From: Staples, Rose
Sent: Monday, July 25, 2011 4:07 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Beuttler, John - CSPA; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Burt, Charles - CalPoly; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Gutierrez, Monica - NOAA-NMFS; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hellam, Anita - HH; Hersh-Burdick, Rachael - USACE; Heyne, Tim - CDFG; Holden, James ; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Kanz, Russ - SWRCB; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Pinhey, Nick - City of Modesto; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shumway, Vern - SNF; Shutes, Chris - CSPA; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Williamson, Harry (NPS); Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Subject: Don Pedro Project Proposed Study Plan - FERC Scoping Document 2

Proposed Study Plan (TID / MID)

The Proposed Study Plan (PSP) for the Don Pedro Project (FERC No. 2299) has been e-filed with FERC today. The document is available on FERC's E-Library website (www.FERC.gov). In addition, a copy has been posted to the Don Pedro Relicensing website at www.donpedro-relicensing.com and is accessible via the DOCUMENTS tab, under the STUDIES category. You may have to scroll down the screen to find the STUDIES section of the Document Listing.

Scoping Document 2 (FERC)
FERC issued today their Scoping Document 2. A copy is available on FERC's E-Library website (www.FERC.gov), or on the Don Pedro Relicensing website at www.donpedro-relicensing.com in the DOCUMENTS / PAD-NOI-SCOPING section.

If you have any difficulties locating and/or downloading the documents, or if you would prefer to receive a CD copy of the Proposed Study Plan, please advise me at the email address noted below. Thank you.

Rose Staples CPS CAP
Executive Assistant
HDR
970 Baxter Boulevard Suite 301 | Portland ME | 04103
Office: 207-775-4495 | Direct: 207-239-3857 | Fax: 207-775-1742
Email rose.staples@hdrinc.com

From: Russ Kanz [RKANZ@waterboards.ca.gov]
Sent: Monday, August 08, 2011 11:46 AM
To: Devine, John; Ruth M. Porter
Cc: Steve - AR' 'Rothert; Dave - AW' 'Steindorf; 'Bill Johnston'; William -CSPA' 'Jennings; Paul ' 'Marko; John - CSPA' 'Beuttler; Jim - MPM' 'Smith; Bill - MR' 'Lyons; Bob' 'Ott; Steve - ARTA' 'Welch; Art - BAWSCA' 'Jensen; Nicole - BAWSCA' 'Sandkulla; Allison - TRC' 'Boucher; Dave -Allison - TRC' 'Boucher; James - BLM' 'Eicher; Lauren - BLM' 'Fety; Rhonda - BVR' 'Morningstar Pope; Roselynn BVR' 'Lwenya; James - BLM' 'Barnes; Jeff -BLM' 'Horn; Peggy - BLM' 'Cranston; Beau - CalPoly' 'Freeman; Charles - CalPoly' 'Burt; Jenny - CT' 'Hatch; Cindy - GWWF' 'Charles; Mary - PRCI' 'Motola; Dan' 'Wheeler; Dave' 'Wheeler; John - CSERC' 'Buckley; Rebecca - CSERC' 'Cremeen; Annie' 'Manji; Jennifer - CDFG' 'O'Brien; Julie - CDFG' 'Means; Mary Jane - CDFG' 'Taylor; Robert - CDFG' 'Hughes; Stephen - CDFG' 'Puccini; Tim - CDFG' 'Heyne; Royal' 'Robbins; Ronn - CNRF/AIC' 'Slay; John - SCERD' 'Aud; Frank - FERC' 'Winchell; James L - FERC' 'Hastreiter; Kelly - FOR' 'Catlett; Ron - FOR' 'Stork; Maggie-SNF' 'Dowd; Vern - SNF' 'Shumway; Craig - USFWS' 'Anderson; Deborah - USFWS' 'Giglio; Michelle - USFWS' 'Workman; Zac - USFWS' 'Jackson; Harry (NPS)' 'Williamson; Janice' 'Keating; Jesse' 'Roseman; Allison - HB' 'Schutte; Ray - BAWSCA' 'McDevitt; Timothy - HansonBridgett' 'Findley; Loy, Carin; Jones, Rick; Staples, Rose; Mike - RHH' 'Marshall; Douglas P. Wheeler; Joseph' 'Lein; Noah' 'Hughes; Chris' 'Ott; Ron - NFMT' 'Goode; Teresa' 'Kinney; 'Justin'; James ' 'Holden; Art - CWRMP' 'Bowman; Dave - FR' 'Wood; David - TRT /RH' 'Linkard; Melissa - CRRMW' 'Powell; George A ' 'TeVelde; 'Greg Dias'; 'Joy Warren'; 'MelissaWilliams'; Jan -Chicken Ranch' 'Costa; Lloyd - CRRMW' 'Mathiesen; Stanley Rob - TBMWI' 'Cox; Reba - TMTC' 'Fuller; Jim - City ofModesto' 'Alves; Jack - City of Modesto' 'Bond; Nick - City of Modesto' 'Pinhey; Bryan - MF' 'Wilson; Colette - TRT/MF' 'Verkuil; Eric - MF' 'Walters; P - MF' 'Day; Zahra - MF' 'Hayat; 'Arthur F Godwin'; Chris - CSPA' 'Shutes; David O - N-R' 'Romano; Lynette - N-R' 'Asay; Jeffrey - NOAA-NMFS' 'McLain; John -NOAA' 'Wooster; Kathryn - NOAA-MNFS' 'Kempton; Larry - NOAA-MNFS' 'Thompson; Maria - NOAA-NMFS' 'Rea; Monica - NOAA-NMFS' 'Gutierrez; Rhonda - NOAA-NMFS' 'Reed; Rick - NOAA-NMFS' 'Wantuck; Steve - NOAA' 'Edmondson; Stephen - NPS' 'Bowes; Tony - NPS' 'Brochini; 'Tim O'Laughlin'; Dan -CDWA' 'McDaniel; Milford Wayne - OHP' 'Donaldson; Susan - CA SHPO' 'Stratton; Jeffrey' 'Cowan; Jerry ' 'Jackman; Donn W - SFPUC' 'Furman; Ellen - SFPUC' 'Levin; Michael - SFPUC' 'Carlin; tramirez@sfwater.org; William - SFPUC' 'Sears; Marty - SMRT' 'McDonnell; John - TUD' 'Mills; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; Tom - SCFB' 'Orvis; Wayne - SCFB' 'Zipser; Anthony - SSMN' 'Brochini; Michael - MFFC' 'Martin; Sandy ' 'Vasquez; 'Lewis-Reggie-PRCI'; Doug - TetraTech' 'Brewer; 'Michelle Reimers'; 'Robert M. Nees'; 'Steve Boyd'; Laura - TNC' 'Jensen; Philip - TNC' 'Cory; Brian - CalTrout' 'Johnson; Eric - TRT' 'Wesselman; Jessie - TRT' 'Raeder; Patrick - TRT' 'Koepele; Peter - TRT' 'Drekmeier; Ron' 'Yoshiyama; Kevin - USACE' 'Richardson; Rachael - USACE' 'Hersh-Burdick; Mary' 'Johannis; Julie -Water-Power Law Grp' 'Ganteinbein; Richard - Water-Power Law Grp forNHI' 'Roos-Collins; Anita - HH' 'Hellam; Tini' 'Horn; Elaine - YSC' 'Gorman

Subject:RE: Request for Additional Information

John,
I am interested in this information also. I recommend you scan this information and provide it to all parties at no cost.

Thanks

Russ J. Kanz
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812-2000
(916) 341-5341
rkanz@waterboards.ca.gov

>>> "Devine, John" <John.Devine@hdrinc.com> 8/5/2011 12:28 PM >>>
Ruth,

To report our progress on this matter, we have located the information you were requesting and will provide the information that is available electronically to you (or load it on the website). It is our intent to complete this by next Tuesday. The information consists of Forms 11, 173, 174, and 150 which exist in electronic format for the period October 1983 through December 2007. The forms prior to October 1983 exist as hard copy only and will need to be scanned. That will require disassembling binders, scanning, and reassembling binders, including staple removal and re-attachment. Do you also want this earlier information? There may be a charge for copying this information, but we have not yet estimated what that would be.

We are still researching the question relating to if, and how often, CCSF has gone negative in the water bank since 1971 (also when and for how long), and if there was compensation. We are hopeful of having this information to you next week as well.

We do believe that the water bank accounting methodology has not changed since the completion of the Project.

John

From: Porter, Ruth M. [mailto:ruth.porter@hoganlovells.com]
Sent: Wednesday, July 06, 2011 8:13 PM
To: Devine, John

From: Staples, Rose
Sent: Thursday, August 11, 2011 3:16 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Kanz, Russ - SWRCB; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Williamson, Harry (NPS); Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Subject: Don Pedro Relicensing Website Location of Additional Information Requested by Restore Hetch Hetchy

I have uploaded 5 new files to the www.donpedro-relicensing.com website, which contain information requested by Restore Hetch Hetchy (Ruth Porter, RHH). Once you have accessed the site, please click on DOCUMENTS. Then, using the scroll bar provided on the right-hand side of your screen, please scroll down past the ***PAD, NOI and FERC Scoping*** section. The next major section title is ***RHH Forms Request*** and in this section, under the sub-group heading *August 2011*, you will find the 5 files. If you have any problems accessing the website or the files, please let me know. Thank you.

ROSE STAPLES
CPS CAP

HDR Engineering, Inc.
Executive Assistant, Hydropower Services

970 Baxter Boulevard, Suite 301 | Portland, ME 04103
207.239.3857 | f: 207.775.1742
rose.staples@hdrinc.com | hdrinc.com

HOME EMAIL ADDRESSES REMOVED PER SECTION 2.4.3 DON PEDRO PAD

From: Loy, Carin
Sent: Thursday, August 25, 2011 4:16 PM
To: Tom Orvis; maperanch[redacted]
Cc: seboyd@tid.org; Craig[redacted]; Craig, Nancy; GREGD@MID.ORG; agodwin[redacted] noah@stillwatersci.com; AGENGR6[redacted] rmnees@tid.org; towater@olaughlinparis.com; duane.paul@cardno.com; Snider, William; steinerd[redacted]; JOYW@MID.ORG; Scott@stillwatersci.com; jalves@modestogov.com; lynette@newman-romano.com; jaud@envres.org; james_barnes@ca.blm.gov; Beuttler[redacted] jbeuttler[redacted]; Bond@[redacted]; jbond@modestogov.com; aboucher[redacted]; anadromous[redacted] Stephen_Bowes@nps.gov; artbow[redacted] douglas.brewer@tetratech.com; brochin[redacted] Buckley[redacted] johnb@cserc.org; cburt@calpoly.edu; Carlin[redacted]; mcarlin@sfwater.org; Catlett[redacted] kelly@friendsoftheriver.org; Charles[redacted] cindy[redacted]; Cory[redacted]; pcory@tnc.org; chixrnch@mlode.com; J.cowan[redacted]; receptionist@mlode.com; pcransto@ca.blm.gov; rebeccac@cserc.org; Pday@mofo.com; Devine, John; mwdonaldson@parks.ca.gov; mdowd@fs.fed.us; Peter@tuolumne.org; steve.edmondson@noaa.gov; james_eicher@BLM.gov; lfety@blm.gov; TFindley@hansonbridgett.com; bfreeman@calpoly.edu; rfuller@mlode.com; donn.w.furman@sfgov.org; jgantenbein@waterpowerlaw.com; Deborah_Giglio@fws.gov; rwgoode911[redacted] vevado[redacted] monica.gutierrez@noaa.gov; James.Hastreiter@FERC.gov; jhatch@caltrout.org; Zhayat@mofo.com; anitajhellam[redacted] Rachael.Hersh-Burdick@USACE.army.mil; theyne@dfg.ca.gov; holden2jo[redacted]; jhorn@ca.blm.gov; timihorn[redacted] noahnsa[redacted] rwhughes@dfg.ca.gov; jjackman[redacted]; zachary_jackson@FWS.gov; deltakeep[redacted]; ajensen@bawsca.org; Laura_Jensen@TNC.org; mjohannis@usbr.gov; bjohnson@tu.org; justin[redacted] rkanz@waterboards.ca.gov; jekeating66[redacted] kathryn.kempton@noaa.gov; tkinney86[redacted]; patrick@tuolumne.org; Mortalis46[redacted]; elevin@sfwater.org; prci.info@chukchansi.net; dslinkard[redacted] amanji@dfg.ca.gov; mike@hetchhetchy.org; mmartin[redacted]; chixrnch2@mlode.com; dampl[redacted] McDevitt[redacted]; rmcdevitt@hansonbridgett.com; marty[redacted]; jeff.mclain@noaa.gov; jmeans@dfg.ca.gov; sixbit[redacted] rhonda@buenavistatribe.com; mary.motola@chukchansi.net; JKObrien@dfg.ca.gov; rsce[redacted]; ottfarms[redacted]

npinhey@modestogov.com; ruth.porter@hoganlovells.com; chixrnch@lodelink.com; spuccini@dfg.ca.gov; jessie@tuolumne.org; tramirez@sfwater.org; maria.rea@noaa.gov; rhonda.reed@noaa.gov; Kevin.A.Richardson@usace.army.mil; royalrobbins[redacted] dave@newman-romano.com; rrcollins@waterpowerlaw.com; jessetroseman[redacted]; srothert@americanrivers.org; nsandkulla@bawsca.org; aschutte@hansonbridgett.com; wsears@sfwater.org; vshumway@fs.fed.us; blancapaloma[redacted]; CNRF[redacted] jpsmithgm[redacted] Staples, Rose; dave@americanwhitewater.org; rstork@friendsoftheriver.org; sstratton@parks.ca.gov; mtaylor@dfg.ca.gov; gatevelde[redacted] larry.thompson@noaa.gov; cverkuil@mofo.com; ewalters@mofo.com; richard.wantuck@noaa.gov; arta[redacted] eric@tuolumne.org; dan.wheelerhay[redacted]; dave.wheelerhay[redacted]; douglas.wheeler@hoganlovells.com; hbwillia44[redacted]; bwilson@mofo.com; frank.winchell@ferc.gov; davewood@ldpmarina.com; john.wooster@noaa.gov; michelle_workman@fws.gov; rmyoshiyama@ucdavis.edu; Wayne Zipser; PBarnes@waterboards.ca.gov; Steve.Pavich@cardno.com

Subject: Don Pedro: Sub-group Meeting Doodlepoll Update

Dear Relicensing Participants,
The Socioeconomics sub-group Doodlepoll has been updated and shows Modesto will be the meeting location.

Please respond to BOTH polls by close-of-business tomorrow, Friday, September 26.

Thank you very much for your participation in this process.

Regards,
Carin Loy
HDR
916-679-8737.
carin.loy@hdrinc.com

HOME EMAIL ADDRESSES REMOVED PER SECTION 2.4.3 DON PEDRO PAD

From: Tom Orvis [tomo@stanfarmbureau.org]
Sent: Thursday, August 25, 2011 2:59 PM
To: maperanch[redacted] Loy, Carin
Cc: seboyd@tid.org; Craig[redacted]; Craig, Nancy; GREGD@MID.ORG; agodwin[redacted] noah@stillwatersci.com; AGENGR6[redacted] rmnees@tid.org; towater@olaughlinparis.com; duane.paul@cardno.com; Snider, William; steinerd[redacted]; JOYW@MID.ORG; Scott@stillwatersci.com; jalves@modestogov.com; lynette@newman-romano.com; jaud@envres.org; james_barnes@ca.blm.gov; Beuttler[redacted] jbeuttler[redacted] Bond@a[redacted]; jbond@modestogov.com; aboucher[redacted]; anadromous[redacted] Stephen_Bowes@nps.gov; artbow[redacted] douglas.brewer@tetratech.com; brochin[redacted] Buckley[redacted] johnb@cserc.org; cburt@calpoly.edu; Carlin[redacted]; mcarlin@sfwater.org; Catlett[redacted] kelly@friendsoftheriver.org; Charles[redacted] cindy[redacted]; Cory[redacted]; pcory@tnc.org; chixrnch@mlode.com; J.cowan[redacted]; receptionist@mlode.com; pcransto@ca.blm.gov; rebeccac@cserc.org; Pday@mofo.com; Devine, John; mwdonaldson@parks.ca.gov; mdowd@fs.fed.us; Peter@tuolumne.org; steve.edmondson@noaa.gov; james_eicher@BLM.gov; lfety@blm.gov; TFindley@hansonbridgett.com; bfreeman@calpoly.edu; rfuller@mlode.com; donn.w.furman@sfgov.org; jgantenbein@waterpowerlaw.com; Deborah_Giglio@fws.gov; rwgoode911[redacted] monica.gutierrez@noaa.gov; James.Hastreiter@FERC.gov; jhatch@caltrout.org; Zhayat@mofo.com; anitajhellam[redacted] Rachael.Hersh-Burdick@USACE.army.mil; theyne@dfg.ca.gov; holden2jd[redacted]; jhorn@ca.blm.gov; timihorn[redacted] noahnsa[redacted] rwhughes@dfg.ca.gov; jjackman[redacted]; zachary_jackson@FWS.gov; deltakeep[redacted]; ajensen@bawsca.org; Laura_Jensen@TNC.org; mjohannis@usbr.gov; bjohnson@tu.org; justin[redacted] rkanz@waterboards.ca.gov; jekeating66[redacted] kathryn.kempton@noaa.gov; tkinney86[redacted]; patrick@tuolumne.org; Mortalis46[redacted]; elevin@sfwater.org; prci.info@chukchansi.net; dslinkard[redacted] amanji@dfg.ca.gov; mike@hetchhetchy.org; mmartin[redacted]; chixrnch2@mlode.com; damplo[redacted] McDevitt[redacted]; rmcdevitt@hansonbridgett.com; [redacted] jeff.mclain@noaa.gov; jmeans@dfg.ca.gov; sixbit[redacted] rhonda@buenavistatribe.com; mary.motola@chukchansi.net; JKObrien@dfg.ca.gov; rsce[redacted]; ottfarms[redacted]

npinhey@modestogov.com; ruth.porter@hoganlovells.com; chixrnch@lodelink.com; spuccini@dfg.ca.gov; jessie@tuolumne.org; tramirez@sfwater.org; maria.rea@noaa.gov; rhonda.reed@noaa.gov; Kevin.A.Richardson@usace.army.mil; royalrobbins[redacted]; dave@newman-romano.com; rrcollins@waterpowerlaw.com; jessetroseman[redacted].com; srothert@americanrivers.org; nsandkulla@bawsca.org; aschutte@hansonbridgett.com; wsears@sfwater.org; vshumway@fs.fed.us; blancapaloma@msn.com; CNRF[redacted] jpsmithgm[redacted] Staples, Rose; dave@americanwhitewater.org; rstork@friendsoftheriver.org; sstratton@parks.ca.gov; mtaylor@dfg.ca.gov; gatevelde[redacted] larry.thompson@noaa.gov; cverkuil@mofo.com; ewalters@mofo.com; richard.wantuck@noaa.gov; arta[redacted] eric@tuolumne.org; dan.wheelerhay[redacted]; dave.wheelerhay[redacted]; douglas.wheeler@hoganlovells.com; hbwillia44[redacted] bwilson@mofo.com; frank.winchell@ferc.gov; davewood@ldpmarina.com; john.wooster@noaa.gov; michelle_workman@fws.gov; rmyoshiyama@ucdavis.edu; Wayne Zipser; PBarnes@waterboards.ca.gov

Subject: RE: Don Pedro: Scheduling Socioeconmics Subgroup Meeting

We agree with Mr. Lyons – We respectfully ask that this subcommittee meeting be in the Modesto/Turlock area.

Your focus needs to be the people that will truly be affected on a day to day basis by any FERC decision. Paid staff, consultants and advocates expect to travel.

If the date is workable, the Stanislaus County Farm Bureau will even offer our Boardroom for the meeting. We are located 1 block east of MID at 1201 L Street.

Tom Orvis
Stanislaus County Farm Bureau
Modesto, CA 95354
(209) 522-7278 Office
TomO@stanfarmbureau.org

"FARMERS FEED FAMILIES"
WWW.STANFARMBUREAU.COM

From: maperanch@[redacted] [mailto:maperanch[redacted]]
Sent: Thursday, August 25, 2011 11:06 AM
To: Carin.Loy@hdrinc.com
Cc: seboyd@tid.org; Craig@[redacted] Nancy.Craig@hdrinc.com; GREGD@MID.ORG; agodwin@m[redacted];

noah@stillwatersci.com; AGENGR6[redacted]; rmnees@tid.org; towater@olaughlinparis.com; duane.paul@cardno.com; William.Snider@hdrinc.com; [redacted]; JOYW@MID.ORG; Scott@stillwatersci.com; jalves@modestogov.com; lynette@newman-romano.com; jaud@envres.org; james_barnes@ca.blm.gov; Beuttler[redacted]; jbeuttler[redacted]; Bond[redacted]; jbond@modestogov.com; abouchen[redacted]; anadromous[redacted]; Stephen_Bowes@nps.gov; artbow[redacted] douglas.brewer@tetratech.com; brochin[redacted]; Buckley[redacted]; johnb@cserc.org; cburt@calpoly.edu; Carlin[redacted]; mcarlin@sfwater.org; Catlett[redacted]; kelly@friendsoftheriver.org; Charles[redacted]; cindy[redacted] net; Cory[redacted]; pcory@tnc.org; chixrnch@mlode.com; J.cowan[redacted]; receptionist@mlode.com; pcransto@ca.blm.gov; rebeccac@cserc.org; Pday@mofo.com; John.Devine@hdrinc.com; mwdonaldson@parks.ca.gov; mdowd@fs.fed.us; Peter@tuolumne.org; steve.edmondson@noaa.gov; james_eicher@BLM.gov; lfety@blm.gov; TFindley@hansonbridgett.com; bfreeman@calpoly.edu; rfuller@mlode.com; donn.w.furman@sfgov.org; jgantenbein@waterpowerlaw.com; Deborah_Giglio@fws.gov; rwgoode911[redacted]; vevado[redacted] com; monica.gutierrez@noaa.gov; James.Hastreiter@FERC.gov; jhatch@caltrout.org; Zhayat@mofo.com; anitajhellam[redacted] Rachael.Hersh-Burdick@USACE.army.mil; theyne@dfg.ca.gov; holden2jd[redacted]; jhorn@ca.blm.gov; timihorn[redacted]; noahhsa[redacted] rwhughes@dfg.ca.gov; jjackman[redacted]; zachary_jackson@FWS.gov; deltakeep[redacted]; ajensen@bawsca.org; Laura_Jensen@TNC.org; mjohannis@usbr.gov; bjohnson@tu.org; justin[redacted]; rkanz@waterboards.ca.gov; jekeating66[redacted]; kathryn.kempton@noaa.gov; [redacted]; patrick@tuolumne.org; Mortalis46[redacted]; elevin@sfwater.org; prci.info@chukchansi.net; dslinkard[redacted]; amanji@dfg.ca.gov; mike@hetchhetchy.org; mmartin[redacted]; chixrnch2@mlode.com; damplo[redacted]t; McDevitt[redacted]; rmcdevitt@hansonbridgett.com; marty[redacted] jeff.mclain@noaa.gov; jmeans@dfg.ca.gov; sixbit[redacted] rhonda@buenavistatribe.com; mary.motola@chukchansi.net; JKObrien@dfg.ca.gov; Tom Orvis; rsce[redacted]; ottfarms[redacted]; npinhey@modestogov.com; ruth.porter@hoganlovells.com; chixrnch@lodelink.com; spuccini@dfg.ca.gov; jessie@tuolumne.org; tramirez@sfwater.org; maria.rea@noaa.gov; rhonda.reed@noaa.gov; Kevin.A.Richardson@usace.army.mil; royalrobbins[redacted] dave@newman-romano.com; rrcollins@waterpowerlaw.com; jessetroseman[redacted]; srothert@americanrivers.org; nsandkulla@bawsca.org; aschutte@hansonbridgett.com; wsears@sfwater.org; vshumway@fs.fed.us; blancapaloma@msn.com; CNRF[redacted]; jpsmithgm[redacted]; Rose.Staples@hdrinc.com; dave@americanwhitewater.org; rstork@friendsoftheriver.org; sstratton@parks.ca.gov; mtaylor@dfg.ca.gov; gatevelde[redacted]; larry.thompson@noaa.gov; cverkuil@mofo.com; ewalters@mofo.com; richard.wantuck@noaa.gov; arta[redacted]; eric@tuolumne.org; dan.wheelerhay[redacted]; dave.wheelerhay[redacted]; douglas.wheeler@hoganlovells.com; hbwillia44[redacted]; bwilson@mofo.com; frank.winchell@ferc.gov; davewood@ldpmarina.com; john.wooster@noaa.gov; michelle_workman@fws.gov; rmyoshiyama@ucdavis.edu; Wayne Zipser; PBarnes@waterboards.ca.gov

Subject: Re: Don Pedro: Scheduling Socioeconmics Subgroup Meeting

You are having the sub-group on socioeconomic impacts to the greater Modesto/Turlock area meeting in Sacramento? May I respectfully ask why hold the meeting in Sacramento? Is it a convenient location for the paid consultants? It is an inconvenient location for local Modesto/Turlock residents, business men and women, Chamber of Commerce, labor groups, social advocates and farmers to attend.

Sincerely,

William (Bill) J. Lyons, Jr.
Mape's Ranch/Lyons' Investments

HOME EMAIL ADDRESSES REMOVED PER SECTION 2.4.3 DON PEDRO PAD

10555 Maze Blvd.
Modesto CA 95358
(209) 522-1762

-----Original Message-----
From: Loy, Carin <Carin.Loy@hdrinc.com>
To: seboyd@tid.org <seboyd@tid.org>; Craig, Nancy <Nancy.Craig@hdrinc.com>; Greg Dias <GREGD@MID.ORG>; [redacted] >; rmnees@tid.org <rmnees@tid.org>; Tim O'Laughlin <towater@olaughlinparis.com>; Duane Paul <duane.paul@cardno.com>; Snider,William <William.Snider@hdrinc.com>; Daniel Steiner <steiner[redacted]>; Joy Warren <JOYW@MID.ORG>; Scott Wilcox <Scott@stillwatersci.com>; Alves, Jim - City of Modesto <jalves@modestogov.com>; Asay, Lynette - N-R <lynette@newman-romano.com>; Aud, John - SCERD <jaud@envres.org>; Barnes, James - BLM <james_barnes@ca.blm.gov>; Beuttler, John - CSPA <jbeuttle[redacted]>; Bond, Jack - City of Modesto <jbond@modestogov.com>; Boucher, Allison -TRC <abouche[redacted]>; Boucher, Dave - Allison - TRC <anadromous[redacted]>; Bowes, Stephen - NPS <Stephen_Bowes@nps.gov>; Bowman, Art - CWRMP <artbow@juno.com>; Brewer,Doug - TetraTech <douglas.brewer@tetratech.com>; Brochini, Anthony - SSMN <brochin[redacted] Buckley, John - CSERC <johnb@cserc.org>; Burt,Charles - CalPoly <cburt@calpoly.edu>; Carlin, Michael - SFPUC <mcarlin@sfwater.org>; Catlett, Kelly - FOR <kelly@friendsoftheriver.org>; Charles, Cindy - GWWF <cindy[redacted]>; Cory, Philip - TNC <pcory@tnc.org>; Costa, Jan - Chicken Ranch <chixrnch@mlode.com>; Cowan,Jeffrey <J.cowan[redacted]>; Cox, Stanley Rob - TBMWI <receptionist@mlode.com>; Cranston, Peggy - BLM <pcransto@ca.blm.gov>; Cremeen, Rebecca - CSERC <rebeccac@cserc.org>; Day, P - MF <Pday@mofo.com>; Devine, John <John.Devine@hdrinc.com>; Donaldson,Milford Wayne - OHP <mwdonaldson@parks.ca.gov>; Dowd, Maggie-SNF <mdowd@fs.fed.us>; Drekmeier, Peter - TRT <Peter@tuolumne.org>; Edmondson, Steve - NOAA <steve.edmondson@noaa.gov>; Eicher, James - BLM <james_eicher@BLM.gov>; Fety, Lauren - BLM <lfety@blm.gov>; Findley,Timothy - Hanson Bridgett <TFindley@hansonbridgett.com>; Freeman, Beau -CalPoly <bfreeman@calpoly.edu>; Fuller, Reba - TMTC <rfuller@mlode.com>; Furman, Donn W - SFPUC <donn.w.furman@sfgov.org>; Ganteinbein, Julie -Water-Power Law Grp <jgantenbein@waterpowerlaw.com>; Giglio, Deborah -USFWS <Deborah_Giglio@fws.gov>; Goode, Ron - NFMT <rwgoode911[redacted]>; Gorman, Elaine - YSC <vevad[redacted]>; Gutierrez, Monica - NOAA-NMFS <monica.gutierrez@noaa.gov>; Hastreiter,James L - FERC <James.Hastreiter@FERC.gov>; Hatch, Jenny - CT <jhatch@caltrout.org>; Hayat, Zahra - MF <Zhayat@mofo.com>; Hellam, Anita- HH <[redacted]>; Hersh-Burdick, Rachael - USACE <Rachael.Hersh-Burdick@USACE.army.mil>; Heyne, Tim - CDFG <theyne@dfg.ca.gov>; Holden, James <holden2j[redacted]>; Horn, Jeff - BLM <jhorn@ca.blm.gov>; Horn, Tini <timihorn[redacted]>; Hughes, Noah <noahnsa[redacted]>; Hughes, Robert - CDFG <rwhughes@dfg.ca.gov>; Jackman, Jerry <[redacted]>; Jackson, Zac - USFWS <zachary_jackson@FWS.gov>; Jennings, William - CSPA <[redacted]>; Jensen, Art - BAWSCA <ajensen@bawsca.org>; Jensen, Laura - TNC <Laura_Jensen@TNC.org>; Johannis, Mary <mjohannis@usbr.gov>; Johnson,Brian - CalTrout <bjohnson@tu.org>; Justin <justin[redacted]>; Kanz,Russ - SWRCB <rkanz@waterboards.ca.gov>; Keating, Janice <jekeating66[redacted]>; Kempton, Kathryn - NOAA-MNFS <kathryn.kempton@noaa.gov>; Kinney, Teresa <tkinney86[redacted]>; Koepele, Patrick - TRT <patrick@tuolumne.org>; Lein, Joseph <Mortalis46[redacted]>; Levin, Ellen - SFPUC <elevin@sfwater.org>; Lewis, Reggie - PRCI <prci.info@chukchansi.net>; Linkard, David - TRT /RH <dslinkard[redacted]>; Lyons, Bill - MR <maperanch[redacted]>; Manji, Annie <amanji@dfg.ca.gov>; Marko, Paul <Dmarko[redacted]>; Marshall,

HOME EMAIL ADDRESSES REMOVED PER SECTION 2.4.3 DON PEDRO PAD

Mike - RHH <mike@hetchhetchy.org>; Martin, Michael - MFFC <mmartin[redacted]t>; Mathiesen, Lloyd - CRRMW <chixrnch2@mlode.com>; McDaniel, Dan -CDWA <damplo[redacted]>; McDevitt, Ray - BAWSCA <rmcdevitt@hansonbridgett.com>; McDonnell, Marty - SMRT <marty[redacted]>; McLain, Jeffrey - NOAA-NMFS <jeff.mclain@noaa.gov>; Means, Julie - CDFG <jmeans@dfg.ca.gov>; Mills, John - TUD <sixbi[redacted] Morningstar Pope, Rhonda - BVR <rhonda@buenavistatribe.com>; Motola, Mary - CT <mary.motola@chukchansi.net>; O'Brien, Jennifer - CDFG <JKObrien@dfg.ca.gov>; Orvis, Tom - SCFB <TomO@stanfarmbureau.org>; Ott,Bob <rsce[redacted]>; Ott, Chris <ottfarms[redacted] Pinhey, Nick -City of Modesto <npinhey@modestogov.com>; Porter, Ruth - RHH <ruth.porter@hoganlovells.com>; Powell, Melissa - CRRMW <chixrnch@lodelink.com>; Puccini, Stephen - CDFG <spuccini@dfg.ca.gov>; Raeder, Jessie - TRT <jessie@tuolumne.org>; Ramirez, Tim - SFPUC <tramirez@sfwater.org>; Rea, Maria - NOAA-NMFS <maria.rea@noaa.gov>; Reed, Rhonda - NOAA-NMFS <rhonda.reed@noaa.gov>; Richardson, Kevin -USACE <Kevin.A.Richardson@usace.army.mil>; Robbins, Royal <royalrobbins[redacted]>; Romano, David O - N-R <dave@newman-romano.com>; Roos-Collins, Richard - Water-Power Law Grp forNHI <rrcollins@waterpowerlaw.com>; Roseman, Jesse <jessetroseman[redacted] Rothert, Steve - AR <srothert@americanrivers.org>; Sandkulla, Nicole - BAWSCA <nsandkulla@bawsca.org>; Schutte, Allison - HB <aschutte@hansonbridgett.com>; Sears, William - SFPUC <wsears@sfwater.org>; Shumway, Vern - SNF <vshumway@fs.fed.us>; Shutes, Chris - CSPA <blancapaloma[redacted]>; Slay, Ronn - CNRF/AIC <[redacted]>; Smith,Jim - MPM <jpsmithgm[redacted]>; Staples, Rose <Rose.Staples@hdrinc.com>; Steindorf, Dave - AW <dave@americanwhitewater.org>; Stork, Ron - FOR <rstork@friendsoftheriver.org>; Stratton, Susan - CA SHPO <sstratton@parks.ca.gov>; Taylor, Mary Jane - CDFG <mtaylor@dfg.ca.gov>; TeVelde, George A <gatevelde[redacted]>; Thompson, Larry - NOAA-MNFS <larry.thompson@noaa.gov>; Verkuil, Colette - TRT/MF <cverkuil@mofo.com>; Walters, Eric - MF <ewalters@mofo.com>; Wantuck, Rick - NOAA-NMFS <richard.wantuck@noaa.gov>; Welch, Steve - ARTA <arta[redacted] Wesselman, Eric - TRT <eric@tuolumne.org>; Wheeler, Dan <dan.wheelerhay[redacted]>; Wheeler, Dave <dave.wheelerhay[redacted]>; Wheeler, Douglas - RHH <douglas.wheeler@hoganlovells.com>; Williamson,Harry (NPS) <[redacted]>; Wilson, Bryan - MF <bwilson@mofo.com>; Winchell, Frank - FERC <frank.winchell@ferc.gov>; Wood, Dave - FR <davewood@ldpmarina.com>; Wooster, John -NOAA <john.wooster@noaa.gov>; Workman, Michelle - USFWS <michelle_workman@fws.gov>; Yoshiyama, Ron <rmyoshiyama@ucdavis.edu>; Zipser, Wayne - SCFB <waynez@stanfarmbureau.org>; Peter Barnes <PBarnes@waterboards.ca.gov>
Sent: Wed, Aug 24, 2011 1:39 pm
Subject: Don Pedro: Scheduling Socioeconmics Subgroup Meeting

Don Pedro Relicensing
Socioeconomics Sub-Group Meeting

At the August 23 Water & Aquatic Resource Work Group meeting, the Relicensing Participants and Districts decided to create a sub-group and schedule a meeting
to discuss and refine the following study plan:

- W&AR-15 Socioeconomics

Please follow the link complete the Doodlepoll with your availability.
http://doodle.com/qmmmvy54cmw2qicr

I will close the poll by the end of the day tomorrow, Thursday, August 25. Afternoons between September 6 and September 14 are included. The sub-group will be able to report back to the greater group at the September 15 meeting.

Everyone who is interested is encouraged to attend. The precise location in Sacramento will be determined and distributed once we have received your responses.

If you have any questions about this meeting, please contact Carin Loy, HDR, at
carin.loy@hdrinc.com<mailto:carin.loy@hdrinc.com> or 916-679-8737.

RE Request for Additional Information
From: Annie Manji [AManji@dfg.ca.gov]
Sent: Friday, August 26, 2011 12:45 PM
To: Devine, John
Cc: Steve - AR' 'Rothert; Dave - AW' 'Steindorf; 'Bill Johnston'; William -CSPA'

'Jennings; Paul ' 'Marko; John - CSPA' 'Beuttler; Jim - MPM' 'Smith; Bill - MR' 'Lyons; Bob' 'Ott; Steve - ARTA' 'Welch; Art - BAWSCA' 'Jensen; Nicole - BAWSCA' 'Sandkulla; Allison - TRC' 'Boucher; Dave -Allison - TRC' 'Boucher; James - BLM' 'Eicher; Lauren - BLM' 'Fety; Rhonda - BVR' 'Morningstar Pope; Roselynn BVR' 'Lwenya; James - BLM' 'Barnes; Jeff -BLM' 'Horn; Peggy - BLM' 'Cranston; Beau - CalPoly' 'Freeman; Charles - CalPoly' 'Burt; Jenny - CT' 'Hatch; Cindy - GWWF' 'Charles; Mary - PRCI' 'Motola; Dan' 'Wheeler; Dave' 'Wheeler; John - CSERC' 'Buckley; Rebecca - CSERC' 'Cremeen; Jim Canaday; Jennifer O'Brien; Julie Means; Mary Jane Taylor; Bob Hughes; Stephen Puccini; Tim Heyne; Royal' 'Robbins; Ronn - CNRF/AIC' 'Slay; John - SCERD' 'Aud; Frank - FERC' 'Winchell; James.Hastreiter@ferc.gov; Kelly - FOR' 'Catlett; Ron - FOR' 'Stork; Maggie-SNF' 'Dowd; Vern - SNF' 'Shumway; Craig - USFWS' 'Anderson; Deborah -USFWS' 'Giglio; Michelle - USFWS' 'Workman; Zac - USFWS' 'Jackson; Harry (NPS)' 'Williamson; Janice' 'Keating; Jesse' 'Roseman; Allison - HB' 'Schutte; Ray - BAWSCA' 'McDevitt; Timothy - HansonBridgett' 'Findley; Loy, Carin; Jones, Rick; Staples, Rose; Mike - RHH' 'Marshall; Douglas P. Wheeler; ruth.porter@hoganlovells.com; Joseph' 'Lein; Noah' 'Hughes; Chris' 'Ott; Ron - NFMT' 'Goode; Teresa' 'Kinney; 'Justin'; James ' 'Holden; Art - CWRMP' 'Bowman; Dave - FR' 'Wood; David - TRT /RH' 'Linkard; Melissa - CRRMW' 'Powell; George A ' 'TeVelde; 'Greg Dias'; 'Joy Warren'; 'MelissaWilliams'; Jan -Chicken Ranch' 'Costa; Lloyd - CRRMW' 'Mathiesen; Stanley Rob - TBMWI' 'Cox; Reba - TMTC' 'Fuller; Jim - City ofModesto' 'Alves; Jack - City of Modesto' 'Bond; Nick - City of Modesto' 'Pinhey; Bryan - MF' 'Wilson; Colette - TRT/MF' 'Verkuil; Eric - MF' 'Walters; P - MF' 'Day; Zahra - MF' 'Hayat; 'Arthur F Godwin'; Chris - CSPA' 'Shutes; David O - N-R' 'Romano; Lynette - N-R' 'Asay; Jeffrey - NOAA-NMFS' 'McLain; John -NOAA' 'Wooster; Kathryn - NOAA-MNFS' 'Kempton; Larry - NOAA-MNFS' 'Thompson; Maria - NOAA-NMFS' 'Rea; Monica - NOAA-NMFS' 'Gutierrez; Rhonda - NOAA-NMFS' 'Reed; Rick - NOAA-NMFS' 'Wantuck; Steve - NOAA' 'Edmondson; Stephen - NPS' 'Bowes; Tony - NPS' 'Brochini; 'Tim O'Laughlin'; Dan -CDWA' 'McDaniel; Milford Wayne - OHP' 'Donaldson; Susan - CA SHPO' 'Stratton; Jeffrey' 'Cowan; Jerry ' 'Jackman; Donn W - SFPUC' 'Furman; Ellen - SFPUC' 'Levin; Michael - SFPUC' 'Carlin; tramirez@sfwater.org; William - SFPUC' 'Sears; Marty - SMRT' 'McDonnell; John - TUD' 'Mills; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; Tom - SCFB' 'Orvis; Wayne - SCFB' 'Zipser; Anthony - SSMN' 'Brochini; Michael - MFFC' 'Martin; Sandy ' 'Vasquez; 'Lewis-Reggie-PRCI'; Doug - TetraTech' 'Brewer; 'Michelle Reimers'; 'Robert M. Nees'; 'Steve Boyd'; Laura - TNC' 'Jensen; Philip - TNC' 'Cory; Brian - CalTrout' 'Johnson; Eric - TRT' 'Wesselman; Jessie - TRT' 'Raeder; Patrick - TRT' 'Koepele; Peter - TRT' 'Drekmeier; Ron' 'Yoshiyama; Kevin - USACE' 'Richardson; Mary' 'Johannis; Russ - SWRCB' 'Kanz; Julie -Water-Power Law Grp' 'Ganteinbein; Richard - Water-Power Law Grp forNHI' 'Roos-Collins; Anita - HH' 'Hellam; Tini' 'Horn; Elaine - YSC' 'Gorman
Subject: RE: Request for Additional Information

Follow Up Flag: Follow up
Flag Status: Flagged

John,

Now that the preliminary study requests and proposed study plan milestones are behind us, I would like to follow-up on two additional information requests from the April 1, 2011 meeting.

At that meeting DFG representatives asked:

"Where, and when, is riparian water used -- and how is it separated form storage? Is riparian water used on lands that meet the definition of "riparian lands"? Please include a map of the lands that are served under a riparian claim. Please provide season and amounts of water provided on those lands under claim of riparian right"

The Progress Tracking List labels this as "Item 13" and the status has not changed from "the Districts' response is in progress"

A related request also submitted at the April 1, 2011 meeting by another relicensing party was:

" Provide copies of the District's pre-1914 appropriative rights, as noted or recorded in accordance with the state laws at the time"

This is Progress Tracking List Item # 16 and again the status is "in progress"

Could you please provide an update on these water rights items?
Thank you

Annie Manji
Statewide FERC Coordinator
California Department of Fish and Game
Water Branch
601 Locust Street
Redding, CA 96001
(530) 225-2315
amanji@dfg.ca.gov

Loy, Carin

From: Porter, Ruth M. [ruth.porter@hoganlovells.com]
Sent: Monday, August 29, 2011 10:21 AM
To: Devine, John; Robert M. Nees; Greg Dias; Joy Warren; 'Arthur F. Godwin (agodwin@mrgb.org)'; William R. Johnston; towater@olaughlinparis.com; Steve Boyd; Melissa Williams; Michelle Reimers
Cc: Staples, Rose; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip - TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan -CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert M. Nees'; 'Greg Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; tramirez@sfwater.org
Subject: RE: Request for Additional Information

John,

Please go ahead and have a vendor do an estimate on scanning the pre-1983 records. Also, please provide the contact information for the vendor that you use so that I can contact them to discuss processing specifications.

Thanks,

Ruth

From: Staples, Rose
Sent: Monday, August 29, 2011 3:57 PM
To: 'Porter, Ruth M.'; Devine, John; Robert M. Nees; Greg Dias; Joy Warren; 'Arthur F. Godwin (agodwin@mrgb.org)'; William R. Johnston; towater@olaughlinparis.com; Steve Boyd; Melissa Williams; Michelle Reimers
Cc: 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip - TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan - CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert M. Nees'; 'Greg

Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; tramirez@sfwater.org

Subject: RE: Request for Additional Information

New HH-150 copy has been uploaded to the Don Pedro Relicensing website this afternoon. Thank you.

ROSE STAPLES
CPS CAP

HDR Engineering, Inc.
Executive Assistant, Hydropower Services

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rose.staples@hdrinc.com | hdrinc.com

From: Porter, Ruth M. [mailto:ruth.porter@hoganlovells.com]
Sent: Monday, August 29, 2011 1:26 PM
To: Devine, John; Robert M. Nees; Greg Dias; Joy Warren; 'Arthur F. Godwin (agodwin@mrgb.org)'; William R. Johnston; towater@olaughlinparis.com; Steve Boyd; Melissa Williams; Michelle Reimers
Cc: Staples, Rose; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip - TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan - CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert

M. Nees'; 'Greg Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; tramirez@sfwater.org
Subject: RE: Request for Additional Information

John,

Also, page 7 of 10 of the HH-150 document the Districts posted to the relicensing website is illegible. It appears there were some sort of printing or scanning issue. Please provide a legible copy of this document.

