**Table J-4. Breeding season species unique to each watershed and species detected in both lower and upper watersheds, 2006-07.**

Lower River Unique Species	Detected in Both Upper and Lower River	Upper River Unique Species
American Coot	Acorn Woodpecker	American Dipper
American Crow	American Robin	Band-tailed Pigeon
American Goldfinch	Anna's Hummingbird	Black-backed Woodpecker
American Kestrel	Ash-throated Flycatcher	Black-throated Gray Warbler
Barn Owl	Barn Swallow	Brown Creeper
Black-crowned Night-Heron	Belted Kingfisher	Canyon Wren
Blue Grosbeak	Bewick's Wren	Cassin's Finch
Canada Goose	Black Phoebe	Chestnut-backed Chickadee
Cedar Waxwing	Black-chinned Hummingbird	Chipping Sparrow
Common Moorhen	Black-headed Grosbeak	Fox Sparrow
Common Yellowthroat	Brewer's Blackbird	Golden-crowned Kinglet
Double-crested Cormorant	Brown-headed Cowbird	Hermit Thrush
Dusky Flycatcher	Bullock's Oriole	Hermit Warbler
Forster's Tern	Bushtit	MacGillivray's Warbler
Golden-crowned Sparrow	California Quail	Mountain Chickadee
Great Blue Heron	California Towhee	Mountain Quail
Great Egret	Cassin's Vireo	Northern Goshawk
Great Horned Owl	Cliff Swallow	Olive-sided Flycatcher
Great-tailed Grackle	Common Merganser	Oregon Junco
Green Heron	Common Raven	Pileated Woodpecker
Hooded Oriole	Cooper's Hawk	Purple Finch
House Finch	Downy Woodpecker	Red Crossbill
House Sparrow	European Starling	Red-breasted Nuthatch
Killdeer	Golden Eagle	Red-breasted Sapsucker
Marsh Wren	Hairy Woodpecker	Rufous Hummingbird
Northern Mockingbird	House Wren	Steller's Jay
Osprey	Hutton's Vireo	Violet-green Swallow
Pied-billed Grebe	Lawrence's Goldfinch	White-headed Woodpecker
Red-shouldered Hawk	Lazuli Bunting	White-throated Swift
Ring-necked Pheasant	Lesser Goldfinch	Winter Wren
Rock Pigeon	Mallard	Wrentit
Rock Wren	Mourning Dove	
Swainson's Hawk	Nashville Warbler	
Swainson's Thrush	Northern Flicker	
Tricolored Blackbird	Northern Rough-winged Swallow	
Western Bluebird	Nuttall's Woodpecker	

**Table J-4. Breeding season species unique to each watershed and species detected in both lower and upper watersheds, 2006-07.**

Lower River Unique Species	Detected in Both Upper and Lower River	Upper River Unique Species
Western Meadowlark	Oak Titmouse	
White-crowned Sparrow	Orange-crowned Warbler	
White-tailed Kite	Pacific-slope Flycatcher	
Willow Flycatcher	Red-tailed Hawk	
Wood Duck	Red-winged Blackbird	
Yellow-billed Magpie	Song Sparrow	
Yellow-breasted Chat	Spotted Sandpiper	
	Spotted Towhee	
	Townsend's Warbler	
	Tree Swallow	
	Turkey Vulture	
	Warbling Vireo	
	Western Kingbird	
	Western Scrub-Jay	
	Western Tanager	
	Western Wood-Pewee	
	White-breasted Nuthatch	
	Wilson's Warbler	
	Yellow Warbler	
	Yellow-rumped Warbler	

**Table J-5. Breeding season species list by monitoring site from point count surveys, 2006-2007.** Species presence (1) indicated by light blue shading.

Includes incidental sightings during point count surveys.

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

**Table J-6. All raptor detections and breeding observations during point count surveys in 2006-2007.** If a bird was flying over, but not using the plot, it was still noted in the dataset.

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

**Table J-7. Total number of individuals detected of each species, average species richness, and average species diversity by monitoring site for fall area search surveys, 2006-2007.**

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

**Table J-8. Total number of individuals detected of each species, average species richness, and average species diversity by monitoring site for winter area search surveys, 2006-2008.**

Excel file available at: <http://www.mercedriverwatershed.org/projects/stillwater>