Ruth

From: Devine, John [mailto:John.Devine@hdrinc.com]
Sent: Friday, August 19, 2011 1:27 PM
To: Porter, Ruth M.; Robert M. Nees; Greg Dias; Joy Warren; 'Arthur F. Godwin (agodwin@mrgb.org)'; William R. Johnston; towater@olaughlinparis.com; Steve Boyd; Melissa Williams; Michelle Reimers
Cc: Staples, Rose; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip - TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie- SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan - CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert M. Nees'; 'Greg Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; tramirez@sfwater.org
Subject: RE: Request for Additional Information

Ruth,

Regarding your most recent email:

[1] As we mentioned in our prior email, the pre-1983 records are not available electronically and are extensive consisting of daily log sheets, summary forms, and hand-written P-173/174s. Reproducing these documents will be a costly undertaking. The Districts are willing to obtain an estimate of the cost to have an outside print shop or service reproduce all of these documents so you may decide whether to deposit the funds necessary to obtain your own copies. Alternatively, you or your clients are welcome to come to TID to view the documents and mark those you want copied. The second alternative may be far less costly and more efficient for you and your clients. Please let us know your wishes on this matter.

[2] As your email states, our response stated that the water bank "was allowed to go negative" once. As you know, day-to-day project operating decisions are made using **real time** information; that is, as it is immediately available. Real time data is the basis of day-to-day decision making, including decisions regarding the volume of the "water bank". Any decision to allow the "water bank" to go negative must occur using this real time data. Months after real time decisions are made, the US Geological Survey can, and frequently does, make adjustments to its water gauge measurements and publishes final flows. Of course, the Districts and CCSF cannot wait 6 months to a year for final USGS data to make real time decisions. The Districts and CCSF, however, have agreed for record keeping purposes to use the USGS final flow data for the "official" water bank accounting in order to use the official USGS published data for consistency in record keeping. Real time decisions made based on real time data are not revisited. The Districts and CCSF use the best information available at the time to make many decisions, including whether the water bank is likely to go negative. The effect of using real time data can readily be seen in the information we provided. Using real time data, the water bank was allowed to go negative in 1988, as we mentioned. The P-174 records show that, using final USGS data, the water bank was also negative in 1990, 1991, and 1992. This reflects the difference between real time data and records based on final USGS flows.

[3] Regarding your item (3), again, we would be pleased to have you come to TID and review the pre-1983 records as an alternative.

[4] We have nothing to add to this item.

Thank you for your continuing interest in the Don Pedro relicensing.

JOHN DEVINE
P.E.

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From: Porter, Ruth M. [mailto:ruth.porter@hoganlovells.com]
Sent: Thursday, August 11, 2011 2:22 PM
To: Devine, John; Robert M. Nees; Greg Dias; Joy Warren; 'Arthur F. Godwin (agodwin@mrgb.org)'; William R. Johnston; towater@olaughlinparis.com; Steve Boyd; Melissa Williams; Michelle Reimers
Cc: Staples, Rose; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip - TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan - CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick -

NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert M. Nees'; 'Greg Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; tramirez@sfwater.org
Subject: RE: Request for Additional Information

John,

Several things on this:

1. When you say "[a]ccording to our records, the 'water bank' was allowed to go negative once" what records are the Districts relying on to support that statement? Your previous e-mail reported that the pre-October 1983 forms are only available in hard copy and that you have not reviewed those records for completeness. The Districts' original response to Item No. 23 in the June 16, 2011 tracking list stated that they only consented once to a SF request to go negative in the water bank through the history of the Project. Thus, the Districts plainly have accounting records for the water bank that provide the historical balance information. These are the records that were originally requested on April 1, 2011. This has gone on long enough. The Districts need to produce these records immediately.

2. Saying that the water bank "was allowed to go negative once" is no different than saying "MID-TID have only consented once" to the creation of a negative balance. Restore Hetch Hetchy asked whether there has ever been a negative balance created without the Districts' prior consent. Your most recent reply is unresponsive.

3. Regarding the pre-1983 records, multiple participants would now like to review these materials. Thus, the Districts should bear the financial burden associated with making these records available to participants unless it truly would be unduly burdensome. In the context of a relicensing proceeding for a major hydro facility, I am not sure that "several" thousand dollars would qualify. About the pre-1983 documents, your previous e-mail indicated that these documents are in binders and that scanning would involve removing and replacing staples. Apparently, now the documents are in binders, stapled, and "large sheets". A few questions:

- Where are these records currently located?
- Approximately how many binders hold these records?
- Are the binders three-hole punch?
- What is the width of the binders?
- When you say "large sheets" what size paper are you referring to? It would be rather unusual to store large-format documents in a binder.

4. Regarding the compensation for the negative balance in the water bank, the June 2, 1988 agreement specifies that San Francisco would pay the Districts the amount necessary to fully compensate them for all damages suffered on or before August 15, 1888. That agreement also specifies that the amount San Francisco paid would include "the cost to the Districts of the time spent by their staff members in calculating the amount of damages." How is it possible that you could have no record of any payment from San Francisco or even the Districts' calculation of what that payment should be?

Ruth

From: Devine, John [mailto:John.Devine@hdrinc.com]
Sent: Wednesday, August 10, 2011 5:05 PM
To: Porter, Ruth M.; Robert M. Nees; Greg Dias; Joy Warren; 'Arthur F. Godwin (agodwin@mrgb.org)'; William R. Johnston; towater@olaughlinparis.com; Steve Boyd; Melissa Williams; Michelle Reimers
Cc: Staples, Rose; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip - TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan - CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert M. Nees'; 'Greg Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; tramirez@sfwater.org
Subject: RE: Request for Additional Information

Ruth,

The Districts have undertaken a search of their records for the information you requested. We have located the following information in electronic format and will be loading it onto the Don Pedro website tomorrow. They are extensive files. Rose Staples will be sending an email with instructions on where to find the files on the website.

[1] Daily log Form 11 from 1983 to 2009
[2] Roll-up calculation Form 174 from 1983 to 2009
[3] Post-provisional flow Form 173 from 1983 to 2009
[4] Form HH-150 from 1983 to 2009

According to our records, the "water bank" was allowed to go negative once. That occurred in 1988. We have not been able to locate the records on the compensation received.

The "water bank" storage calculation has not undergone any changes since the commencement of Don Pedro operations.

Regarding pre-1983 information, we have only found hand-written records of these forms. They are large sheets and they number well into the thousands of pages. We have not reviewed them for completeness. The cost will be significant for copying or scanning. We will have to send them to an outside shop because of the paper size, number of sheets and condition of the sheets. The cost is likely to be several thousand dollars. Do you want us to proceed? Please let me know"

From: Porter, Ruth M. [mailto:ruth.porter@hoganlovells.com]
Sent: Friday, August 05, 2011 7:16 PM
To: Devine, John; Robert M. Nees; Greg Dias; Joy Warren; 'Arthur F. Godwin (agodwin@mrgb.org)'; William R. Johnston; towater@olaughlinparis.com; Steve Boyd; Melissa Williams; Michelle Reimers
Cc: Staples, Rose; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip - TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Hersh-Burdick, Rachael - USACE'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan -CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola,

Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert M. Nees'; 'Greg Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; tramirez@sfwater.org
Subject: RE: Request for Additional Information

John,

Thank you for the update. We look forward to receiving the initial set of documents next week. I will touch base with my client and get back to you about the pre-1983 documents.

Ruth

From: Devine, John [mailto:John.Devine@hdrinc.com]
Sent: Friday, August 05, 2011 3:28 PM
To: Porter, Ruth M.; Robert M. Nees; Greg Dias; Joy Warren; 'Arthur F. Godwin (agodwin@mrgb.org)'; William R. Johnston; towater@olaughlinparis.com; Steve Boyd; Melissa Williams; Michelle Reimers
Cc: Staples, Rose; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip - TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Hersh-Burdick, Rachael - USACE'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan -CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William -

SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert M. Nees'; 'Greg Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; tramirez@sfwater.org
Subject: RE: Request for Additional Information

Ruth,

To report our progress on this matter, we have located the information you were requesting and will provide the information that is available electronically to you (or load it on the website). It is our intent to complete this by next Tuesday. The information consists of Forms 11, 173, 174, and 150 which exist in electronic format for the period October 1983 through December 2007. The forms prior to October 1983 exist as hard copy only and will need to be scanned. That will require disassembling binders, scanning, and reassembling binders, including staple removal and re-attachment. Do you also want this earlier information? There may be a charge for copying this information, but we have not yet estimated what that would be.

We are still researching the question relating to if, and how often, CCSF has gone negative in the water bank since 1971 (also when and for how long), and if there was compensation. We are hopeful of having this information to you next week as well.

We do believe that the water bank accounting methodology has not changed since the completion of the Project.

John

From: Porter, Ruth M. [mailto:ruth.porter@hoganlovells.com]
Sent: Wednesday, July 06, 2011 8:13 PM
To: Devine, John
Cc: Staples, Rose; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip -

TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Hersh-Burdick, Rachael - USACE'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan -CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert M. Nees'; 'Greg Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; tramirez@sfwater.org
Subject: RE: Request for Additional Information

John,

Thank you for your response. To clarify: the original request dated April 1, 2011 was made by another relicensing participant. My client's original request was that of June 22, 2011. In that request, I noted that other relicensing participants had previously requested the relevant materials on April 1, 2011. Regarding the April 1 request, it appeared that the Districts were the ones ultimately responsible for providing the requested materials given that:

(1) the Districts tracked these requests on their Progress Tracking List for the proceeding;
(2) the Districts' Progress Tracking List dated June 16, 2011 reflected responses to these requests even though the requests were supposedly directed at CCSF;
(3) the Districts posted materials responsive to these requests on the Don Pedro relicensing website; and
(4) the April 1st request was made at a relicensing participant meeting held by the Districts to "an invited guest speaker" who happens to own the rights to 1/3 of water storage in the Don Pedro Project.

As you note, CCSF is not currently a licensee of the Don Pedro Project. CCSF is, however, a necessary party to any proceeding before the Commission pertaining to minimum flow requirements. Moreover, according to the PAD, "[t]he Districts and CCSF alike have been active and willing partners in efforts to improve and protect the anadromous fisheries in the lower Tuolumne River and they intend to continue this active involvement in the future." PAD at 1-3. In light of CCSF's active involvement in these issues and the Districts' cooperative relationship with CCSF, Restore Hetch Hetchy believed that the Districts were ultimately responsible for responding to these requests with the assistance of CCSF to the extent necessary. Given the amount of time that passed since the initial request was made, Restore Hetch Hetchy submitted a follow-up request to ensure that the requested materials were provided in a timely fashion.

Regarding 18 C.F.R. 5.6(c), Restore Hetch Hetchy's request does, in fact, meet the definition of an information request under this section. First, the PAD states that Don Pedro is used to provide a water bank for CCSF. PAD at 3-2. The PAD also states that when CCSF has a credit in its water bank account "CCSF may intercept and divert waters of the Tuolumne River in amount that will reduce the inflow into Don Pedro Reservoir to less than the Districts would otherwise be entitled." PAD at 3-19. In addition, the PAD states that "[d]ue in large part to CCSF's out-of-basin diversions upstream of the Project, the total releases from the Don Pedro Project have averaged approximately 1.6 million ac-ft annually (WY 1975 to 2009)." PAD at 4-7. Because the operations of the water bank play a significant role in the amount of water kept in storage in Don Pedro and the timing of flow releases, these operations plainly qualify as a "known or potential resource impact" of the Project. Therefore, records regarding the operations of that water bank qualify as "source of information" on a "known or potential resource impact." The Districts' failure to reference this valuable source of information in the PAD does not excuse the Districts from providing the requested materials. Moreover, the Districts' suggested reading of the regulation would create the perverse incentive for applicants to omit relevant information from the PAD to avoid having to provide that information to relicensing participants.

Given that Restore Hetch Hetchy requested electronic copies of the materials, I am unsure what reproduction costs you are referring to. We are happy to cover reasonable costs associated with responding these requests, but we would like to discuss the Districts' collection and production methodology to ensure that such costs are reasonable in that instance.

Ruth Porter

Counsel for Restore Hetch Hetchy

From: Devine, John [mailto:John.Devine@hdrinc.com]
Sent: Tuesday, July 05, 2011 9:21 AM
To: Porter, Ruth M.
Cc: Staples, Rose; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip - TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Hersh-Burdick, Rachael - USACE'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan -CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of

Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert M. Nees'; 'Greg Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick
Subject: RE: Request for Additional Information

Ruth,

I am in receipt of your most recent email of June 30 (6:23 PM, PDT). I would like to point out that your client's original request for additional information was directed at **CCSF**, not the Districts, at a relicensing meeting on April 1 sponsored by the Districts at which CCSF was an invited guest speaker. CCSF responded that it was willing to provide the requested information, but of course CCSF is not a FERC licensee, did not have to provide the information under any FERC-licensing obligation, and is not bound by any ILP regulations.

By email dated June 22, you have now requested certain portions of the original data request be provided by the Districts. The data you seek is extensive and goes back 40 years. Districts believe it may have this data and is willing to provide it, but it may take considerable time and effort to locate, copy and transmit the information. The Districts do not believe this request meets the definition of an information request under Section 5.6 (c)(2) of FERC's regulations. Your request was made directly to **CCSF** at the April 1 meeting, and was not a request for source documents cited in the PAD. Information about "water bank" accounting methods and historical balances does not qualify as *"information on the existing environment"* or *"known or potential resource impacts".* Section 5.6 (c)(2) reads:

(2) *Availability of source information and studies*. The sources of information on the existing environment and known or potential resource impacts included in the descriptions and summaries must be referenced in the relevant section of the document, and in an appendix to the document. The information must be provided upon request to recipients of the Pre-Application Document. A potential applicant must provide the requested information within 20 days from receipt of the request. Potential applicants and requesters are strongly encouraged to use electronic means or compacts disks to distribute studies and other forms of information, but a potential applicant must, upon request, provide the information in hard copy form. The potential applicant is also strongly encouraged to include with

the Pre-Application Document any written protocol for distribution consistent with this paragraph to which it has agreed with agencies, Indian tribes, or other entities.

Our reading of 5.6(c)(2) is that it requires the licensees to furnish sources of information *referenced* in the PAD within 20 days of request. None of the materials you seek were referenced in the PAD —all of these materials were requested in meetings with relicensing participants. Therefore, while the Districts are willing to provide the requested documents, to the extent we have them, we are uncertain just how long it will take.

Please be aware that there may be costs associated with compiling, reproducing and transmitting these documents in accordance with California and/or FERC regulations. We will keep you up to date on our progress.

Regards,

John Devine, P.E.
Senior Vice President
HDR|DTA
970 Baxter Blvd, Suite 301| Portland, ME | 04103
Office: 207.775.4495 | Fax: 207.775.1742
Cell: 207-776-2206

From: Porter, Ruth M. [mailto:ruth.porter@hoganlovells.com]
Sent: Thursday, June 30, 2011 9:23 PM
To: Devine, John
Cc: Staples, Rose; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip - TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT';

'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Hersh-Burdick, Rachael - USACE'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan -CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert M. Nees'; 'Greg Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick
Subject: RE: Don Pedro Website Upload Today Include Updated PTL and Revised RedLine Bathymetry Study Plan

John,

Thank you for the update. To be clear: it is our expectation that the Districts will provide the requested data on or before July 12th in accordance with the requirements of 18 C.F.R. § 5.6(c)(2). Given that the Districts have had over three months to compile most of this information since relicensing participants initially requested it on April 1st, it is unclear why the Districts would need more than the 20 days permitted under the regulations to provide the requested data. If the Districts do not intend to meet this deadline, please advise so that we can discuss next steps.

Ruth Porter

Counsel for Restore Hetch Hetchy

From: Devine, John [mailto:John.Devine@hdrinc.com]
Sent: Thursday, June 30, 2011 1:38 PM
To: Devine, John; Porter, Ruth M.
Cc: Staples, Rose; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Beuttler, John - CSPA'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cory, Philip - TNC'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W -

SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hellam, Anita - HH'; 'Hersh-Burdick, Rachael - USACE'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan -CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Pinhey, Nick - City of Modesto'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; Wheeler, Douglas P.; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'; 'Robert M. Nees'; 'Greg Dias'; 'Joy Warren'; 'Arthur F Godwin'; 'Bill Johnston'; 'Tim O'Laughlin'; 'Steve Boyd'; 'Melissa Williams'; 'Michelle Reimers'; Loy, Carin; Jones, Rick
Subject: RE: Don Pedro Website Upload Today Include Updated PTL and Revised RedLine Bathymetry Study Plan

Ruth,

To keep you updated on our progress towards responding to your requests of June 22, the Districts are continuing to conduct a search of their files for the data you requested. We will update you when we have a firm schedule for providing you what relevant information we can find.

John

From: Devine, John
Sent: Wednesday, June 22, 2011 3:15 PM
To: Porter, Ruth M.
Cc: Staples, Rose; Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Beuttler, John - CSPA; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Burt, Charles - CalPoly; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cory, Philip - TNC; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Gutierrez,

Monica - NOAA-NMFS; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hellam, Anita - HH; Hersh-Burdick, Rachael - USACE; Heyne, Tim - CDFG; Holden, James ; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Kanz, Russ - SWRCB; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Pinhey, Nick - City of Modesto; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shumway, Vern - SNF; Shutes, Chris - CSPA; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Steindorf, Dave - AW; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas P.; Williamson, Harry (NPS); Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB; Robert M. Nees; Greg Dias; Joy Warren; Arthur F Godwin; Bill Johnston; Tim O'Laughlin; Steve Boyd; Melissa Williams; Michelle Reimers; Loy, Carin; Jones, Rick
Subject: RE: Don Pedro Website Upload Today Include Updated PTL and Revised RedLine Bathymetry Study Plan

Ruth,

I believe I understand your requests. I will discuss these items with the Districts and get back to you with our response.

John

From: Porter, Ruth M. [mailto:ruth.porter@hoganlovells.com]
Sent: Wednesday, June 22, 2011 12:45 PM
To: Devine, John
Cc: Staples, Rose; Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Beuttler, John - CSPA; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Burt, Charles - CalPoly; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cory, Philip - TNC; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Gutierrez, Monica - NOAA-NMFS; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hellam, Anita - HH; Hersh-Burdick, Rachael - USACE; Heyne, Tim - CDFG; Holden, James ; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Kanz, Russ - SWRCB; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick

- TRT; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Pinhey, Nick - City of Modesto; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shumway, Vern - SNF; Shutes, Chris - CSPA; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Steindorf, Dave - AW; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas P.; Williamson, Harry (NPS); Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB; Robert M. Nees; Greg Dias; Joy Warren; Arthur F Godwin; Bill Johnston; Tim O'Laughlin; Steve Boyd; Melissa Williams; Michelle Reimers; Loy, Carin; Jones, Rick
Subject: RE: Don Pedro Website Upload Today Include Updated PTL and Revised RedLine Bathymetry Study Plan

John:

According to the June 16, 2011 Progress Tracking List referenced below, the Districts/CCSF have responded to Item Nos. 21, 23, and 24. As discussed below, the materials provided in response to Item Nos. 21 and 23 are either unresponsive or not fully responsive to the Relicensing Participant requests. Moreover, no response has actually been provided for Item No. 24 despite the Progress Tracking List's statement that responsive materials were attached. Therefore, as discussed below, Restore Hetch Hetchy has a number of follow-up requests. Note that these requests are made pursuant to 18 C.F.R. § 5.6 (c)(2) and are therefore subject to the timing requirements specified therein.

Item No. 21: This request: (1) asks the CCSF to provide the historical water bank "account balance" that the Districts have provided to CCSF and (2) asks for documentation on the water bank accounting method. The attached response to Item No. 21 contains the Instructions for Water Bank Accounting of Hetch Hetchy Water and Power, Modesto Irrigation District, and Turlock Irrigation District dated April 1971 ("Instructions"). Thus, assuming that the Districts and CCSF have not modified the accounting method since April 1971, it appears that part two of this request has been satisfied. The response provided utterly ignores, however, the first part of the request seeking the historical water bank account balance.

Therefore as a follow-up to this item, Restore Hetch Hetchy requests that the Districts:

(1) Provide the historical water bank "account balance," as requested; and
(2) Confirm that the Districts and CCSF have not modified the water bank accounting method since April 1971. In the event the water bank accounting method has been modified subsequently, Restore Hetch Hetchy requests that the Districts provide documentation regarding any new accounting methods used.

Item No. 23: This request asks what compensation CCSF provides to the Districts when CCSF's water bank account has a negative balance. In response to this request, the updated Progress Tracking List states "MID-TID have only consented once to SF request to 'go-negative' in the water bank through the history of the Project. See attached 'Response 23.'" The attached Response 23 is an agreement between Hetch Hetchy Water and Power and the Districts dated June 2, 1988 ("Agreement"). This Agreement, among other things states "[t]he letter agreement of May 27, 1988 and the consent therein granted shall stand terminated as of June 2, 1988. Such termination shall not affect the Districts' right to compensation thereunder." Agreement at 2. Moreover, the Agreement also provides that "San Francisco shall pay to the Districts on or before August 15, 1988, the amount of money necessary to fully compensate the Districts for all damages suffered by them as a result of the existence of the debit balance." *Id.*

Therefore, as a follow-up to this item, Restore Hetch Hetchy requests that the Districts:

(1) State whether there has ever been a negative balance in CCSF's water bank without the prior consent of MID-TID, and, to the extent applicable, provide the date(s) and duration(s) of those negative balances;
(2) Provide a copy of the May 27, 1988 letter agreement that was referenced in the June 2, 1988 agreement;
(3) Provide a list any compensation that the Districts have received from CCSF or any divisions thereof as a result of a negative balance in the water bank account. This list should include: (i) the date and amount of any monetary payments for damages the Districts incurred; and (2) an explanation of how the damages were calculated.

Item No. 24: This request asks CCSF to provide copies of the water balance reports it sends to the Districts. Despite the fact that the Progress Tracking List states First, the Instructions state that CCSF, MID, and TID developed a written form called "Hetch Hetchy Water and Power System, Daily Operating Summary Form "See attached 'Response 24' for water bank accounting," no such document is posted on the Don Pedro Relicensing website. Regarding these water balance reports, according to the Instructions provided in response to Item No. 21, the Districts and CCSF should have records of several forms used for water bank accounting:HH-11," which is a form that CCSF completes on a monthly basis with data furnished by the Districts and CCSF operating personnel on a daily basis.

- Second, the Instructions state that the daily "Bank Account" status is computed by CCSF and then furnished to the Districts at the end of each month on "Tuolumne River Flow Accounting" Form P-174.
- Third, three to five months later, the status information furnished by CCSF on Form P-174 is compared to the data collected from gauging stations that is compiled on "Study of the Tuolumne River Watershed" form P-173. Form P-173 complies the computed daily flows and average reservoir contents by months and serves as the official record of storage and stream flows for Raker Act compliance.
- Finally, after Form P-174 is compared to Form P-173, CCSF issues a "Bank Account Adjustment" Form HH-150, which shows CCSF's net credit balance at the end of the latest month, adjusted by any difference with the latest monthly official recording.

Therefore, as a follow-up to this item, Restore Hetch Hetchy requests that:

(1) CCSF provide copies of all "Hetch Hetchy Water and Power System, Daily Operating Summary" Form HH-11 in PDF format;
(2) The Districts provide copies of all completed "Tuolumne River Flow Accounting" Form P-174 in PDF format;
(3) The Districts provide copies of all completed "Study of the Tuolumne River Watershed" Form P-173 in PDF format; and

(4) The Districts provide copies of all completed "Bank Account Adjustment" Form HH-150 in PDF format.

Please feel free to contact me if you have any questions regarding these requests.

Regards,

Ruth Porter

Counsel for Restore Hetch Hetchy

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From: Staples, Rose [mailto:Rose.Staples@hdrinc.com]
Sent: Thursday, June 16, 2011 7:55 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Beuttler, John - CSPA; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Burt, Charles - CalPoly; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cory, Philip - TNC; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Gutierrez, Monica - NOAA-NMFS; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hellam, Anita - HH; Hersh-Burdick, Rachael - USACE; Heyne, Tim - CDFG; Holden, James ; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Kanz, Russ - SWRCB; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Pinhey, Nick - City of Modesto; Porter, Ruth M.; Powell, Melissa - CRRMW;

Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shumway, Vern - SNF; Shutes, Chris - CSPA; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas P.; Williamson, Harry (NPS); Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John - NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Subject: Don Pedro Website Upload Today Include Updated PTL and Revised RedLine Bathymetry Study Plan

I have uploaded to the Don Pedro Relicensing Website today an updated Progress Tracking List (PTL) with some Districts and CCSF responses. In addition, I have uploaded a red-line version of the Bathymetry Study Plan, which reflects suggestions and comments received from the Relicensing Participants during the June 2 Bathymetry Study Plan conference call.

Both of these documents, and attachments to the PTL, can be found as the first two ANNOUNCEMENTS on the INTRODUCTION page of the website www.donpedro-relicensing.com.

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From: Devine, John
Sent: Tuesday, August 30, 2011 8:28 AM
To: Annie Manji; Staples, Rose
Cc: Steve - AR' 'Rothert; Dave - AW' 'Steindorf; 'Bill Johnston'; William -CSPA' 'Jennings; Paul ' 'Marko; John - CSPA' 'Beuttler; Jim - MPM' 'Smith; Bill - MR' 'Lyons; Bob' 'Ott; Steve - ARTA' 'Welch; Art - BAWSCA' 'Jensen; Nicole - BAWSCA' 'Sandkulla; Allison - TRC' 'Boucher; Dave -Allison - TRC' 'Boucher; James - BLM' 'Eicher; Lauren - BLM' 'Fety; Rhonda - BVR' 'Morningstar Pope; Roselynn BVR' 'Lwenya; James - BLM' 'Barnes; Jeff -BLM' 'Horn; Peggy - BLM' 'Cranston; Beau - CalPoly' 'Freeman; Charles - CalPoly' 'Burt; Jenny - CT' 'Hatch; Cindy - GWWF' 'Charles; Mary - PRCI' 'Motola; Dan' 'Wheeler; Dave' 'Wheeler; John - CSERC' 'Buckley; Rebecca - CSERC' 'Cremeen; Jim Canaday; Jennifer O'Brien; Julie Means; Mary Jane Taylor; Bob Hughes; Stephen Puccini; Tim Heyne; Royal' 'Robbins; Ronn - CNRF/AIC' 'Slay; John - SCERD' 'Aud; Frank - FERC' 'Winchell; James.Hastreiter@ferc.gov; Kelly - FOR' 'Catlett; Ron - FOR' 'Stork; Maggie-SNF' 'Dowd; Vern - SNF' 'Shumway; Craig - USFWS' 'Anderson; Deborah -USFWS' 'Giglio; Michelle - USFWS' 'Workman; Zac - USFWS' 'Jackson; Harry (NPS)' 'Williamson; Janice' 'Keating; Jesse' 'Roseman; Allison - HB' 'Schutte; Ray - BAWSCA' 'McDevitt; Timothy - HansonBridgett' 'Findley; Loy, Carin; Jones, Rick; Staples, Rose; Mike - RHH' 'Marshall; Douglas P. Wheeler; ruth.porter@hoganlovells.com; Joseph' 'Lein; Noah' 'Hughes; Chris' 'Ott; Ron - NFMT' 'Goode; Teresa' 'Kinney; 'Justin'; James ' 'Holden; Art - CWRMP' 'Bowman; Dave - FR' 'Wood; David - TRT /RH' 'Linkard; Melissa - CRRMW' 'Powell; George A ' 'TeVelde; 'Greg Dias'; 'Joy Warren'; 'MelissaWilliams'; Jan -Chicken Ranch' 'Costa; Lloyd - CRRMW' 'Mathiesen; Stanley Rob - TBMWI' 'Cox; Reba - TMTC' 'Fuller; Jim - City ofModesto' 'Alves; Jack - City of Modesto' 'Bond; Nick - City of Modesto' 'Pinhey; Bryan - MF' 'Wilson; Colette - TRT/MF' 'Verkuil; Eric - MF' 'Walters; P - MF' 'Day; Zahra - MF' 'Hayat; 'Arthur F Godwin'; Chris - CSPA' 'Shutes; David O - N-R' 'Romano; Lynette - N-R' 'Asay; Jeffrey - NOAA-NMFS' 'McLain; John -NOAA' 'Wooster; Kathryn - NOAA-MNFS' 'Kempton; Larry - NOAA-MNFS' 'Thompson; Maria - NOAA-NMFS' 'Rea; Monica - NOAA-NMFS' 'Gutierrez; Rhonda - NOAA-NMFS' 'Reed; Rick - NOAA-NMFS' 'Wantuck; Steve - NOAA' 'Edmondson; Stephen - NPS' 'Bowes; Tony - NPS' 'Brochini; 'Tim O'Laughlin'; Dan -CDWA' 'McDaniel; Milford Wayne - OHP' 'Donaldson; Susan - CA SHPO' 'Stratton; Jeffrey' 'Cowan; Jerry ' 'Jackman; Donn W - SFPUC' 'Furman; Ellen - SFPUC' 'Levin; Michael - SFPUC' 'Carlin; tramirez@sfwater.org; William - SFPUC' 'Sears; Marty - SMRT' 'McDonnell; John - TUD' 'Mills; sharon.coleman@spiegelmcd.com; william.huang@spiegelmcd.com; Tom - SCFB' 'Orvis; Wayne - SCFB' 'Zipser; Anthony - SSMN' 'Brochini; Michael - MFFC' 'Martin; Sandy ' 'Vasquez; 'Lewis-Reggie-PRCI'; Doug - TetraTech' 'Brewer; 'Michelle Reimers'; 'Robert M. Nees'; 'Steve Boyd'; Laura - TNC' 'Jensen; Philip - TNC' 'Cory; Brian - CalTrout' 'Johnson; Eric - TRT' 'Wesselman; Jessie - TRT' 'Raeder; Patrick - TRT' 'Koepele; Peter - TRT' 'Drekmeier; Ron' 'Yoshiyama; Kevin - USACE' 'Richardson; Mary' 'Johannis; Russ - SWRCB' 'Kanz; Julie -Water-Power Law Grp' 'Ganteinbein; Richard - Water-Power Law Grp forNHI' 'Roos-Collins; Anita - HH' 'Hellam; Tini' 'Horn; Elaine - YSC' 'Gorman; Robert M. Nees; Greg Dias; Joy Warren; 'Arthur F Godwin'; William

R. Johnston; 'Tim O'Laughlin'; Steve Boyd; Loy, Carin
Subject:RE: Request for Additional Information

Annie,

Thank you for the reminders. Our response follows.

[1] Regarding PTL Item #16 that deals with the Districts' pre-1914 appropriative rights, this question/request was asked by Richard Roos-Collins. We responded to this request on June 5, but neglected to copy all parties. We will upload to the website our June 5 response to Richard which includes the list of all pre-1914 rights.

[2] Regarding PTL Item #13 regarding the Districts riparian water rights, our response is provided below:

(i) the Districts do not rely upon riparian rights for irrigation purposes.

(ii) there may be riparian landowners within the District boundaries that rely upon riparian water rights for all or a portion of their water needs. However, the Districts' service of those lands does not include any riparian water rights; therefore, since no lands are served with any District riparian rights, there is no map we can produce, nor data on seasons or amounts. Furthermore, the Districts have no way of identifying which landowners within their service areas are using riparian water, the amount of use, or the season of use.

(iii) the Districts do have a riparian claim for power use at Don Pedro powerhouse and TID has one for its powerhouse at La Grange; these are provided in the Districts Triennial Reports, Enclosure 3 and 5.

We will upload today these answers to your questions.

Again, thank you for the reminder.

JOHN DEVINE, P.E.
HDR Engineering, Inc.
Senior Vice President, Hydropower Services

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From: Jessie Raeder [jessie@tuolumne.org]
Sent: Thursday, September 01, 2011 5:48 PM
To: 'Jessie Raeder'; Devine, John; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Barnes, Peter - SWRCB'; 'Beuttler, John - CSPA'; 'Blake, Martin'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Cadagan, Jerry'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cismowski, Gail - SWRCB'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Derwin, Maryann Moise'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Grader, Zeke'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hackamack, Robert'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hayden, Ann'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Holm, Lisa'; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Hume, Noah - Stillwater'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Madden, Dan'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan -CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Paul, Duane - Cardno'; 'Pinhey, Nick - City of Modesto'; 'Pool, Richard'; 'Porter, Ruth - RHH'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Ridenour, Jim'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sander, Max - TNC'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shipley, Robert'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Sill, Todd'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; Staples, Rose; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'Terpstra, Thomas'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Vierra, Chris'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; 'Wheeler, Douglas - RHH'; 'Wilcox, Scott - Stillwater'; 'Williamson, Harry (NPS)'; 'Wilson, Bryan -

MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'
Subject: RE: Results of doodlepoll and updated meeting schedule.

Sorry about that - I meant Tuesday the 13th, not Thursday the 13th.
Jessie

From: Jessie Raeder [mailto:jessie@tuolumne.org]
Sent: Thursday, September 01, 2011 2:43 PM
To: 'Devine, John'; 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Barnes, Peter - SWRCB'; 'Beuttler, John - CSPA'; 'Blake, Martin'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Burt, Charles - CalPoly'; 'Cadagan, Jerry'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cismowski, Gail - SWRCB'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, P - MF'; 'Derwin, Maryann Moise'; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Grader, Zeke'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hackamack, Robert'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hayden, Ann'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Holm, Lisa'; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Hume, Noah - Stillwater'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Kanz, Russ - SWRCB'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; 'Loy, Carin'; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Madden, Dan'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan -CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Paul, Duane - Cardno'; 'Pinhey, Nick - City of Modesto'; 'Pool, Richard'; 'Porter, Ruth - RHH'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Ridenour, Jim'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sander, Max - TNC'; 'Sandkulla, Nicole - BAWSCA'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shipley, Robert'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Sill, Todd'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; 'Staples, Rose'; 'Steindorf, Dave - AW'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'Terpstra, Thomas'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Vierra, Chris'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; 'Wheeler, Douglas - RHH'; 'Wilcox, Scott - Stillwater'; 'Williamson, Harry (NPS)'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'
Subject: RE: Results of doodlepoll and updated meeting schedule.

John,

Regarding the Economics subgroup meeting, I am curious to know why Thursday the 13th was chosen, when 4 more people could attend on Monday the 12th (which was the date that clearly had the most availability). Seems to defeat the point of a doodle poll? This is very unfortunate for TRT, which was one of the groups that had requested this meeting, since our two leads on this topic, Peter Drekmeier and Patrick Koepele, cannot attend that day. We think it's also unfortunate because Ellen Levin cannot attend on the 13th (whereas she can on the 12th) as CCSF will certainly play a large role in this subject area.

Jessie

Jessie Raeder
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From: Staples, Rose [mailto:Rose.Staples@hdrinc.com] **On Behalf Of** Devine, John
Sent: Thursday, September 01, 2011 2:08 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Kanz, Russ - SWRCB; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA;

Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Subject: Results of doodlepoll and updated meeting schedule.

First, I would like to thank those who participated in the recent doodlepoll. Based on the poll, here is what we have come up with for meeting dates.

[1] The **Socioeconomic Study Plan subgroup** will meet on **Tuesday afternoon, September 13 from 1:30 to 5:00 PM in Modesto** at a meeting location still to be identified.

[2] Due to a small response on the W&AR -5 and -6 subgroup meeting and a lack of consensus on a date, we'll just keep those two study plans within the overall **Water & Aquatic RWG** meeting already scheduled for all day on **Thursday, September 15 at MID**. However, there is plenty to cover in this meeting because we still have to discuss those study requests not adopted by the Districts and we also need to continue to discuss the proposed studies. For that reason, I believe we all need to be ready for a long day of meeting on September 15 (possibly break for dinner, then return), and even a continuation of the meeting on **Friday, September 16**. We will have Live Meeting and a conference line to aid participation. I recognize the inconvenience of this schedule, but spending this bit of extra time on the W&AR issues on September 15 and 16 will benefit all of us down the road as we move towards the Revised Study Plan document. If there was a preference for a two-day meeting to be held September 14 and 15 instead of September 15 and 16, that would be fine with the Districts. Please let us know.

[3] The **Recreation RWG** is still scheduled to meet on **Wednesday morning, September 14 at MID** – no change there.

[4] The **Cultural RWG** is well along and will be holding their next meeting by **conference call on Wednesday afternoon, September 15**.

[5] The **Terrestrial RWG** is scheduled to meet on **Thursday morning, September 15 at MID**.

Detailed agenda will follow next week.

Thank you for your patience and continuing interest in the relicensing of Don Pedro

JOHN DEVINE P.E.

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From: Staples, Rose
Sent: Friday, September 02, 2011 5:48 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Kanz, Russ - SWRCB; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Subject: Don Pedro Project - Water Rights Lists of Pre-1914 Documents
Attachments: Water Rights Lists of Pre-1914 Documents..pdf

These lists of the Districts' Water Rights are being provided in response to PTL #16. For background information, please reference Item #16 on the updated Progress Tracking List (PTL) which is being uploaded to the relicensing website later today.

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CPS CAP

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1. THE LA GRANGE DITCH RIGHT (66cfs)

1.1 May 18, 1871, Water Claim by E. Green and A.D. Allen for 3,000 miners inches. Recorded Tuolumne County at the request of R.P. Denoon, June 8, 1871. Claims. Vol. 8. p. 543.

1.2 July 3, 1871 Indenture conveying property and water right from Edmond Green and A.D. Allen to the La Grange Ditch and Hydraulic Mining Company. Recorded Stanislaus County. July 10, 1871. Deeds. Vol. 6, p. 455-460.

1.2.1 December 1, 1906. Indenture conveying property known as the "Hardin Ranch" which would be overflowed by a dam 100 feet high built at the narrows , or gorge, upon said north fork of the Tuolumne River, from La Grange Ditch and Hydraulic Mining Co. to La Grange Water & Power Company. Recorded Tuolumne County. January 16, 1909. Deeds. Book "A" , Vol. 67, p. 88-91.

1.3 May 21, 1907. Indenture conveying La Grange Property and Water Right from La Grange Ditch and Hydraulic Mining Co. to La Grange Water & Power Co. No amount of right specified. Recorded Stanislaus County. January 15, 1908. Deeds. Vol. 120, p. 83-88.

1.4 September 19, 1908. Indenture confirming deeds of December 1, 1906 and May 21, 1907, from La Grange Ditch and Hydraulic Mining Co. to La Grange Water & Power Co. (A) Recorded Tuolumne County. March 1, 1909. Book "A", Vol. 67, p. 162-163, and (B) Stanislaus County. January 15, 1909. Deeds. Vol. 120, p. 89.

1.5 January 14, 1909. Indenture from La Grange Water & Power Co. transferring property, but not water right of 5,000 miners' inches, to La Grange Gold Dredging Co.. Recorded Stanislaus County. January 15, 1909. Deeds. Vol. 120, p. 90-92.

1.6 May 23, 1911. La Grange Water and Power Co. water right transferred to Yosemite Power Co. Recorded Stanislaus County. ~~May 23~~ October 4, 1911. Deeds. Vol. 136, p. 594.

1.7 December 29, 1916. Yosemite Power Co. conveys 300 miners' inches of original 5,000 miners' inches of water right to La Grange Gold Dredging Co. Recorded Stanislaus County. January 4, 1917. Deeds. Vol. 237, p. 334-336.

1.7.1 August 2, 1917. Yosemite Power Co. conveyed 100 miners' inches of water for duration of dredging operations, and a permanent right to 167 miners' inches of water for irrigation (not to exceed a maximum equivalent of 100 miners' inches continuous flow annual consumption) of original filing of 5,000 miners' inches to La Grange Gold Dredging Co. Recorded Stanislaus County. October 5, 1917. Deeds. Vol. 250, p. 629-630.

1.7.2 August 2, 1917. La Grange Gold Dredging Co. transferred under a Quit Claim Deed a penstock site to Yosemite Power Co. Recorded Stanislaus County. October 5, 1917. Deeds. Vol. 250, p. 631.

1.8 September 26, 1917. Deed from the Yosemite Power Company to Sierra and San Francisco Power Company transferring 66 cfs water right. Recorded Stanislaus County. October 10, 1917. Deeds. Vol. 250, p. 632-635.

1.9 September 27, 1917. Stipulated Judgement in the Superior Court of the County of Stanislaus Turlock Irrigation District and Modesto Irrigation District vs. La Grange Water and Power Company and La Grange Gold Dredging Company awarding Yosemite Power Company 66 cfs from the natural flow of the Tuolumne River all times when the flow of the river amounts to at least 66 cfs and all of the natural flow if the natural flow is less than 66 cfs. Recorded Stanislaus County . September 27, 1917. Judgement Book. Vol. 9. p. 350. Case No. ???

1.10 October 9, 1917. La Grange Gold Dredging Company and Yosemite Power Company by Deed of Quit Claim conveyed all property including "all water ditches, canals, privileges,...appurtenant to...said reservoir...." to Sierra and San Francisco Power Company. Recorded Stanislaus County. October 10, 1917. Deeds. Vol 250, p. 636-637.

1.11 January 24, 1920. Deed from Sierra and San Francisco Power Company selling 60 cfs for six months of each year, under certain conditions, to Waterford Irrigation District. Recorded Stanislaus County. February 2, 1920. Deeds. Vol. 299. p. 109-112.

1.12 October 26, 1921. Deed from Sierra and San Francisco Power Company and Pacific Gas and Electric Company transferring 66 cfs water right to Turlock Irrigation District and Modesto Irrigation District. Recorded Tuolumne County. May 12, 1922 . Book A, Deeds. Vol. 85. p. 1; Recorded Stanislaus County. July 6, 1923. Official Records. Vol. 24. p. 473-481.

1.13 December 14, 1977. State of California, Certificate of Filing, Annexation of the Waterford Irrigation District to the Modesto Irrigation District and the Dissolution of the Waterford Irrigation District. Recorded Stanislaus County, Official Records. Vol. 3000, p. 516-535.

1.14 December 15, 1977. Deed and Bill of Sale from the Waterford Irrigation District to the Modesto Irrigation District. Recorded in Stanislaus County, Official Records, July 14, 1989. Document No. 054104. 15p.

2. THE WHEATON RIGHT (10,000 cfs)

2.1 January 16, 1855, Posting of water claims by the Franklin Water Company. Recorded in the Tuolumne County Records. January 23, 1855. Claims, Vol. 1. p. 156.

2.2 November 27, 1855, Franklin and French Bar Water Company change to the Stanislaus Water Company. Recorded in Stanislaus County Records, November 30, 1855. Miscellaneous Records, Vol. 1. p. 8.

2.3 November 27, 1855. Stanislaus Water Company Certificate of Organization. Recorded in Stanislaus County Records. February 1, 1856. Miscellaneous Records, Vol. 1. pp. 10-11.

2.4 January 18, 1862, Filing of claim by Elam Dye. Recorded in Stanislaus County Records. January 18, 1862. Miscellaneous Records, Vol . 1. p. 73.

2.5 May 28, 1862, Grant of Stanislaus Water Company to Elam Dye. Recorded in Stanislaus County Records. May 29, 1862. Deeds, Vol . 2. pp. 391-392.

2.6 June 15, 1863, Grant from Elam Dye to John Reedy and John Bixby. Recorded in Stanislaus County Records. September 19,1863. Deeds, Vol . 3. pp. 195-196.

2.7 May 7, 1868, Indenture from John Bixby to John Reedy. Recorded in Stanislaus County Records. May 14, 1868. Deeds, Vol . 4. pp. 355-356.

2.8 September 6, 1870, Deed from John Reedy to Michael Kelly. Recorded in Stanislaus County Records. September 6, 1870. Deeds, Vol . 6. pp. 466-467.

2.9 September 16, 1870, Deed from John Reedy to Michael Kelly. Recorded in Stanislaus County Records. September 26, 1870. Deeds, Vol . 6. pp. 495-496.

2.10 May 1, 1871, Notice of Appropriation by Michael Kelly. Recorded in Stanislaus County Records. May 23, 1871. Miscellaneous Records, Vol . 1. p. 500.

2.11 May 1, 1871, Agreement Michael Kelly to J.M. Thompson. Recorded in Stanislaus County Records. May 27, 1871. Miscellaneous Records, Vol . 1. p. 501.

2.12 June 26, 1871, Deed to transfer of water, ditch and privileges from Michael Kelly to J.M. Thompson, Charles Elliot and M.A. Wheaton. Recorded in the Stanislaus County Records, June 27, 1871. Deeds, Vol. 7. pp 434-435.

2.13 August 26, 1871, Deed to transfer of one fourth part of above June 26, 1871 transfer, from J.M. Thompson to John Burcham. Recorded in the Stanislaus County Records, September 27, 1871. Vol. 7 Deeds. pp 627-629.

2.14 November 8, 1871, Deed to fix of ownership of water, ditch, property and privileges as follows: John Burcham 23/32, M.A. Wheaton 6/32 & Charles Elliott 3/32. Recorded in the Stanislaus County Records, November 18, 1871, Deeds. Vol. 8. pp 114-116.

2.15 May 18, 1872, Claim of 500,000 inches (10,000 cfs) of water flowing in the Tuolumne River by John Burcham, M.A. Wheaton & Charles Elliott. Recorded in the Stanislaus County Records, May 20, 1872. Miscellaneous Records. Vol. 2. pp 12-13.

2.16 July 30, 1872, Deed to transfer of water right, dam, ditch, improvements, rights and privileges by John Burcham, M.A. Wheaton, Charles Elliott, Abner Doble and I.W. Spaulding to J.S. Doe. Recorded in the Stanislaus County Records, August 5, 1872. Deeds. Vol. 8. pp 698-700.

2.17 January 27, 1873, Deed to transfer of right title and interest in water right and improvements from J.S. Doe, M.A. Wheaton, John Burcham and Charles Elliott to Stanislaus Water Company. Recorded in the Stanislaus County Records, January 31, 1873. Deeds. Vol. 10. pp 49-50.

2.18 December 31, 1873, Deed to sell and convey all property belonging to Stanislaus Water Company including water rights of the Tuolumne River, dam, ditch and easements, rights and improvements to M.A. Wheaton. Recorded in the Stanislaus County Records, January 29, 1874. Deeds. Vol. 11. p 637.

2.19 June 11, 1890, Transfer of water right, dam and other property from M.A. Wheaton to Modesto Irrigation District, Recorded in the Stanislaus County Records, June 28, 1890. Deeds. Vol. 48. pp 45-49.

2.20 August 15,1890, Transfer of water rights and property from M.A. Wheaton to Modesto and Turlock Irrigation Districts. Recorded in the Stanislaus County Records. August 19, 1890. Deeds. Vol. 48. pp 96-99.

3. THE TURLOCK IRRIGATION DISTRICT POSTINGS

3.1 June 20, 1887, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 263-265.

3.2 June 20, 1887, for 225,000 M.I. at 40 ft. above Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 265-267.

3.3 June 20, 1887, for 225,000 M.I. at 40 ft. below Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 267-268.

3.4 August 9, 1887, for 225,000 M.I. at 40 ft. below Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 285-287.

3.5 August 9, 1887, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 287-288.

3.6 August 9, 1887, for 225,000 M.I. at 150 ft. above Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 289-290.

3.7 September 20, 1887, for 225,000 M.I. at Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 313-315.

3.8.1 September 20, 1887, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 315-316

3.8.2 September 20, 1887, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Tuolumne County Records. Claims. Vol. 9. pp. 20-21.

3.9.1 November 18, 1887, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 353-354.

3.9.2 November 18, 1887, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Tuolumne County Records. Claims. Vol. 9, pp.24-25.

3.10 November 18, 1887, for 225,000 M.I. at Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 355-356.

3.11 January 14, 1888, for 225,000 M.I. at Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 372-374.

3.12.1 January 14, 1888, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 374-375.

3.12.2 January 14, 1888, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Tuolumne County Records. Claims. Vol. 9. pp. 27.

3.13 March 26, 1888, for 225,000 M.I. at Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 422-423.

3.14 March 26, 1888, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 423-424.

3.15 May 14, 1888, for 225,000 M.I. at opposite Mining Company House. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 446-447.

3.16 May 14, 1888, for 225,000 M.I. at near Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 447-448.

3.17 July 16, 1888, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 485-486.

3.18 July 16, 1888, for 225,000 M.I. at or near Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 487-488.

3.19 September 11, 1888, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 496-498.

3.20 September 11, 1888, for 225,000 M.I. at or near Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 498-499.

3.21 November 9, 1888, for 225,000 M.I. at 100 ft. North of Mining Company House. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 508-509.

3.22 November 9, 1888, for 225,000 M.I. at or near Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 509-511.

3.23 January 5, 1889, for 225,000 M.I. at Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 520-521.

3.24 January 5, 1889, for 225,000 M.I. at 150 ft. North of Mining Company House. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 522-523.

3.25 January 10, 1890, for 200,000 M.I. at 2,400 ft. East of County Line. Recorded in the Tuolumne County Records. Claims. Vol. 9. p. 79.

4. THE MODESTO IRRIGATION DISTRICT POSTINGS

4.1 August 18, 1887, for 50,000 M.I. at near the East Line of Section 17. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 301-302.

4.2 August 24, 1887, for 50,000 M.I. at near the West Line of Section 16. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 302-303.

4.3 April 10, 1889, 250,000 M.I. at near Silva's Ferry. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 557.

4.4 July 28, 1889, 250,000 M.I. at near Silva's Ferry. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 570-571.

4.5 September 25, 1889, 250,000 M.I. at near Silva's Ferry. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 581-582.

4.6 November 25, 1889, 250,000 M.I. at near Silva's Ferry. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 590.

4.7 January 25, 1890, 250,000 M.I. at near Silva's Ferry. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 595-596.

4.8 February 19, 1890, 250,000 M.I. at about 400 ft. above Kelly's Ferry. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 597-598.

4.9 February 19, 1890, 250,000 M.I. at about 1,600 ft. above Kelly's Ferry. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 599-600.

4.10 April 19, 1890, 250,000 M.I. at about 1,600 ft. above Kelly's Ferry. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 5. pp. 634-635.

4.11 June 21, 1890, for 250,000 M.I. at near Wheaton Dam. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 6. pp. 3-4.

5. MODESTO IRRIGATION DISTRICT APPROPRIATION
(40,000 Acre-feet Storage Right)

5.1 October 1, 1908, for 50,000 M.I. at the joint dam of the MID and the TID for irrigation, power and all other purposes and more particularly filling 40,000 acre feet of storage for irrigating lands now and hereafter included in the MID. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 10. pp. 99-100.

6. TURLOCK IRRIGATION DISTRICT APPROPRIATION
(100,000 Acre-Feet Storage Right)

6.1 August 31, 1911, for 200,000 M.I. at the head of its canal for filling 100,000 acre feet of storage for use in irrigating lands in theTID. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 12. pp. 243-244.

7. NOTICE OF APPROPRIATION OF WATERS OF THE TUOLUMNE RIVER by J.M. Finley (13,000 M.I. - 260 CFS)

7.1 February 27, 1913, for 13,000 M.I. at the La Grange Dam for irrigation and domestic use on lands in Stanislaus County in the vicinity of Waterford. Recorded in the Stanislaus County Records. Miscellaneous Records. Vol. 14. p. 59.

7.2 March 21, 1916, Transfer of Finley Appropriation to Waterford Irrigation District. Recorded in the Stanislaus County Records March 27, 1916. Deeds. Vol. 227. pp. 524-525.

From: Staples, Rose
Sent: Friday, September 02, 2011 8:02 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Kanz, Russ - SWRCB; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Subject: Updated Progress Tracking List (PTL) Uploaded to Don Pedro Project Relicensing Website

An updated PTL has been uploaded to the Don Pedro website (in the INTRODUCTION/ANNOUNCEMENTS section). It contains items from the August 23-24 RWG Meetings, as well as responses to some of those items--and responses to some of the prior items. Also note the CLOSED ITEM section at the back of the document, as quite a few items (all marked as closed "08/31/2011") have now been moved to this section. Thank you.

ROSE STAPLES
CPS CAP

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Executive Assistant, Hydropower Services

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Don Pedro Progress Tracking List

Items completed are shaded in gray and will be moved to the CLOSED ITEM worksheet before the next issue of the Progress Tracking List (PTL) is uploaded to the Relicensing Website.
Red Text indicates either NEW items or NEW responses/status updates added since the last upload.
(RP = Relicensing Participant) - Last Updated 9/02/2011 by R Staples

Item No.	*Source of Item*	*Item*	*Date Requested*	*Date Due*	*Responsible Party*	*Action Taken/Status*	*Date Closed*
		Items 1-12 Closed					
13	RPs	Where, and when, is riparian water used--and how is it separated from storage? Is riparian water the water used on lands that meet the definition of "riparian lands"? Include a map of the lands that are served under a riparian claim. Provide season and amounts of water provided on those lands under claim of riparian right.	4/1/2011	n/a	Districts	**(1) The Districts do not rely upon riparian rights for irrigation purposes. (2) There may be riparian landowners within the Districts' boundaries that rely upon riparian water rights for all or a portion of their water needs. However, the Districts' service of those lands does not include any riparian water rights; therefore, since no lands are served with any Districts' riparian rights, there is no map to produce, nor data on seasons or amounts. Furthermore, the Districts have no way of identifying which landowners within their service areas are using riparian water, the amount of use, or the season of use. (3) The Districts do have a riparian claim for power use at Don Pedro powerhouse and TID has one for its powerhouse at La Grange; these are provided in the Districts' Triennial Reports, Enclosure 3 and 5.**	
		Items 14-15 Closed					
16	RPs	Provide copies of the Districts' pre-1914 appropriative rights, as noted or recorded in accordance with the state laws at the time.	4/1/2011	n/a	Districts	**The list of the Districts' water rights was forwarded to the original requestor, Richard Roos-Collins on June 5, 2011. The list was forwarded to the full Relicensing Participants' list on September 2, 2011.**	

Item No.	*Source of Item*	*Item*	*Date Requested*	*Date Due*	*Responsible Party*	*Action Taken/Status*	*Date Closed*
		Items 17-28 Closed					
29	Recreation RWG Mtg	NPS to provide new ORV guidelines applicable to the Project area.	4/19/2011	4/29/2011	NPS	At the May 18 Recreation RWG meeting, NPS to provide guidelines prior to June 10.	
		Items 30-45 closed					
46	Water / Aquatic / Terrestrial RWG Mtg	The question was asked if pikeminnow population has increased over time? Districts to locate and distribute Tim Ford report developed using known information.	4/20/2011	n/a	Districts	**This is the Ford and Brown (2002) report, available on the TRTAC website.**	
		Items 47-51 closed					
52	Water / Aquatic / Terrestrial RWG Mtg	It was asked what impact does flow have on moving predators out of prime spawning and rearing habitat?	4/20/2011	n/a	Districts	**This is a question that will be addressed in study plan W&AR-5.**	
		Items 53-57 closed					
58	Water / Aquatic / Terrestrial RWG Mtg	Districts were advised to consider the relationship between pollinator species, vernal pools, and special-status plants.	4/20/2011	n/a	Districts	**This is addressed in study plans TR-1 and TR-6.**	
59	Water / Aquatic / Terrestrial RWG Mtg	Concern was raised about effect of dispersed recreation on sensitive areas (e.g. serpentine soils). Consider modifying current plan?	4/20/2011	n/a	Districts	**This is addressed in study plans RR-1, TR-1, and TR-4.**	
		Items 60-64 closed					
65	Water / Aquatic / Terrestrial RWG Mtg	It was indicated that the Districts would likely be asked for a PM&E measure for periodic eagle monitoring. It was asked if the Districts would accept this; and if so, it would obviate the need for study now.	4/20/2011	n/a	Districts	**Bald Eagle study is under discussion in the Terrestrial RWG meetings.**	
		Items 66-73 closed					

Item No.	*Source of Item*	*Item*	*Date Requested*	*Date Due*	*Responsible Party*	*Action Taken/Status*	*Date Closed*
74	Water / Aquatic / Terrestrial RWG Mtg	Districts were asked to plot escapement vs total acre-feet released to the lower Tuolumne.	4/20/2011	n/a	Districts	Plots of escapement vs lagged flow (flow 3 years prior to a given run) are under preparation (a) period of record (b) since the completion of New Pedro Dam (escapement from 1974 to 2010 vs flows from 1971-2007).	
		Item 75 closed					
76	Water / Aquatic / Terrestrial RWG Mtg	It was mentioned that other potential data gaps were (1) potential to improve salmon success if timing of fall pulse flows were adjusted for actual water temperatures, (2) relationship between predation and water temperature, and (3) possible acoustic tagging of bass to track movements under different temperature and flow regimes.	4/20/2011	n/a	Districts	**This is addressed in study plans W&AR-5, 7, and 9. Also, the Districts are planning to recalibrate the HEC-5Q stream temperature model and this may be useful for this item.**	
		Items 77-85 closed					
86	Recreation RWG Mtg	Lower Tuolumne River boating study scope.	5/18/2011	7/25/2011	Districts	P Koepele to provide related information. Boating study may extend from Route 132 bridge to Turlock Lake State Park. Legion Park is an undesirable put-in because of the old Dennet Dam remnants.	
87	Water/Aquatic RWG Meeting	Don Pedro bathymetry work: A separate conference call was agreed-upon to discuss the ongoing bathymetry work.	5/19/2011	6/2/2011	Districts	Districts issued the data gathering protocol on May 27th and held a conference call on June 2. R Kranz and A Manji participated. Districts agreed to issue a redline version of the May 27th protocol to clarify/describe questions raised.	
88	Water/Aquatic RWG Meeting	Reservoir 3-D Model: RPs raised three concerns to be addressed in the July 25 Proposed Study Plan (PSP): (1) ease of use/compulational time frame, (2) accuracy, and (3) ability for RPs to make model runs	5/19/2011	7/25/2011	Districts	**Districts responded in the July 25, 2011 Proposed Study Plan (PSP). Final details on the compulational time frames will depend on RPs individual computers.**	

Item No.	Source of Item	Item	Date Requested	Date Due	Responsible Party	Action Taken/Status	Date Closed
89	Water/Aquatic RWG Meeting	Temperature Modeling: RPs raised a question of whether the reach of river between Don Pedro Dam and La Grange Dam will be modified and if additional temperature data needs to be collected in this reach.	5/19/2011	7/25/2011	Districts	**Districts responded in the July 25, 2011 Proposed Study Plan (PSP). Additional data collection is underway and the reach will be included.**	
		Item 90 closed					
91	Water/Aquatic RWG Meeting	CEQA information: RPs noted that CEQA requires addressing the new greenhouse gas regulations	5/19/2011	No date	Districts	**Noted.**	
92	Water/Aquatic RWG Meeting	RPs reported that flows greater than 6,000 cfs affect Lower Tuolumne River farmland. Farmers asked how and when decisions are made on flow releases.	5/19/2011	No date	Districts	**Districts have met with Lower Tuolumne Farmers (LTF). W&AR-2 will further consider this issue.**	
93	**Terrestrial RWG Meeting**	**Scope of Terrestrial-based study plans.**	**5/19/2011**	**7/25/2011**	**Districts & RPs**	**Districts are proposing to conduct studies where there are Project effects, not every acre inside the Project Boundary. RPs may not agree. Districts developed a Project Effects map for discussion at the August 23 RWG meeting.**	
94	**Terrestrial RWG Meeting**	**Extent of dispersed recreational use.**	**5/19/2011**	**7/25/2011**	**Districts**	**Dispersed recreational areas primarily defined as areas that are both "usable and accessible". This issue has been incorporated into study plans RR-1, TR-1, and TR-4.**	
		Items 95-96 closed					
97	**Water/Aquatic RWG Meeting**	**Jim Hastreiter will distribute FERC's guidance document clarifying "Project nexus" and the ILP process, which is expected to be published in September.**	**8/23/2011**	**No date**	**FERC**		
98	**Water/Aquatic RWG Meeting**	**Conduct doodlepoll to schedule salmonids sub-group (W&AR-5 and -6).**	**8/23/2011**	**No date**	**Districts**	**Doddlepoll conducted; reference John Devine email of 09/01/2011.**	

Item No.	Source of Item	Item	Date Requested	Date Due	Responsible Party	Action Taken/Status	Date Closed
99	Water/Aquatic RWG Meeting	Richard Roos-Collins and Jim Hastreiter to contact NMFS regarding attending salmonids sub-group and/or regularly scheduled RWG meetings.	8/23/2011	No date	Roos-Collins/FERC	Call held on 08/29/2011.	
100	Water/Aquatic RWG Meeting	Conduct doodlepoll to schedule socioeconomics sub-group (W&AR-15).	8/23/2011	No date	Districts	Doddlepoll conducted; reference John Devine email of 09/01/2011.	
101	Water/Aquatic RWG Meeting	Show Peter Drekmeier where full natural flow data are located on the Project web-site.	8/23/2011	No date	Districts	Done on 08/29/2011.	
102	Water/Aquatic RWG Meeting	Communicate any computer system requirements on the MIKE 3-D Temperature Model.	8/23/2011	No date	Districts	Districts will put this information in the study plan.	
103	Water/Aquatic RWG Meeting	Communicate results of investigation on old Don Pedro Dam and whether or not the gates are open.	8/23/2011	No date	Districts	In study plan.	
104	Water/Aquatic RWG Meeting	Post superimposition study report on web-site.	8/23/2011	No date	Districts	Districts will post.	
105	Water/Aquatic RWG Meeting	Provide documentation on other SJ Chinook population models on web-site.	8/23/2011	No date			
106	Water/Aquatic RWG Meeting	Provide SWRCB the recreation use levels data.	8/23/2011	No date			
107	Water/Aquatic RWG Meeting	Create new study plan for lower Tuolumne River temperature model that describes recalibration of the HEC-5Q Model.	8/23/2011	No date	Districts	Districts will provide in the Updated Study Plan.	
108	Water/Aquatic RWG Meeting	Conservation Groups and Tim O'Laughlin agreed to establish a "non-flow measures" discussion group.	8/23/2011	No date	CG/O'Laughlin		
109	Water/Aquatic RWG Meeting	Post documentation on the ORCM model on the web-site.	8/23/2011	No date			
110	Terrestrial RWG Meeting	Conduct a doddlepoll to schedule a conference call between now and the September RWG meeting to discuss wetlands methodology.	8/23/2011	No date	Districts	Done.	

Item No.	*Source of Item*	*Item*	*Date Requested*	*Date Due*	*Responsible Party*	*Action Taken/Status*	*Date Closed*
111	Terrestrial RWG Meeting	Obtain more information from DPRA regarding on-going annual bald eagle surveys.	8/23/2011	No date	Districts		
112	Recreation RWG Mtg	Districts to circulate visitor survey to RPs for their review and comments prior to September RWG meeting.	8/24/2011	No date	Districts	Districts emailed to RPs for comments on 08/31/2011. Comments due to the Districts by 09/06/2011.	
113	Recreation RWG Mtg	Obtain more details from DPRA regarding dispersed recreation.	8/24/2011	No date	Districts		

Don Pedro Progress Tracking List

CLOSED ITEMS

Item No.	*Souce of Item*	*Item*	*Date Requested*	*Date Due*	*Responsible Party*	*Action Taken/Status*	*Date Closed*
1	RP	Poll of RPs for meeting availability and resource area interests.	2/28/2011	3/8/2011	Districts	Created Doodle Poll questionaire and sent it to RPs via email on 3/2/2011. Responses due 03/07/2011. Poll completed 03/07/2011; 2011 meeting dates announced to RPs via email on 03/15/2011 and have been posted on website calendar.	5/13/2011
2	CSPA; CDFG; and TRT	Use of an independent facilitator.	2/28/2011	n/a	n/a	Request documented; Districts' response emailed to RPs on 03/07/2011.	5/13/2011
3	Several RPs	Alternating the meeting locations for future meetings.	2/28/2011	3/11/2011	Districts	Request for alternating meeting locations to be considered. Districts' response emailed to RPs on 03/15/2011.	5/13/2011
4	Several RPs	Use of web conferencing as part of future meetings.	2/28/2011	3/11/2011	Districts	Request for web conferencing as part of the meeting to be considered. Districts' response emailed to RPs on 03/15/2011.	5/13/2011
5	NGOs	RPs not to have to pay for PAD reproduction costs.	2/28/2011	3/11/2011	Districts	Request for RPs not to have to pay for PAD reproduction costs to be considered. Districts' response emailed to RPs on 03/15/2011.	5/13/2011
6	Several RPs	Procedure for managing study plan revisions on the Don Pedro website.	2/28/2011	3/18/2011	Districts	At the August 23-24 RWG meetings, the Districts described the process for sharing study plan revisions on the Don Pedro website.	8/31/2011

7	Several RPs	Exhibit G or other Project Boundary Maps for tailwater and Gasburg Creek areas.	2/28/2011	3/11/2011	Districts	Project Boundary Maps to be uploaded to the Don Pedro website. Two Project Boundary maps (showing area below the Don Pedro Dam) have been uploaded and RPs advised via email 03/15/2011.	5/13/2011
8	Districts	RP review of Relicensing Participants List in PAD (Appendix B) to identify additional parties interested in the relicensing.	2/28/2011	3/18/2011	RPs	RPs to advise Districts of additional interested parties and their contact information, if known. Additional names have been received and added to the Relicensing Participants Contact Email List	5/13/2011
9	NHI	"Discussion of Cummulative Impacts" to be an agenda item for the April 19-20 meeting.	2/28/2011	04/19-20/2011	Districts	"Discussion of Cummulative Impacts" to be added to the agenda for the April 19-20 RP meeting. Project effects were discussed at the April 19-20 RWG meetings	5/13/2011
10	RPs	Uploading of Meeting Slides to the Don Pedro ebsite.	2/28/2011	3/11/2011	Districts	Slides used at the Feb 28 RP meeting to be uploaded to the Don Pedro website. Meeting presentation slides have been uploaded and RPs advised via email 03/15/2011	5/13/2011
11	RPs	Provide a copy of this year's snow surveys used for forecasting.	4/1/2011	n/a	Districts	Snow survey data are from the DWR CDEC website. The Districts and CCSF help pay for that information, but DWR does the forecasting. Http://cdec.water.ca.gov/snow/current/snow/. A spreadsheet of historic values accompanies this tracking list.	7/01/2011
12	RPs	Provide an historic account of the times and duration since project commencement that the reservoir has been into the flood conservation pool during the applicable period-frequency, number of occurrences, duration, and	4/1/2011	n/a	Districts	A spreadsheet containing the requested information accompanies this tracking list.	7/01/2011

14	RPs	How long does the reservoir normally stay at the peak elevation it reaches in any year?	4/1/2011	n/a	Districts	In average to wet years, and depending on runoff rates, Don Pedro reaches its maximum level for the year between the last week in June and the second week in July--and then starts to drop off quickly due to the runoff ending and releases for irrigation increasing. The reservoir remains at its highest level for the year for a very short period, from a day to a week.	7/01/2011
15	RPs	Provide the unimpaired flows at La Grange and the historical flows at La Grange since the Project began operating.	4/1/2011	n/a	Districts	The two spreadsheets containing the requested information accompanies this tracking list.	7/01/2011
17	RPs	Provide pre-settlement, post-new Don Pedro flows and reservoir elevations similar to which is provided in the PAD for post-settlement	4/1/2011	n/a	Districts	See answer to Item 15 for flows. A spreadsheet containing the requested reservoir information also accompanies this tracking list	7/01/2011
18	RPs	What model will be used to develop the Project Operations Model?	4/1/2011	n/a	Districts	This topic was discussed at the May 19 Aquatic/Water RWG meeting. The Districts will prepare and submit a Proposed Study Plan in its July 25 PSP.	7/01/2011
19	RPs to CCSF	Is there a technical document that describes in some detail the operations of the HHWP?	4/1/2011	n/a	CCSF	See the Regional Water System Hetch Hetchy Water&Power Operations Plan (URS 2006) at https://infrastructure.sfwater.org/fds/fds.aspx?lib=HHWP&doc=127205&data=3 [illegible]	7/01/2011
20	RPs to CCSF	What is the projected future water demand estimated by CCSF? Are new water storage resources being planned to meet the demand?	4/1/2011	n/a	CCSF	See the Draft 2010 UWMP at http://sfwater.org/mto_main.cfm/MC_ID/13/MSC_ID/165/MTO_ID/286	7/01/2011
21	RPs to CCSF	Provide the historical water bank "account balance" that the Districts have provided CCSF. Also, provide documentation on water bank accounting method.	4/1/2011	n/a	CCSF	See attached "Response 21" for Instructions for Water Bank Accounting document (CCSF&Districts, 1971)	7/01/2011

22	RPs to CCSF	Explain how the Don Pedro FERC relicensing process can affect CCSF.	4/1/2011	n/a	CCSF	See attached "Response 22" for ALJ process testimony. Also see FEIS for Reservoir Release Requirement at Don Pedro; and pages 2-36 to 2-39, and page 2-42 to 2-43 of WSIP PEIR at http://sfwater.org/Project.cfm/MC_ID/35/MSC_ID/393/MTO_ID/649/PRJ_ID/216	7/01/2011
23	RPs to CCSF	What compensation does CCSF provide the Districts when CCSF's water bank account has a negative balance?	4/1/2011	n/a	CCSF	MID-TID have only consented once to SF request to "go negative" in the water bank through the history of the Project. See attached "Response 23".	7/01/2011
24	RPs to CCSF	Could CCSF provide copies of the water balance reports it sends to the Districts?	4/1/2011	n/a	CCSF	The Districts uploaded the information to the Relicensing Website under DOCUMENTS\RHH Forms Request\August 1011--and relicensing participants were notified of their location via email on 08/11/2011.	08/31/2011
25	RPs to CCSF	Does CCSF have a water balance model it could share with relicensing participants? Or could CCSF provide portions of its water model to the Districts' water balance model?	4/1/2011	n/a	CCSF	Yes, a watershed-wide water balance model is being developed.	7/01/2011
26	RPs to CCSF	What quantity of water in acre feet will CCSF take annually from the river in the next 40 years, compared to same in the last 10 years? What will be the effect on pre-flood releases below Don Pedro?	4/1/2011	n/a	CCSF	See the Draft 2010 UWMP at http://sfwater.org/mto_main.cfm/MC_ID/13/MSC_ID/165/MTO_ID/286 and the WSIP PEIR at http://sfwater.org/Project.cfm/MC_ID/35/MSC_ID/393/MTO_ID/649/PRJ_ID/216	7/01/2011
27	Recreation RWG Mtg	Districts were asked to Investigate relationship of the Project Boundary and the downstream Wild & Scenic River Boundary.	4/19/2011	n/a	Districts	The Districts can confirm that the Wild and Scenic Boundary overlaps into the Project Boundary, but not to Ward's Ferry. The Districts are continuing to seek more precise information.	7/01/2011

28	Recreation RWG Mtg	Districts were asked to consider performing a "feasibility" or "site suitability" study of relocating or improving current take-out	4/19/2011	4/29/11; extended to 5/05/11, then 5/18/11	Districts	In the May 18 Recreation RWG meeting, the Districts agreed to including this study in the PSP to be filed on July 25.	7/01/2011
30	Recreation RWG Mtg	Districts' debris maintenance and log-jam removal/management appreciated. Districts were asked if it will continue as part of the new license?	4/19/2011	n/a	Districts	FERC will determine the new license's terms. The Districts are likely to continue their current practices.	7/01/2011
31	Recreation RWG Mtg	The question was asked that if dispersed recreational use was found to be impacting rare or sensitive plant areas, would Districts restrict such use?	4/19/2011	n/a	Districts	Districts responded to this during the meeting, noting that the new license application is likely to contain identification of unique or sensitive habitats, and it is not uncommon to restrict recreation access to those areas. In fact, some areas of the reservoir shoreline are already restricted.	
32	Recreation RWG Mtg	Districts were asked if they were planning to prepare a study plan for surveying recreational users to identify unmet demand, satisfaction levels, and need for additional facilities?	4/19/2011	4/29/2011; extended to 5/05/11; then 5/18/11	Districts	The Districts have prepared the RR-1 Recreation Facility Condition and Public Accessibility Assessment Study Plan, which is in the Proposed Study Plan (PSP) filed with FERC on July 25, 2011.	08/31/2011
33	Recreation RWG Mtg	Districts were asked if the current flows on the lower Tuolumne are boatable and compatible with other uses (fishing)?	4/19/2011	n/a	Districts	Districts responded via email 5/05/11.	

34	Recreation RWG Mtg	Districts were asked to consider the following study needs: (1) boatable flows on lower Tuolumne River (were fishery flows boatable) and possible need for additional put-ins/take-outs, (2) suitability of Wards Ferry take-out, (3) recreational use levels, visitor preferences and satisfaction, unmet demand, (4) existing facility condition assessment, including ADA accessiblility, and (5) visual quality assessment, possibly photo documentation of visual quality at different water levels or landscape features to be brought into future planning of recreation improvements.	4/19/2011	n/a	Districts	See responses to Items 28, 32, 33, 43, and 57.	
35	Recreation RWG Mtg	The Districts were asked if Turlock Lake was stocked; and if so, with what?	4/19/2011	n/a	Districts	The Department of Fish and Game stocks catchable rainbows in this lake from April through October, normally a time when plants in low elevation reservoirs are suspended, because the water entering the lake from the Tuolumne River at La Grange Dam keeps the lake relatively cool. The DFG plants 5,000 pounds of rainbows annually in Turlock Lake. The trout are raised at the Moccasin Creek Fish Hatchery. Also, Allison Boucher reports that only rainbow trout are stocked, no warm water species.	7/01/2011
36	Cultural RWG Mtg	Study plan should include the requirement for field investigators to have California archaeology experience.	4/19/2011	n/a	Districts	Study plan will include.	
37	Cultural RWG Mtg	Consistent standards of investigation must be used from area to area, probably adopt the BLM standards.	4/19/2011	n/a	Districts	Historic Properties and TCP Study Plans have been revised to specify that the BLM guidelines will be followed.	7/01/2011

38	Cultural RWG Mtg	James Barnes, BLM archaeologist, should be copied on all correspondence with the SHPO regarding Section 106 consultation.	4/19/2011	n/a	Districts	Will occur.	
39	Cultural RWG Mtg	Agreement should be reached prior to field studies on how to handle discovery of human remains--and human remains on BLM lands. BLM does not delegate responsibility to FERC for handling human remains on BLM lands. The NID/PG&E process was satisfactory, including the providing of site records to BLM, why sites were not evaluated if this were to occur, and the content of Technical Memos.	4/19/2011	n/a	Districts	The Districts are working with the tribes and agencies to revise the language in the study plans regarding discovery of human remains.	7/01/2011
40	Cultural RWG Mtg	It was suggested that the Districts visit the newly opened UC Davis collection.	4/19/2011	n/a	Districts	Districts will do.	
41	Cultural RWG Mtg	James Barnes to give suggestions for how to consider/approach isolets.	4/19/2011	n/a	BLM	The Districts are working with James Barnes to include an appropriate definition of isolets to be issued for the Historic Properties Study Plan	7/01/2011
42	Cultural RWG Mtg	It was emphasized that "protect and preserve is the goal".	4/19/2011	n/a	Districts	Districts acknowledge this goal.	
43	Water / Aquatic / Terrestrial RWG Mtg	It was asked if it was the Districts' intention to perform a study that would develop a clear understanding of how flow relates to other stressors to the anadromous fisheries? Or perform a "limiting factors analysis" of each salmon life stage compared to individual [illegible]?	4/20/2011	4/29/2011; extended to 5/05/2011	Districts	Districts responded via email 5/05/11.	
44	Water / Aquatic / Terrestrial RWG Mtg	The question was asked if Turlock Lake and Modesto Reservoir were stocked, by whom, and with what? Also, does Turlock Lake spill into the Tuolumne River?	4/20/2011	n/a	Districts	See response to Item #35.	7/01/2011
45	Water / Aquatic / Terrestrial RWG Mtg	The qustion was asked where did the population of rainbow trout in La Grange Reservoir come from?	4/20/2011	n/a	Districts	It was noted at the meeting that no one knew the origin of this population..	

47	Water / Aquatic / Terrestrial RWG Mtg	Districts were asked to provide a citation for study done for Merced Project relicensing on riffle habitat use.	4/20/2011	n/a	Districts	Allison Boucher provided the citation.	7/01/2011
48	Water / Aquatic / Terrestrial RWG Mtg	It was pointed out that CDFG recently issued a draft EIR on section dredging that was still open for comment.	4/20/2011	n/a	n/a	No action required.	
49	Water / Aquatic / Terrestrial RWG Mtg	R Kanz requested a copy of the ongoing IFIM study plan be forwarded to him. It was also asked if any disease studies been conducted on anadromous fish in the Tuolumne River? CDFG to look into this and respond.	4/20/2011	n/a	Districts & CDFG	A copy of the IFIM plan has been posted to the Relicensing Website. CDFG's response is in progress.	7/01/2011
50	Water / Aquatic / Terrestrial RWG Mtg	Question raised about period of time over which O. mykiss tracking occurred?	4/20/2011	n/a	Districts	Tracking of six O. mykiss during 2010 was done from April 1 to November 1. The study results are contained in Volume II of the Don Pedro PAD (Page 5-115).	7/01/2011
51	Water / Aquatic / Terrestrial RWG Mtg	The question was asked if a study should be undertaken to determine effect on predator location in river with changing water temperature?	4/20/2011	n/a	Districts	N Hume responded during the meeting that he believed this could be addressed with existing data.	
53	Water / Aquatic / Terrestrial RWG Mtg	The question was raised about the status of other native species in the lower Tuolumne River (including lamprey, sturgeon, and cyprinids)? It was also noted that reports of sturgeon in the Tuolumne have occurred; this was clarified to be an anecdotal observation by a riparian water user near the Grayson Ranch in late summer.	4/20/2011	n/a	Districts	Locations of all fish species encountered during all seining, snorkel, RST, and other surveys have been documented. FERC Report 2002-9 includes a detailed assessment of flow and resident fish communities by Ford and Brown (2002). No corroboration of sturgeon observations has been made by routine sampling or other sources.	7/01/2011

54	Water / Aquatic / Terrestrial RWG Mtg	Question raised about the status of mussels in the lower Tuolumne River? Is this a data gap? It was reported that anecdotal observations were that prior to 1995 there were many mussels in the river and that now there are very few. Idea was offered that stranding may be a potential cause. It was pointed out that the Project no longer peaks, but RPs noted that flows change in accordance with seasonal downstream flow requirements.	4/20/2011	n/a	Districts	The Districts responded via email 5/05/11.	
55	Water / Aquatic / Terrestrial RWG Mtg	Districts were encouraged to refer to counties' weed watch list for additional information on invasive weeds.	4/20/2011	n/a	Districts	Districts will contact counties.	
56	Water / Aquatic / Terrestrial RWG Mtg	Districts were advised to refer to a study of cottonwoods in the Central Valley.	4/20/2011	n/a	Districts	The Districts advised in the meeting that this study, performed by Stella et al, was summarized in the PAD.	
57	Water / Aquatic / Terrestrial RWG Mtg	It was pointed out that the Districts were not proposing to perform a study dedicated to wetlands mapping and the potental project effects on wetlands. RPs wondered if this would not be needed/useful	4/20/2011	4/29/2011; extended to 5/05/2011	Districts	The Districts responded via email 5/05/11.	
60	Water / Aquatic / Terrestrial RWG Mtg	Concern about proposed size of areas to be studied around project facilities.	4/20/2011	na/a	Districts	Districts responded during the meeting that a possible approach to coming to site-specific agreement would be for BLM staff to join field investigators in the field to perform beta testing of appropriate area to study based on actual site observations. Study would have to be modified to indicate such an approach. It was noted that BLM may have limited staff time.	

61	Water / Aquatic / Terrestrial RWG Mtg	Districts were advised that the protocols for CRLF that were in the YT/DS study plan were acceptable.	4/20/2011	n/a	Districts	No response required.	
62	Water / Aquatic / Terrestrial RWG Mtg	Districts were asked to upload copy of proposed WPT protocols to the website	4/20/2011	n/a	Districts	Districts will do.	
63	Water / Aquatic / Terrestrial RWG Mtg	Zac Jackson to forward report which included observations of WPT downstream of the project.	4/20/2011	n/a	USFWS	The report has been forwarded.	
64	Water / Aquatic / Terrestrial RWG Mtg	Districts were asked to Include Critical Habitat maps in the ESA study plan.	4/20/2011	n/a	Districts	At the meeting, the Districts agreed to include Critical Habitat maps in the study plan.	
66	Water / Aquatic / Terrestrial RWG Mtg	Regarding water quality study plan, Is oxidation-reduction occurring at reservoir bottom?	4/20/2011	n/a	Districts	The Study Plan will add a field measurement of oxidation-reduction to the Study Plan for hypolimnion samples, where physically practical. Don Pedro's great depth poses logistic difficulties for sampling water within centimeters of the bottom sediments.	7/01/2011
67	Water / Aquatic / Terrestrial RWG Mtg	Regarding water quality study plan, will reservoir bathymetry be able to distinguish original ground from sediment?	4/20/2011	n/a	Districts	The type of bathymetric survey which we are performing will not provide detailed sedimentation estimates. We can get a general idea by comparing the existing operations reservoir stage/elevation and volume table to the area/capacity curve that we develop using the new bathymetric model, but a direct comparison would not be precise.	7/01/2011

68	Water / Aquatic / Terrestrial RWG Mtg	Districts should consider getting ADCP readings between old Don Pedro and the new Don Pedro.	4/20/2011	n/a	Districts	The Districts will consider getting ADCP readings at this location. ADCP readings could be useful to determine if there are any velocity gradients that exist over the old dam, and if any eddying/mixing is occurring downstream of the old dam. Key consideration will be (1) to determine whether or not ADCP is reliable at the depths that would be required here, (2) the feasibility of obtaining measurements at several reservoir elevations (the dynamics of flow over that old dam will change drastically depending on the depth of water over it, and (3) if it would be more straightforward to simply be sure to take several temperature profiles upstream, at and below the old dam, to get an understanding for the thermal mixing dynamics.	7/01/2011
69	Water / Aquatic / Terrestrial RWG Mtg	Districts were asked if there would be a separate study plan for the 3D temperature model development?	4/20/2011	n/a	Districts	The Districts are developing a study plan for the 3D temperature model development.	
70	Water / Aquatic / Terrestrial RWG Mtg	It was suggested the Districts get data on flows and temps in Moccasin Creek; thought CCSF would have it?	4/20/2011	n/a	Districts	Districts will do.	
71	Water / Aquatic / Terrestrial RWG Mtg	Districts were asked if they would prepare a Study Plan for a Socioeconomic Study? It was suggested it would be needed for CEQA.	4/20/2011	4/29/2011; extended to 5/05/2011	Districts	Districts responded via email 5/05/11.	

72	Water / Aquatic / Terrestrial RWG Mtg	Districts were asked if they planned to conduct an analysis of projected population growth and irrigination use compared to their water rights? Study potential effects of such growth on water quality (due to less water being in the river)	4/20/2011	4/29/2011; extended to 5/05/2011	Districts	Districts responded via email 05/05/11.	
73	Water / Aquatic / Terrestrial RWG Mtg	Districts were asked if they were going to evaluate benefits to fisheries with more flow being released to the river. Suggested that high-flow benefits was a data gap.	4/20/2011	n/a	Districts	Districts indiciated in meeting that the current IFIM study is investigating that issue. Also, data from prior monitoring could also address that question.	
75	Water / Aquatic / Terrestrial RWG Mtg	It was suggested that a data gap existed as no data on number of salmon emerging from the gravel and the number leaving the Tuolumne.	4/20/2011	n/a	Districts	Districts responded in the meeting that they were uncertain how a one- or two-year study of this would inform any such gap, nor could they think of how to conduct such a study, nor could RPs when asked.	
77	Water / Aquatic / Terrestrial RWG Mtg	The Districts were asked if they were planning any reservoir fish population studies?	4/20/2011	n/a	Districts	Districts responded in the meeting that the reservoir fishery included both good cold and warm water fishery and both were healthy and viable based on the data it had. Reservoir fishery is primarily a stocked fishery. Because there was no evidence of a problem, therefore no apparent Project effect, the study would not be justified under the ILP.	
78	Water / Aquatic / Terrestrial RWG Mtg	It was requested the Districts provide a GIS layer describing the Project Boundary to the BLM.	4/20/2011	n/a	Districts	Districts will do.	
79	Cultural RWG Mtg	Provide redline and clean copy of next revision of both Historic Properties and TCP study plans incorporating changes discussed at 5/18/11 meeting.	5/18/2011	6/3/2011	Districts	Districts to revise both Historic Properties and TCP study plan. The Districts provided both clean and redline copies of CR-1 Historic Properties Study and CR-2 Native American Traditional Cultural Properties Study in the Proposed Study Plan (PSP) filed with FERC on 07/25/2011.	08/31/2011

80	Cultural RWG Mtg	R Fuller to provide information on preferred process for handling of human remains to be included in Study Plan.	5/18/2011	6/10/2011	R Fuller	D Risse, HDR, to follow up. The information was provided by R Fuller and included in the CR-1 Historic Properties Study Plan in the Proposed Study Plan (PSP) filed with FERC on 07/25/2011.	08/31/2011
81	Cultural RWG Mtg	F Winchell, FERC, requested that Districts send a separate letter to FERC requesting Section 106 designation of authority for Section 106 consultation.	5/18/2011	6/10/2011	HDR	The Districts requested such designation in its NOI and and the designation was subsequently received from FERC in its Notice filed 04/08/2011. However, in response to Frank Winchell's request, the Districts also filed a separate letter of confirmation with FERC on 08/05/2011.	08/31/2011
82	Recreation RWG Mtg	Work group members are planning to request a visitor use survey.	5/18/2011	6/10/2011	Work Group RPs	Districts will respond in the July 25, 2011 Proposed Study Plan (PSP). RR-1 Recreation Facility Condition and Public Accessibility Assessment Study Plan in the Proposed Study Plan (PSP) filed with FERC on 07/28/2011 includes a Visitor Survey.	08/31/2011
83	Recreation RWG Mtg	Districts asked to provide 2002/2003 recreation user survey DPRA conducted.	5/18/2011	6/3/2011	Districts	Completed; information posted.	7/01/2011
84	Recreation RWG Mtg	RPs asked Districts to confirm they would prepare a study plan of assessing improvements to the Wards Ferry takeout.	5/18/2011	6/3/2011	Districts	This was confirmed in the May 18th meeting (see PTL #28); the Districts also indicated they would not have a draft study plan issued before 06/10/2011.	7/01/2011
85	Recreation RWG Mtg	RPs asked if Facility Study Assessment Study Plan draft would be issued by June 3	5/18/2011	6/3/2011	Districts	Districts uploaded draft study plan on 06/03/2011.	7/01/2011
90	Water/Aquatic RWG Meeting	Operations Modeling: A question was asked whether the Districts would consider use of HEC RESSIM model instead of the Excel platform proposed.	5/19/2011	7/25/2011	Districts	Districts responded in the Proposed Study Plan (PSP) filed with FERC on 07/25/2011.	08/31/2011

95	Terrestrial RWG Meeting	BLM asked if an invasive species or special-status species were located, would the Districts document the entire population?	5/19/2011	7/25/2011	Districts	Districts responded that "in general-yes" and would include further confirming language in the July 25, 2011 Proposed Study Plan. The Districts noted in TR-1 Special-Status Plants Study and TR-4 Noxious Weed Survey in the Proposed Study Plan (PSP) filed with FERC on 07/25/2011 that if "occurrences are located, the study area will be expanded to the full extent of the occurence or the Project Boundary, whichever is less."	08/31/2011

96	Aquatics	Clarification of "data gap" study request addressed in email of 5 May 2011. It was advised that the April 20th request was that the Districts undertake a study to evaluate the relative effects of project ops and other stressors on these fisheries in the lower Tuolumne. How do project ops affect each of these fisheries--its population, geographic distribution, age distribution, or habitat, whether overall or by life stage? Can you distinguish the effects of the project relative to other stressors? To the statement that certain non-project stressors are "among the most significant", 5 questions were asked: (1) What do you mean by significant? (2) What is the basis for conclusion that non-project stressors listed have significant effects? (3) Since a comparative term was used ("among the most significant"), what evidence in the existing record is the basis for the comparison? (4) Does the existing record show whether project ops are a stressor for these fisheries? and (5) Does the existing record show whether the project ops are a significant stressor?	5/18/2011	7/25/2011	Districts	Email Response of June 14, 2011 to the five questions asked: (1) It means having an "influence", (2) The existing data and studies undertaken by the Districts and others provide the information from which this conclusion is drawn. We would refer you to the various studies on the TR TAC website and the ALJ testimony, (3) Response to question 2 provides the general sources of the information; all of these documents might not yet be on the record of the relicensing proceeding, (4) We are sure there are many differing opinions on this question. We encourage you to review the data available on the TR TAC, the PAD, and the FERC website to help inform your opinion, and (5) Please see response above.	7/01/2011

From: Brown, Carol
Sent: Thursday, September 08, 2011 7:48 PM
To: denean@buenavistatribe.com; office@cvmt.net; tmtc@mlode.com; jsaunders@parks.ca.gov; Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Stone, Vicki ; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS;

Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John - NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Cc: Loy, Carin

Subject: Don Pedro Project Relicensing Study Plans Available for Review

Hello All,

Revised Study Plans have been uploaded to the Don Pedro Project Relicensing website for your review and discussion at the RWG meetings next week. The Study Plans are located in the Studies/RWG Study Plan Development area of the website located here:

http://www.donpedro-relicensing.com/documents.aspx

Thank you,
Carol

CAROL BROWN

HDR Engineering, Inc.
Project Administrator

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From: Staples, Rose
Sent: Friday, September 09, 2011 7:56 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Stone, Vicki ; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell,

Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Cc: Regina Cox

Subject: Directions to Don Pedro Relicensing September 13 Afternoon Socioeconomic RWG Subgroup Meeting

Directions to the Tuesday afternoon, **September 13th Socioeconomic RWG Subgroup Meeting:**

Tuesday, September 13, 2011 – 1:30 to 5:00 p.m.
RWG Subgroup Meeting - Socioeconomic Study Plan
New Location for Tuesday Afternoon Meeting Only
If calling in: 866-994-6437 – Conference code 5424697994

Modesto Irrigation District's Woodland Service Center
929 Woodland Avenue
Modesto, CA 95351

Directions:

From Highway 99 South:

- Take the Briggsmore Exit and go RIGHT to Carpenter Road
- Follow Carpenter Road to Woodland Avenue and turn LEFT
- Go to 1st Stop Light which is Graphics and turn LEFT directly into MID Service Center
- Go through the gate and turn LEFT on the first street (sign will be in place)
- Grey Modular Building on the left.
- Parking is available in front and both sides of the building (signs will be in place)

From Downtown Modesto:

- Take 9th Street North to Woodland Avenue and turn LEFT
- Go to 1st Stop Light which is Graphics and turn RIGHT directly into MID Service Center
- Go through the gate and turn LEFT on the first street (sign will be in place)
- Grey Modular Building on the LEFT
- Parking is available in front and both sides of the building (signs will be in place)

If you have any questions, please contact Regina Cox, 209-526-7571 or email reginac@mid.org prior to the meeting date. If you have any questions regarding the directions on the day of the meeting, please contact Marsha Stallings, 209-526-7563.

ROSE STAPLES
CPS CAP

HDR Engineering, Inc.
Executive Assistant, Hydropower Services

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From: Staples, Rose
Sent: Friday, September 09, 2011 8:15 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Stone, Vicki ; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Subject: Additional Info on PARKING for Don Pedro Sept 13 Socioeconomic Subgroup Meeting

See HIGHLIGHTED section below for information on additional parking opportunities, as parking is limited at 929 Woodland.

Tuesday, September 13, 2011 – 1:30 to 5:00 p.m.
RWG Subgroup Meeting - Socioeconomic Study Plan
New Location for Tuesday Afternoon Meeting Only

If calling in: 866-994-6437 – Conference code 5424697994

Modesto Irrigation District – Woodland Service Center
929 Woodland Avenue
Modesto, CA 95351

DIRECTIONS:

FROM HIGHWAY 99 SOUTH:

- Take the Briggsmore Exit and go RIGHT to Carpenter Road
- Follow Carpenter Road to Woodland Avenue and turn LEFT
- Go to 1st Stop Light which is Graphics and turn LEFT directly into MID Service Center
- Go through the gate and turn LEFT on the first street (sign will be in place)
- Meeting will be held in the Grey Modular Building on the left.
- Parking is available in front and both sides of the building (signs will be in place). If parking is not available, please see the **PARKING** directions below.

FROM DOWNTOWN MODESTO:

- Take 9th Street North to Woodland Avenue and turn LEFT
- Go to 1st Stop Light which is Graphics and turn RIGHT directly into MID Service Center
- Go through the gate and turn LEFT on the first street (sign will be in place)
- Meeting will be held in the Grey Modular Building on the LEFT
- Parking is available in front and both sides of the building (signs will be in place). If parking is not available, please see the **PARKING** directions below.

PARKING

Limited parking is available at the meeting site. Therefore, if you cannot find parking, it may be necessary for you to park across the street on Graphics in the gravel parking area to the right. You will have to take a short walk across the street at the **Red Light** and walk directly through the gate. To the left you will see a **Grey Modular Building. That building is where the meeting is being held. You will see bright yellow signs for directions.**

If you have any questions, please contact Regina Cox, 209-526-7571 or email reginac@mid.org prior to the meeting date. If you have any questions regarding the directions on the day of the meeting, please contact Marsha Stallings, 209-526-7563.

ROSE STAPLES
CPS CAP

HDR Engineering, Inc.
Executive Assistant, Hydropower Services

970 Baxter Boulevard, Suite 301 | Portland, ME 04103
207.239.3857 | f: 207.775.1742
rose.staples@hdrinc.com | hdrinc.com

From: Loy, Carin
Sent: Monday, September 19, 2011 3:17 PM
To: Alves, Jim - City of Modesto; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Beuttler, John - CSPA; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Buckley, John - CSERC; Burt, Charles - CalPoly; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cory, Philip - TNC; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Gutierrez, Monica - NOAA-NMFS; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hellam, Anita - HH; Hersh-Burdick, Rachael - USACE; Heyne, Tim - CDFG; Holden, James ; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Kanz, Russ - SWRCB; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Lein, Joseph; Levin, Ellen - SFPUC; Lewis, Reggie - PRCI; Linkard, David - TRT /RH; Loy, Carin; Lyons, Bill - MR; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - CT; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Pinhey, Nick - City of Modesto; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shumway, Vern - SNF; Shutes, Chris - CSPA; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Verkuil, Colette - TRT/MF; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Williamson, Harry (NPS); Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Cc: Staples, Rose; Devine, John
Subject: Don Pedro W&AR Group: Please RSVP by COB Tuesday 9/20; Scheduling Follow Up Conference Call to September's Meeting

Thank you to everyone who attended the Don Pedro Relicensing September 15 Resource Work Group meeting. The Districts feel that the conversation was valuable and productive and appreciate everyone's contributions.

To continue discussions on the W&AR Study Plan development, the Districts would like to schedule a full day conference call to finish last week's agenda. We are proposing a conference call/Live Meeting from 8:30 am to 4:30 pm on one of the three days below. We expect that RPs may choose to check-in or out of the Call as they need to and will send out a preliminary agenda with approximate start times of each Study Plan, which will be updated at the lunch break or if the agenda timing has either slipped or advanced during the day.

Before finalizing the date, we would like to know your availability; the Districts and their consultants are available on all three dates.

Tuesday, September 27
Wednesday, September 28
Thursday, September 29

Please email carin.loy@hdrinc.com with your availability by COB Tuesday, September 20.

Thank you.

CARIN COUCH LOY

HDR Engineering, Inc.
Senior Scientist, Hydropower Services

2379 Gateway Oaks Drive, Suite 200 | Sacramento, CA 95833
916.564.4214 | d: 916.679.8737
carin.loy@hdrinc.com | hdrinc.com

From: Jim Alves [jalves@modestogov.com]
Sent: Monday, September 19, 2011 5:39 PM
To: Loy, Carin; Asay, Lynette - N-R; JOHN AUD; Barnes, James - BLM; Beuttler, John - CSPA; Jack Bond; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Buckley, John - CSERC; Burt, Charles - CalPoly; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cory, Philip - TNC; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, P - MF; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Gutierrez, Monica - NOAA-NMFS; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hellam, Anita - HH; Hersh-Burdick, Rachael - USACE; Heyne, Tim - CDFG; Holden, James ; Horn, Jeff - BLM; Horn, Tini; Hughes, Noah; Hughes, Robert - CDFG; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Kanz, Russ - SWRCB; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Lein, Joseph; Levin, Ellen - SFPUC; Lewis, Reggie - PRCI; Linkard, David - TRT /RH; Lyons, Bill - MR; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - CT; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Nick Pinhey; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sandkulla, Nicole - BAWSCA; Schutte, Allison - HB; Sears, William - SFPUC; Shumway, Vern - SNF; Shutes, Chris - CSPA; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Verkuil, Colette - TRT/MF; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Williamson, Harry (NPS); Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Cc: Staples, Rose; Devine, John
Subject: RE: Don Pedro W&AR Group: Please RSVP by COB Tuesday 9/20; Scheduling Follow Up Conference Call to September's Meeting

Carin,

It might also be helpful to indicate which Study Plans remain to be discussed at this next meeting for those that did not attend the last meeting or left the meeting prior to adjournment.

Thanks,

Jim Alves
City of Modesto
Associate Civil Engineer
Utility Planning & Projects Dept.
Ph: 209-571-5557
Fx: 209-522-1780

From: Staples, Rose
Sent: Friday, September 23, 2011 6:03 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

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Subject: Don Pedro Project Water-Aquatic RWG CONFERENCE CALL now scheduled for Wed, September 28, from 9:00 a.m. to 4:00 p.m.

Thank you all who responded to Carin Loy's query about your availability for a conference call next week to continue discussion on the proposed Don Pedro Project Water & Aquatic study plans, especially those which have not yet been discussed in the recent August and September RWG meetings.

Based on the responses, the conference call is now scheduled for Wednesday, September 28, from 9:00 a.m. to 4:00 p.m. Call-in details are provided below, and an agenda will be forwarded the first of the week.

September 28, 2011 – 9:00 a.m. start
Call-In Number 866-994-6437
Conference Code 5424697994

To attend the meeting online, using Microsoft Office Live Meeting, please follow the following link. If you are a first time user, please see the note below. Some trouble shooting information is located below as well.

https://www.livemeeting.com/cc/hdrinc/join?id=9JMGJ8&role=attend&pw=j%5B%25D%7Ck%216b

If you have any questions, please do not hesitate to contact Carin Loy (carin.loy@hdrinc.com 916-679-8737) or myself.

Thank you.

Additional LiveMeeting Information:

Meeting time: Sep 28, 2011 9:00 AM (PDT)

FIRST-TIME USERS
To save time before the meeting, check your system to make sure it is ready to use Microsoft Office Live Meeting.
http://go.microsoft.com/fwlink/?LinkId=90703

TROUBLESHOOTING
Unable to join the meeting? Follow these steps:

1. **Copy this address and paste it into your web browser:**
   https://www.livemeeting.com/cc/hdrinc/join
2. **Copy and paste the required information:**
   Meeting ID: 9JMGJ8
   Entry Code: j[%D|k!6b
   Location: https://www.livemeeting.com/cc/hdrinc

If you still cannot enter the meeting, contact support:
http://r.office.microsoft.com/r/rlidLiveMeeting?p1=12&p2=en_US&p3=LMInfo&p4=support

NOTICE
Microsoft Office Live Meeting can be used to record meetings.
By participating in this meeting, you agree that your communications may be monitored or recorded at any time during the meeting.

ROSE STAPLES
CPS CAP

HDR Engineering, Inc.
Executive Assistant, Hydropower Services

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207.239.3857 | f: 207.775.1742
rose.staples@hdrinc.com | hdrinc.com

From: Staples, Rose
Sent: Monday, September 26, 2011 7:52 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

	Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Subject:	Don Pedro Water-Aquatic RWG Conference Call September 28 9:00 a.m. AGENDA
Attachments:	Don Pedro Sept 28 W-AR RWG Conf Call AGENDA 110926.pdf

Don Pedro Relicensing
Water-Aquatic Resource Work Group
CONFERENCE CALL
Wednesday, September 28, 2011
9:00 a.m. – 4:00 p.m.

Call-In Number 866-994-6437
Conference Code 5424697994

9:00 a.m. - 9:10 a.m.	Call-in, Introductions, Purpose of Meeting	
9:10 a.m. - 9:30 a.m.	Summary of Study Plan Development Process and Progress to Date	
9:30 a.m. - 10:15 a.m.	Review and Discussion	
	W&AR 7	Predation Study
10:15 a.m. - 10:45 a.m.	W&AR 8	Salmonid Redd Mapping Study
10:45 a.m. - 11:30 a.m.	W&AR 9	Chinook Salmon Fry Study
11:30 a.m. - 12:00 p.m.	W&AR 10	*Oncorhynchus mykiss* Population Study
12:00 p.m. - 12:30 p.m.	Lunch Break	
12:30 p.m. - 1:00 p.m.	W&AR 11	Chinook Salmon Otolith Study
1:00 p.m. - 1:45 p.m.	W&AR 12	*Oncorhynchus mykiss* Habitat Assessment
1:45 p.m. - 2:15 p.m.	W&AR 13	Fish Assemblage and Population Between Don Pedro Dam and LaGrange Dam Study
2:15 p.m. - 3:00 p.m.	W&AR 14	Temperature Criteria Assessment (Chinook and *Oncorhynchus mykiss)*
3:00 p.m. - 3:45 p.m.	W&AR 2 through W&AR 6: Comments on Latest Revisions	
3:45 p.m. - 4:00 p.m.	Path Forward	

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If you have any questions, please do not hesitate to contact Carin Loy (carin.loy@hdrinc.com 916-679-8737) or myself.

Additional LiveMeeting Information: **Meeting time: Sep 28, 2011 9:00 AM (PDT)**

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Don Pedro Relicensing
Water-Aquatic Resource Work Group
CONFERENCE CALL
Wednesday, September 28, 2011
9:00 a.m. – 4:00 p.m.

Call-In Number 866-994-6437
Conference Code 5424697994

9:00 a.m. - 9:10 a.m.	Call-in, Introductions, Purpose of Meeting	
9:10 a.m. - 9:30 a.m.	Summary of Study Plan Development Process and Progress to Date	
9:30 a.m. - 10:15 a.m.	Review and Discussion	
	W&AR 7	Predation Study
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3:45 p.m. - 4:00 p.m.	Path Forward	

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If you have any questions, please do not hesitate to contact Carin Loy (carin.loy@hdrinc.com 916-679-8737) or myself.

Additional LiveMeeting Information: Meeting time: Sep 28, 2011 9:00 AM (PDT)

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From: Staples, Rose
Sent: Tuesday, September 27, 2011 10:33 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

	Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Subject:	New Redline Revisions Don Pedro W&AR 03, 05, and 06 have been Uploaded to Website

Please note that new redline versions of the Don Pedro Project Proposed Study Plans W&AR 03, 05, and 06 have been uploaded to the website under DOCUMENTS/STUDIES/ RWG STUDY PLAN DEVELOPMENT. These versions reflect the comments from the September 15th RWG Meeting. The other proposed study plans under discussion in the second part of the Water-Aquatic RWG conference call tomorrow (W&AR 02 and 04) did not have any changes.

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STUDY PLAN W&AR-3

TURLOCK IRRIGATION DISTRICT
AND
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT
FERC NO. 2299

Reservoir Temperature Model Study Plan

RELICENSING PARTICIPANTS' COMMENTS

Comment No.	RWG Meeting Date	Comment	Response
General Comments:			
1	08/23/2011	Additional information was requested about the condition of the outlet gate in old Don Pedro Dam.	See Section 5.3.3.
2	08/23/2011	It was requested that any ongoing data collection be identified.	See Section 5.3.3.
3	09/15/2011	Confirm study plan extent of recalibrated HEC 5 model in the riverine temperature study plan.	The Districts are preparing a study plan for the recalibration of the lower Tuolumne River stream temperature model. It will be included in the Updated Study Plan.
4	09/15/2011	Continue discussions with DHI on use and/or any limitations on use.	The Districts will contact DHI and communicate back to the RPs.
5	09/15/2011	Section 10. Scenario Development and Execution. Districts will train users or run scenarios as requested by the RPs. Cross-reference to schedule – should all be ready to run in 2013.	Modify text. See new Section 10.

NOTE:
The Districts are preparing a study plan for the recalibration of the lower Tuolumne River stream temperature model. It will be included in the Updated Study Plan document.

STUDY PLAN W&AR-3

TURLOCK IRRIGATION DISTRICT
AND
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT
FERC NO. 2299

Reservoir Temperature Model Study Plan

~~**July 2011**~~

Related Study Requests: AR-03, 16; CDFG-03; FOT-03; NMFS-06; Reclamation-03

(See RP General Comment 1 & 2)

1.0 Project Nexus

Turlock Irrigation District's and Modesto Irrigation District's (Districts) continued operation and maintenance (O&M) of the Don Pedro Project (Project) will affect the temperature regime of waters in the Don Pedro Reservoir. Similarly, flow releases from Don Pedro Reservoir will affect the temperature of waters downstream of Don Pedro Dam and may contribute to the cumulative effects to resources in the lower Tuolumne River.

2.0 Resource Agency Management Goals

The Districts believe that two agencies have resource management goals related to water temperature in Don Pedro Reservoir and in the lower Tuolumne River: (1) the California Department of Fish and Game (CDFG), and (2) the State Water Resources Control Board, Division of Water Rights (SWRCB). Each of these agencies and their management goals, as understood by the Districts at this time, is described below.

CDFG's goal is to preserve and protect the habitats necessary to support native fish, wildlife and plant species.

SWRCB is the state agency that administers the federal Clean Water Act (CWA) (33 U.S.C. §11251-1357) as applies to California waters with the responsibility to maintain the chemical, physical, and biological integrity of the state's waters and to protect the beneficial uses of stream reaches consistent with Section 401 of the federal CWA, the Regional Water Quality Control Board Basin Plans, State Water Board regulations, California Environmental Quality Act, and other applicable state law.

3.0 Study Goals

The reservoir temperature model will accurately simulate and characterize the seasonal water temperature dynamics experienced in Don Pedro Reservoir under current and potential future conditions. The model would:

- simulate reservoir temperatures resulting from current Project operations,
- accurately reproduce observed reservoir temperatures, within acceptable calibration standards, over a range of hydrologic conditions,
- provide output that can inform other studies, analyses, and models, and
- predict potential changes in reservoir thermal conditions under alternative future operating conditions.

4.0 Existing Information and Need for Additional Information

The existing SJR5Q model, which is an application of the HEC-5Q modeling platform, is based on a 1-D representation of the Don Pedro Reservoir and the lower Tuolumne River to its confluence with the San Joaquin River. Temperature regimes in the Don Pedro Reservoir are likely to be an important resource issue in relicensing. The existing 1-D model is not well-suited to accurately represent the thermal dynamics and structure of the Don Pedro reservoir. The Districts will be developing a 3-D model of the Don Pedro Reservoir that will be capable of more accurately representing the thermal structure and dynamics experienced in the reservoir under a wide range of reservoir water levels and meteorological conditions. Section 5.3.1 below provides a detailed explanation of the benefits of a 3-D reservoir temperature model. One of the benefits is the capability of modeling the old Don Pedro dam, including its spillway and outlet gates (further details are provided in Section 5.3.3, Data Sources). The 3-D temperature model of the Don Pedro Reservoir will be "linked" in a feed-forward mode to the lower Tuolumne River temperature model. Existing data and ongoing data collection to support the development of the 3-D temperature model of the Don Pedro Reservoir are described below in Section 5.3.3, Data Sources.

5.0 Study Methods

This study will develop a 3-D model characterizing the thermal structure and dynamics of the Don Pedro Reservoir in Tuolumne County, California. This section of the study plan describes the basis for employing a 3-D model in this case, the model selection, and the model development and use.

5.1 Study Area

The study area encompasses the area from the inflows to Don Pedro Reservoir to the outflow from Don Pedro Reservoir. The reservoir temperature model will interface with the Project Operations Model and the existing HEC-5Q model of the lower Tuolumne River extending from ~~below~~ the impoundment of La Grange Dam to the confluence with the San Joaquin River.[1] [Confirm study plan extent of recalibrated HEC 5 model in the riverine temperature study plan.]

[1] The Districts have agreed to recalibrate the existing HEC-5Q model of the lower Tuolumne River as recommended in the March 2011 report submitted to FERC.

5.2 General Concepts and Procedures

The following general concepts apply to any field work associated with this study:

- Personnel safety is an important consideration of each fieldwork team. The Districts and their consultants will perform the study in a safe manner.
- The Districts will make a good faith effort to obtain permission in advance of performance of any field work to access private property where needed.
- Field crews may make minor modifications in the field to adjust to and to accommodate actual field conditions and unforeseeable events. Any modifications made will be documented and reported in the draft study reports.

5.3 Study Methods

The development plan for the 3-D temperature model of the Don Pedro Reservoir is presented in the following sections:

- 5.3.1 Model Selection
- 5.3.2 MIKE3-FM Model Theoretical Principles
- 5.3.3 Data Sources
- 5.3.4 Model Setup
- 5.3.5 Model Calibration and Verification
- 5.3.6 Baseline Conditions

5.3.1 Model Selection

One-dimensional (1-D) and multi-dimensional (2-D/3-D) modeling platforms were identified for potential application to the Don Pedro Reservoir. The four candidate models evaluated were:

- HEC-5Q, 1-D, longitudinally- and laterally-averaged
- CE-QUAL-W2 - 2-D, laterally averaged
- RMA-10 - 3-D
- MIKE3-FM - 3-D

The San Joaquin River Basin Water Temperature Model (SJR5Q) is an application of the HEC-5Q modeling platform that represents the Don Pedro Reservoir as a one-dimensional vertically-segmented reservoir (AD Consultants 2009). The Don Pedro Reservoir portion of the SJR5Q model was subject to limited calibration using temperature profiles taken by CDFG between September 2005 and September 2006. All the data used in comparisons with model results to date were collected at water levels greater than approximately 790 ft. Therefore, no calibration has been able to occur under conditions of substantial drawdown. During relicensing, it is anticipated that reservoir temperatures will be evaluated under a broad set of reservoir conditions, including under substantial drawdown conditions. The lack of model comparisons with temperature profiles at water levels below 790 ft is a significant deficiency in the SJR5Q model. The 1-D reservoir temperature model is empirical in design and reservoir behavior is estimated by equations and algorithms developed from a set of other reservoirs. Don Pedro Reservoir is 24 miles long and has a shape that does not conform to a typical 1-D configuration, that is, either long and narrow (highly longitudinal) or short and wide (highly transverse). In fact the Don Pedro Reservoir is both narrow and wide at different reaches within the reservoir. It is also asymmetrical and dendritic with several arms (e.g., Moccasin, Woods Creek, Hatch Creek, Big Creek and Rogers Creek) extending into local tributaries. A 2-D or 3-D model, which establishes the reservoir thermal regime based on the analysis of the detailed hydrodynamics (i.e., physics) of the reservoir, boundary conditions (inflows and atmospheric/meteorological conditions), and heat exchange factors, does not have the same inherent deficiency as the empically-based SJR5Q model. In addition, the existence of the old Don Pedro Dam poses a longitudinal variation that is difficult to represent accurately in a 1-D vertically-segmented model. Temperature profiles above and below the old Don Pedro Dam showed a 1 °C difference in temperature below the crest of the old dam (Elevation 607 ft.) in May 2011, when the reservoir level was at approximately 800 ft. Moreover, lower reservoir levels have a greater potential to affect differences in temperature at the old dam and consequently affect release temperatures.

In analyzing the complex Don Pedro system, a 1-D model would generally possess value only if (1) sufficient observed data were available to calibrate the model over the entire range of potential future circumstances it was called on to evaluate, and (2) the 1-D model were actually shown to reliably simulate the observed data throughout the full range of operations. If both of these circumstances exist, then the 1-D model would not have to be extrapolated beyond its zone of calibration. These circumstances do not exist with the 1-D model of the Don Pedro Reservoir.

A 2-D model (CE-QUAL-W2) would require multiple branches to accurately represent the dendritic shape of the Don Pedro Reservoir and result in the loss of detail where branches overlap. Once it is recognized that a multi-dimensional model is needed, then the geometry and complexity of the reservoir becomes a primary determinant in selecting the preferred model. In this case, the Don Pedro Reservoir has a complex structure, not only because of the presence of the old Don Pedro Dam. Lastly, the temperature of water releases from Don Pedro under a full range of reservoir levels is anticipated to be an important factor in the consideration of potential future operating scenarios. A 3-D model was preferred for these reasons. Based on review of the two 3-D modeling platforms, MIKE3-FM was selected for the temperature modeling of the Don Pedro Reservoir because its documentation, graphical user interface, and technical support are superior to RMA-10.

MIKE3 was developed by the Danish Hydraulic Institute as a professional engineering software package for 3-D free-surface flows (DHI 2009a, 2009b, 2009c). It is applicable to simulations of flows, cohesive sediments, water quality, and ecology in rivers, lakes/reservoirs, estuaries, bays, coastal areas and seas. MIKE3 is the result of 20 years of continuous development and is tuned through the experience gained from hundreds of applications worldwide. The 1-D, 2-D, and 3-D versions of MIKE are probably the most used hydrodynamic models in the world. MIKE3 is fully integrated with GIS enabling the user to efficiently set up model geometry given geo-referenced bathymetric data. The Graphical User Interface enables the modeler to efficiently prepare input and graphically present output.

The flexible mesh version of the model (MIKE3-FM) allows variable-spacing of computational grid points to obtain high spatial resolution in areas of prime interest while saving on model run time through a coarse mesh in other areas. The hydrodynamic model in MIKE3-FM is a general numerical modeling system for simulation of flows in estuaries, bays, lakes/reservoirs, and coastal areas as well as in oceans. It simulates unsteady three-dimensional flows taking into account density variations, bathymetry, and external forcing such as meteorology, tidal elevations, currents and other hydrographic conditions.

A free version of the model allows users to view results, look at the model inputs, understand model logic; in fact, do everything except run the model. When the model is already owned/leased by a consulting firm, there is no cost to others involved in its application. HDR owns/leases the MIKE3-FM model and has used it extensively to model hydrodynamics and temperature. The Districts will provide training for Relicensing Participants interested in using the model.

5.3.2 MIKE3-FM Theoretical Principles

The mathematical foundation in MIKE3-FM is the mass conservation equation, the Reynolds-averaged Navier-Stokes equations in three dimensions, including the effects of turbulence and variable density, together with the conservation equations for salinity and temperature (DHI 2009a). MIKE3-FM employs the Boussinesq and hydrostatic approximations. The salinity, temperature, and pressure are related to the density through the UNESCO definitions. Wind-driven transport is simulated as a function of the shear stress at the water surface. Turbulence is modeled using an eddy viscosity concept and allows the user to select one of several vertical turbulence algorithms. The numerical solution employs a cell-centered finite-volume method.

The MIKE3 Advection/Dispersion (AD) module provides the advection/dispersion basis for the computations to simulate the spreading and fate of dissolved or suspended substances when provided with the flow field from the hydrodynamic module. Conservative and non-conservative constituents can be modeled. The AD module is not necessary for modeling temperature because temperature is in the base MIKE3-FM model.

The underpinnings for modeling temperature are based on heat balance principles. The heat exchange with the atmosphere is calculated on the basis of four physical processes: (1) long wave solar radiation, (2) sensible heat flux (convection), (3) short wave solar radiation (which includes a depth-variable absorption relationship), and (4) latent heat flux (evaporation).

5.3.3 Data Sources

The two broad categories of data required by the model are (1) input data and (2) data for model calibration/verification. Input data pertain to the detailed physical characteristics of the reservoir being modeled. The boundary conditions also require input data and include inflows and withdrawals, temperature of inflows and meteorological data (air temperature, wind speed and direction, solar radiation, relative humidity). Mechanistic response parameters such as heat exchange coefficients are also input along with reservoir operation rule data. Data for model calibration/verification are primarily measurements of the metrics that are calculated by the model, which in this case, are temperature measurements in the reservoir (e.g., vertical profiles) and at the hydroelectric station. The Project database has compiled most of the historical flow and temperature data. The specific data required for the MIKE3-FM model are listed in Table 5.3.3-1 under four headings: (1) Physical and Geomorphological, (2) Flow and Operations, (3) Temperature, and (4) Meteorology.

Table 5.3.3-1. Summary of data needed for Don Pedro Reservoir 3-D temperature model.

Required Data	Source	In Project Database
	Physical and Geomorphological	
Bathymetry	Field survey	yes
Outlet (invert elevation)	Design drawings	yes
Outlet (lat/long)	Design drawings	yes
Dam spillway (elevation)	Design drawings	yes
Dam spillway (length, type)	Design drawings	yes
Old Don Pedro Dam spillway (elevation)	Design drawings or bathymetric survey	yes
Old Don Pedro Dam spillway (length, type)	Design drawings or bathymetric survey	yes
Old Don Pedro Dam crest (elevation)	Design drawings or bathymetric survey	yes
Old Don Pedro Dam crest (length, type)	Design drawings or bathymetric survey	yes
Old Don Pedro outlet (elevation)	SJR5Q Report	yes
Old Don Pedro outlet (lat/long)	USGS Topographical Map	no
	Flow and Operations	
Tuolumne River upstream of reservoir (regulated)	CCSF, TID	yes
Tuolumne River upstream of reservoir (total)	TID	yes
Storage (daily)	USGS	yes
Withdrawals through powerhouse (daily)	TID	yes
	Temperature	
Tuolumne River upstream of reservoir	HDR (starting October 2010); CCSF (regulated)	no
Profiles at several locations (see Table x)	CDFG	yes
	Meteorology	
Air temperature, wind speed/direction, solar radiation, relative humidity	TID (starting November 2010); unlisted owners of stations	no

CCSF City and County of San Francisco
CDFG California Department of Fish and Game
TID Turlock Irrigation District
USGS U S Geological Survey

Physical and Geomorphological

A digital terrain model (DTM) was purchased from the vendor, INTERMAP®, in August 2008. The DTM was derived from remotely sensed data collected with interferometric synthetic aperture radar (IFSAR) and was processed by the vendor to remove vegetation and cultural features. The shoreline of the reservoir will be generated using a GIS contouring tool with the DTM. It will additionally be visually inspected and modified as needed using a horizontally more accurate hi-resolution aerial image acquired from the vendor DigitalGlobe®.

Bathymetry data were collected in accordance with the study plan provided in Attachment A. Any overlap in the topographical elevations of the IFSAR data and elevations covered by the bathymetric survey will be checked to provide a unified set of reservoir bottom points as Cartesian (x, y, z) coordinates.

The dam spillway and outlet elevations and dimensions will be taken from design drawings of the new Don Pedro Reservoir. The old Don Pedro dam and spillway elevations and dimensions will be based on available design drawings, if any, or detailed bathymetry survey data. The old Don Pedro Dam had 12 gated outlets arranged in two rows of six gates. Each outlet was 52-inches in diameter; the lower row of six have a centerline at elev 392 ft and the upper row of six has a centerline of elev 482 ft. All of these gates were left in the open position when old Don Pedro Dam was inundated by the new Don Pedro Dam.

Flow and Operations

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The hydrology of the Don Pedro Reservoir's watershed includes flows regulated by the City and County of San Francisco (CCSF) and unregulated flows. The combined total inflow to the reservoir is back-calculated by the California Department of Water Resources; however, the daily inflows are highly variable (noisy) and would require smoothing for use in the model. TID's inflow dataset for the historical period will be used in the model calibration and verification. The flow withdrawals for the hydroelectric station will be defined on a daily or hourly basis using TID's data. Daily flows generated by the Water Balance – Operations Study (W&AR 02) will be used to set the input to the reservoir temperature model.

Temperature

The temperature of the inflows will be estimated using a temperature balance (calculation) in conjunction with the regulated and unregulated flows. As the temperatures of the regulated flows are measured by CCSF, these data will be used in a temperature balance model pre-processor. The temperature station just upstream of the North Fork Tuolumne River confluence (installed in fall 2010) accounts for all of the regulated watershed area and most of the unregulated watershed area. These data will be used to guide the development of the pre-processor as a water temperature balance or an air-water equilibrium temperature balance. The pre-processor will be used to estimate the temperature of all inflows for the calibration period, which precedes the installation of the HDR temperature station. The verification will use the data being collected at the HDR temperature station.

Temperature profiles were measured by CDFG, and continue to be measured, at six stations in Don Pedro Reservoir. These measurements started in August 2004 and were done almost every month since then. In addition, temperature profiles at a station above the old Don Pedro dam and below the same dam were conducted by HDR~~DTA~~ in June 2011 and will be continued monthly until the fall 2011 using a Hydrolab MS5 multi-parameter water quality sonde (temperature sensor +/- 0.2°C). Surface water temperature recorded concurrently with the bathymetric data in May and June 2011 will also be used in the model calibration. The computerized dataset comprises the primary data for comparisons with the model in the calibration and verification. Temperature measurements at the- powerhouse (1978 - 1988, 2010 - 2011) will also be used for the model calibration/verification.

Meteorology

Air temperature, wind speed and direction, solar radiation, and relative humidity are required for the model. A weather station was installed near the dam on November 30, 2010 by the Districts to collect site-specific data, which will be used for the model verification. Data from existing weather stations near Don Pedro Reservoir will be used for the model calibration.

5.3.4 Model Set-up

A flexible mesh of control volumes that define the computational points in the model will be constructed using bathymetry and shoreline data described in Section 5.3.3. The mesh will be unstructured in the horizontal domain and a structured mesh will be used in the vertical domain. A finer mesh will be used in parts of the reservoir where a high degree of spatial resolution is warranted, such as near the intake structure and the old dam. The overall mesh will be developed to balance the competing needs for high spatial resolution and low model run time. Examples of recent MIKE3-FM meshes are shown in Figures 5.3.4-1 and 5.3.4-2.

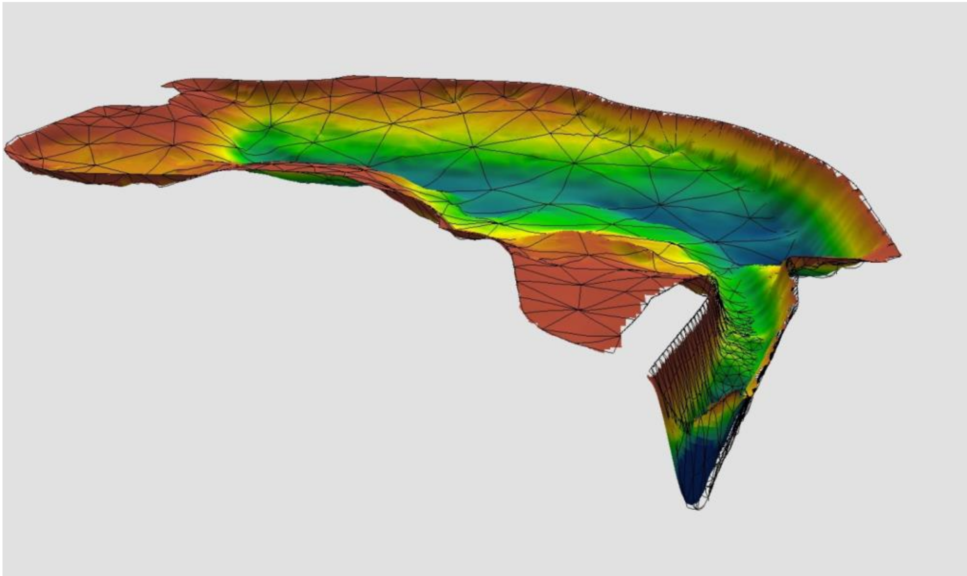

Figure 5.3.4-1 MIKE3-FM 3D model of Northfield Reservoir, MA.

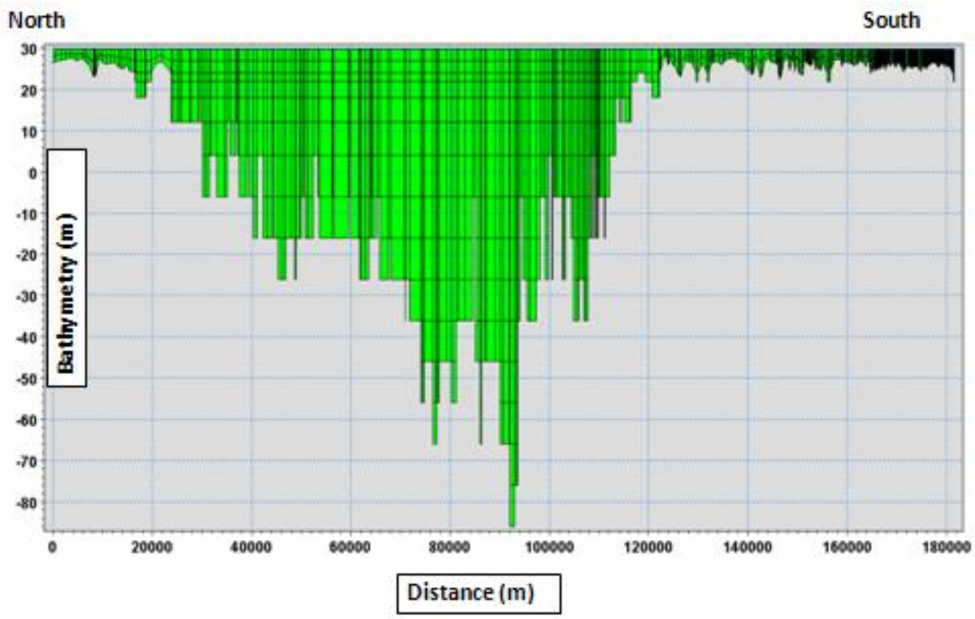

Figure 5.3.4-2 MIKE3-FM 3D model's vertical mesh scheme for Lake Champlain, VT.

Inflow boundaries will be defined to represent the mainstem Tuolumne River and key tributaries that account for the greatest portion of the local reservoir watershed flow. The tributary boundaries will be coincident with two or three arms of the reservoir (e.g., Woods Creek, Rogers Creek, and Hatch Creek). The flow from the unregulated portion of the watershed will be apportioned on the basis of drainage area and the associated temperature will be estimated as described in Section 5.3.3.

5.3.5 Model Calibration and Verification

The general procedure is to calibrate a model (i.e., adjust model parameters within acceptable ranges) using sampling data collected during a certain period, and then verify the model (i.e., compare model and observations without any further adjustment of model parameters) using data collected during different hydrological conditions. Generally, the same types of data are available for both the calibration and verification periods. However, inflow temperature and meteorological data collections for the Don Pedro Reservoir were recently added in the fall of 2010 to provide a more complete set of data for the modeling than the dataset previously available. Several months of these new data will be available for model verification. The model calibration will therefore be done primarily with the data collected prior to the fall of 2010 and the approaches for defining the boundary conditions that were described in Sections 5.3.2 through 5.3.4. Note that the bathymetry survey data are essential for calibrating the model. We assume that reservoir depths have not changed in the last few years so that the same bathymetry data will be used for the model calibration and verification.

The seasonal progression of temperature stratification in the spring and early summer, followed by destratification in late summer and fall, is an important phenomenon for the 3-D temperature model to simulate. The existing temperature profiles indicate that most of the stratification occurs during April through September, and most of the de-stratification takes place October through November. Hence, the model calibration should span at least from April through November. (The temperature is relatively constant over depth during the winter.) In addition, the water surface of the reservoir generally varies due to hydrological conditions and the Districts' operations for flood control and water supply. Existing water surface data show a minimum elevation of approximately 732 feet in October, November, and December 2008. As one of the key issues is the effect of reservoir drawdown on temperature, January through December 2008 is proposed as one of the model calibration periods. Monthly temperature profiles are available for this period.

An additional period may be used to calibrate the model depending on the results of the 2008 comparisons and model run time. There is apparently a gap in the temperature profile sampling data between May 22, 2009 and March 3, 2010, so 2009 would not be appropriate. However, 2007 appears to have monthly profiles and may be used for model calibration, if necessary.

The model verification period would cover the period with the added inflow temperature and meteorological data collections, presumably December 2010 through the early fall of 2011. Model-computed temperature profiles and measured temperatures at the six reservoir profile stations will be shown graphically. Temperature just below the water surface measured during the bathymetry survey along with temperature profiles done at the six CDFG stations and two stations near the old dam during the survey will also be compared to the model as part of the verification. Available powerhouse temperature data will also be compared with model output as time series graphs. Model and measured temperatures at each station will be statistically analyzed to determine how well the model compares with the data. These statistics will be presented in graphical and/or tabular form.

The Districts will conduct a QA/QC review of the modeling following the calibration and verification to confirm its validity for evaluating future conditions. Following this review, the Districts will meet with the Relicensing Participants, per Section 6.0.

5.3.6 Baseline Conditions

The 3-D model will initially be configured to represent how the Districts currently operate the Project, including all physical, regulatory, and contractual constraints. This case represents the "No Action Alternative." A full description of these baseline conditions will be prepared and distributed. All subsequent model runs will be compared to the baseline conditions.

5.4. Documentation and Reporting

A report will be developed that documents all methods and results. Maps showing coverage of the depth sounding points will also be included. In addition to the maps, a table showing area and storage volume for each foot of elevation will be developed and included in the report. Storage volume will be plotted against elevation and compared graphically to the existing reservoir capacity curve presented in the PAD. Vertical temperature profiles and surface temperature plots that show model output and observed data will also be provided.

A description of the model, sources of data, model parameters, assumptions, and calibration and verification will also be provided. In addition, model input files for the calibration, verification, and projections will be provided with annotated documentation of the sources of the data so the files can be traced to the backup upon which they were based.

6.0 Study-Specific Consultation

The Districts will meet with interested Relicensing Participants to review the model's key features and demonstrate the model's primary results following the QA/QC review of the model calibration/verification. Relicensing Participants will be given a description of the model's theoretical principles, model mesh of the reservoir, summary of input data and modeling assumptions, and a draft of the model's validation documentation.

The model will be reviewed by RPs after the calibration/verification to provide the agencies with an opportunity to ask questions and comment on technical aspects of the modeling. The 3-D Modeling Team will conduct a workshop meeting with the reviewers to discuss any issues raised during the review. Model adjustments, if any, will be made in finalizing the calibrated and verified model. The review comments and responses will be documented in a technical memo that will be included as an appendix to the modeling report. The QA/QC review at this juncture of the study will render the 3-D temperature model as suitable for the simulation of existing and baseline conditions during this study as well as future reservoir operating scenarios. The Districts will provide training on the use of the model to interested RPs.

7.0 Schedule

The Districts' schedule to complete the study proposal assumes FERC's Study Plan Determination is deemed final on December 31, 2011. Data compilation and model set-up will occur January and February 2012. Model calibration and verification will then take place during March through July 2012. Consultation with Relicensing Participants will occur during April, June and August 2012 and a final report will be produced by November 30, 2012. The model will be available by March 2013 to evaluate alternate future reservoir operation scenarios.

8.0 Consistency of Methodology with Generally Accepted Scientific Practices

Three-dimensional hydrodynamic modeling and temperature modeling have been extensively used for complex systems and are generally accepted scientific practices. The 3-D temperature modeling of the Don Pedro Reservoir is consistent with these generally accepted scientific practices.

9.0 Deliverables

In addition to the model itself, the Districts will prepare a report, which will document the methodology and model calibration/verification and model projections.

10.0 Scenario Development and Model Projections

Future scenarios that reflect potential changes to reservoir operation (i.e., the flows released through the powerhouse and hollow jet value) will be developed during the Integrated Licensing Process. The Districts will provide training for model users to execute the Don Pedro Reservoir temperature model and perform model projections for scenarios of interest.

~~10~~11.0 Budget

The cost of development of the model for the Don Pedro Reservoir will be provided in the Revised Study Plan.

~~11~~12.0 References

AD Consultants, Resources Manaagement Assocoiates, Inc., Watercourse Engineering, Inc. San Joaquin River Basin Water Temperature Modeling and Analysis, Prepared for CALFED ERP-06D-S20, October 2009

Danish Hydraulic Institute 2009a. MIKE21 & MIKE3 Flow Model FM, Hydrodynamic and Flow Transport Model, Scientific Documentation, January 2009

Danish Hydraulic Institute 2009b. MIKE21 & MIKE3 Flow Model FM, Hydrodynamic and Flow Transport Model, Step by step training guide, January 2009

Danish Hydraulic Institute 2009c. MIKE3 Flow Model FM, Hydrodynamic Model, User's Guide, January 2009

ATTACHMENT A

BATHYMETRIC AND SURFACE TEMPERATURE DATA COLLECTION

TURLOCK IRRIGATION DISTRICT
AND
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT
FERC NO. 2299

Bathymetric and Surface Temperature Data Collection

July 2011

1.0 Project Nexus

Turlock Irrigation District and Modesto Irrigation District's (TID and MID or Districts) continued operation and maintenance (O&M) of the Don Pedro Hydroelectric Project (Project) has a potential to affect water temperature. In particular, stratification of the reservoir affects the amount of cold water stored in Don Pedro Reservoir.

The Districts plan to develop a 3-D water temperature model that requires bathymetry information as input. Bathymetric data will also provide a better understanding of the elevation-reservoir storage relationship of the reservoir.

2.0 Resource Management Goals of Agencies with Responsibility for the Resource to be Studied

The Districts believe that two agencies have jurisdiction over water temperature in the reservoir: (1) the California Department of Fish and Game (CDFG), and (2) the State Water Resources Control Board, Division of Water Rights (SWRCB). Each of these agencies and their jurisdiction and management direction, as understood by the Districts at this time, is described below.

CDFG's goal is to preserve; to protect; and, as needed, to restore habitat necessary to support native fish, wildlife and plant species.

SWRCB has authority under the federal Clean Water Act (CWA) (33 U.S.C. §11251-1357) to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Throughout the relicensing process, the SWRCB maintains independent regulatory authority to condition the operation of the Project to protect water quality and the beneficial uses of stream reaches consistent with Section 401 of the federal CWA, the Regional Water Quality Control Board Basin Plans, State Water Board regulations, California Environmental Quality Act, and any other applicable state law.

3.0 Study Goals and Objectives

This study is needed as input for the proposed 3-D water temperature model and to update the historical reservoir elevation-storage curve. Though monthly profiles collected by CDFG since 2004 will be the predominant dataset used for the 3-D model's calibration and verification, water temperature data collected concurrently with the bathymetric data will also support the effort.

4.0 Existing Information and Need for Additional Information

Previous detailed bathymetric data are not available for the Don Pedro Reservoir. It appears that the only data available to define the original reservoir bathymetry is U.S. Geological Survey (USGS) 15-minute quadrangle maps developed prior to the construction of the new Don Pedro Project. These are not of sufficient detail to define the current bathymetric characteristics of the reservoir.

CDFG has collected monthly water temperature profiles from six locations in Don Pedro Reservoir for several years and profiles collected by CDFG, from 2004 through and including the present, effectively characterize Don Pedro Reservoir's vertical thermal trends. A seventh profile location, upstream of the old Don Pedro Dam, would provide insight into temperature dynamics at this location. Profiles collected during the bathymetry fieldwork will provide a temperature-related link between the bathymetry data and CDFG's long term data-set.

5.0 Study Methods and Analysis

Bathymetry data collected with the reservoir water surface at approximately elevation 790 feet (ft) will be combined with interferometric synthetic aperture radar (IFSAR) topographic mapping, obtained by the Districts when the water surface elevation was at approximately 760 ft, to develop a full description of the reservoir geometry and depth-area-storage relationships.

5.1 Study Area

This study will take place at Don Pedro Reservoir in Tuolumne County, California. The study area consists of Don Pedro Reservoir below the Project Boundary at an elevation of approximately 860 ft, as depicted in Figure 5.1-1.

5.2 General Concepts

The following general concepts apply to the study:

- Personal safety is an important consideration of each fieldwork team. The Districts and their consultants will perform the study in a safe manner.
- The Districts will make a good faith effort to obtain permission in advance of performance of the study to access private property where needed. Field crews may make minor modifications in the field to adjust to and to accommodate actual field conditions and unforeseeable events. Any modifications made will be documented and reported in the draft study reports.

5.3 Study Methods

The plan for developing the bathymetric model of Don Pedro Reservoir is presented below in five subsections: (1) preparation, (2) field data collection, (3) data processing, (4) quality assurance/quality control, and (5) documentation and reporting.

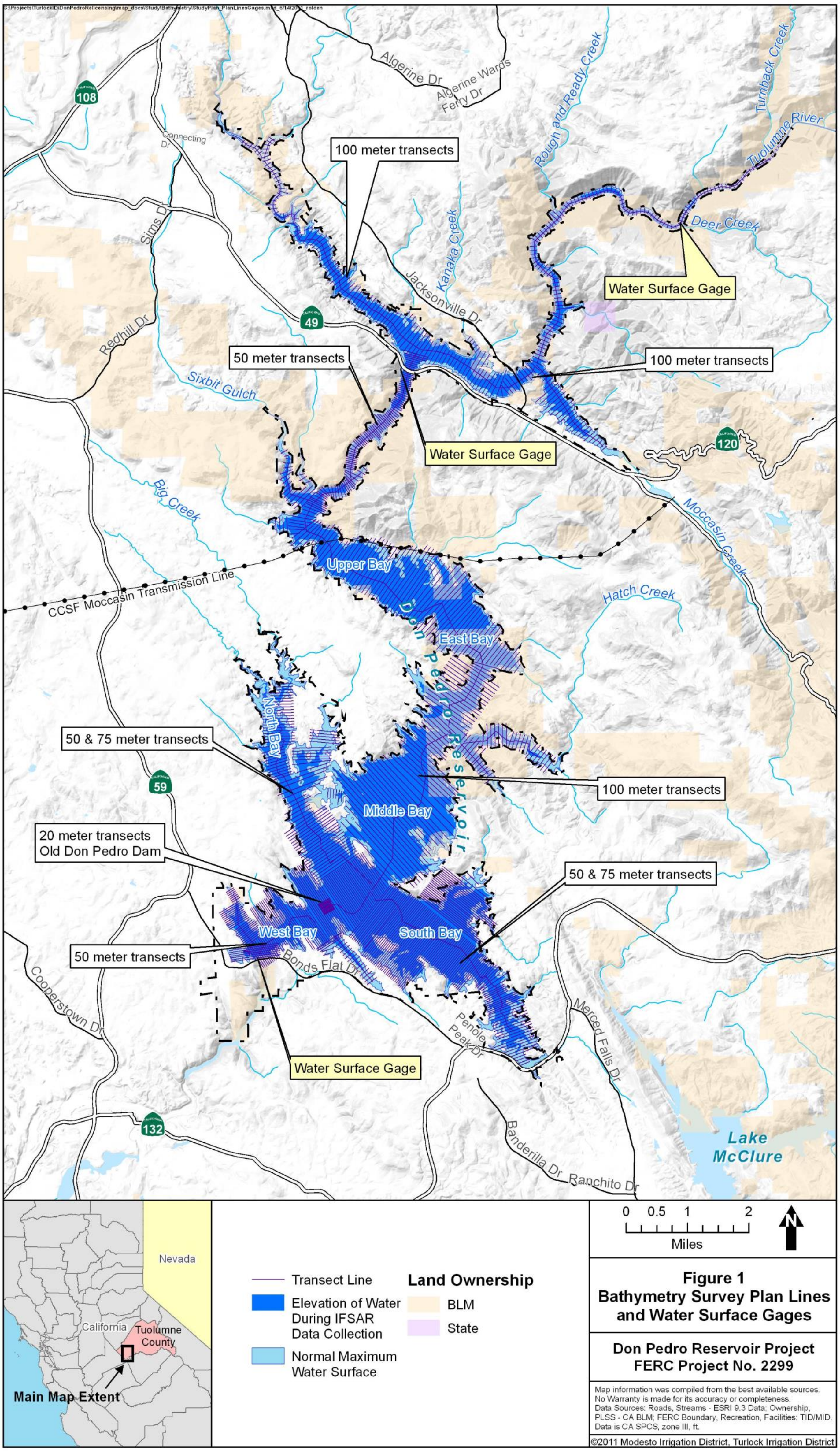

Figure 5.1-1 Bathymetry survey plan lines and water surface gages.

5.3.1 Preparation

Before data collection begins, transects spaced at 50, 75, and 100 meter intervals oriented approximately perpendicular to the longitudinal axis of the reservoir will be established using the bathymetric data collection software, Hypack. In addition to the standard transects, at least one perpendicular "tie line", oriented approximately parallel to the longitudinal axis of the reservoir will be established to ensure inter-transect data consistency. Transects will cover the entire reservoir at the water elevations observed during the time of the field data collection.

The location of the Old Don Pedro Dam, inundated by the construction of the new dam, has been estimated using historical USGS topographic maps. A 20-meter transect spacing will be developed in the area of the Old Don Pedro Dam to establish the geometry and location of the old dam.

5.3.2 Field Data Collection

5.3.2.1 Bathymetric Data

The technique that will be used for data collection employs precision depth sounder and navigation systems aboard an outboard powered 19-ft Johnboat, in conjunction with vertical control to determine the elevation of the water surface at the time of the survey. Vertical control and water surface elevation data will be taken from the gages at the Don Pedro Dam, the Highway 120/49 Bridge, and the Wards Ferry Bridge. The gages at the two bridges will be used to establish vertical control in the upstream portion of the Don Pedro Reservoir. Temporal and spatial variations in water surface elevation throughout the bathymetric survey will be taken into account in the data processing as explained below.

Water depth will be measured using an Airmar B258 1-kilowatt dual frequency transducer and a Foruno FCV-585 digital depth sounder (or equivalent), with a vertical resolution of 0.1 ft. The depth sounder will be deployed aboard the Johnboat that will navigate along predetermined transects. Transect locations may be adjusted in the field to accommodate shallow water, in-water structures, marinas, and/or recreational activities.

Soundings will be taken at approximately 1 second intervals and the boat speed will be set to ensure that bottom features will be appropriately sampled (typically, at least 1 sounding is taken for every 2 linear meters along the vessel track). The boat will be navigated using a differential Global Positioning System (DGPS), and the position of each sounding will be determined using the DGPS system. The DGPS will provide better than 1 meter circular positioning accuracy. All depth and horizontal positioning data will be recorded digitally in the field as a series of points with x-y-z coordinates, using a rugged field notebook PC running Hypack Hydrographic Survey software (or equivalent).

5.3.2.2 Reservoir Temperature Data

CDFG continues to collect monthly temperature profiles in Don Pedro Reservoir and these data will be used as the primary dataset for the 3-D model's calibration and verification. As part of this study, reservoir temperature data will be collected concurrently with the bathymetric data to provide additional data for the 3-D model's verification.

Surface water temperature will be measured concurrently with the bathymetric data and recorded digitally using the Hypack software. Temperature data will be collected using a Falmouth Scientific Ocean Temperature Module (FSI OTM). The accuracy FSI OTM is -± 0.005 degree Celsius temperature. Surface water data provide information about the variation in the reservoir's temperature through the horizontal plane. Vertical temperature profiles will be collected at least one-time each at the six CDFG profile stations and two additional locations, one just upstream of old Don Pedro Dam and one just downstream of the old Don Pedro Dam, to capture any influence of the old dam on reservoir temperature. During each week of surveying, water temperature profiles (along with dissolved oxygen) will be taken at the nearest CDFG profile location or nearby locations.

5.3.2.3 Water Surface Elevation Data

Reservoir water level elevations will be measured throughout the study. Water surface elevations near the dam of the reservoir are routinely measured and recorded by TID. Water surface elevation gages will be installed at two other locations, where benchmarks provide vertical control for combining all elevation data to a common datum: (1) Highway 120/49 Bridge, and (2) Wards Ferry Bridge. All vertical control will be converted to match the vertical datum of the gage at Don Pedro Dam, which is NGVD 29. The three water surface gages will provide continuous data during the bathymetry survey for data processing.

5.3.3 Data Processing

5.3.3.1 Bathymetric Surface Development

The data will be processed using the Hypack software and exported to a table that can be imported into Geographic Information System (GIS). Elevation values for each point will be calculated in a spreadsheet by first correcting the depth of the reading to include the known submergence value of the transducer and then subtracting the depth of the sounding from the water surface elevation of the reservoir according to the nearest gage reading from the same day and time.

Remotely sensed data will be used to supplement the bathymetric data collected in the field. Previously obtained Digital Terrain Model (DTM) data will be integrated with the bathymetric model. These data were collected in August 2004 by the vendor Intermap using IFSAR. The water surface of the reservoir at the time the DTM data were collected was 760 ft and the DTM data extend upwards to well above the Project Boundary elevation. The DTM will assist with defining the reservoir geometry at water levels above that obtained by the bathymetric survey. In the instances of overlap in the topographical elevations of the DTM and elevations covered by the bathymetric survey, the DTM will provide information that may assist in the interpolation of the surface in between the transect points collected in the field.

A contour line at maximum water level will be generated using a GIS contouring tool with the DTM. It will be visually checked and modified as needed using a horizontally more accurate high-resolution aerial image. The field collected points, the DTM surface data below the high water contour, and the maximum water contour will then be used to interpolate a reservoir geometry model in GIS.

The bathymetric survey elevation data will be developed by using the Environmental Science Research Institute (ESRI) geoprocessing tool “Topo to Raster”. Contours will be developed from the surface using ESRI contouring tools and displayed at an appropriate resolution for the maps that will be included in the final report.

5.3.3.2 Temperature Data Processing

Surface water temperature data and temperature profiles will be used to assist in the 3-D temperature model verification. In addition, surface water temperature data will be plotted and contoured using Surfer (by Golden Software). Temperature data collected during time intervals of two to four hours will be mapped separately to constrain the diurnal temperature variation and provide a “snapshot” of surface temperature. The resulting temperature contours will be shown on a series of maps of the reservoir.

Vertical temperature profiles will also be plotted and a map showing the location of the vertical profiles will also be produced.

5.3.4 Quality Assurance/Quality Control

Data quality will be assured through following manufacture’s instructions and periodically verifying data values through an alternative measurement. Throughout the survey, the depth measured by the sounder will be periodically compared to the actual depth. The actual depth will be measured by either lowering a “bar” beneath the sounder or by direct measurement of the bottom with a lead line or pole. Measurement of the “draft” or the depth from the water surface to the face of the transducer will also be recorded. All measurements will be recorded in the field notebook.

Quality Assurance will be performed by an independent reviewer. A three-step approach will be used for quality assurance of the bathymetric survey data. The first step is a review of the field methods and materials. The second step is checking the edited raw data. Finally, the methods used in the production of the final deliverable will be checked.

Review of field methods will include a check of any “bar checks” performed in the field. A bar check compares the depth measured by the sounder to the actual depth, measured physically. The specifications of the sounder and GPS used in the survey will be reviewed to confirm the accuracy of the data as reported. The water surface elevation data at the three gages will be checked for consistency.

The next step is to check the processing of the raw data. Any data with GPS errors or sounding errors that were flagged accordingly and deleted prior to contour plotting will be checked to confirm that the deletion was appropriate. Soundings will be spot checked for consistency. The crossing of transects and tie-lines will be reviewed to ensure that the sounder recorded similar depths at the intersection of survey lines. If any sharp differences in depth at adjacent points are present, they will be identified as either an error or a real feature.

The last step is a check of the final deliverable. Once the field methods and raw data have been reviewed, the production of contours or a bathymetric surface relative to a know datum will be checked. Calculation of the bottom elevation from sounding depths will be reviewed to ensure corrections for the draft and water surface elevation were properly accounted for. The method of interpolation and setting used to in the interpolation will be reviewed to ensure that reasonable contours are generated. Contours created using interpolation will be checked against actual soundings to verify that the interpolated surface is reasonable. Finally, contours will be checked against any previous studies for consistency.

5.3.5 Documentation and Reporting

A report will be developed that documents all methods and results. Contours derived from the use of the bathymetric and IFSAR data will be displayed in maps of appropriate scale. Maps showing coverage of the depth sounding points will also be included. In addition to the maps, a table showing area and storage volume for each two feet of reservoir elevation will be developed and included in the report. Storage volume will be plotted against elevation and compared graphically to the reservoir area-capacity curve presented in the Pre-Application Document. Vertical temperature profiles and sample surface temperature plots will also be provided.

6.0 Schedule

Surveys are planned to be completed during the months of May and June 2011. IFSAR data has been obtained. Data compilation and mapping will occur from June through September, 2011. Final checking and review will occur in October and November, 2011 and final maps produced by the end of 2011.

7.0 Consistency of Methodology with Generally Accepted Scientific Practices

The methods presented in this study plan are consistent with those used in recent relicensings in California including most recently for the Merced Irrigation District's Lake McClure and McSwain Reservoir. Additional surveys with similar methodology include the Yuba-Bear/Drum-Spaulding Project's Lake Spaulding, Rollins Reservoir, Bowman Lake, Jackson Meadows Reservoir, Fordyce Lake, and Lake Valley Reservoir.

8.0 Deliverables

The Districts will make the draft report available to relicensing participants following internal quality assurance review. The final report will be provided along with the elevation and temperature data in GIS files. These GIS files will be used in developing the 3-D Temperature Model.

9.0 References

Environmental Science Research Institute ArcGIS 10. Available online at: <http://help.arcgis.com/en/ arcgisdesktop/10.0/help/index html>.

Golden Software. Surfer. Available online at: <http://www.goldensoftware.com/products/surfer/surfer.shtml>

Intermap. Available online at: <http://www.intermap.com/>.

STUDY PLAN W&AR-5

TURLOCK IRRIGATION DISTRICT
AND
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT
FERC NO. 2299

Salmonid Population Information Integration and Synthesis Study Plan

RELICENSING PARTICIPANTS' COMMENTS

Comment No.	RWG Meeting Date	Comment	Response
General Comments:			
1	08/23/2011	A suggestion was made to combine W&AR-5 and W&AR-6 because they seemed to be interrelated.	After considering this idea, the Districts think it best to keep the studies separate because they deal with very different geographic scales. This study is focused on empirical data from the lower Tuolumne; W&AR-6 deals with the entire life cycle of the species.
Section-Specific Comments:			
2	08/23/2011	**Section 3.0 Study Goals:** SWRCB and others suggested that the study plan include additional details on study implementation, including RP consultation process.	Section 6.0 of study plan now includes details regarding consultation process, including two workshops as well as documentation of rationale for information inclusion or exclusion from analysis,
3	08/23/2011	**Section 5.3 Study Methods** CSPA and others commented that the study plan should identify the sources of information to be included in the study.	Information will center primarily upon Tuolumne River-specific information, as well as information from other studies and reports of the San Joaquin River basin tributaries.
4	09/15/2011	**Section 5.3:** Provide a list and copies of data sources that are included in the analysis, organized by life stage, and cross-reference the schedule and add specific step in the schedule.	List of available PAD sources will be compiled and transmitted in advance of RSP. Refined list will be developed in Step 1 with opportunity for additional RP input.

STUDY PLAN W&AR-5

TURLOCK IRRIGATION DISTRICT
AND
MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT
FERC NO. 2299

Salmonid Population Information Integration and Synthesis Study Plan

~~**July 2011**~~

Related Study Requests: Acterra-01, Beam-03, CCSF-02, FOT-02, Gardner-02, Rosapepe-01, USFWS-12

(See RP General Comment 1)

1.0 Project Nexus

The continued operation and maintenance (O&M) of the Don Pedro Project (Project) may contribute to cumulative effects on habitat availability and production of in-river life stages of Central Valley Fall run Chinook salmon (*Oncorhynchus tshawytscha*) and *O. mykiss* in the lower Tuolumne River.

2.0 Resource Agency Management Goals

The Districts believe that four agencies have resource management goals related to Chinook salmon and/or their habitat: (1) U.S. Department of Interior, Fish and Wildlife Service (USFWS); (2) United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS); (3) California Department of Fish and Game (CDFG); and 4) State Water Resources Control Board, Division of Water Rights (SWRCB).

A goal of the USFWS (2001) Anadromous Fish Restoration Program (AFRP), as stated in Section 3406(b)(1) of the Central Valley Project Improvement Act, is to double the long-term production of anadromous fish in California's Central Valley rivers and streams. Objectives in meeting this long-term goal include: (1) improve habitat for all life stages of anadromous fish through provision of flows of suitable quality, quantity, and timing, and improved physical habitat; (2) improve survival rates by reducing or eliminating entrainment of juveniles at diversions; (3) improve the opportunity for adult fish to reach spawning habitats in a timely manner; (4) collect fish population, health, and habitat data to facilitate evaluation of restoration actions; (5) integrate habitat restoration efforts with harvest and hatchery management; and (6) involve partners in the implementation and evaluation of restoration actions.

NMFS has developed Resource Management Goals and Objectives for species listed under the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §1801 et seq.) and the Endangered Species Act (ESA) (16 U.S.C. §1531 et seq.), as well as anadromous species that are not currently listed but may require listing in the future. NMFS' (2009) Public Draft Recovery Plan for Sacramento River Winter-run Chinook salmon, Central Valley Spring-run Chinook salmon, and Central Valley steelhead (Draft Recovery Plan) outlines the framework for the recovery of ESA-listed species and populations in California's Central Valley. For Central Valley steelhead, the relevant recovery actions identified for the Tuolumne River are to: (1) Conduct habitat evaluations, and (2) manage cold water pools behind La Grange and Don Pedro dams to provide suitable water temperatures for all downstream life stages. For Chinook salmon, the relevant goals are to enhance the Essential Fish Habitat downstream of the Project and achieve a viable population of Central Valley fall/late fall-run Chinook salmon in the Tuolumne River.

CDFG's mission is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. CDFG's resource management goals, as summarized in restoration planning documents such as "Restoring Central Valley Streams: A Plan for Action" (Reynolds et al. 1993), are to restore and protect California's aquatic ecosystems that support fish and wildlife, and to protect threatened and endangered species under California Fish and Game Code (Sections 6920–6924).

SWRCB has responsibility under the federal Clean Water Act (33 U.S.C. §11251–1357) to preserve and maintain the chemical, physical and biological integrity of the State's waters and to protect water quality and the beneficial uses of stream reaches consistent with Section 401 of the federal Clean Water Act, the Regional Water Quality Control Board Basin Plans, State Water Board regulations, the California Environmental Quality Act, and any other applicable state law.

3.0 Study Goals *(See RP Comment 2)*

The goal of this study is to summarize relevant available information regarding in-river and out-of-basin factors affecting Chinook salmon and *O. mykiss* production in the Tuolumne River. This synthesis will update conceptual model(s) of Chinook salmon and *O. mykiss* life history in the lower Tuolumne River to reflect the results of post-1995 FERC Settlement Agreement ("FSA") monitoring and other Tuolumne River studies, changes in Tuolumne River conditions since 1995 (e.g., from the 1997 flood), as well as recent advances in the understanding of Central Valley salmonid populations (e.g., genetic structure, hatchery influences, ocean conditions, etc.). Objectives in meeting this goal include:

- collect and summarize available existing data on Chinook salmon and *O. mykiss* to characterize the watershed, Project operations and issues affecting salmonid populations,
- develop hypotheses to understand potential impacts of contributing factors affecting salmonid populations, and
- inform and contribute to development/revision and parameterization of numerical in-river salmon population models.

Specific data compiled from this study will be used in the development of conceptual and quantitative population models as part of interrelated relicensing studies, including the *Tuolumne River Chinook Salmon Population Model* (Study Plan W&AR-6) and the *O. mykiss Population Study* (Study Plan W&AR-10). Results from these interrelated studies would also inform this study.

4.0 Existing Information and Need for Additional Information

Chinook salmon life history has been extensively studied under Article 37 of the original (1964) FERC license of the Don Pedro Project (P-2299), subsequent amendments to Article 37, as well as a 10-year monitoring program developed under Article 58 of the current (1996) license for the Project. Review of Chinook salmon run estimates since 1960 and the decades following completion of the New Don Pedro Project in 1971 indicates that similar cyclical patterns of high and low spawning returns have occurred in the lower Tuolumne River and the other San Joaquin Basin tributaries both before and after 1971. This pattern has been shown to be correlated with large variations in San Joaquin Basin outflow corresponding to drier and wetter water year types (TID/MID 2005; Mesick et al. 2008). However, estimates of Chinook salmon spawning escapement in the Tuolumne River since implementation of the 1996 Article 37 flow schedule have been variable with both high and low escapements following high flow years, so other factors are known to have significant effects on the salmon population. As an example, the Pacific salmon fishery collapse during the past decade has been attributed to deterioration in ocean conditions (NMFS 2008) and highlights the importance of understanding out-of-basin habitat conditions and contributing factors unrelated to Project operations.

As summarized in the Pre-Application Document (PAD), observations of *O. mykiss* have been recorded in the Tuolumne River since 1981 in various river monitoring programs. In-river conditions potentially affecting juvenile rearing and outmigrant life stages include flow-related effects on available habitat area (e.g., TID/MID 1992, Appendices 4 and 5; USFWS 1995) and water temperature (TID/MID 1992, Appendix 19; RMA 2008). The Districts are currently conducting updated Instream Flow Incremental Methodology studies to evaluate suitable steelhead/*O. mykiss* habitat area as a function of flow.

The Districts, as well as state and federal resource agencies, have identified several factors that may affect juvenile Chinook salmon and *O. mykiss* production and survival in the Tuolumne River. However, compilation of the findings of prior assessments into a comprehensive synthesis and integration of existing information, as proposed in this study plan, has not been performed.

5.0 Study Methods

Because of the large amount of information available from previously conducted studies and ongoing data collection and monitoring activities, additional field-based data collection is not needed as part of this study.

5.1 Study Area

The study area includes the Tuolumne River from the La Grange Dam (River Mile 52) downstream to the confluence with the San Joaquin River (River Mile 0).

5.2 General Concepts

The following general concepts apply to the study:

- The goal of this review is to help readers make sense of a wide and complex set of studies through a focused examination of the available literature.
- The review synthesizes *findings* specific to the study area or topic.
- Primary sources are preferred and secondary sources are rarely cited. If a secondary or tertiary source is cited, it is clearly identified as such.

5.3 Study Methods (See RP Comment 3)

Step 1 – Compile Data from Previously Conducted Studies. Although a large body of existing information has been previously summarized in the PAD, specific information needed to inform quantitative assessments as well as to inform future Project license requirements will be synthesized as part of this study. Information from previously conducted monitoring of Chinook salmon populations in the lower Tuolumne River will be supplemented with compilations of other relevant biologic, hydrologic, physical habitat, and water quality data information. A preliminary list of existing information included in the PAD will be provided to RPs for review and updated as part of this Step. This information will be updated in advance of a workshop (Section 6.0), with an opportunity for Relicensing Participants to provide additional relevant information following the workshop. The highest priority will be given to data and reports specific to the lower Tuolumne River, then to data and reports related to the San Joaquin and its major tributaries. Information from broader sources may be used to address specific data or information gaps identified as part of this process.

Step 2 – Perform Analysis. The proposed study will use existing information that is suitable to develop life-history-based conceptual models of linkages between land and water use, watershed processes, aquatic and riparian habitat in the Tuolumne River and Delta, hatchery influences, ocean conditions, and population responses of Chinook salmon and *O. mykiss*. For example, a large body of information from previous FERC studies has been summarized in the PAD, including the geomorphic process-based Tuolumne River Restoration Plan (McBain & Trush 2000). The *AFRP/CALFED Adaptive Management Forum: Tuolumne River Restoration Summary Report* (Stillwater Sciences 2001) summarizes much of this information collected through the year 2000 and proposes a number of conceptual models of factors affecting Chinook salmon life history. An example of an overall life-history model of Chinook salmon adapted from this report is presented in Figure 5.3-1 ~~below~~ showing a range of potential factors affecting each life stage.

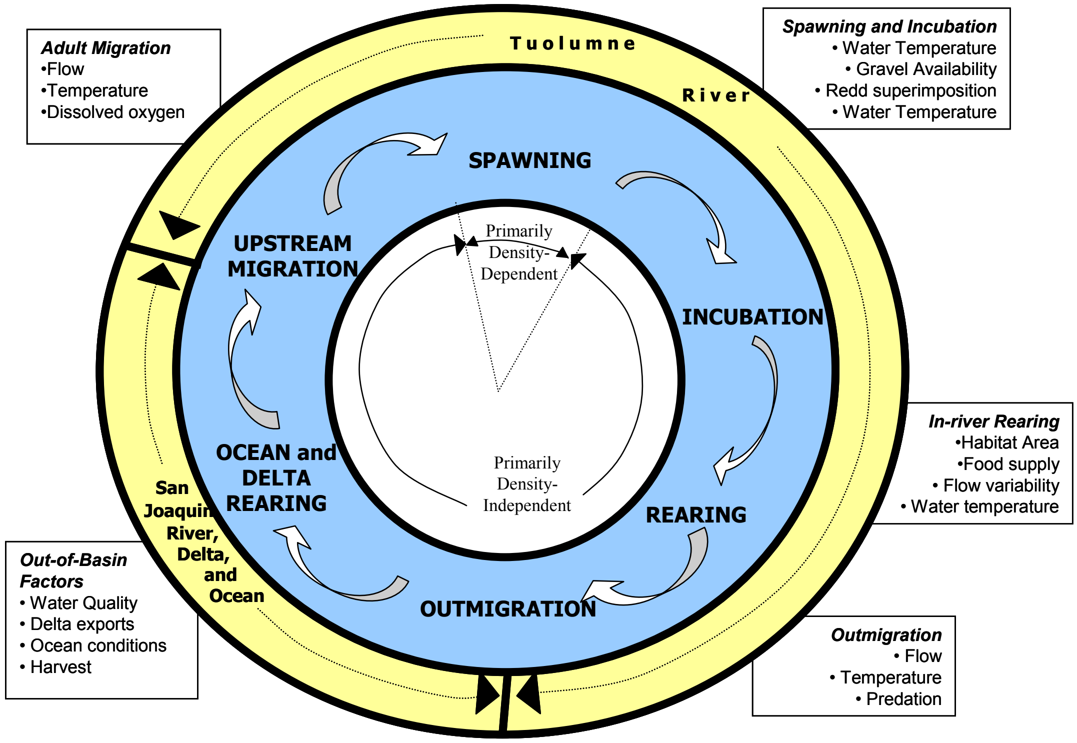

Figure 5.3-1. Example of model of factors affecting Chinook salmon population abundance in the Tuolumne River (adapted from Stillwater Sciences 2001).

Hypotheses about those in-river factors thought to be of greatest importance to salmonid population levels in the basin will be evaluated with existing data and literature and to provide the foundation for quantitative models. Review and synthesis of available data will provide the context for rejecting, accepting, or refining hypotheses and will improve understanding of key uncertainties affecting any conclusions drawn from this study. A workshop will be held with Relicensing Participants (See Section 6.0) to discuss and review preliminary conceptual models regarding factors affecting various life stages of Chinook salmon and *O. mykiss.*

At the conclusion of this step, the refined conceptual models will be used to ~~This study will determine and~~ document the most appropriate data for the ~~to be used to~~ parameterization of ~~e~~ any habitat based, individual based, or multi-stage population dynamics models that may be employed as part of interrelated studies of salmon population dynamics, including the *Tuolumne River Chinook Salmon Population Model* (Study Plan W&AR-6) and the *O. mykiss Population Study* (Study Plan W&AR-10).

Step 3 – Prepare Report. The Districts will prepare a report that includes the following sections: (1) Study Goals and Objectives; (2) Methods and Analysis; (3) Results; (4) Discussion; and (5) Conclusions. The report for this study will be a synthesis of previous and ongoing data collection. The study products will include a list of key hypotheses, a summary of the data supporting or refuting each hypothesis, the relative importance of various factors potentially limiting salmonid populations, and an indication of the level of uncertainty associated with these conclusions.

6.0 Consultation During Study Implementation

The Districts will meet with interested Relicensing Participants in two separate workshops (See Section 7.0 for schedule). The first workshop will be held to provide an opportunity for Relicensing Participants' independent information review and to suggest data and literature sources that may be relevant as part of the initial data compilation (Step 1). Following the development of preliminary conceptual models regarding factors affecting various life stages of Chinook salmon and *O. mykiss*, (Step 2) a second workshop will be held to review, refine, and potentially propose alternative conceptual models that may not have been considered in the development of the preliminary models. Information proposed and submitted by Relicensing Participants as part of the scheduled workshops will be reviewed with documentation provided as an Appendix to the Final Report as to the rationale for inclusion or exclusion of the supplied information.

7.0 Schedule

The Districts anticipate the schedule to complete the study proposal as follows assuming FERC issues its Study Plan Determination by December 31, 2011 and the study is not disputed by a mandatory conditioning agency:

- Existing Data Compilation (Step 1) .... January – April~~March~~ 2012
- Workshop No. 1 – Literature/Data Review .... March 2012
- Analysis and Synthesis (Step 2) .... April~~March~~ – August 2012
- Workshop No. 2 – Conceptual Model Review .... August 2012
- Report Preparation (Step 3) .... August – December 2012
- Report Issuance .... January 2013

~~7~~8.0 Consistency of Methodology with Generally Accepted Scientific Practices

The methods presented in this study plan are consistent with other generally accepted scientific study methods concerning anadromous salmonid population assessments, including those conducted by the state and federal resource agencies.

~~8~~9.0 Deliverables

The Districts will prepare a final study report, which will document the methodology and results of the study~~.~~, and include the results of the Workshops discussed in Section 6.0 above.

~~9~~10.0 Level of Effort and Cost

Study Plan implementation cost will be provided in the Revised Study Plan.

~~10~~11.0 References

McBain & Trush. 2000. Habitat Restoration Plan for the lower Tuolumne River Corridor. Final report. Prepared for Tuolumne River Technical Advisory Committee (Don Pedro Project, FERC License No. 2299) by McBain and Trush, Arcata, California.

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_____. 2001. Final restoration plan for the Anadromous Fish Restoration Program. A Plan to increase Natural Production of Anadromous Fish in the Central Valley of California. Report of the Anadromous Fish Restoration Program Core Group, Central Valley Project Improvement Act to the Secretary of the Interior. Stockton, CA.

STUDY PLAN W&AR-6

TURLOCK IRRIGATION DISTRICT AND MODESTO IRRIGATION DISTRICT

DON PEDRO PROJECT FERC NO. 2299

Tuolumne River Chinook Salmon Population Model Study Plan

RELICENSING PARTICIPANTS' COMMENTS

Comment No.	RWG Meeting Date	Comment	Response
General Comments:			
1	08/23/2011	A suggestion was made to combine W&AR-5 and W&AR-6 because they seemed to be interrelated.	After considering this idea, the Districts think it best to keep the studies separate because they deal with very different geographic scales. This study is focused on empirical data from the lower Tuolumne; W&AR-6 deals with the entire life cycle of the species.
Section-Specific Comments:			
2	08/23/2011	**Section 3.0 Study Goals:** It was suggested that this study plan would benefit from a more detailed description of the consultation process during study plan implementation.	See new Section 6.0.
3	08/23/2011	**Section 4.0 Existing Information and Need for Additional Information:** It was recommended that the study plan indicate that the study would consider models being developed by others in parallel regulatory processes being conducted in California; and, at a minimum, the study should acknowledge these other efforts.	See Section 5.3.
4	09/15/2011	**Section 5.3:** Add comment to Step 2 clarifying not calibrating model to escapement but validating juvenile production estimates using rotary screw trap data.	See Section 5.3.
5	09/15/2011	**Section 5.3:** expand on this narrative to reflect scenario development.	See Section 5.3.
6	09/15/2011	**Section 7.0:** Expand schedule to W&AR 5 and other 2012 studies.	See Section 7.0.

STUDY PLAN W&AR-6

**TURLOCK IRRIGATION DISTRICT
AND
MODESTO IRRIGATION DISTRICT**

**DON PEDRO PROJECT
FERC NO. 2299**

Tuolumne River Chinook Salmon Population Model Study Plan

~~**July 2011**~~

Related Study Requests: NMFS-08

(See RP General Comment 1)

1.0 Project Nexus

The continued operation and maintenance of the Don Pedro Project (Project) may contribute to cumulative effects on habitat availability and production of in-river life stages of Chinook salmon (*Oncorhynchus tshawytscha*) in the lower Tuolumne River.

2.0 Resource Agency Management Goals

The Districts believe that four agencies have resource management goals related to Chinook salmon and/or their habitat: (1) U.S. Department of Interior (USDOI), Fish and Wildlife Service (USFWS); (2) U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS); (3) California Department of Fish and Game (CDFG); and (4) State Water Resources Control Board, Division of Water Rights (SWRCB).

A goal of the USFWS (2001) Anadromous Fish Restoration Program, as stated in Section 3406(b)(1) of the Central Valley Project Improvement Act, is to double the long-term production of anadromous fish in California's Central Valley rivers and streams. Objectives in meeting this long-term goal include: (1) improve habitat for all life stages of anadromous fish through provision of flows of suitable quality, quantity, and timing, and improved physical habitat; (2) improve survival rates by reducing or eliminating entrainment of juveniles at diversions; (3) improve the opportunity for adult fish to reach spawning habitats in a timely manner; (4) collect fish population, health, and habitat data to facilitate evaluation of restoration actions; (5) integrate habitat restoration efforts with harvest and hatchery management; and (6) involve partners in the implementation and evaluation of restoration actions.

NMFS has developed Resource Management Goals and Objectives for species listed under the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §1801 et seq.) and the Endangered Species Act (ESA) (16 U.S.C. §1531 et seq.), as well as anadromous species that are not currently listed but may require listing in the future. NMFS' (2009) Public Draft Recovery

Plan for Sacramento River Winter-run Chinook salmon, Central Valley Spring-run Chinook salmon, and Central Valley steelhead (Draft Recovery Plan) outlines the framework for the recovery of ESA-listed species and populations in California's Central Valley. For the Tuolumne River, the relevant goals are to enhance the Essential Fish Habitat downstream of the Project and achieve a viable population of Central Valley fall/late fall-run Chinook salmon.

CDFG's mission is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. CDFG's resource management goals, as summarized in restoration planning documents such as "Restoring Central Valley Streams: A Plan for Action" (Reynolds et al. 1993), are to restore and protect California's aquatic ecosystems that support fish and wildlife, and to protect threatened and endangered species under California Fish and Game Code (Sections 6920–6924).

SWRCB has responsibility under the federal Clean Water Act (33 U.S.C. §11251–1357) to preserve and maintain the chemical, physical and biological integrity of the State's waters and to protect water quality and the beneficial uses of stream reaches consistent with Section 401 of the federal Clean Water Act, the Regional Water Quality Control Board Basin Plans, State Water Board regulations, the California Environmental Quality Act, and any other applicable state law.

3.0 Study Goals *(See RP Comment 2)*

The Chinook salmon population model developed through this study will be used to examine the relative influences of various factors on the life-stage specific production of Chinook salmon in the Tuolumne River, identify critical life-stages that may represent a life-history "bottleneck", and compare relative changes in population size between alternative management scenarios. Specific information obtained by this study will be used to assess the extent to which the abundance of the Chinook salmon populations in the Tuolumne River is affected by in-river factors.

4.0 Existing Information and Need For Additional Information *(See RP Comment 3)*

A number of attempts have been made in the past two decades to assess the relative importance of factors influencing the Chinook salmon population abundance in the Tuolumne River and larger San Joaquin River basin. Four separate population models have been developed to provide a framework for investigating the relative influences of various factors on various Chinook salmon life stages, to identify critical life-stages that may be limiting overall population sizes, and to compare relative changes in population size between alternative resource management scenarios.

- The EACH population model (TID/MID 1992b, Appendix 1) is a compartment-based deterministic simulation model, with a time-step of one week, that represents the dynamics of populations from each of the three salmon-bearing tributaries to the San Joaquin River using a set of finite difference equations that describe changes in the numbers of Chinook salmon at various geographical locations and developmental stages as functions of these numbers and environmental parameters (represented by flows in the Tuolumne River and Delta exports). The model was recently updated to reflect hydrology from 1973–2007, but the model parameters have not been refitted using recent data. As with the Stock-Recruit Model, use of the EACH model would require refitting of several model parameters and appropriate scaling of input variables to represent changes in Tuolumne River flow or habitat availability.

The Oak Ridge Chinook Salmon model (ORCM) (Jager et al. 1997, Jager 2000, Jager and Rose 2003, Jager and Sale 2006) is also a compartment-based model originally developed in the 1990s by staff at the Oak Ridge National Laboratory (ORNL) and most aspects of the model have remained unchanged since the model was first documented by Jaeger et al. (1997). The ORCM model is spatially and temporally explicit (at a scale of one-mile river reaches and one-day time steps) and simulates the in-river life history of Chinook salmon by tracking growth, development, migration, and survival of individual fish. Jager and Sale (2006) validated the model outputs by comparisons of the magnitude and timing of juvenile outmigration, as estimated from recent rotary screw trap (RST) data, with those predicted by the ORCM model. Overall, the model predicts outmigration timing very well, but large differences between modeled and observed smolt productivity were apparent in some years. Re-examination of the underlying habitat (i.e., weighted usable area) relationships for individual life stages may improve the model performance, and the mechanistic basis of the ORCM allows the model to be used to exploring management alternatives not closely related to flow, such as changes in habitat area from gravel augmentation, floodplain re-contouring, etc.

- The Stock-Recruit model (TID/MID 1992a, Appendix 2; TID/MID 1997, Report 96-5) uses statistical analysis of the time-series of historical Chinook salmon escapements to the San Joaquin basin in relation to Vernalis flow and Delta exports. The model attempts to capture how density-independent mortality, as influenced by basin-wide spring outflow, combines with density-dependent mortality to affect the rate and magnitude of changes in the San Joaquin system's Chinook salmon population. The model parameters were recently recalibrated for escapement and hydrology data through 2006, and validation testing showed divergence in the modeled and observed escapements during 2005–2006, possibly attributable to changes in ocean conditions during this period (NMFS 2008). These discrepancies suggest some model assumptions regarding stable conditions for adult salmon vary from year to year as a result of ocean conditions. Use of this model would require the refitting of several model parameters and appropriate scaling of input variables to represent changes in Tuolumne River flow or habitat availability.

- CDFG's San Joaquin River Salmon Population Model (CDFG 2005) is a deterministic model comprising linear-regression based relationships between escapement (spawner abundance) and springtime Vernalis flow to predict future smolt and adult production. Although CDFG's model (2005, revised 2009) has been cited in Agency comments on the Don Pedro Project and other proceedings regarding San Joaquin River basin salmon populations, Pyper et al. (2006) and CALFED peer reviewers identified substantial flaws in the initial model and provided several modification recommendations. In response, CDFG issued a revised version (CDFG 2009) that only contains partial revisions and has not yet been peer reviewed. Based on an assessment by Lorden and Bartroff (2010), the current model revisions remain inadequate to address many of the original problems that were identified. Therefore, this model is not functional and is not considered further in this document.

It is apparent based upon the performance of the functional models above that: (1) variations in escapements are not well captured by existing models in all years, (2) a number of out-of-basin factors affect salmon populations in the Tuolumne River, and (3) the effects of Project operations are not easily separable from other factors affecting Chinook salmon in the Tuolumne River. As a result, there is a need for an up-to-date population model that evaluates factors affecting life-stage production and overall population levels. The models described above represent a variety of population modeling paradigms, from compartment based models such as ORCM and EACH that require a great deal of information regarding specific mechanisms to almost purely statistical models such as the Stock-Recruit model) that describes how individuals are distributed across times and locations at a particular life-stage. Spatial scales vary from one-mile reaches of the Tuolumne River (ORCM), to major habitat divisions such as the ocean, bay, delta, and primary river systems (EACH), to a single amorphous unit (the Stock Recruit model). The EACH and ORCM models are constructed with explicit time steps (7 days and a day, respectively), whereas the other two are primarily of stock-production form, stepping directly from life-stage to life-stage. In this study plan, we propose to develop a new population model using a stock-production approach, as described below.

5.0 Study Methods

The Tuolumne River Chinook salmon population modeling study will rely upon existing literature and information, including previously conducted Tuolumne River studies, as well as interrelated relicensing studies in the development of both conceptual and quantitative population models to examine the relative importance of in-river factors affecting Chinook salmon production.

5.1 Study Area

The study area includes the Tuolumne River from the La Grange Dam (River Mile [RM] 52) downstream to the location of the rotary screw trap at Grayson River Ranch (RM 5) near the San Joaquin River confluence.

5.2 General Concepts

The following general concepts apply to the study:

- Cumulative effects are difficult to assess individually unless cause-effect relationships can be parsed out.
- The model focuses on variables that can be influenced by both Project and non-Project influences on the resource(s).
- Project-specific and resource-specific data will be used to calibrate and validate the model whenever possible.
- Model outputs consist of representation of the modeled response variable under an existing baseline or initial condition, as well as predictions under one or more scenarios.
- Although model uncertainties will be identified as part of this study, modeling predictions may show statistically significant differences from baseline conditions that do not display

an ecologically or biologically significant difference. Should this occur, the criteria and rationale for biological significance will be documented along with the results.

5.3 Study Methods

Step 1 – Develop Conceptual Model from Previously Conducted Studies. Information from previously conducted studies, as well as the concurrent *Salmonid Populations Integration and Synthesis study* (Study Plan W&AR-5), will be summarized. Using this information, conceptual models of the potential density-dependent and density-independent factors affecting each life-stage of Chinook salmon in the Tuolumne River will be developed and refined. Although review of out-of-basin factors may be included, detailed modeling of historical escapements resulting from variations in these factors (e.g., variations in Delta barrier and export facility operations, ocean productivity, ocean and inland harvest, etc.) is not anticipated. A workshop (See Section 6.0) will be held to review and discuss conceptual models and relevant factors to be included in the development of a numerical population model in Step 2.

Step 2 – Develop Quantitative Population Model. Using conceptual models developed in Step 1, a quantitative population model will be developed to provide a framework to examine the relative influences of in-river factors upon life-stage production or population levels of Chinook salmon. Current population modeling efforts being undertaken in the Delta and San Joaquin River basin tributaries will be identified and reviewed for consistency with the Districts' population model to the extent reasonable and practicable in the Districts' opinion. However, the ~~The~~ proposed approach is a multi-stage stock production model (Baker 2009) in which starting numbers of a particular life-stage (stock) are mathematically modeled to predict how the numbers change as the cohort goes through subsequent life stages. Individual life stage to life stage steps will be modeled using independent submodels, which can be implemented with methodologies ranging from common stock production forms (e.g., Beverton-Holt). This approach allows model structure to be initially developed without detailed consideration of the underlying mechanisms, but also allows the introduction of one or more mechanisms affecting life-stage to life-stage survival. A redd superimposition model may be used for the step from female spawners to deposited eggs if spawning gravel availability or actual redd superimposition observations suggest this is occurring. A linear model may be used to reflect density-independent mortality (e.g., the step from eggs to emergent fry, in which mortality is not affected by density). Lastly, the Beverton-Holt (1957) and "hockey stick" models (Barrowman and Myers 2000) are typically used for density-dependent[1] interactions (e.g., the life-step from fry to juvenile in circumstances when available habitat limits the population). More elaborate compartment or individual-based models may be introduced as sub-models to reflect variations in habitat conditions due to seasonal shifts in river flow, water temperature, predation, or other factors.

The modeled life-stage structure, the factors selected and default values for parameters and stock production forms will be determined from Tuolumne River data and previously conducted studies, literature values, and agency consultation. For example, a carrying capacity (K) is generally specified for all density-dependent stock production relationships. Information from

[1] Density-dependence in stock-production relationships occurs whenever food or space limitations cause the life-stage specific survival or growth to be related to the numbers of individuals present.

prior Tuolumne River Chinook salmon seine and snorkeling studies will be used to provide current estimates of rearing densities by habitat type (e.g., riffle, pool head, run, etc.) and literature review will be used to establish maximum densities. To determine carrying capacity, maximum densities within particular habitat types will be combined with up-to-date estimates of habitat availability developed from the ongoing *Tuolumne River Instream Flow Study*[2] as well as the following interrelated studies being conducted as part of relicensing:

- Spawning Gravel Study (Study Plan W&AR-4)
- Salmonid Redd Mapping Study (Study Plan W&AR-8)
- Chinook Salmon Fry Study (Study Plan W&AR-9)
- Predation Study (Study Plan W&AR-7)
- Temperature Criteria Assessment (Study Plan W&AR-14).

In order to parameterize the model, estimates of life-stage specific survival (*r*) will also be made from studies and long-term monitoring summarized as part of the *Salmonid Populations Information Integration and Synthesis Study* (Study Plan W&AR-5 as well as literature values. For example, prior studies of egg survival-to-emergence, predation, and outmigrant survival summarized in the Pre-Application Document provide life history parameter estimates specific to the Tuolumne River. Model parameterization will also be compared to literature values. It should be noted that although the model will not be calibrated to the existing escapement record, limited calibration -and validation will be carried out by comparisons of modeling results of fry and/or smolt production with annual production estimates available from season-long RST sampling conducted since 1998 near Waterford (RM 30) and the Grayson River Ranch (RM 5) (e.g., TID/MID 2011).

Step 3 – Evaluation of Factors Affecting Chinook Salmon Production. To determine the life-stages and model parameters that most affect Chinook salmon production, a sensitivity analysis will be conducted of the parameters and values in the model. The sensitivity analysis will evaluate the equilibrium juvenile and smolt production using initial parameter values established in Step 2, followed by varying the initial parameter values by:

- Decreasing initial value by 50%
- Decreasing initial value by 25%
- Increasing initial value by 33%
- Increasing initial value by 100%

For each change in value, the model will be used to calculate the equilibrium population size, holding all other values constant. For sensitive parameters, additional scrutiny will be focused upon the source of data, and the potential for the Project to influence those parameters. It should be noted, however, that sensitivity analyses of this type cannot explore the potential interactions of multiple input values that are simultaneously increased or decreased.

[2] The Tuolumne River Instream Flow Study is currently being conducted in accordance with the May 12, 2010 FERC Order Modifying and Approving Instream Flow and Water Temperature Model Study Plans for the Don Pedro Project (Project No. 2299-072), as modified by Ordering Paragraph (A) of the July 21, 2010 FERC Order.

Step 4 – Evaluation of Relative Salmon Production under Current and Potential Future Project Operations. Scenarios representing current habitat conditions for ~~An evaluation of~~ Chinook salmon ~~production~~ under ~~the~~ current Project operations as well as up to three additional conditions will be developed in consultation with Relicensing Participants as part of Workshop No. 2 (See Section 6.0). For example, scenarios ~~FERC flow schedule will be developed to~~ representing the habitat conditions ~~magnitude and timing of Tuolumne River flows~~ under the current FERC flow schedule could be developed, as well as those under alternative flow and non-flow potential habitat enhancements~~s across representative water year types~~.

Step 5 – Prepare Report. The Districts will prepare a report that includes the following sections: (1) Study Goals, (2) Methods and Analysis, (3) Results, (4) Discussion, and (5) Conclusions. A Year 1 report will be prepared to document study progress and any outstanding issues in the model development and parameterization.

6.0. Consultation During Study Implementation

The study includes study-specific consultation in Steps 1 and 2 above. The Districts will invite interested Relicensing Participants to a collaborative workshop to review and discuss conceptual models and to determine -relevant factors to be included in the development of a numerical population model (Step 1). As part of the population model development (Step 2), an additional workshop will be held to review and discuss the selected modeling approach, to review model parameter selection, and to develop up to four scenarios for evaluation.

~~6~~7.0 Schedule

The Districts anticipate the schedule to complete the study proposal as follows assuming FERC issues its Study Plan Determination by December 31, 2011 and the study is not disputed by a mandatory conditioning agency:

- Conceptual Model Development (Step 1) ....January 2012 – September ~~March~~ 2012
- Workshop No. 1 – Conceptual Models.. September 2012
- Population Model Development (Step 2) .... August ~~March~~ 2012 – ~~September~~ March 2012
- ~~Modeling~~ Workshop No. 2 – ~~(~~Modeling Approach~~Step 2)~~ .... November ~~May~~ 2012
- ~~■~~ Year 1 ~~Modeling Sensitivity and Evaluation (Steps 2, 3, and 4). June 2012 – September 2012~~
- Report Study Repor~~Preparation~~t ....~~September 2012 December~~January -201~~2~~3
- Sensitivity Analyses and Scenario Evaluation (Step 3 and 4)..........January 2013 – June 2013
- Report Issuance ....December ~~January~~ 201~~3~~3

~~7~~8.0 Consistency of Methodology with Generally Accepted Scientific Practices

Population modeling is supported by a large body of literature spanning several decades (e.g., Paulik 1973, Moussalli and Hilborn 1986, Sharma et al. 2005). Population models are commonly employed in hydroelectric relicensing projects to predict relative changes in salmonids population levels in response to changing variables.

~~8~~9.0 Deliverables

In addition to the completed model, the Districts will prepare a report, which will document the methodology and results of the study.

~~9~~10.0 Level of Effort and Cost

Study Plan implementation cost will be provided in the Revised Study Plan.

11~~0~~.0 References

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From: Staples, Rose
Sent: Wednesday, September 28, 2011 5:04 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Subject: Don Pedro October RWG Meetings AGENDA - October 4, 5 and 12

Attachments: Don Pedro Oct 2011 RWG MTGS AGENDA 110928.pdf

Please find attached the AGENDA for the Don Pedro RWG meetings and/or conference calls on October 4, October 5, and October 12:

October 4

9 am – 4 pm Water-Aquatic RWG Meeting, MID Offices, Modesto

9 am Terrestrial FIELD Meeting, gathering at DPRA Visitor Center

October 5

9 am – 12:30 pm Recreation RWG CONFERENCE CALL

October 12

1:30 – 3:30 pm Cultural RWG CONFERENCE CALL

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Don Pedro Relicensing
Resource Work Group
Meetings AGENDA
October 4, 5 and 12, 2011
Modesto CA

Tuesday, October 4 – Water & Aquatic Resource Work Group Meeting: 9:00 a.m. to 4:00 p.m. – MID Offices in Modesto. In Person or Via Phone (Call-In Number 866-994-6437, Conf Code 5424697994) with LIVE MEETING connection available (link will be sent just prior to meeting).

9:00 a.m. - 12:00 p.m.	Review and Discussion of Revisions to Districts' Proposed Study Plans (W&AR-1 through W&AR-15--all of these study plans have been reviewed at least once)
12:00 p.m. - 1:15 p.m.	Lunch (on your own)
1:15 p.m. - 3:00 p.m.	Continued Review and Discussion
3:00 p.m. - 3:15 p.m.	Break
3:15 p.m. - 4:30 p.m.	Continued Review and Discussion
4:30 p.m. - 5:00 p.m.	Next Steps

Tuesday, October 4 – Terrestrial Resource Work Group FIELD Meeting to evaluate the BLM's proposed wetland assessment methodologies and to discuss proposed study areas for the botanical studies. The Districts will be providing a boat. Please RSVP to carin.loy@hdrinc.com or rose.staples@hdrinc by September 30 to confirm attendance. Everyone participating will be meeting at 9:00 a.m. at the DPRA Visitor Center, 10200 Bonds Flat Road, La Grange. Please bring lunch, water, and sun protection.

Wednesday, October 5 - Recreation Resource Work Group CONFERENCE CALL 9:00 a.m. to 12:30 p.m. Call-In Number 866-994-6437, Conference Code 5424697994. Live Meeting will NOT be available.

9:00 a.m. - 10:30 a.m.	Review and Discussion of Revisions to Districts' Proposed Recreation Study Plans
10:30 a.m. - 10:45 a.m.	Break
10:45 a.m. - 11:30 a.m.	Continued Review and Discussion
11:30 a.m. - 12:30 p.m.	Next Steps

Wednesday, October 12 – Cultural Resource Work Group CONFERENCE CALL. 1:30 to 3:30 p.m. Call-in Number 866-994-6437, Conference Code 6164399). Live Meeting will NOT be available.

1:30 p.m. - 3:15 p.m.	Review and Discussion of Revisions to Districts' Proposed Cultural Resource Study Plans
3:15 p.m. - 3:30 p.m.	Next Steps

From: Staples, Rose
Sent: Sunday, October 02, 2011 8:05 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan - CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Subject: Study Plan Revisions - Newsletter Issue 2 - Live Meeting

NEWEST STUDY PLAN REVISIONS

We are working on creating a new subdirectory--RWG STUDY PLAN DEVELOPMENT-OCT—and hope to be able to move the newest study plan revisions into this separate folder for your use at the October RWG Meeting/Conference calls. In the meantime, you will find the newest study plan revisions in with the older versions under DOCUMENTS/STUDIES/RWG STUDY PLAN DEVELOPMENT. To assist you in locating the correct version, I have created the table below, noting the "D-{date}" in the file name containing the newest version. If you are unsure about any of the plans, please do email or call me.

RELICENSING NEWSLETTER – ISSUE #2 – Published September 2011

Issue No. 2 of the Don Pedro Relicensing Newsletter has been published and a copy of the document is located in the INTRODUCTION/ANNOUNCEMENTS section of the website.

LIVE MEETING LINK FOR THE OCT 4 WATER-AQUATIC RWG MEETING will be sent Monday, October 3. If you haven't used LIVE MEETING before, be sure to install it before you try to connect in to the meeting.

Your LIVE MEETING connection for the October 4 W&AR RWG Meeting will be emailed to you on Monday. If you plan to use the LIVE MEETING connection (to see the documents being projected onto the meeting screen) and you haven't used it before, please note that at the bottom of your LIVE MEETING email coming tomorrow there are instructions and a link to setting up LIVE MEETING, which you should do at least an hour before you try to connect into the actual meeting.

Don Pedro Study Plans		For Oct RWG Mtg, Use as Reference the Website Version Ending in:
CR-1	Historic Properties	D-110929
CR-2	Native American Traditional Cultural Properties	D-110930
RR-1	Recreation Facility Condition, Public Accessibility, and Recreation Use Assessment	D-110930
RR-2	Whitewater Boating Take Out Improvement Feasibility	D-110930
RR-3	Lower Tuolumne Boatable Flow	D-110930
RR-4	Visual Quality	D-110930
TR-1	Special-Status Plants	D-110930
TR-2	ESA- & CESA-Listed Plants	D-110908
TR-3	Wetlands Habitats Associated with Don Pedro Reservoir	D-110930
TR-4	Noxious Weed Survey	D-110908
TR-5	ESA-Listed Wildlife - Valley Elderberry Longhorn Beetle	D-110908
TR-6	Special-Status Amphibians and Aquatic Reptiles	D-110908
TR-7	ESA-Listed Amphibians - California Red-Legged Frog	D-110908
TR-8	ESA-Listed Amphibians - California Tiger Salamander	D-110908
TR-9	Special-Status Wildlife - Bats	D-110908
W&AR-1	Water Quality Assessment	D-110725
W&AR-2	Project Operations/Water Balance Model	D-110930
W&AR-3	Reservoir Temperature Model	D-110927
W&AR-4	Spawning Gravel	D-110930
W&AR-5	Salmonid Populations Integration & Synthesis	D-110927

W&AR-6	Tuolumne River Chinook Salmon Population Model	D-110927
W&AR-7	Predation Study	D-110930
W&AR-8	Salmonid Redd Mapping	D-110930
W&AR-9	Chinook Salmon Fry	D-110930
W&AR-10	*Oncorhynchus mykiss* Population Study	D-110930
W&AR-11	Chinook Salmon Otolith	D-110930
W&AR-12	*Oncorhynchus mykiss* Habitat Survey	D-110725
W&AR-13	Fish Assemblage and Population Between Don Pedro Dam & La Grange Dam	D-110930
W&AR-14	Temperature Criteria Assessment (Chinook & *Oncorhynchus mykiss*)	D-110930
W&AR-15	Socioeconomics	D-111002

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Volume 1 | Issue 2

Don Pedro

A newsletter about the relicensing of the Don Pedro Project

Study Plan development taking place

Following a pair of scoping meetings and plenty of discussions with relicensing participants, the Modesto and Turlock irrigation districts filed a Proposed Study Plan (PSP) on July 25 as part of the effort to relicense the Don Pedro Project.

The PSP outlines 30 studies proposed by the districts resulting from 130 study requests, each of which were carefully considered.

The filing of the PSP is just one of many steps in the arduous but necessary process to renew the license of the Don Pedro Project. The current license expires in 2016.

INSIDE: Some data collection is taking place prior to the Final Study Plan. Take a look inside to learn more.

Also part of the relicensing process, the districts met with interested parties Aug. 23-24 in Modesto to discuss and review various aspects of the study plan.

In the coming months, the districts will work with relicensing participants to develop a Revised Study Plan to submit to FERC for approval in late fall of 2011. Once approved, likely in late December 2011, the stage will be set for studies to begin the next part of the relicensing process. Approved studies will be conducted during much of 2012 and 2013.

The districts look forward to continuing their work with federal and state resource agencies, Indian tribes, FERC staff, local governmental authorities, non-governmental organizations and members of the public in finalizing the study plan for the Project's relicensing.

The Relicensing Process

The relicensing of the Don Pedro Project formally began in 2011. Below are some of the major stages of the process.

1. Districts filed PAD and Notice of Intent in Feb. 2011.
2. FERC conducts scoping in Spring '11.
3. Interested parties discuss issues and develop study requests.
4. Districts file Proposed Study Plan (PSP) on 7/25/11 and undertake a series of meetings with relicensing participants to review and discuss the PSP.
5. FERC issues Study Plan Determination on 12/22/11.
6. Studies are conducted and Study Report issued for review and comment.
7. Applicant files draft and final license applications.
8. FERC issues new license with new terms and conditions in 2016.

For those interested in viewing the PSP, it is available online within the documents section located at www.donpedro-relicensing.com.

Throughout this process, the districts remain willing to meet with any group interested in the relicensing of the Don Pedro Project, and encourage active participation by anyone with an interest in the future allocation and distribution of the water of the Tuolumne River.

Important dates

Oct. 23
Participants file their comments on the districts' proposed studies

Nov. 22
Districts file Revised Study Plan with FERC and participants

Dec. 22
FERC issues Study Plan Determination

What's inside

Scoping meetings in Modesto (above) and Turlock attracted over a hundred people.

Scoping meetings conclude

Forums in Modesto, Turlock not lacking in public participation

More than 100 participants attended a pair of public scoping meetings hosted by the Federal Energy Regulatory Commission (FERC) on May 11 in Modesto and Turlock.

Both of the meetings were of the same format; a FERC presentation covering the relicensing process, followed by an informative presentation from TID and MID staff, culminating in a public comment period. In all, more than 80 members of the public voiced their views regarding the Don Pedro Project and its scope. Many others communicated their views to FERC in writing.

The purpose of the meetings, which were sponsored and facilitated by FERC, was to identify relevant issues of public interest involving the Don Pedro Project in relation to the National Environmental Policy Act.

The Modesto and Turlock irrigation districts are co-applicants to relicense the Don Pedro Project. The current license expires in 2016.

An integral part of the relicensing process, scoping meetings are designed for members of the public to have the opportunity to speak their concerns in a documented public forum. The scoping meetings were recorded by a stenographer and are part of the formal record of the FERC proceeding on the project.

Transcripts of the scoping meetings are available via the FERC eLibrary located online at **www.ferc.gov**.

Also at the meetings, FERC staff described the environmental review process, provided relevant information and answered procedural questions.

The information gathered at these scoping meetings proved helpful to the districts in the development of the Proposed Study Plan (PSP). Read this issue's cover story for more on the PSP.

Some river studies conducted proactively

While the process of developing final study plans is well underway, there's already plenty of data collection taking place around and within the Tuolumne River. Some of these efforts include:

- The collection of water temperature and dissolved oxygen data at the discharge from the Don Pedro Powerhouse.
- The districts have already established two meteorological stations in the vicinity of the project to obtain better data to support the development of a rigorous three-dimensional model of the temperatures in the Don Pedro Reservoir.
- Studies are being conducted in the lower Tuolumne River on the relationships between flow and habitat. A report is due to be completed early in 2012.

Studies involving water temperature and dissolved oxygen data at the discharge from the Don Pedro Powerhouse are being conducted. Here, the river is shown downstream of the powerhouse.

Scoping Document 2 issued by FERC

Based on verbal comments received by the Federal Energy Regulatory Commission (FERC) at its May 11, 2011 scoping meetings held in Turlock and Modesto, in addition to written comments received during the scoping process, FERC issued Scoping Document 2 (SD2) on July 25, 2011.

SD2 highlighted decisions made by FERC about the scope of the Don Pedro Project Among them:

- Several parties had requested that FERC make the La Grange project part of the Don Pedro Project. FERC rejected this request stating, "the Don Pedro Project is a complete unit of development, separate and distinct from La Grange."
- Some groups had indicated to FERC that the City and County of San Francisco should be made co-licensee of Don Pedro along with MID and TID. FERC indicated that this decision was beyond the scope of the SD2 and was a legal matter to be addressed by the FERC at its Commission level.
- FERC also determined that alternatives to be considered under National Environmental Policy Act (NEPA) that address the consumptive use of water in the Tuolumne River through construction of new structures or methods designed to alter or reduce consumptive use of water are alternative mitigation strategies that could not replace the Don Pedro project", and as such "these recommended alternatives do not satisfy the NEPA purpose and need for the proposed action and are not reasonable alternatives for the NEPA analysis."
- FERC decided that the districts should evaluate the potential feasibility of alternative takeout facilities at the Wards Ferry Bridge to accommodate white water rafting on the upstream Wild & Scenic Tuolumne River.

Relicensing website packed with information

Whether interested parties simply desire a little background of the Don Pedro Project or want to download detailed transcripts and documents, the **www.donpedro-relicensing.com** website is loaded with useful information.

In addition to being regularly updated with meeting times, agendas, documents, filings and other information, the site also describes the relicensing process, provides useful links and offers contact information.

The website serves as one of the primary communication outlets informing stakeholders of events and meetings that are part of the relicensing process.

A screenshot of www.donpedro-relicensing.com

Modesto Irrigation District

Water and Power

TID WATER & POWER

Serving Central California since 1887

From: Staples, Rose
Sent: Monday, October 03, 2011 3:40 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki - TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Subject: W-AR RWG Meeting Oct 5 LIVE MEETING Link and a change to the Study Plan Revisions Table

WATER & AQUATIC RWG LIVE MEETING INFORMATION and LINKS:

Carin Loy has invited you to attend an online meeting using Microsoft Office Live Meeting.

https://www.livemeeting.com/cc/hdrinc/join?id=5689K9&role=attend&pw=j%5B%25D%7Ck%216b

Meeting time: Oct 4, 2011 9:00 a.m. (The line will be open from 8:30 AM (PDT) on, though the meeting itself will not start until 9:00 a.m.)

AUDIO INFORMATION
Use call-in number: 866-994-6437, Conference Code 5424697994

FIRST-TIME USERS
To save time before the meeting, check your system to make sure it is ready to use Microsoft Office Live Meeting. http://go.microsoft.com/fwlink/?LinkId=90703

TROUBLESHOOTING
Unable to join the meeting? Follow these steps:

1. Copy this address and paste it into your web browser:
   https://www.livemeeting.com/cc/hdrinc/join
2. Copy and paste the required information:
   Meeting ID: 5689K9
   Entry Code: j[%D|k!6b
   Location: https://www.livemeeting.com/cc/hdrinc

If you still cannot enter the meeting, contact support:
http://r.office.microsoft.com/r/rlidLiveMeeting?p1=12&p2=en_US&p3=LMInfo&p4=support

NOTICE
Microsoft Office Live Meeting can be used to record meetings. By participating in this meeting, you agree that your communications may be monitored or recorded at any time during the meeting.

MOST RECENT STUDY PLAN REVISIONS INFORMATION – A Correction

The following table reflects a correction to the date of the current version of W&AR-14. I rechecked the document history and this study plan has not undergone further revisions, so that the original version with the 07-25-2011 date, currently on the website, is the one to use at tomorrow's meeting.

Don Pedro Study Plans		**For Oct RWG Mtg, Use as Reference the Website Version Ending in:**
CR-1	Historic Properties	D-110929
CR-2	Native American Traditional Cultural Properties	D-110930
RR-1	Recreation Facility Condition, Public Accessibility, and Recreation Use Assessment	D-110930
RR-2	Whitewater Boating Take Out Improvement Feasibility	D-110930
RR-3	Lower Tuolumne Boatable Flow	D-110930
RR-4	Visual Quality	D-110930
TR-1	Special-Status Plants	D-110930
TR-2	ESA- & CESA-Listed Plants	D-110908

TR-3	Wetlands Habitats Associated with Don Pedro Reservoir	D-110930
TR-4	Noxious Weed Survey	D-110908
TR-5	ESA-Listed Wildlife - Valley Elderberry Longhorn Beetle	D-110908
TR-6	Special-Status Amphibians and Aquatic Reptiles	D-110908
TR-7	ESA-Listed Amphibians - California Red-Legged Frog	D-110908
TR-8	ESA-Listed Amphibians - California Tiger Salamander	D-110908
TR-9	Special-Status Wildlife – Bats	D-110908
W&AR-1	Water Quality Assessment	D-110725
W&AR-2	Project Operations/Water Balance Model	D-110930
W&AR-3	Reservoir Temperature Model	D-110927
W&AR-4	Spawning Gravel	D-110930
W&AR-5	Salmonid Populations Integration & Synthesis	D-110927
W&AR-6	Tuolumne River Chinook Salmon Population Model	D-110927
W&AR-7	Predation Study	D-110930
W&AR-8	Salmonid Redd Mapping	D-110930
W&AR-9	Chinook Salmon Fry	D-110930
W&AR-10	*Oncorhynchus mykiss* Population Study	D-110930
W&AR-11	Chinook Salmon Otolith	D-110930
W&AR-12	*Oncorhynchus mykiss* Habitat Survey	D-110725
W&AR-13	Fish Assemblage and Population Between Don Pedro Dam & La Grange Dam	D-110930
W&AR-14	Temperature Criteria Assessment (Chinook & *Oncorhynchus mykiss*)	D-110725
W&AR-15	Socioeconomics	D-111002

Thank you.

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From: Staples, Rose
Sent: Monday, October 03, 2011 4:52 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Subject: Don Pedro Water & Aquatic RWG Meeting tomorrow in Modesto

Attachments: Don Pedro Oct 2011 RWG MTGS AGENDA 110928.pdf

I just wanted to confirm that the Water & Aquatic RWG meeting tomorrow is indeed an "in person" meeting at the MID Offices in Modesto. However, for those who are not able to attend, calling in to the meeting is an option (see call-in number/conference code information below) and there will also be a LIVE MEETING connection for those who want to follow along with the projection screen (Live Meeting link emailed earlier today). Thank you.

Tuesday, October 4 – Water & Aquatic Resource Work Group Meeting: 9:00 a.m. to 4:00 p.m. – MID Offices in Modesto. In Person or Via Phone (Call-In Number 866-994-6437, Conf Code 5424697994) with LIVE MEETING connection available (link will be sent just prior to meeting).

9:00 a.m. -	12:00 p.m.	Review and Discussion of Revisions to Districts' Proposed Study Plans (W&AR-1 through W&AR-15--all of these study plans have been reviewed at least once)
12:00 p.m. -	1:15 p.m.	Lunch (on your own)
1:15 p.m. -	3:00 p.m.	Continued Review and Discussion
3:00 p.m. -	3:15 p.m.	Break
3:15 p.m. -	4:30 p.m.	Continued Review and Discussion
4:30 p.m. -	5:00 p.m.	Next Steps

The Terrestrial RWG meeting will be an "In the Field Meeting", as noted in the AGENDA attached, and the Recreation RWG meeting on Wednesday morning will be a conference call. And, the Cultural RWG meeting on Wednesday, October 12 will also be a conference call. More details in the agenda attached.

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Don Pedro Relicensing
Resource Work Group
Meetings AGENDA
October 4, 5 and 12, 2011
Modesto CA

Tuesday, October 4 – Water & Aquatic Resource Work Group Meeting: 9:00 a.m. to 4:00 p.m. – MID Offices in Modesto. In Person or Via Phone (Call-In Number 866-994-6437, Conf Code 5424697994) with LIVE MEETING connection available (link will be sent just prior to meeting).

9:00 a.m. - 12:00 p.m.	Review and Discussion of Revisions to Districts' Proposed Study Plans (W&AR-1 through W&AR-15--all of these study plans have been reviewed at least once)
12:00 p.m. - 1:15 p.m.	Lunch (on your own)
1:15 p.m. - 3:00 p.m.	Continued Review and Discussion
3:00 p.m. - 3:15 p.m.	Break
3:15 p.m. - 4:30 p.m.	Continued Review and Discussion
4:30 p.m. - 5:00 p.m.	Next Steps

Tuesday, October 4 – Terrestrial Resource Work Group FIELD Meeting to evaluate the BLM's proposed wetland assessment methodologies and to discuss proposed study areas for the botanical studies. The Districts will be providing a boat. Please RSVP to carin.loy@hdrinc.com or rose.staples@hdrinc by September 30 to confirm attendance. Everyone participating will be meeting at 9:00 a.m. at the DPRA Visitor Center, 10200 Bonds Flat Road, La Grange. Please bring lunch, water, and sun protection.

Wednesday, October 5 - Recreation Resource Work Group CONFERENCE CALL 9:00 a.m. to 12:30 p.m. Call-In Number 866-994-6437, Conference Code 5424697994. Live Meeting will NOT be available.

9:00 a.m. - 10:30 a.m.	Review and Discussion of Revisions to Districts' Proposed Recreation Study Plans
10:30 a.m. - 10:45 a.m.	Break
10:45 a.m. - 11:30 a.m.	Continued Review and Discussion
11:30 a.m. - 12:30 p.m.	Next Steps

Wednesday, October 12 – Cultural Resource Work Group CONFERENCE CALL. 1:30 to 3:30 p.m. Call-in Number 866-994-6437, Conference Code 6164399). Live Meeting will NOT be available.

1:30 p.m. - 3:15 p.m.	Review and Discussion of Revisions to Districts' Proposed Cultural Resource Study Plans
3:15 p.m. - 3:30 p.m.	Next Steps

From: Staples, Rose
Sent: Monday, October 10, 2011 1:32 PM
To: 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Barnes, Peter - SWRCB'; 'Beuttler, John - CSPA'; 'Blake, Martin'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brenneman, Beth - BLM'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Buckley, Mark'; 'Burley, Silvia-CVMT'; 'Burt, Charles - CalPoly'; 'Cadagan, Jerry'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cismowski, Gail - SWRCB'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, Kevin - TBMI'; 'Day, P - MF'; 'Denean - BVR'; 'Derwin, Maryann Moise'; Devine, John; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Grader, Zeke'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hackamack, Robert'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hayden, Ann'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Holm, Lisa'; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hudelson, Bill - StanislausFoodProducts'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Hume, Noah - Stillwater'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Kordella, Lesley - FERC'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; 'Looker, Mark - LCC'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Madden, Dan'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Martin, Ramon - USFWS'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan - CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Paul, Duane - Cardno'; 'Pavich, Steve-Cardno'; 'Pinhey, Nick - City of Modesto'; 'Pool, Richard'; 'Porter, Ruth - RHH'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Ridenour, Jim'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sander, Max - TNC'; 'Sandkulla, Nicole - BAWSCA'; 'Saunders, Jenan'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shipley, Robert'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Sill, Todd'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; Staples, Rose; 'Steindorf, Dave - AW'; 'Steiner, Dan'; 'Stone, Vicki -TBMI'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'Terpstra, Thomas'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Vierra, Chris'; 'Villalabos, Ruben'; 'Walters, Eric - MF';

'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; 'Wheeler, Douglas - RHH'; 'Wilcox, Scott - Stillwater'; 'Williamson, Harry (NPS)'; 'Willy, Alison - FWS'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'

Subject: Mill Creek Model Reference

Please find below the reference to the Mill Creek model we have been referencing in the W&AR work group meetings related to study plan W&AR-6: Chinook Salmon Population Model

http://www.savetheredwoods.org/media/pdf_howard.pdf

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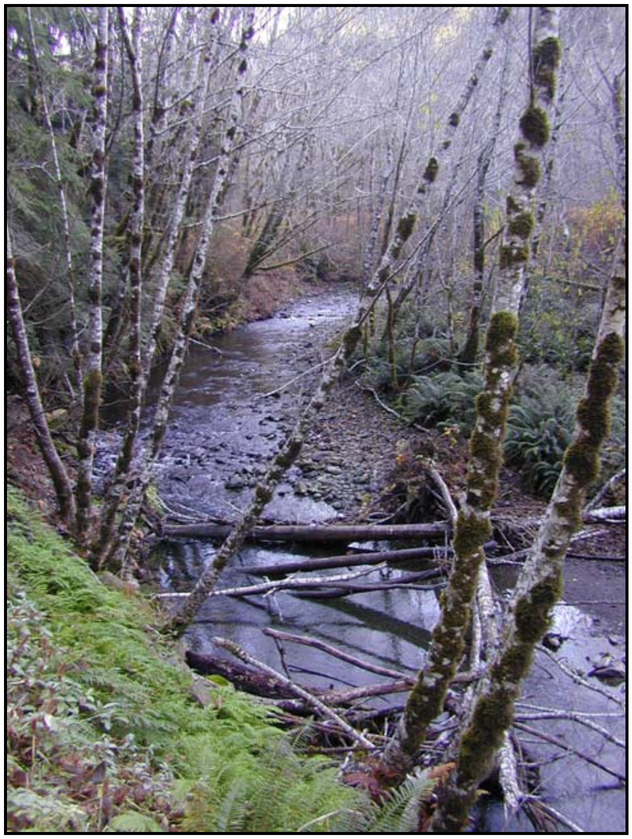
Mill Creek Fisheries Monitoring Program: Ten Year Report. Final Report to Save-the-Redwoods League

Christ Howard and Stillwater Sciences

Recommen ded Citation:

Stillwater Sciences. 2006. Mill Creek fisheries monitoring program: ten year report. Final report. Prepared by Stillwater Sciences, Arcata, California for Department of Fish and Game and Save the Redwoods League, San Francisco, California.



Mill Creek Fisheries Monitoring Program: Ten Year Report

Final Report

Prepared for
Department of Fish and Game
and
Save-the-Redwoods League

Prepared by
Stillwater Sciences
Arcata, California

March 2006

Stillwater Sciences

Acknowledgments

This report was funded by the Department of Fish and Game, Salmon and Steelhead Trout Restoration Account as part of the Monitoring Protocol Training project (grant agreement number P0310531), and by Save-the-Redwoods League.

Suggested citation:

Stillwater Sciences. 2006. Mill Creek fisheries monitoring program: ten year report. Final report. Prepared by Stillwater Sciences, Arcata, California for Department of Fish and Game and Save the Redwoods League, San Francisco, California.

Executive Summary

Introduction

Coho salmon (*Oncorhynchus kisutch*) in the Southern Oregon/Northern California Coasts (SONCC) Evolutionarily Significant Unit (ESU) were listed as federally threatened in 1997 (NMFS 1997), which was reaffirmed on June 28, 2005 (NMFS 2005). In 2002, the California Fish and Game Commission issued a finding that coho salmon warranted listing as a threatened species in the SONCC ESU and as an endangered species in the Central California Coast ESU, directing the California Department of Fish and Game to develop a recovery strategy (CDFG 2004). Chinook salmon in the Southern Oregon and northern coastal California ESU were not warranted for federal listing (NMFS 1999).

Mill Creek is a tributary to the Smith River, the only major undammed river in California, and supports anadromous populations of coho salmon, Chinook salmon, steelhead, and coastal cutthroat trout. Population modeling was used to evaluate limiting factors for coho and Chinook salmon and prioritize restoration actions in the East Fork and West Branch of Mill Creek, the two main tributaries that join to form the mainstem Mill Creek, using data from a long-term fisheries monitoring program.

The primary objectives of this report were to build and parameterize population models for coho and Chinook salmon, evaluate existing data in the context of this modeling effort, identify potential limiting factors, and prioritize restoration alternatives and future monitoring efforts. A secondary objective was to predict coho salmon adult returns through the construction and use of a state-space model.

Methods

The conceptual models provide a foundation for the quantitative models by describing how we think the population functions and what we think are the relative importance of different sources of mortality for the population dynamics of the species. Two quantitative population models were developed for the Study Area: one for coho salmon and one for fall Chinook salmon. The models were developed in spreadsheet form using Microsoft Excel 2003®. The models follow the stock-production approach to population modeling, which is supported by a large body of literature spanning several decades (e.g., Paulik 1973, Moussalli and Hilborn 1986). The utility of these models, like all models, is constrained by the quality of the data that is used to populate them, and in some cases models may be best used to identify additional information needs. Nonetheless, the models represent a compilation of all available data, in a rigorous and transparent framework.

All available data on coho salmon and Chinook salmon in the East Fork and West Branch of Mill Creek was compiled to construct quantitative models. The models were used to determine the factors affecting both populations. The intention of the models was not to predict the precise population size of any particular life-stage, but rather identify critical life stages, and prioritize restoration actions and future monitoring efforts.

The Study Area includes: (1) the mainstem Mill Creek downstream of West Branch and East Fork Mill Creek; and (2) West Branch Mill Creek and East Fork Mill Creek upstream to natural fish passage barriers. West Branch and East Fork Mill Creek sub-watersheds were intensively managed for commercial timber harvest until recent acquisition and incorporation into the California State Park system (Stillwater Sciences 2002).

Results

The coho salmon population model is sensitive (>10% change in spawner abundance) to overwinter carrying capacity, summer rearing habitat carrying capacity, late summer survival, and overwinter survival. Our conceptual model hypothesized that rearing habitat, particularly overwintering habitat, would limit the current population, which is supported by model results. Doubling overwintering habitat in both tributaries increased the adult population size by more than 15%. Increasing summer rearing habitat has less of an impact on the population given the current parameter values than increasing overwintering habitat (for the West Branch, a 24% increase in the adult population size when doubling the habitat, as compared to a 45% increase when doubling overwintering habitat).

Within the model, decreasing overwinter and late summer survival in the West Branch given current conditions has an impact on the coho salmon population (12% decrease in equilibrium population size), although the change is not dramatic if marine survival is high enough to produce enough returning adults to fully seed the overwintering habitat. Model runs with marine survivals more typical of pre-water year (WY)[1] 2000 conditions (assumed to be 0.006, based on OPI marine survival indices from Chilcote et al. 2006) indicated that a 50% decrease in any one of the density-independent survival rates would lead to extinction.

For Chinook salmon, the model is sensitive to spring rearing carrying capacity, and not other freshwater parameters. The Chinook salmon conceptual model hypothesized that spring rearing habitat would limit the current population, which is also supported by model results. Doubling spring rearing habitat in both tributaries increased the adult population size by more than 40%. These values provide the relative magnitude in population change with respect to potential habitat changes. Increasing spring rearing habitat in the West Branch has slightly more value (55% increase) to the total population than increasing spring rearing habitat in the East Fork (45% increase).

Models for both species were sensitive to smolt to adult survival rates. The survival from smolt to adult parameter was only included to allow the population model to estimate escapement and predict equilibrium conditions. However, the influence of this parameter indicates the importance of smolt-to-returning-adult survival in the coho salmon and Chinook salmon life-cycles. This could have important implications for the Mill Creek salmon population in years with poor ocean conditions and low marine survival rates.

Recommendations

We recommend a continuation of the existing sampling methodologies of outmigrant trapping and juvenile abundance snorkel surveys, to evaluate any changes in carrying capacity that result from future management actions. Juvenile abundance snorkel surveys in the East Fork are also recommended to better define coho salmon summer carrying capacity, a sensitive model parameter, and improve our understanding of population dynamics in the East Fork. In addition, we recommend winter juvenile abundance snorkel surveys before and after winter freshets to help better quantify overwintering carrying capacity, the most sensitive freshwater model parameter for coho salmon.

[1] Water year describes the 12 month period from 1 October to 30 September; the numeric designation is consistent with the calendar year in which it ends (i.e., WY 2005 is from 1 October 2004 to 30 September 2005).

Redd counts were useful in obtaining spawning escapement estimates, and future counts are recommended. Minimum escapement estimates involved a fair amount of subjectivity and are not adequate for population monitoring.

More accurate estimates of spawning escapement are needed for the state-space model to better predict adult returns. Weir counts could potentially be used to establish a relationship between the total numbers of spawners and redd counts to improve both past and future estimates for spawning escapement.

Population modeling identified overwintering habitat as the limiting factor for coho salmon populations, and we recommend that increasing overwintering habitat be the highest priority for any restoration activities. Large woody debris enhancements could potentially help increase overwintering habitat as well as summer rearing habitat.

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1 INTRODUCTION

Pacific salmon (*Oncorhynchus* sp.) have undergone a notable decline in population numbers, with habitat degradation and loss being major causes (Nehlson et al. 1991). Coho salmon (*Oncorhynchus kisutch*) in the Southern Oregon/Northern California Coasts (SONCC) Evolutionarily Significant Unit (ESU) were listed as federally threatened in 1997 (NMFS 1997), which was reaffirmed on June 28, 2005 (NMFS 2005). This ESU includes all naturally spawned populations of coho salmon in coastal streams between Cape Blanco, Oregon and Punta Gorda, California as well as three artificial propagation programs. In 2002, the California Fish and Game Commission issued a finding that coho salmon warranted listing as a threatened species in the SONCC ESU and as an endangered species in the Central California Coast ESU, directing the California Department of Fish and Game to develop a recovery strategy (CDFG 2004). Chinook salmon in the Southern Oregon and northern coastal California ESU were not warranted for federal listing (NMFS 1999).

There is primary interest in evaluating factors that may limit these populations, particularly for listed coho salmon, and for prioritizing restoration actions. Population modeling is a tool that can be used to conduct both of these tasks. This report summarizes our efforts to examine population dynamics of coho salmon and fall Chinook salmon (*O. tshawytscha*) in the Mill Creek watershed by developing a multi-stage stock-production model.

Mill Creek is a tributary to the Smith River, the only major undammed river in California, and supports anadromous populations of coho salmon, Chinook salmon, steelhead, and coastal cutthroat trout. The Mill Creek watershed (60 km^2 [23 mi^2]) includes the two main tributaries, the East Fork Mill Creek (East Fork, 20.5 km^2, 7.9 mi^2) and the West Branch Mill Creek (West Branch, 19.6 km^2, 7.6 mi^2) that join to form the mainstem Mill Creek (Stillwater Sciences 2002). The focus of this report is on coho salmon primarily, and Chinook salmon secondarily, in the East Fork and West Branch of Mill Creek.

Although ocean conditions can be the dominating factor in terms of coho abundance, as it was in the 1970's and 1980's (Coronado and Hilborn 1998), freshwater habitat conditions are also critical to the viability of coho salmon populations. Freshwater habitat conditions can play a major role in the interannual variability in numbers of outmigrating smolts (Bradford 1995). During years when ocean survival is especially low, if freshwater habitat conditions are poor, smolt production may not be high enough to ensure continuation of the run. By using population modeling, we can look at the various factors affecting the coho salmon population in freshwater and the ocean, and how each factor affects the population as a whole.

The primary objectives of this report were to build and parameterize population models for coho and Chinook salmon, evaluate existing data in the context of this modeling effort, identify potential limiting factors, and prioritize restoration alternatives and future monitoring efforts. A secondary objective was to predict coho salmon adult returns through the construction and use of a state-space model.

1.1 Modeling Approach

Our population models are essentially quantified conceptual models, organized around the principle of identifying and separating density-dependent and density-independent factors affecting the population. The level of detail of these models should not overrun the real scientific understanding of coho and Chinook salmon ecology. Several life stages were used to represent the life-cycles of fall Chinook and coho salmon, typically using two parameters per life stage. The detail and complexity of biological and biological-physical interactions were reflected in the development of suitable values for model parameters, rather than calculated within the model itself. These parameters were assigned values based on the existing dataset from Mill Creek and existing scientific literature where appropriate.

Initially, conceptual models were developed to provide a narrative description of the potential density-dependent and density-independent factors affecting each life stage of coho and Chinook salmon. Linkages were explored between changing habitat conditions and the population response for specific life stages, first in conceptual models, and then followed by quantitative assessment using multi-stage stock-production population models.

The stock-production approach is based on a large body of literature going back several decades (e.g., Paulik 1973). The model itself is a relatively simple and transparent spreadsheet (i.e., not a black box). The models will be made available to CDFG and Save-the-Redwoods League.

The model development process was intended to help determine which of the many gaps in our present understanding most impair our efforts to protect or enhance the population. Not all potential mechanisms need to be understood to the same level of detail, and not all system parameters need to be known to the same degree of accuracy. For all parameters, the model will be run for a range of values to determine the sensitivity of the model to these inputs. Based on the quality of available information, modeling some components of the population (e.g., coho pre-smolts and smolts in the West Branch) may be based on a full time series of data, whereas other areas (e.g., coho pre-smolts in the East Fork Mill Creek) may be based on more limited data.

Classically, a stock-production relationship is used to describe a complete life-cycle (e.g., to express the adult population of one generation as a function of the adult population of the previous generation). However, the idea can also be applied to specific life stages. We can identify a sequence of landmarks in the life-history, and step from each to the next with a stock-production relationship (Paulik 1973). Construction and examination of a multi-stage stock-production model for a population is essentially a limiting factors analysis, in which the interactions between potentially limiting factors are taken into account and examined.

The value of decomposing the overall stock-production relationship into a sequence of stage-to-stage relationships is that we may be able to relate the parameters of these individual relationships fairly directly to the biology of the animal modeled. In particular, we can attempt to break up the life-cycle in such a way that the r and K parameters of the individual stock-production relationships correspond to a partition of the factors affecting the population into density-independent and density-dependent terms, respectively, having fairly clear biological interpretations. For example, factors such as fecundity, or the dependence of egg survival on the quality of spawning gravels, are (at least to a first approximation) independent of population densities. Such factors will contribute to r terms. Factors such as abundance of overwintering habitat will contribute to K terms.

We attempted to use state-space modeling to further describe the coho salmon population in Mill Creek. State-space modeling is a tool which incorporates both population dynamics processes (the state process) and data collected from samples of the population (the observation process) (Buckland et al. 2004). This approach allows for incorporation of stochastic variation, as well as the incorporation of functions which relate population parameters to environmental variables. We used state-space models to predict adult escapement and to improve estimates of escapement using the complete time series of data collected in Mill Creek.

1.2 Study Area

The Study Area includes: (1) the mainstem Mill Creek downstream of West Branch and East Fork Mill Creek; and (2) West Branch Mill Creek and East Fork Mill Creek upstream to natural fish passage barriers (Figure 1). West Branch and East Fork Mill Creek sub-watersheds were intensively managed for commercial timber harvest until recent acquisition and incorporation into the California State Park system (Stillwater Sciences 2002).

In addition to coho salmon and fall Chinook salmon, chum salmon (*O. keta*), steelhead (*O. mykiss irideus*), coastal cutthroat trout (*O. clarki clarki)*, western brook lamprey (*Lampetra richardsoni*), Pacific lamprey (*Lampetra tridentata*), coastrange sculpin (*Cottus aleuticus*), prickly sculpin (*Cottus asper*), threespine stickleback (*Gasterosteus aculeatus*), and Klamath smallscale sucker (*Catostomus rimiculus*) (Albro and Gray 2002) are known to occur in the Study Area.

2 METHODS

2.1 Conceptual Model

The conceptual models provide a foundation for the quantitative models by describing how we think the population functions and what we think are the relative importance of different sources of mortality for the population dynamics of the species. The first step in developing the conceptual models was to summarize available information on coho and Chinook salmon life histories by life stage, focusing on information from the Study Area. In particular, information on life stage-specific habitat use, growth, and density-independent factors (e.g., fecundity, sex ratio, gravel quality) and density-dependent factors (e.g., age 0+ carrying capacity, age 1+ carrying capacity) that may limit the survival of each life stage, was also obtained and reviewed. We developed a conceptual model based on a review of the available information, and local knowledge of the geomorphic, hydrologic, and biological characteristics of the Study Area.

2.2 Quantitative Population Models

Quantitative population models were developed for coho salmon and fall Chinook salmon in the Study Area in spreadsheet form using Microsoft Excel 2003®. The models are meant to provide a framework for investigating the relative influence of survival at each life stage on the salmon's population dynamics. The utility of these models, like all models, is constrained by the quality of the data that is used within them, and in some cases models may be best used to identify additional information needs.

The models follow the stock-production approach to population modeling, supported by a large body of literature spanning several decades (e.g., Paulik 1973, Moussalli and Hilborn 1986, Sharma et al. 2005). Stock-production modeling is based on the idea of treating the number of individuals (P) in a cohort at a particular developmental stage, as a function of the number of individuals (S) in that cohort at an earlier developmental stage, in the function:

$$P = f(S)$$

Such a function f is called a stock-production relationship. This approach is useful because the important properties of f can often be deduced from general biological considerations. In particular, the function can often be expressed in terms of parameters *r* and *K*, where *r* represents the effect of births and/or deaths independent of density considerations, and *K* is an upper limit on the population size. Terms used to describe population models are defined in Appendix A.

2.2.1 Model development

The quantitative models were developed using the stock-production framework. Life stages were selected based on the conceptual model and the nature of available data. Once the life stage structure was determined, the basic model structure was assembled in an Excel spreadsheet. A Visual Basic interface was provided for data entry and parameter changes, and it allowed graphical representation of individual stock-production relationships. The basic life stage structure, the factors selected as parameters, and default values for parameters and stock-production forms were determined from local information and literature values.

2.2.1.1 Model input parameters

Model input parameters were selected by: (1) defining life stages most appropriate for modeling, (2) acquiring data, (3) selecting appropriate stock-production models, and (4) selecting values for *r* and *K*.

Life stages

Life stages for modeling were selected based on the biology of the modeled species (Table 2-1). The models were run based on intervals of time between a stock life stage, and the resulting production into the next life stage, defined here as a life-step (e.g., 0+ juvenile to 1+ smolt) (Table 2-2). The life stages of the model correspond to the beginning of these intervals of development. For coho salmon and Chinook salmon, the model was run to estimate production of adults.

Table 2-1. Life stages modeled for coho salmon and fall Chinook salmon.

Life stage	Size (fork length [FL])	
	mm	in
Coho salmon		
Eggs	NA	NA
Emergent fry	~30	~1.2
Early summer 0+	35–55	1–1.8
Late summer 0+	> 55 with no signs of smolting	> 2.2
Spring 1+ smolts	> 55 with signs of smolting	> 2.2
Adult	> 400	> 15.8
Female spawner	> 400	> 15.8
Fall Chinook salmon		
Eggs	NA	NA
Emergent fry	~35	~1.4
Fry	35–55	1.4–2.2
Juvenile	> 55 with no signs of smolting	> 2.2
Smolt	> 55 with signs of smolting	> 2.2
Adult	> 400	>15.8
Female spawner	> 400	>15.8

Table 2-2. Life-steps modeled for coho salmon and fall Chinook salmon.

Life step	Approximate dates	Approximate time interval
Coho salmon		
Emergent fry to early summer 0+	Mid-March through April	< 1 day
Early summer 0+ to late summer 0+	Mid-March to October	7 months
Late summer 0+ to 1+ smolt	October to May	7 months
1+ smolt to returning adults	All year	1.5 years
Adult to female spawner	December to January	1 month
Female spawner to deposited eggs	December through January	1 month
Deposited eggs to emergent fry	December through April	2 months

Life step	Approximate dates	Approximate time interval
Fall Chinook salmon[1]		
Emergent fry to 0+ smolts	March to June	4 months
0+ smolt to returning adults	All year	2.5 years
Adult to female spawner	November to January	1 month
Female spawner to deposited eggs	November through January	1 month
Deposited eggs to emergent fry	November through April	2 months

[1]Age of returning adults based on majority of fish returning as 3-year olds (Waldvogel 2005).

Input data

Three basic types of data were needed to estimate life stage-specific survival: (1) carrying capacity of habitat for each life stage, (2) density-independent mortality prior to attaining carrying capacity, and (3) density-independent mortality occurring after attaining carrying capacity. Analyses based on local data were used to determine many of the input values (see Section 3 for estimates and rationale). The local data used in the analyses presented in this report were provided by Chris Howard (Mill Creek Fisheries Monitoring Program). Any differences in data values from past released reports are due to improvements and corrections made to the existing dataset by Chris Howard. All selected values and their sources are documented in Appendices B and C.

In this modeling approach, habitat area and fish density inputs are used to explicitly represent carrying capacity (*K*). In addition, mortality is explicitly represented by input values dependent on the rate of increase of the population (*r*). Factors such as food supply, growth rates, and competition are implicitly included based on available data used to adjust the mortality values. For example, if food availability was low, lower survival may result, and be reflected in the *r* value (see "*r* and K values" subsection for more detail).

Stock-production models

Four stock-production models were selected to "step" between selected life stages in the population dynamics models. The Beverton-Holt (1957) and "hockey stick" models (Barrowman and Myers 2000) were typically used for density-dependent interactions (e.g., the life-step from emergent fry to 0+ juvenile when habitat limits the population). The linear model was used to reflect density-independent mortality (e.g., the step from eggs to emergent fry, in which mortality is not affected by density). The redd superimposition model was also used for the step from female spawners to deposited eggs. Each of these models is described below.

The Beverton-Holt model allows production to increase toward a limiting carrying capacity (*K*) for the production (*P*) of the stock (*S*). The Beverton-Holt model was used both in its original form, and in another form of the model (Beverton-Holt 2) when production approached carrying capacity at a faster rate than assumed under the original form of the model. The equations for the Beverton-Holt models are:

Beverton-Holt: $P = r \cdot K \cdot S / (K + r \cdot S)$

Beverton-Holt 2: $P = r \cdot K \cdot S / \left(K^2 + (r \cdot S)^2\right)$,

where for all equations:

P = production,

r = density-independent effects,
K = carrying capacity,
S = stock value

The "hockey stick" model was typically used as an alternative to Beverton-Holt 2; it allows production to approach carrying capacity more rapidly than the Beverton-Holt 2 model. The hockey stick model is a piecewise linear relationship with a slope defined by *r* prior to reaching carrying capacity, reflective of complete density-independence (Barrowman and Myers 2000). Once reaching *K*, however, the slope is zero, reflecting complete density-dependence. This model was used to more clearly identify limiting factors. The equation for the hockey stick model is:

$$P = \min(r \cdot S, K),$$

where "min" takes the minimum of the values in parentheses.

The linear model was used to represent relationships with no obviously relevant density-dependence (such as for deposited eggs to emergent fry), and to reflect density-independent mortality for fish during migration (since habitat is not limiting during migration). The equation for the linear model is:

$$P = r \cdot S.$$

The redd superimposition model was used in the population dynamics model to represent the relationship between spawners and deposited eggs. The step from female bull trout spawners to viable eggs in the model has *r* and *K* values based on the fecundity and total available gravel area divided by average redd size. The equation for the superimposition model is:

$$P = K \cdot \left(1 - e^{-rS/K}\right)$$

Although the user can select any of the four models for any of the life-steps, model selection should consider density-dependence or density-independence. Although density-dependent relationships are assumed to govern the transition from stock to production for many life-steps, the rate at which carrying capacity is reached was not modeled. The hockey stick model gives the simplest and most abrupt change from density-independence to density-dependence, and so has the least complex interpretation of all the models. Given the lack of evidence to the contrary, and due to its ease of interpretation, the hockey stick model was used for analysis. Use of the Beverton-Holt 2 model yields a similar result, but with a more gradual approach to carrying capacity.

r and *K* values

The "*r*" value is the effect of births and/or deaths independent of density considerations, resulting from factors such as fecundity, temperature-related mortality, or dependence of egg survival on spawning gravel quality. Depending on the life stage of interest and the stock-production model selected, the input parameter *r* represents the fraction of adults spawning, fecundity, or a density-independent survival rate.

The *r* values were typically based on estimates of survival from the literature and/or results from the past 10 years of data for Mill Creek. For some of the life-steps, the *r* values were based on the literature, since survival is difficult to estimate without individually tagged animals, and life stages younger than juveniles are typically difficult to tag. If the abundance of a particular life stage (say, juveniles) is well below the carrying capacity in a given system, then an estimate of survival under these conditions could be used to represent density-independent survival. For coho salmon, late summer, overwinter, and marine density-independent survival rates were all estimated, based on dive survey, outmigrant trapping, and redd count data.

Coho overwinter survival rates (from late summer 0+ to spring 1+ smolts) for both the West Branch and East Fork were based on estimates of 0+ from late summer snorkel surveys and estimates of 1+ from spring outmigrant trapping during years when 1+ habitat could not be fully seeded due to low densities of 0+ (i.e., 1995, 1996, 1998, and 2001). It is reasonable under these circumstances to assume that survival rates based on these data are primarily related to density-independent mechanisms.

For the West Branch, late summer survival for coho salmon was estimated based on the number of 0+ juveniles estimated in reaches that were becoming dry at the time of the survey. The estimate of late summer survival was calculated as the proportion of the estimated number of juveniles in these potential "dry" reaches to the estimated total number.

Coho outmigration and marine survival was estimated as the proportion of 1+ smolts returning to Mill Creek as adults approximately 1.5 years later. Chinook outmigration and marine survival was estimated as the proportion of 0+ smolts returning to Mill Creek as 3-year old adults, for the purposes of simplifying interpretation of modeling results. Estimates of smolts based on trapping and estimated adults based on redd counts were used. For Chinook, data on annual proportions of 3-year old returns based on Waldvogel (2005) were used in combination with redd count data to estimate the number of 3-year old fish in each spawning year from 1996 to 2004.

The "*K*" value represents the carrying capacity or population size limit for the life stage of interest. The *K* values were typically based on maximum abundance levels using data from the summer juvenile abundance snorkel surveys or outmigrant trapping.

Coho salmon carrying capacity for 0+ early summer juveniles and 1+ smolts was estimated based on the estimates of 0+ from juvenile abundance snorkel surveys and the estimates of 1+ from outmigrant trapping. We based our estimate of early summer 0+ juvenile carrying capacity on estimated abundance from the snorkel surveys. Although snorkel surveys were conducted from July through October, we assumed that density-independent mortality from early summer 0+ to late summer 0+ occurred after this timeframe. Carrying capacity for 1+ smolts was based on higher estimates of 1+ smolt abundance based on outmigrant trapping.

Carrying capacity for Chinook salmon smolts (>55 mm FL) was estimated based on outmigrant trapping data. No efficiency data were collected for Chinook salmon during the study period, so numbers trapped were used, and a relatively high trap efficiency was assumed. Carrying capacity was determined through graphical inspection of the number of smolts versus the estimated number of emergent fry.

We used the fraction of 0+ fish >55 mm FL to help establish the carrying capacity for 0+ smolts in the population model. Data on individual fish size from water year (WY) 1994, 1997, and 2002 to 2005 were used to estimate time-specific (i.e., for March/April, May, and June/July time periods) fractions of the population that were >55 mm FL. These fractions were then applied to the trap totals from the corresponding time periods to obtain an estimate of the number of 0+ smolts in each time period. Assuming trap efficiencies are high for these smaller fish (as compared to 1+ coho smolts, where trapping efficiencies typically ranged from 25 to 50%), this calculation can be used as a conservative estimate of 0+ outmigrants. It is likely that the estimates of the number of 0+ smolts are slight underestimates, as trapping efficiency is less than 100%.

In addition, we also applied the average location and time-specific proportions of fish >55 mm FL (over WY 1994, 1997, 2002 to 2005) to all other years of trapping data where possible. This process extended the time series of smolt estimates so as to improve the ability to estimate carrying capacity.

Stock values

The population dynamics models require a stock "starting point" for the life stage considered to be the first step; the population of that life stage must be known or estimated. For coho salmon, the stock of adults was the starting point population estimate. Based on a recent estimate of the number of redds (assuming the number of adults was equivalent to twice the number of redds), 1,522 adults were used as the initial coho salmon population size and 2,048 adults as the initial Chinook population size, as the starting point for model runs. The initial stock size that was entered into the model only reflects the starting point, and does not typically affect the results when the model is run to equilibrium. However, initial stock size may affect the running of the model through a single production cycle, especially if the starting number of adults cannot produce enough eggs to reach the carrying capacity for deposited eggs.

Spawning escapement was estimated using the time series for redd counts, to estimate the number of coho and Chinook salmon spawners. The objective of this analysis was to apportion the number of "unknown" redds, which was substantial in some years, between Chinook and coho salmon, and steelhead. The apportionment is based on the assumption that the distribution of redd construction dates for each year and each species is Gaussian, and that the detection probability for redds was high.

Finite normal mixture methods (McLachlan and Peel 2000) were used to separate the distribution of the redd creation dates for unknown species into Chinook and coho salmon based on all data that could lead to identity of the species most likely to create the redd. A finite normal mixture model with partial classification was fit to the spawner data. Routines were created in S-Plus which use an expectation maximization (EM) algorithm to obtain maximum likelihood estimates for the model parameters (McLachlan and Krishnan 1997).

2.2.2 Model execution

To run the coho salmon or Chinook salmon population dynamics model, required input values are entered at the end of each row of the spreadsheet (by clicking on the grey button). The user enters appropriate values for parameters such as habitat area and density-independent survival, or accepts the given default values. The initial number of adults is entered directly into the spreadsheet (yellow cells). After entering all of the required input values, the model "steps through" the calculations from "stock" to "production" for each life-step (Figures 2, 3). The models can be run for one generation or to equilibrium.

2.2.3 Evaluation of factors affecting populations

The models were used to evaluate the factors affecting populations of both species. Current habitat conditions were considered, as were habitat enhancements, or management options to increase production of coho salmon or Chinook salmon smolts. Key factors were assumed to be those that influenced the equilibrium adult population size or annual production of smolts.

To determine the life stages and parameters that most affect the equilibrium population, a sensitivity analysis was conducted of the parameters and values in the model. The sensitivity analysis was performed by building a spreadsheet macro that calculated the equilibrium population size of adults with the initial parameter values (Appendices B and C), and then by varying the parameter values as follows:

- Decreasing initial value by 50%,
- Decreasing initial value by 25%,
- Increasing initial value by 33%, and
- Increasing initial value by 100%.

For each change in value, the model calculated the equilibrium population size, holding all other values constant. If altering the value for a parameter resulted in a change to the population size, it was considered a sensitive parameter. However, sensitivity analysis does not explore the potential interactions of multiple input values that are simultaneously increased or decreased. Only changes in values greater than 10% were considered sensitive. For sensitive parameters, additional scrutiny was focused on the source of data, and the potential for management to influence those parameters.

2.3 State-Space Population Models

State-space modeling was used to predict adult escapement for WY 2006, and to improve estimates of adult spawners in other water years. State-space models present a framework which can use multiple sources of data (e.g., spawning escapement, smolt outmigration estimates, and 0+ juvenile estimates) to account for error in adult estimates and to reflect interannual relationships in the true abundance levels over time (Newman and Hankin 2004).

State-space models can take advantage of time series data by alternating between a filtering and predicting step for each time interval (e.g., one year), in which all elements of the state process (true numbers of each modeled life stage) can be estimated based on the observation process (this year's data and observations from all previous years of data) and the underlying state model.

Statistical models for the evolution of the state of the system and the process of observation can be expressed in terms of density functions:

$$p(y_t \mid x_t) \qquad \text{(observation)}$$

$$p(x_{t+1} \mid x_t, y^{(t)} \qquad \text{(evolution of state),}$$

where $y^{(t)} = (y_1, ..., y_t)$.

Four life stages were used in our state-space model: spawners, smolts, pre-smolts, and age 2 adults. The underlying assumption of the state process is that the basic structure of the multi-stage stock-production model (hereafter referred to as the "state model") governs the state process. The model was implemented in S-Plus version 6.2 (Copyright © 1988, 2003 Insightful Corp.).

Stochasticity was incorporated into the multi-stage stock-production parameters, winter carrying capacity for the pre-smolt to smolt step. Winter carrying capacity was modeled as a function of peak winter flow based on a relationship that was observed from the data. A linear model was fit to log-transformed annual smolt abundance estimates and peak winter flows, with resulting model coefficients being used to initialize values for the winter carrying capacity~flow submodel within the state model.

An S-Plus function was then constructed to model the observation process. Variation of the estimates of smolt numbers was used to incorporate stochasticity, with sampling of an assumed normal distribution with mean and variance taken directly from the smolt estimates derived from Mill Creek trapping data. The observation process model was used to assign observation probabilities for the smolt estimates in each year, given a state matrix.

The estimation process was based on a Monte-Carlo approach (Manly 1997) and essentially has two major steps: 1) a Bayesian filtering step, and 2) a prediction step. The Bayesian filtering step initially takes a prior distribution (the state matrix) and "filters" it by simulating the observation process (field sampling), given the initial state matrix (i.e., prior). Observations of smolts and spawners from the Mill Creek dataset were input into the model. Probabilities of observing *y* (the Mill Creek data from a given WY) given the state *x* (5,000 sets of simulated true population numbers based on the assumed initial state matrix and the state model) are generated assuming a normal distribution with means and variances from the Mill Creek data (for the smolt data), and a lognormal distribution with means and variances based on the Mill Creek data (for the spawner data).

An initial state matrix, the "prior", was provided in the model, based on the earliest possible estimates (from WY 1994). However, because the estimates are updated based on each year's data, the starting point is not critical to the model's final output and predictions.

Mathematically, input into the filter step is a representation of $x_{t+1} \mid y^{(t)}$ as $\{x_t{}^i\}_{i=1}^B$, and the output is a representation of $x_{t+1} \mid y^{(t+1)}$ as $\{x_t{}^{i*}\}_{i=1}^B$, where * denotes the filtered estimates, and B is the number of simulations (i.e., 5,000).

For the prediction step, the output from the filter step (which consists of B different vectors of the state, xt) becomes the input and is a representation of $x_t \mid y^{(t)}$ as $\{x_t{}^{i*}\}_{i=1}^B$. Prediction then occurs by running the state model on these input vectors, with the output a representation of $x_{t+1} \mid y^{(t)}$ as $\{x_{t+1}{}^i\}_{i=1}^B$.

Then another filter step occurs for the next time interval, followed by another prediction step. This process is repeated until there is a prediction for one time step (i.e., year) beyond the final year of observation (i.e., data collection).

Because each input/output is actually a distribution of 5,000 values, only the mean, variance, and quantiles (i.e., 2.5 and 97.5 percentiles to represent a 95% confidence interval) were reported for each filtering and prediction step.

The filtering and prediction calculations can be represented mathematically as:

$$p(x_t \mid y^{(t)}) \propto p(y_t \mid x_t)p(x_t \mid y^{(t-1)}) \quad \text{(filtering)}$$

$$p(x_{t+1} \mid y^{(t)}) = \int p(x_{t+1} \mid x_t, y^{(t)})p(x_t \mid y^{(t)})d\mu(x_t) \quad \text{(prediction)}$$

The filtered estimates represent our best estimates of the state process variables (i.e., true abundance of smolts and spawners), and the final predicted estimate represents the prediction for WY 2006. After a new year of data collection (i.e., for WY 2006), the filtered estimates will be improved further, and a prediction for the following year (i.e., WY 2007) can also be forecasted.

The log-likelihood of the model was maximized based on three fitted parameters: the slope and intercept from the ln(1+ smolts)~ln(winter peak flow) relationship used to define overwinter carrying capacity; and the smolt to adult survival parameter. The fitted model was then used to calculate the filtered and predicted estimates for 1+ smolts and adult spawners for the West Branch Mill Creek.

3 RESULTS

3.1 Conceptual Models

Conceptual models for coho salmon and Chinook salmon were developed based on a review of the available information, and local knowledge of the geomorphic, hydrologic, and biological characteristics of the Study Area.

3.1.1 Coho salmon

Because juvenile coho salmon generally smolt at age 1+ (or sometimes at age 2+, particularly in colder regions or less productive streams where growth rates are reduced) and must spend at least one summer and winter in freshwater prior to outmigrating to the sea, they tend to establish territories[2] in suitable rearing habitat soon after emergence (as opposed to fall Chinook, chum, pink, and sockeye salmon, which only spend a few weeks or months in the rearing stream). Territories are established to ensure access to sufficient food supply, typically within pool habitats. The role of territories in regulating individual growth is an important mechanism for partitioning a finite food resource among juvenile coho salmon. Larger coho salmon smolts (up to a certain size threshold) have a higher probability of returning as adults (Bilton et al. 1982). If territories were not established and defended by individuals, the result would be either mortality due to starvation or a large number of small smolts which would have very poor ocean survival. The size of individual territories may vary from location to location as a function of food availability and temperature, becoming smaller in more productive habitats or colder streams.

Typically, the maximum number of juvenile coho salmon that can be supported by very good summer habitat is small relative to the number of fry that a few successful redds can produce. Because of this, spawning gravel availability and egg mortality (e.g., as a result of poor gravel quality, redd dewatering, fungus infections, redd scour) rarely have an important effect on coho salmon population dynamics. In other words, any density-dependent mortality that might result from redd superimposition and density-independent mortality resulting from redd scour and poor gravel quality (among other factors) are usually irrelevant because, despite these sources of mortality, far more fry are typically produced than can be supported by the available rearing habitat. Typically, the density-dependent mortality or emigration that occurs when juvenile coho salmon establish territories sets the carrying capacity for juvenile rearing and overshadows other sources of mortality affecting eggs and juveniles. Therefore, the availability of suitable juvenile rearing habitat (either in the summer or winter) is the factor that usually governs the number of coho salmon smolts produced from a stream.

During winter, juvenile coho salmon are typically associated with low-velocity habitats. When temperatures drop and base flows rise, juvenile coho make seasonal shifts to off-channel habitats or undergo temporary shifts (i.e., within a season) during winter freshets. This type of winter habitat provides foraging opportunities at base flows and refuge from displacement by high flows. Over-wintering coho salmon, therefore, are often found in slower velocity habitats such as floodplains, sloughs, off-channel water bodies, beaver ponds, and complex in-channel habitats

[2] We use the term territory and territory size not only in its traditional sense—as a particular defended area —but also in cases where defense of a particular area may not occur but agonistic behavior by dominant individuals (e.g., nips, fin extensions, charges) effectively determine the maximum density of rearing juvenile coho in a pool.

associated with large woody debris jams. We postulate that such habitat conditions were abundant in many streams in northern California and the Pacific Northwest under historical conditions.

Historically, rearing habitat limitations may have frequently been greater in summer months than in winter. Greater summer limitations may have occurred because in winter, territorial behavior largely disappears and food supply and growth are less important than in other seasons, particularly where winter temperatures are very cold. Additionally, winter habitats such as floodplains and off-channel waterbodies, were often more extensive than summer in-channel habitats. If winter habitat was moderately abundant under historical conditions, greater limitations would be expected during the summer when low flows and warmer temperatures would restrict habitat size and territorial behavior would limit the carrying capacity of a stream. However, because of the profound changes that have occurred in streams throughout coastal Northern California and the Pacific Northwest, such as large-scale removal of in-channel wood, channelization of previously complex drainage patterns, and the construction of levees disconnecting floodplains from the channel, the availability of suitable winter habitat has been greatly diminished. While summer habitat conditions have also deteriorated due to land management activities, it is likely that impacts in many watersheds have disproportionately affected winter habitat. Thus, in our conceptual model for coho salmon, we initially assume that winter habitat under current conditions is in shorter supply than summer habitat.

While it is difficult, if not impossible, to assess coho salmon production from a stream without considering winter habitat limitations, it is also difficult, given the current state of knowledge, to predict rearing densities and habitat utilization during winter freshets. The effects of high flow refuge limitations must often be determined indirectly by examining population abundance before and after the winter season or before and after high flow events.

We used existing available information to evaluate this conceptual model. Our primary objective during this evaluation was to assess the importance of summer and winter rearing habitat to coho salmon production. If summer habitat is not limiting and is fully saturated, we would expect summer densities to be similar between years, suggesting pre-summer mortality does not affect population dynamics. If winter habitat is not limiting, we would expect the number of smolts in the spring to be similar to the number of juveniles found in the summer. These hypotheses are evaluated below.

3.1.1.1 Summer habitat and abundance

Contrary to our conceptual model, data presented in Howard and McLeod (2005a) show considerable variation in year-to-year juvenile summer abundance of coho salmon. In both the East Fork and the West Branch, juvenile numbers are highly variable. This led us to explore the following hypotheses:

(1) All mortality during summer is density-independent; there is no density dependent mechanism. (We would expect to see a linear relationship between the numbers of emergent fry and 0+ fish).

(2) There is extremely high mortality of eggs or early emergent fry; therefore it takes massive numbers of emergent fry for the summer rearing habitat to be fully seeded.

(3) The quality of summer abundance data varied from year to year due to poor data collection (e.g., as a result of poorly-trained personnel, inconsistent field methods or statistics).

(4) In some years, but not all, high density-independent mortality of juvenile coho salmon occurs in summer *after* summer densities have been established through territorial/agonistic behavior. If this is true, it most likely would be the result of low flows greatly reducing available habitat area, making juveniles more susceptible to predation.

Density-dependence versus density-independence

Based on a graphical analysis, it appears that there is evidence for density-dependence for the emergent fry to early summer 0+ step in the West Branch, based on 1+ mean smolt size versus 0+ densities in the preceding summer (Figure 4), and the estimated annual number of 0+ juveniles (from juvenile abundance snorkel surveys) versus the estimated number of emergent fry (assuming a constant survival to emergence of 0.5 and fecundity of 2,300 eggs per female) (Figure 5), West Branch Mill Creek, WY 1995 to 2005). We would expect that 1+ mean sizes would generally decrease with increasing 0+ densities and that the number of 0+ would level off at a given number of emergent fry. For the West Branch, there was evidence for a significant negative relationship between mean 1+ size and 0+ densities (r^2=0.56, p=0.01332), based on a linear model applied to log-transformed data (often appropriate for ratio scale data, such as densities).

There was also evidence that the number of 0+ stabilizes at high emergent fry levels (Figures 4 and 5). Even if assumed values of survival to emergence and fecundity are inaccurate, the shape of the curve relating 0+ juvenile to emergent fry abundance will remain the same as long as fecundity and survival to emergence are roughly constant over the study period. The shape of the curve appears to be asymptotic, indicating a density-dependent relationship (Figure 5).

For the East Fork, this analysis was complicated by the lack of data for 0+ juveniles. Consequently, we graphed the mean 1+ smolt size versus the estimated number of emergent fry, our next best information regarding early life stages. This plot, although not as strong as the West Branch, seems to indicate a decreasing trend in size with increasing numbers of emergent fry (Figure 6), although not significantly so (*p*=0.2514, based on linear regression). The graph of estimated annual number of 1+ smolts versus the number of emergent fry may indicate the effect of two separate density-dependent mechanisms, one in summer and one in winter (Figure 7).

Egg and emergent fry mortality

After reviewing the available data, the second hypothesis that there is extremely high mortality of eggs or early emergent fry, seems unlikely for the West Branch, but possible for the East Fork. High egg or early fry mortality would be most likely due to 1) high peak flows that either scour redds or displace fry, and/or 2) fine sediment deposition in redds that entombs alevins or decreases permeability.

In this study, low summer juvenile abundance is not necessarily associated with high instantaneous peak flows occurring within the incubation period during the previous winter/spring. Relatively low numbers of juveniles (typically <5,000 fish) were estimated in 1995, 1998, 1999, 2000 (5,049 fish) and 2001, yet high peak flows (>30,000 cfs in the mainstem Smith River based on the USGS gage at Jedediah Smith) occurred during 4 of the 5 years during January through March. However, there were also larger numbers of juveniles (>5,000 fish) in other years with high instantaneous peak flows (1997, 2002). There have been few reports of other sources of density-independent mortality such as disease or redd dewatering that might also account for high egg or fry mortality for coho salmon.

High peak flows are common in the Smith River watershed following spawning, however we would not expect frequent scour (i.e., several times per year) to a depth that would affect a significant portion of coho salmon redds. Since the survival of eggs depends in part on redd depths exceeding the depth of scour during the incubation period, salmonid species have faced selective pressures to adjust their reproductive behavior to the typical timing and depth of bed scour. The redd depth for a given species would presumably be the result of an evolutionary trade-off between scour mortality and fecundity. Deeper redds result in reduced scour mortality but require energy that might otherwise be used to produce eggs (e.g., at some point the energy required for a female salmon to dig a deeper redd and have a lower probability of having the eggs scoured would be better spent, in terms of the likely number of her progeny that return to spawn again, on producing more eggs). For example, Chinook salmon typically dig the deepest redds and use largest spawning substrate of any of the Pacific salmon because they tend to spawn in mainstem habitats where bed scour is relatively deep. Similarly, over an evolutionary time-scale, we would expect coho salmon to have adjusted their egg burial depths to at least exceed the depth of scour for floods that have a high probability of occurring, such as bankfull discharge (which will occur on average two out of every three years).

Redd entombment (infiltration of fines into redds that impedes the movement of water and alevins within the redd) may also limit the survival-to-emergence of coho salmon. After hatching, alevins remain within the redds for an additional two to three weeks before emerging from the substrate and establishing territories in suitable habitat. The amount of fine sediment in a redd will limit the ability of alevins to emerge from the streambed. There is a greater presence of fine sediments in the East Fork of Mill Creek and the mainstem Mill Creek (based on field reconnaissance), although gravel quality is apparently high in the West Branch of Mill Creek (Anonymous 1977 and Millan 1980, as cited inWaldvogel 2005). In years where the channel was re-routed due to major storm events, there may be sediment movement downstream which could influence survival in the lower reach of the West Branch. However, redd entombment is not likely to be a major factor in the West Branch of Mill Creek, although it could influence survival in the East Fork of Mill Creek.

Alternatively or in addition to redd scour and/or entombment, entrainment of early emergent fry during winter or spring freshets can lead to high mortality prior to the summer rearing period. Although no direct information is available to assess mortality of early emergent fry, changes in land use within the watershed have likely decreased in-channel shelter, which has the potential to increase the incidence of fry entrainment.

Data quality

The third hypothesis, that data quality varied from year to year, also seems unlikely. Fish population monitoring has been conducted by the same personnel and, with a few exceptions to adjust for changing channel conditions, sampling has occurred at the same sites since 1994. A similar level of sampling effort has been performed in surveys from 1995 to present.

Late summer mortality

After reviewing the available literature, the fourth hypothesis, that in some years high mortality occurs in summer, seems highly likely, particularly for the West Branch. Stranding is one potential source of mortality that could vary from summer to summer and that would occur after summer densities had been established through territorial/agonistic behavior. Within the extent of habitat associated with dry channel or subsurface flow in the West Branch, 0+ juvenile densities were significantly higher than for the rest of the stream based on t-tests comparing densities from the wet reach versus dry reach ($p<0.001$ for each year from 1999 to 2005). Although this may be due to other factors, it seems biologically reasonable that the densities may be higher due to fish becoming trapped in shallower habitat. In addition, there has been documented stranding in the West Branch of Mill Creek (Ozaki 2004, unpubl. data), where available habitat was documented as being dewatered, with several thousand salmonid juveniles observed stranded in drying pools.

3.1.1.2 Winter habitat and abundance

Although high egg and/or early fry mortality may result in less than saturated summer habitat, winter carrying capacity may still be exceeded, and may be the more important limiting factor. We assessed the importance of winter habitat and winter carrying capacity by comparing the available data on summer juvenile coho salmon abundance and spring smolt numbers. If density-dependence is the governing mechanism and an overwintering carrying capacity exists, we would expect in years with sufficient numbers of spawners and typical survival to emergence rates that the number of smolts produced would be nearly constant.

Data supporting density-dependence

If density-dependence exists from 0+ to 1+, and a carrying capacity exists, then we would expect the number of 1+ smolts to level off once reaching a certain number of 0+ juveniles. A plot of 1+ smolt estimates versus 0+ juvenile coho salmon for the West Branch revealed that there is likely some density-dependent mechanism regulating the production of 1+ smolts (Figure 8). The WY 2001 estimate of 10,821 1+ smolts followed a peak flow of 11,403 cfs, the lowest peak flow of all surveyed years (mean flow of 72,597 cfs, based on WY's 1996 to 2005), indicating that overwinter carrying capacity is likely strongly influenced by flow.

The abundance of 1+ smolts appears to be related to the peak winter flow level[3], with a rapidly decreasing relationship between peak flow and the number of 1+ smolts produced (Figure 9). Juveniles overwintering in Mill Creek would require sufficient quantity and quality of refuge habitat to survive high peak flows. It appears that at lower flows, the West Branch offers much more overwinter rearing habitat than the East Fork, but that the difference between the two tributaries decreases with higher flows.

For the East Fork, 0+ juvenile data was only available for 3 years where corresponding smolt estimates were available. However, density dependence can be evaluated by graphing a time series of 1+ smolt estimates. Smolt numbers are fairly consistent in the East Fork as well, rarely exceeding 2,000 fish. As was the case for the West Branch, in WY 2001 the abundance of 1+ smolts in the East Branch was exceptionally high (3,200 fish) (Figure 10).

Even though 0+ summer habitat does not appear to be fully seeded, it appears that the number of 0+ is usually sufficient to exceed carrying capacity of the overwintering habitat. The number of 0+ juveniles is typically sufficient to meet the carrying capacity of overwintering habitat.

[3] We used the mainstem Smith River gage records as a surrogate for discharge in Mill Creek. The USGS monitored streamflow and sediment discharge of Mill Creek from 1974-1981. The Mill Creek stream gauge was located approximately 1 km (0.6 mi) downstream of the East Fork and West Branch confluence (drainage area 74.1 km2). The Mill Creek hydrograph closely mimicked the Smith River, although the Smith River has a higher runoff-per-unit-area than Mill Creek (Madej et al. 1986). Refer to Madej et al. (1986) for flow frequency and flow duration curves for the Mill Creek basin.

3.1.2 Chinook salmon

Of the Pacific salmon species, Chinook salmon probably exhibits the greatest diversity in lie history patterns. Juveniles may enter an estuary immediately following emergence or after spending more than a year residing in freshwater (Healey 1991). Thereafter, juvenile Chinook salmon spend from 6 days to 6 months in estuaries prior to moving to the ocean for further growth (Simenstad et al. 1982). Ocean residence may range from 1 to 6 years, and ocean migration patterns are highly variable across populations. Age–at-maturity ranges from age 2 (almost exclusively males) to age 7 (males and females). Adult fish may enter freshwater throughout the year and time of spawning ranges from 1 to 7 months following freshwater entry (Nicholas and Hankin 1988).

Fall Chinook salmon in the Smith River basin appear to be primarily ocean-type fish (defined by Healey 1991), typically migrating to the ocean within 3 months of emergence. We believe that 0+ juveniles may have stayed in larger numbers and reared to larger sizes in tributaries such as Mill Creek than they do currently. Freshwater habitat in the Smith River system is considered relatively pristine, yet there is also a history of logging and effects from logging roads. Currently, forest stands in the Mill Creek watershed lack large conifers necessary for long-term recruitment and retention of instream LWD (Stillwater Sciences 2002), an important component of freshwater habitat. The extent of mainstem rearing may have always supported large numbers of juvenile Chinook in the summer.

The biggest change from historic to current conditions may be in the estuary, where habitat has been much simplified due to agriculture and diking. The majority of Chinook salmon outmigrants appear to arrive in the estuary in early summer and appear to spend only 1-2 weeks here (Zajanc 2003). Consequently, juvenile Chinook salmon outmigrants today may be smolting at smaller sizes than historically, potentially resulting in reduced ocean survival.

3.1.2.1 Spawning habitat

In many systems, spawning habitat is a limiting factor, as fry densities can be relatively high, and spawning gravel is often in short supply. However, for Mill Creek there appears to be abundant spawning gravel based on reconnaissance surveys (Stillwater Sciences, unpubl. data, 2005).

If there is a density-dependent mechanism acting during the step from spawners to deposited eggs, we would expect a limit to the number of emergent fry produced given an increasing number of spawners. Although there is not direct evidence regarding emergent fry, outmigrant trap catch typically consisted of large numbers of smaller fish (<55 mm FL), including emergent fry. As long as density-independent survival of these fish was relatively consistent from year to year, it is reasonable to use these numbers to evaluate the relationship between redds and emergent fry. These numbers are, however, conservative and should be treated as relative measures only, as they are based solely on trap catch and include fish with varying levels of residence time; trap efficiencies clearly less than 100%, with some density-independent mortality likely, which occurs for juveniles between emergence and arrival at the trap (particularly for larger juveniles outmigrating in June/July).

There was evidence of density-dependence once reaching 350 female spawners for the West Branch and about 140 female spawners for the East Fork. For the West Branch, there appeared to be an increasing linear trend until reaching about 350 redds, after which the number of juvenile outmigrants appeared to level off (Figure 11). These data support the idea that density-dependence only occurs at high levels of spawners not typically observed in West Branch Mill

Creek. There appears to be a positive relationship between spawners and juvenile outmigrants with less than 350 spawners, suggesting that there is little superimposition occurring at these levels of escapement.

However for the East Fork, spawning escapement for Chinook has typically exceeded 140 female spawners. It appears that for most years, the abundance of juvenile outmigrants does not exceed 15,000 fish, as compared to 50,000 fish for the West Branch. The years where trap catch exceeded these numbers were low flow years (WY 2001 and 2002), with the two lowest peak winter flows observed during the study period. The difference in the magnitude of juvenile outmigrants between the two branches could be due to density-independent effects, such as survival to emergence, which is likely given that gravel quality appears to be higher in the West Branch than the East Fork (Stillwater Sciences 2005, unpubl. data).

In the East Fork, relatively few female spawners (~140) can produce the typical yearly maximum for juvenile outmigrants (about 15,000 fish). This is supported by the lack of any apparent relationship between spawners and juvenile outmigrants (Figure 11). The relationship in the East Fork contrasts sharply with the positive relationship between the number of spawners and juvenile outmigrants in the West Branch. In the West Branch, the number of juvenile outmigrants appears to increase until about 350 female spawners, with a typical annual maximum of 50,000 juvenile outmigrants. The difference in the relationship between the number of redds and juvenile outmigrant catch seems to suggest that there are different density-dependent mechanisms acting between the two locations.

The density-dependent factors which could be considered at the spawner to emergent fry life-step include redd scour and redd superimposition. Redd scour seems unlikely for either branch, due to the reasons noted for coho salmon (see subsection 3.1.1.1, Egg and emergent fry mortality).

Differences between the East Fork and the West Branch could be due to competition for existing spawning habitat. Early season spawners tend to spawn in the lower East Fork, in contrast to the West Branch, where spawning typically occurs after a high flow event (Figure 12). High flows open access to larger areas of spawning habitat than are available in the East Fork during lower flow conditions. The presence of a positive relationship in the West Branch suggests that the effects of superimposition here are minimal at spawner escapements below 350 female spawners. It seems more likely for superimposition to occur in the East Fork.

3.1.2.2 Juvenile rearing habitat

Even if spawning habitat is being used to its full potential, 0+ spring rearing habitat could be the most important limiting factor if it appears that the number of emergent fry typically produced is enough to exceed the capacity of spring rearing habitat. Based on graphs of 0+ versus emergent fry for the West Branch, it appears that the number of 0+ smolts levels off at high numbers of emergent fry, suggesting density-dependence (Figure 13). Although evidence of such a relationship is less clear for the East Fork, the estimated number of emergent fry are far greater than the number of 0+ smolts produced, suggesting that there are enough emergent fry in most years to fully seed the spring rearing carrying capacity and that there is a density-dependent mechanism operating between emergence and outmigration (Figure 14).

Spring rearing habitat quantity may be dictated by the amount of high flow refuge habitat available for fry or by the typical amount of suitable rearing habitat available in the spring. There was a strong significant relationship between peak winter flow and 0+ smolt estimates (Figure 15), suggesting that entrainment of emergent fry may be the primary density-dependent mechanism. This would help explain the somewhat strong negative relationship between peak winter flow and trapping totals for the West Branch, as trap totals decrease with increasing winter peak flows (Figure 16). This is less convincing for the East Fork, although there is a decreasing trend here as well. It is possible that the effect of fry entrainment may be much greater in the East Fork than the West Branch. The East Fork is more geologically confined and bedrock-influenced than the West Branch, and likely has less velocity refuge than the West Branch (based on Ozaki 2003, unpubl. data).

The two low flow years, WY 2001 and 2002, produced the two highest estimates of 0+ smolts during the study (Figures 13, 14). Low spring base flows may have resulted in abundant low velocity rearing habitat and much higher than typical numbers of 0+ juveniles rearing to smolt size. It is difficult to discern, without early spring or summer dive data, which flow mechanism (i.e., entrainment due to high peak spring/winter flows versus more rearing habitat due to low spring base flows) is more likely to have influenced carrying capacity for 0+ smolts. Regardless, it is apparent that there is a density-dependent force acting on the population from emergence to outmigration.

3.2 Population Models

Population dynamics models were developed and used to help identify critical uncertainties and prioritize restoration actions for coho and Chinook salmon populations. Both models predict adult production by assuming a smolt-to-adult survival rate and running to equilibrium with returning adults. Model input values and their sources, for the coho and Chinook salmon models, respectively, under current conditions, are provided in Appendices B and C.

3.2.1 Coho salmon carrying capacity

A graphical approach was used to estimate carrying capacity for 0+ juveniles and 1+ smolts. The estimation of the value for the model parameter early summer rearing carrying capacity (from the emergent fry to early summer 0+ life stages) was based on the analysis of the relationship between expected numbers of emergent fry and early summer 0+ described in Section 3.1.1.1 (Figures 5). We estimated a 0+ juvenile carrying capacity of 25,000 for the West Branch and 12,000 for the East Fork. The estimated 1+ smolt carrying capacity was 5,500 and 2,300 for the West Branch and East Fork, respectively, based on Figures 8 and 10.

3.2.2 Coho salmon survival

Survival was estimated using data from Mill Creek where possible. Late summer, overwinter, and marine survival rates were all estimated, based on dive survey, outmigrant trapping, and redd count data.

Late summer survival in the West Branch was estimated to be 0.8, assuming 50% mortality of fish in the dry reaches during the summer juvenile abundance snorkel surveys (Table 3-1), based on the estimated number of 0+ juveniles in potential stranding areas. Ozaki (2004, unpubl. data) observed stranding of several thousand salmonid juveniles in the Park reach (approximately 2000 m long) of West Branch Mill Creek during late summer of 2003, confirming the potential for these reaches to strand fish. The extent of stranding may vary annually however, depending on summer base flows and rate of water withdrawal at the Mill Creek campground.

Table 3-1. Potential late summer mortality due to stranding, West Branch of Mill Creek, 1999 to 2006.

Year	Mortality rate (assume 100% mortality of stranded fish)	Mortality rate (assume 50% mortality of stranded fish)
1999	0.30	0.15
2000	0.41	0.21
2001	0.46	0.23
2002	0.26	0.13
2003	0.24	0.12
2004	0.31	0.16
2005	0.16	0.08
Overall	**0.26**	**0.13**

Overwinter survival rate was estimated to be 0.5, based on data from 1995, 1996, 1998, and 2001, years where the number of 0+ juveniles were estimated at near the 1+ smolt winter carrying capacity. However, this rate does not account for any density-dependent mechanisms which are likely still taking place. We used a density-independent survival rate of 0.8 for overwintering, assuming that density-dependent mechanisms were at least partly responsible for the observed survival rates.

Estimated smolt to spawner survival rates ranged from 0.001 to 0.313 (Figure 17), and were highly variable over the course of the study. Survival rates between the East Fork and West Branch appeared to exhibit similar trends. These rates are likely highly influenced by flow and ocean conditions, with flow influencing the timing of outmigration and consequently size of outmigrants (i.e., earlier outmigration resulting in smaller smolts), and likely the survival of these outmigrants in the ocean. The change from a gradual trend to a rapidly increasing trend in smolt-to-adult survival since 2000 was consistent with trends observed for Oregon coastal coho salmon between Cape Blanco and the mouth of the Columbia River (Chilcote et al. 2005).

3.2.3 Chinook salmon carrying capacity

Carrying capacity for 0+ Chinook salmon was estimated based on outmigrant trapping data. No efficiency data were collected for Chinook salmon during the study period, so numbers trapped were used, and a relatively high trap efficiency was assumed. This seems to be a reasonable assumption, given the smaller size of these fish and the greater likelihood of capture, and that the entire stream was funneled into these traps. The carrying capacity for fish >55 mm FL (assumed to be smolts) was estimated at 6,000 for the West Branch and 5,000 for the East Fork, based on graphs of 0+ versus emergent fry (Figures 13, 14). Although there were values greater than these in the dataset, they come from abnormal low flow years (WY 2001 and 2002).

3.2.4 Chinook salmon survival

For Chinook salmon, smolt-to-returning adult ratios ranged from 0.01 to 0.04, based on combined numbers of smolts and adults from the West Branch and East Fork (Figure 18). We assumed that 62% of adults from each year's estimated spawning run were 3-year old fish, based on the ratio of 3-year old returning adults from WY 1993 to 2003 (Waldvogel 2005). These are conservative estimates of survival, as the ratios are based only on the estimated number of 3-year old returning adults. Survival rates from the literature were however comparable. Mean ocean survival rates of CWT release groups from California and coastal Oregon were estimated from 0.07 to 0.16, over the period from 1972 to 1998 (Magnusson 2002).

3.3 Factors Affecting Population Dynamics of Coho Salmon

Following a cohort from the West Branch or East Fork illustrates that although many eggs are deposited, the carrying capacity for eggs is higher than the amount that is currently being deposited. 0+ juveniles in both reaches appear to saturate the available habitat at the current spawner escapement level (based on redd counts from 2005, one female per redd). In the West Branch, there are a sufficient number of 0+ juveniles to saturate overwintering habitat, whereas in the East Fork, overwintering carrying capacity is not currently being reached. Mortality during each life step results in population declines, such that nearly 48,000 emergent fry, 16,000 0+ juveniles, and 8,000 1+ smolts survive to reach the mainstem Mill Creek below the West Branch and East Fork.

Although 1+ smolts are the primary life stage for evaluating the coho salmon population, emergent fry and 0+ juveniles also have considerable ecological value. Coho salmon fry and juveniles may be an important part of the food base for cutthroat trout and possibly juvenile steelhead in the mainstem Mill Creek below the East Fork and West Branch and the mainstem Smith River. Coho salmon that leave the East Fork and West Branch may also rear in the mainstem Mill and/or Smith River and emigrate as 1+ smolts. Emergent fry and 0+ juveniles leaving the Study Area are not necessarily losses, and may potentially survive to become returning adult spawners.

3.3.1 Adult escapement estimates (number of spawners)

Choice of an initial input value for adult escapement does not affect the equilibrium population size or interpretation of the model results. The population model runs were not affected in any meaningful way by the uncertainty associated with the adult escapement estimates. Until summer rearing habitat is fully seeded, the population will continue to increase with each succeeding generation.

3.3.2 Sensitivity analyses

The sensitivity analysis conducted on the coho salmon model under current conditions indicated that the coho salmon population is primarily influenced by the model parameter "1+ smolt ocean survival", found in the last row of the model. While this parameter strongly affects model results, smolt-to-adult survival estimates have high and currently unquantifiable uncertainty; the smolt survival parameter was only included to allow the population model to estimate escapement and predict equilibrium conditions. However, the influence of this parameter indicates the importance of smolt-to-returning-adult survival in the coho salmon life-cycle. This could have important implications for the Mill Creek coho salmon population as it is not uncommon to have order of magnitude differences in coho salmon ocean survival rates between high and low adult return years (Chilcote et al. 2005).

The model is sensitive (>10% change in spawner abundance) to overwinter carrying capacity, summer rearing habitat carrying capacity and overwinter survival as well as late summer survival (Table 3-2; see Appendix D for more detailed reporting of sensitivity analyses).

Table 3-2. Results of sensitivity analyses for the coho salmon population model.

Parameter	% change (with doubling)	% change (with halving)
1+ smolt ocean survival	77	-42
West Branch overwinter carrying capacity	45	-24
East Fork overwinter carrying capacity	19	-10
West Branch early summer carrying capacity	24	-12
West Branch overwinter survival	6	-12
West Branch late summer survival	6	-12

3.3.2.1 Rearing habitat carrying capacity

Our conceptual model hypothesized that rearing habitat, particularly overwintering habitat, would limit the current population, which is supported by model results. Doubling overwintering habitat in both tributaries increased the adult population size by more than 15% (Table 3-2). Although these values are not to be taken too literally, they do give an indication of the relative magnitude in population change with respect to potential habitat changes. Increasing summer rearing habitat has less of an impact on the population given the current parameter values than increasing overwintering habitat (for the West Branch, only a 24% increase in the adult population size when doubling the habitat, as compared to a 45% increase when doubling overwintering habitat).

3.3.2.2 Survival

Increases or decreases in 1+ smolt ocean survival have a dramatic effect on equilibrium population size, with an increase of 77% with a doubling of ocean survival and a decrease of 42% with a halving of the ocean survival rate. These results highlight the importance of obtaining a 1+ smolt ocean survival estimate as accurate as possible for adult spawner projections to be realistic. In addition, these modeling results indicate that it would be misleading to use trends in adult spawner numbers alone as an indicator of changes to freshwater habitat conditions.

Decreasing overwinter and late summer survival in the West Branch given current conditions has an impact on the population (12% decrease in equilibrium population size), although the change is not dramatic if marine survival is high enough to produce enough returning adults to fully seed the overwintering habitat. Model runs with marine survivals more typical of pre-WY2000 conditions (assumed to be 0.006, based on OPI marine survival indices from Chilcote et al. 2005) indicated that a 50% decrease in any one of the density-independent survival rates would lead to extinction (Appendix D).

3.4 Factors Affecting Population Dynamics of Chinook Salmon

Following a cohort from the West Branch or East Fork illustrates that although many eggs are deposited, the carrying capacity for eggs is higher than the amount that is currently being deposited. Emergent fry in both reaches appear to saturate the available habitat at the current spawner escapement level (based on redd counts from WY 2005, one female per redd). Mortality during each life step results in population declines, such that nearly 125,000 emergent fry and

11,000 0+ smolts survive to reach the mainstem Mill Creek below the West Branch and East Fork.

Although 0+ smolts are the primary life stage for evaluating the Chinook salmon population, emergent fry also have ecological value. Chinook salmon fry may be an important part of the food base for cutthroat trout and possibly juvenile steelhead in the mainstem Mill Creek below the East Fork and West Branch and the mainstem Smith River. Chinook salmon emergent fry that leave the East Fork and West Branch may also rear in the mainstem Mill Creek and/or Smith River and emigrate as 0+ smolts. Therefore, emergent fry leaving the Study Area could potentially survive to become returning adult spawners.

3.4.1 Sensitivity analyses

The sensitivity analysis conducted on the Chinook salmon model under current conditions indicated that the Chinook salmon population is primarily influenced by the model parameter "smolt-to-adult survival", found in the last row of the model. While this parameter strongly affects model results, smolt-to-adult survival estimates have high and currently unquantifiable uncertainty; the smolt survival parameter was only included to allow the population model to estimate escapement and predict equilibrium conditions. However, the influence of this parameter indicates the importance of smolt-to-returning-adult survival in the Chinook salmon life-cycle. This could have important implications for the Mill Creek Chinook salmon population in years with poor ocean conditions and low marine survival rates.

The model is sensitive (>10% change in spawner abundance) to spring rearing carrying capacity, and no other freshwater parameters (Table 3-3; see Appendix E for more detailed reporting of sensitivity analyses).

Table 3-3. Results of sensitivity analyses for the Chinook salmon population model.

Parameter	% change (with doubling)	% change (with halving)
0+ smolt ocean survival	100	-50
West Branch spring carrying capacity	55	-27
East Fork spring carrying capacity	45	-23

3.4.1.1 Rearing habitat carrying capacity

The Chinook salmon conceptual model hypothesized that spring rearing habitat would limit the current population, which is supported by model results. Doubling spring rearing habitat in both tributaries increased the adult population size by more than 40% (Table 3-2). These values provide the relative magnitude in population change with respect to potential habitat changes. Increasing spring rearing habitat in the West Branch has slightly more value (55% increase) than increasing spring rearing habitat in the East Fork (45% increase).

3.4.1.2 Survival

The model is not sensitive to any of the density-independent survival rates in freshwater habitat. It is however very sensitive to survival from smolt to returning adult, with a 100% increase in the number of adult returns by doubling the 0+ smolt ocean survival, and a 50% decrease in the number of returning adults by halving the 0+ smolt ocean survival.

3.5 State-space Model

State-space modeling was used to obtain improved estimates of coho salmon 1+ smolts and spawners (filtered estimates) and predicted numbers of 1+ smolts and spawners, based on the underlying stock-production model and input values for spawner and smolt observations (Table 3-4). Filtered and predicted estimates for 1+ smolts and spawners in the West Branch Mill Creek are presented in Figure 19.

Table 3-4. State-space model input values for coho salmon spawning adults (based on finite normal mixture estimates using redd counts) and 1+ smolts (based on population estimates from outmigrant trapping) in the West Branch Mill Creek.

WY	Spawners	Smolts	
	Estimate	Estimate	Variance
1995	150	2,717	17,823
1996	90	1,277	76,491
1997	104	1,392	108,434
1998	16	5,554	346,580
1999	4	1,342	7,857
2000	4	2,140	39,192
2001	4	10,821	1,345,600
2002	98	5,004	342,225
2003	280	2,931	64,009
2004	76	3,832	219,961
2005	1,120	763	16,384

The 95% confidence intervals for both predicted and filtered estimates typically contained the observed data (Figure 19). Predicted estimates for WY 2006 were 47 spawners (with a 95% CI of 4–194) and 2006 1+ smolts (95% CI of 278–6751).

Predicted values tended to be higher than filtered values for spawners but lower than filtered values for 1+ smolts (Figure 19). Filtered estimates for 1+ smolts were fairly precise, and less precise for spawners. Due to the incorporation of observation data from a given year, filtered estimates are more precise than predicted values.

Filtered and predicted estimates of spawners based on state-space modeling would be more precise if estimates of variance for spawner estimates are obtained. In addition, further improvements to the model could include a predictive equation for smolt to adult survival based on flow and/or ocean conditions. The likelihood of the model could then be maximized based on the choice of a parameter within the predictive equation (e.g., slope or intercept) rather than the current parameter of smolt to adult survival. This would allow for variability in the smolt to adult survival rate over time.

4 RECOMMENDATIONS

4.1 Juvenile/Smolt Monitoring

We recommend a continuation of the existing sampling methodologies of outmigrant trapping and juvenile abundance snorkel surveys. Coho smolt and juvenile data were essential for estimating values for model parameters. We were able to evaluate the potential carrying capacity due to the length of the dataset, and will be able to evaluate any changes in carrying capacity that result from future management actions.

A complete quality control of the juvenile abundance data, similar to that which was conducted for the spawner surveys, is recommended. Once the quality assurance and control is completed, older datasets (WY 1994 to 1998) could be re-run using DARR 2.0 to obtain population estimates for smolts, and more recent years could be re-analyzed for any potential changes.

In the East Fork, estimation of spring and summer rearing habitat carrying capacity was problematic, due to a limited dataset for 0+ juvenile abundance. We strongly recommend continued juvenile abundance snorkel surveys here to better define coho salmon summer carrying capacity, a sensitive model parameter, and improve our understanding of population dynamics in the East Fork. Chinook salmon spring rearing capacity, another sensitive model parameter, may be better defined if these surveys are conducted in the spring, before typical outmigration of any Chinook salmon 0+ smolts. Habitat mapping is recommended to quantify the amount of suitable spring and summer rearing habitat, providing a habitat-based method to assess spring and summer carrying capacity.

Because there is little available data for the mainstem Mill Creek, where there may be substantial rearing of juveniles; we recommend sampling via trapping or snorkel surveys here. The population model could then be expanded to include mainstem Mill Creek parameters as well, improving the capability to assess the Mill Creek coho salmon population.

Trapping data could be used to attempt to separate age classes of steelhead and cutthroat trout in conjunction with evaluating steelhead and cutthroat juvenile densities with regard to coho salmon juvenile densities. This analysis could be focused on effects of interspecies interactions on coho salmon overwinter and summer carrying capacities.

In addition, we recommend winter juvenile abundance snorkel surveys before and after winter freshets to help better quantify overwintering carrying capacity, the most sensitive freshwater model parameter for coho salmon. This monitoring effort could be contextualized within a BACI (before-after control-impact) study design to also help evaluate any habitat enhancement which takes place. Such a study would also help better describe the relationship between flow and overwinter carrying capacity, which in turn would improve the ability of the state-space model to predict adult returns.

4.2 Spawning Surveys

Redd counts were useful in obtaining spawning escapement estimates, and future counts are recommended. The current frequency of redd surveys is adequate for describing spawning timing. The methodology of flagging new redds allowed approximate identification of redd creation dates. These data were critical for assigning a species to redds of unknown species origin.

Minimum escapement estimates involved a fair amount of subjectivity and are not adequate for population monitoring. Estimates of the number of females per redd based on such data are likely to be vast underestimates. Because surveys are conducted on a weekly basis, it is possible for fish to have entered and died between survey dates; therefore, it is not reasonable to assume that carcasses from a current survey were counted as live fish during a past survey. Also, due to the frequency of surveys, it is likely that not all live fish will be counted. Observation probabilities are unknown, hence it is not possible to generate an estimate of the total number of spawners using these data.

More accurate estimates of spawning escapement are needed for the state-space model to better predict adult returns. Weir counts could potentially be used to establish a relationship between the total numbers of spawners and redd counts to improve both past and future estimates for spawning escapement. We recommend that weir counts be conducted for at least 4 to 5 years to establish a relationship between weir-based estimates and redd counts. If a strong relationship exists, we could use redd counts in the future to estimate escapement, with periodic validation from weir counts.

4.3 Restoration Needs

Population modeling identified overwintering habitat as the limiting factor for coho salmon populations, and we recommend that increasing overwintering habitat be the highest priority for any restoration activities. Large woody debris enhancements could potentially help increase overwintering habitat as well as summer rearing habitat. Juvenile coho select habitat primarily on the basis of water velocity (Shirvell 1990), preferring low-velocity habitats throughout the juvenile rearing period. In coastal streams, low-velocity habitat conditions are primarily created by LWD.

The BACI study design recommended in section 4.1 can be used to monitor the response of the coho salmon population to habitat restoration or enhancement. BACI studies have been successfully conducted in other watersheds to evaluate environmental restoration projects, including the response of coho salmon populations to habitat enhancement (Solazzi et al. 2000, Michener 1997).

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Figures

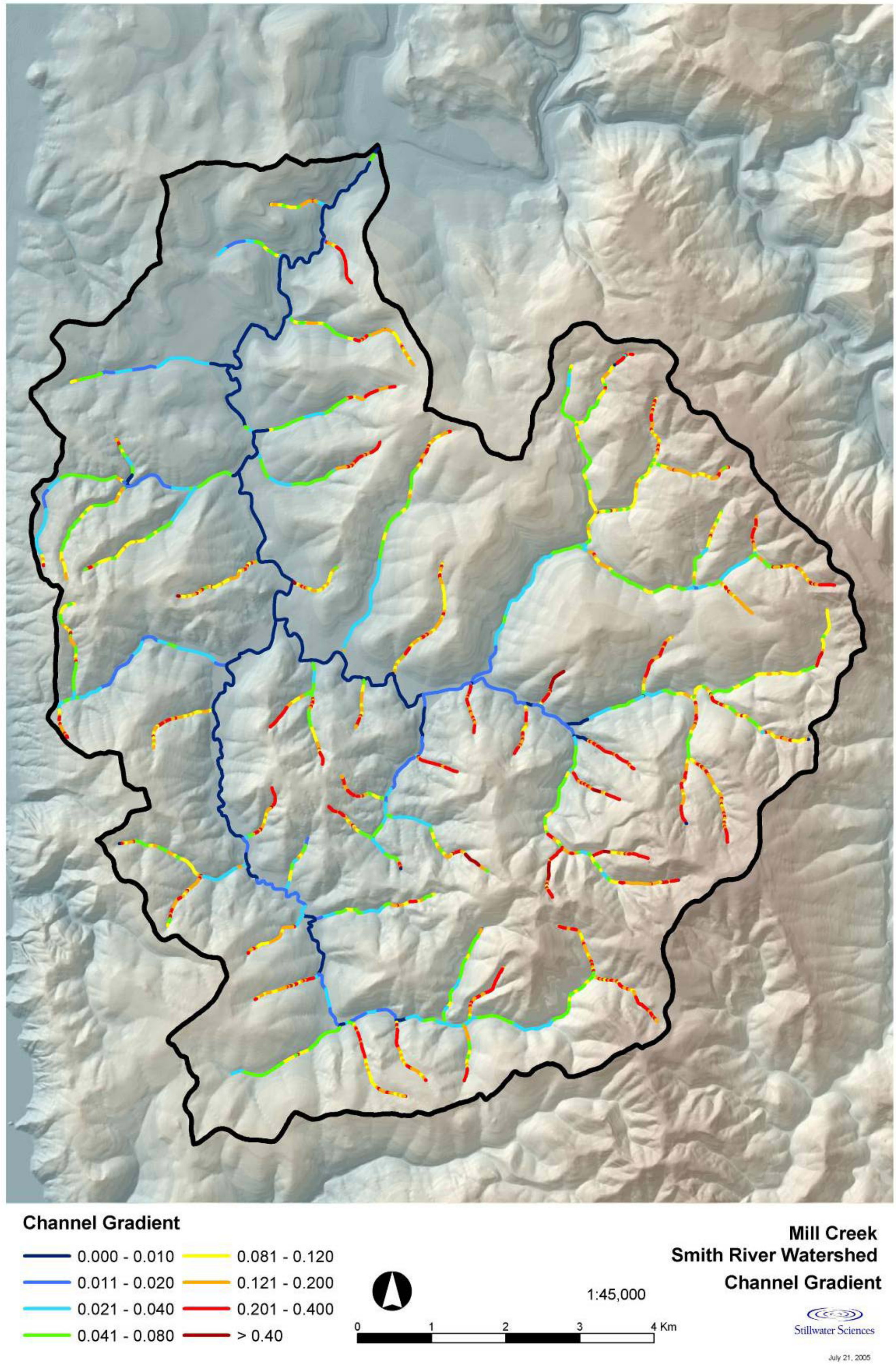

Figure 1. Mill Creek Study Area, Smith River Waterhsed, California.

Mill Creek Coho Salmon Population Model
Version 1.1

Stillwater Sciences

Initial population

Lifestage (Stock) → Stock-Production Model → Lifestage (Production)

Lifestage	population	model	r	K	population	Lifestage	details
returning adults to mainstem Mill	352	Linear	0.5	176		*total female spawners*	
total female spawners	176	Linear	0.5	88		*W. Branch female spawners*	
			0.5		88	*E. Fork female spawners*	

W. branch subreach

Lifestage (Stock) → Stock-Production Model → Lifestage (Production)

Lifestage	population	model	r	K	population	Lifestage	details
W. branch female spawners	88	Superimposition	2300	1,048,442	184,246	*deposited egg*	
deposited eggs	184,246	Linear	0.5	92,123		*emergent fry*	
emergent fry	92,123	Hockey Stick	0.8	25,000	25,000	*early summer 0+*	
					48,699	*mig em fry*	
early summer 0+	25,000	Linear	0.8		20,000	*late summer 0+*	
					0	*mig early summer 0+*	
late summer 0+	20,000	Hockey Stick	0.8	5,530	5,530	*spring 1+ smolts*	
					10,470	*mig late summer 0+*	

E. Fork subreach

Lifestage (Stock) → Stock-Production Model → Lifestage (Production)

Lifestage	population	model	r	K	population	Lifestage	details
female spawner	88	Superimposition	2300	873,701	180,844	*deposited egg*	
deposited egg	180,844	Linear	0.1	18,084		*emergent fry*	
emergent fry	18,084	Hockey Stick	0.8	2,844	2,844	*early summer 0+*	
					11,623	*mig em fry*	
early summer 0+	2,844	Linear	0.8		2,275	*late summer 0+*	
					0	*mig early summer 0+*	
late summer 0+	2,275	Hockey Stick	0.8	2,370	1,820	*spring 1+ smolts*	
					0	*mig late summer 0+*	

Below West Branch and East Fork

Lifestage (Stock) → Stock-Production Model → Lifestage (Production)

Lifestage	population	model	r	K	population	Lifestage	details
mig em fry from upstream	60,322	Linear	0.0001	6		*adults produced from em fry*	
mig early summer 0+ from upstream	0	Linear	0.001	0		*adults produced from early summer 0+*	
mig late summer 0+ from upstream	10,470	Linear	0.005	52		*adults produced from late summer 0+*	
spring 1+ smolts from upstream	7,350	Linear	0.040	294		*adults produced from spring 1+ smolts*	
					352	***Total returning adults***	

Figure 2. Mill Creek Coho Salmon Population Model interface.

Mill Creek Chinook Salmon Population Model
Version 1.1

Stillwater Sciences

Initial population

Lifestage (Stock) → Stock-Production Model → Lifestage (Production)

Lifestage	population	model	r	K	population	Lifestage	details
returning adults to mainstem Mill	27	Linear	0.5	13		*total female spawners*	
total female spawners	13	Linear	0.5	7		*W. Branch female spawners*	
		Linear	0.5		7	*E. Fork female spawners*	

W. Branch subreach

Lifestage (Stock) → Stock-Production Model → Lifestage (Production)

Lifestage	population	model	r	K	population	Lifestage	details
W. branch female spawners	7	Hockey Stick	4800	787,879	32,128	*deposited egg*	
deposited eggs	32,128	Linear	0.5	1	6,064	*emergent fry*	
emergent fry	16,064	Hockey Stick	0.8	1,275	1,275	*0+ smolts*	
					11,576	*mig em fry*	

E. Fork subreach

Lifestage (Stock) → Stock-Production Model → Lifestage (Production)

Lifestage	population	model	r	K	population	Lifestage	details
female spawner	7	Hockey Stick	4936	30,383	30,383	*deposited egg*	
deposited egg	30,383	Linear	0.1	3,0	38	*emergent fry*	
emergent fry	3,038	Hockey Stick	0.8	1,275	1,275	*0+ smolts*	
					1,156	*mig em fry*	

Below West Branch and East Fork

Lifestage (Stock) → Stock-Production Model → Lifestage (Production)

Lifestage	population	model	r	K	population	Lifestage	details
mig em fry from upstream	12,732	Linear	0.0001	1		*adults produced from em fry*	
0+ smolts from upstream	2,550	Linear	0.01	26		*adults produced from 0+ smolts*	
					27		

Figure 3. Mill Creek Chinook Salmon Population Model interface.

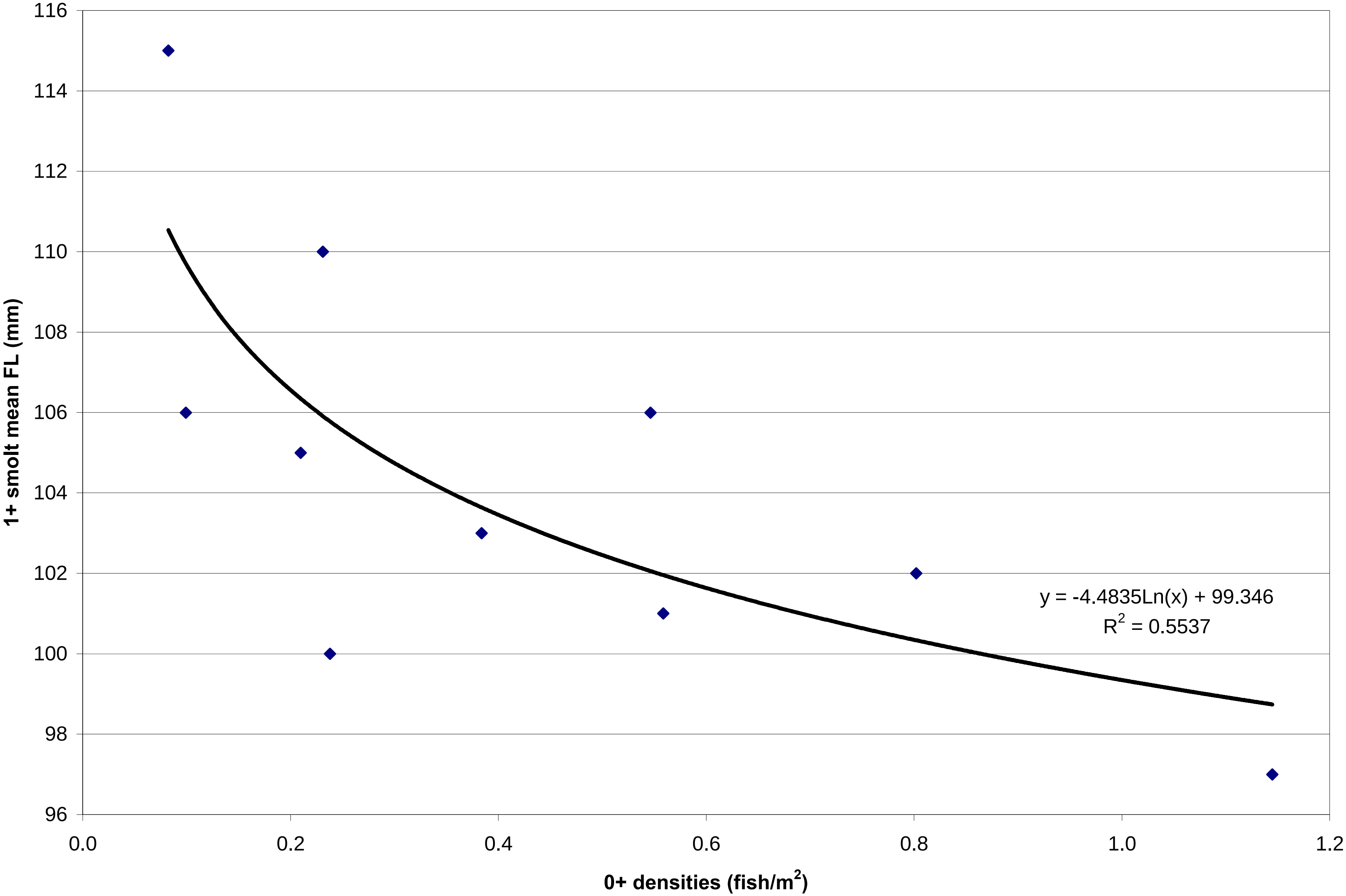

Figure 4. Mean size (fork length in mm) of 1+ coho salmon smolts vs. 0+ densities (fish/m^2) from the preceding water year, West Branch Mill Creek, 0+ densities from WY 1994, 1996 to 2004 and mean smolt sizes from WY 1995, 1997 to 2005.

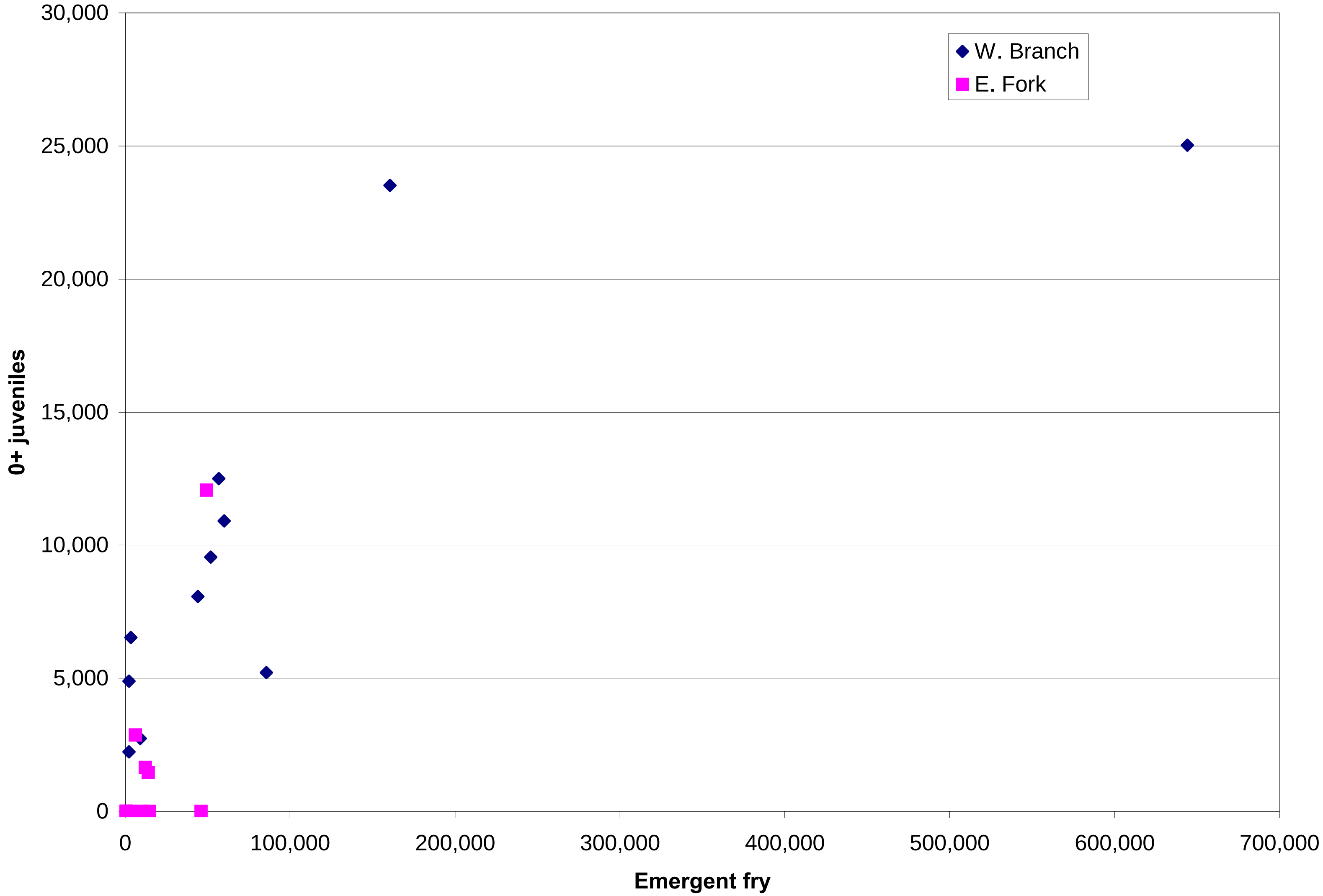

Figure 5. Estimated annual number of coho salmon 0+ juveniles (based on juvenile abundance snorkel surveys) vs. estimated number of emergent fry (assuming a constant survival to emergence of 0.5 and fecundity of 2,300 eggs/female), Mill Creek, WY 1995 to 2005.

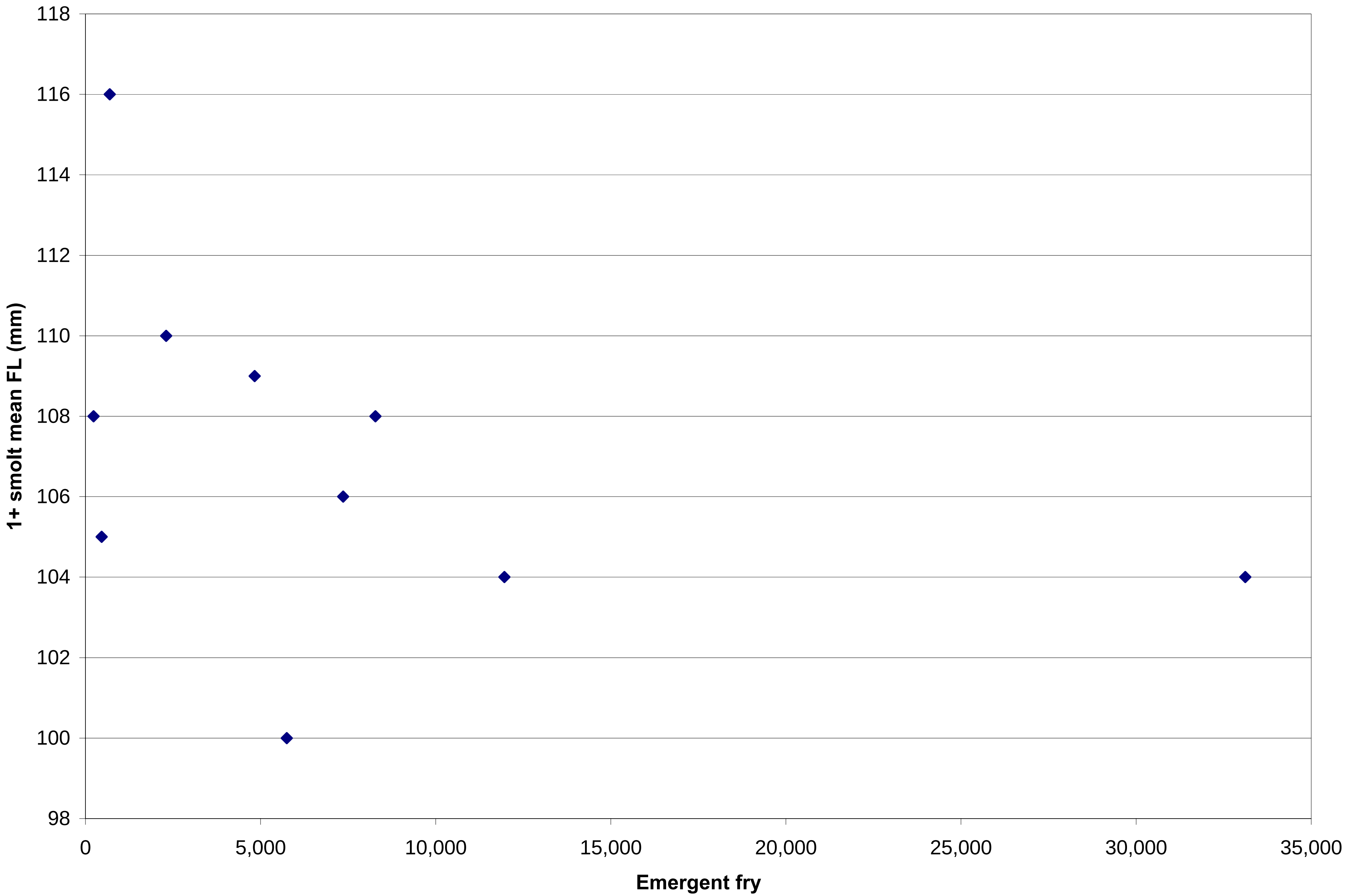

Figure 6. Mean size (fork length in mm) of 1+ coho salmon smolts vs. number of emergent fry from the preceding water year, West Branch Mill Creek, 0+ densities from WY 1995 to 2004 and mean smolt sizes from WY 1996 to 2005.

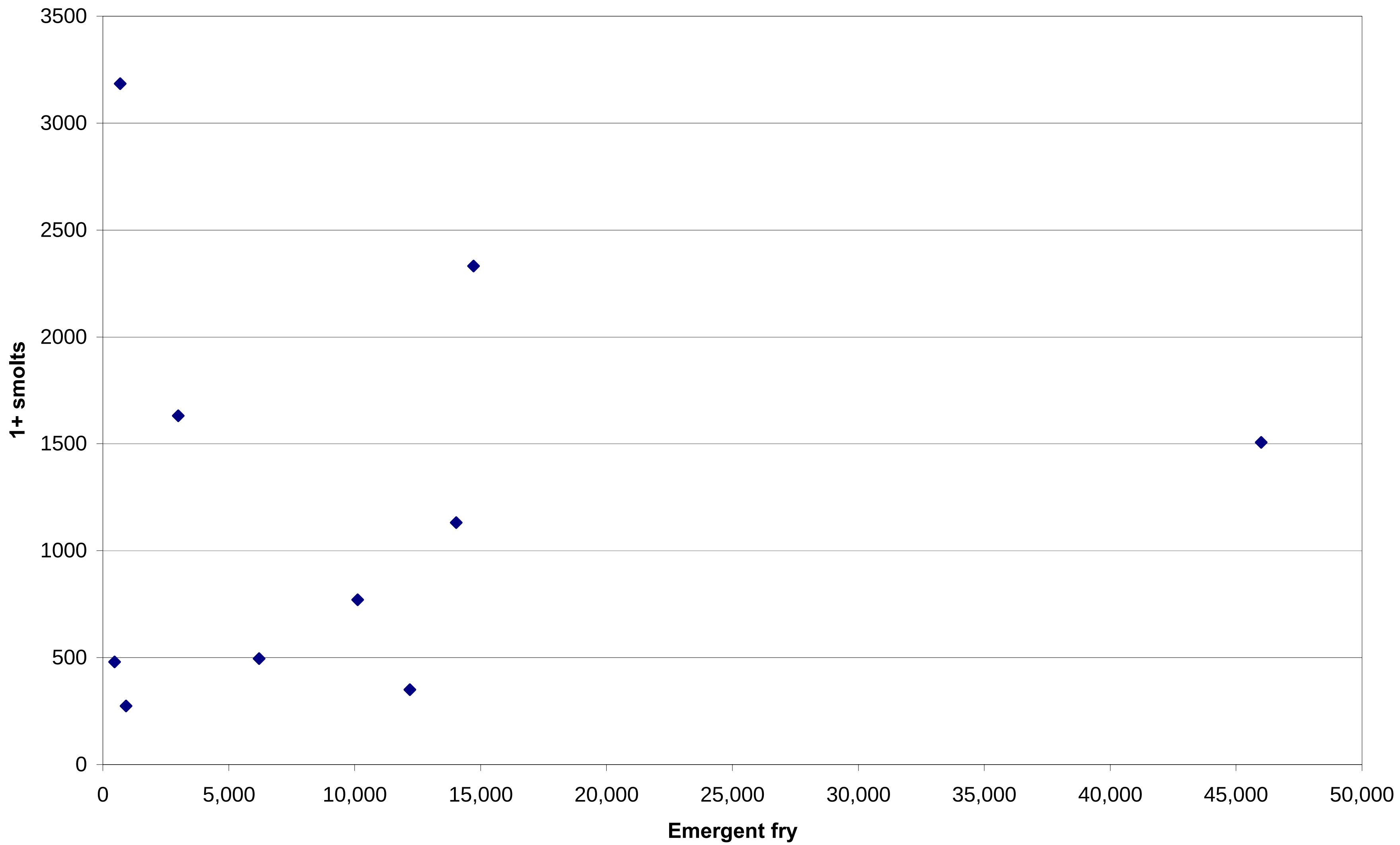

Figure 7. Estimated annual number of coho salmon 1+ smolts (based on outmigrant trapping) vs. estimated number of emergent fry (assuming a constant survival to emergence of 0.1 and fecundity of 2,300 eggs/female), East Fork Mill Creek, WY 1995 to 2005.

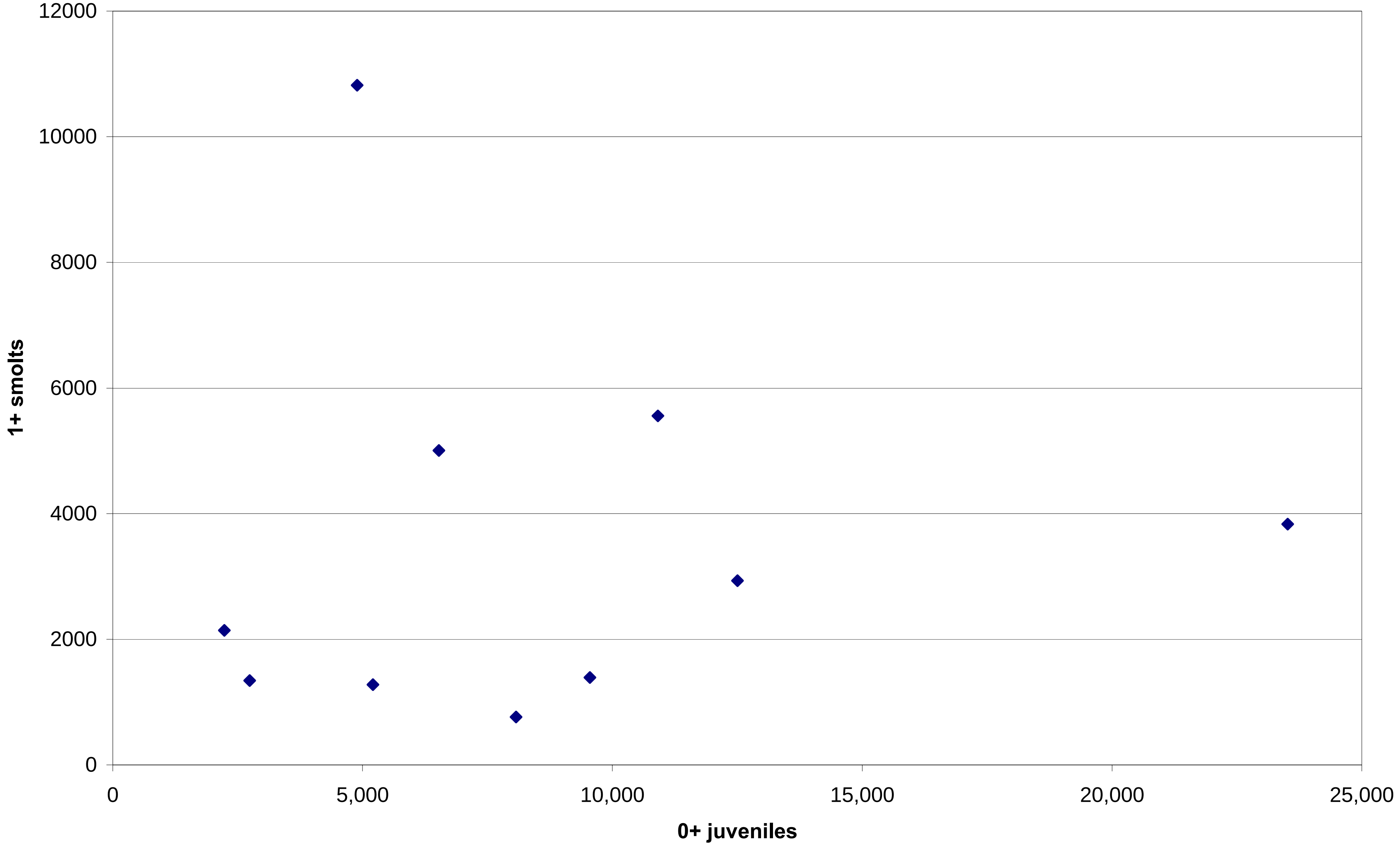

Figure 8. Estimated numbers of 1+ coho salmon smolts versus 0+ juveniles from the preceding water year, West Branch Mill Creek, smolt estimates from WY 1996 to 2005, and 0+ juvenile estimates from WY 1995 to 2004.

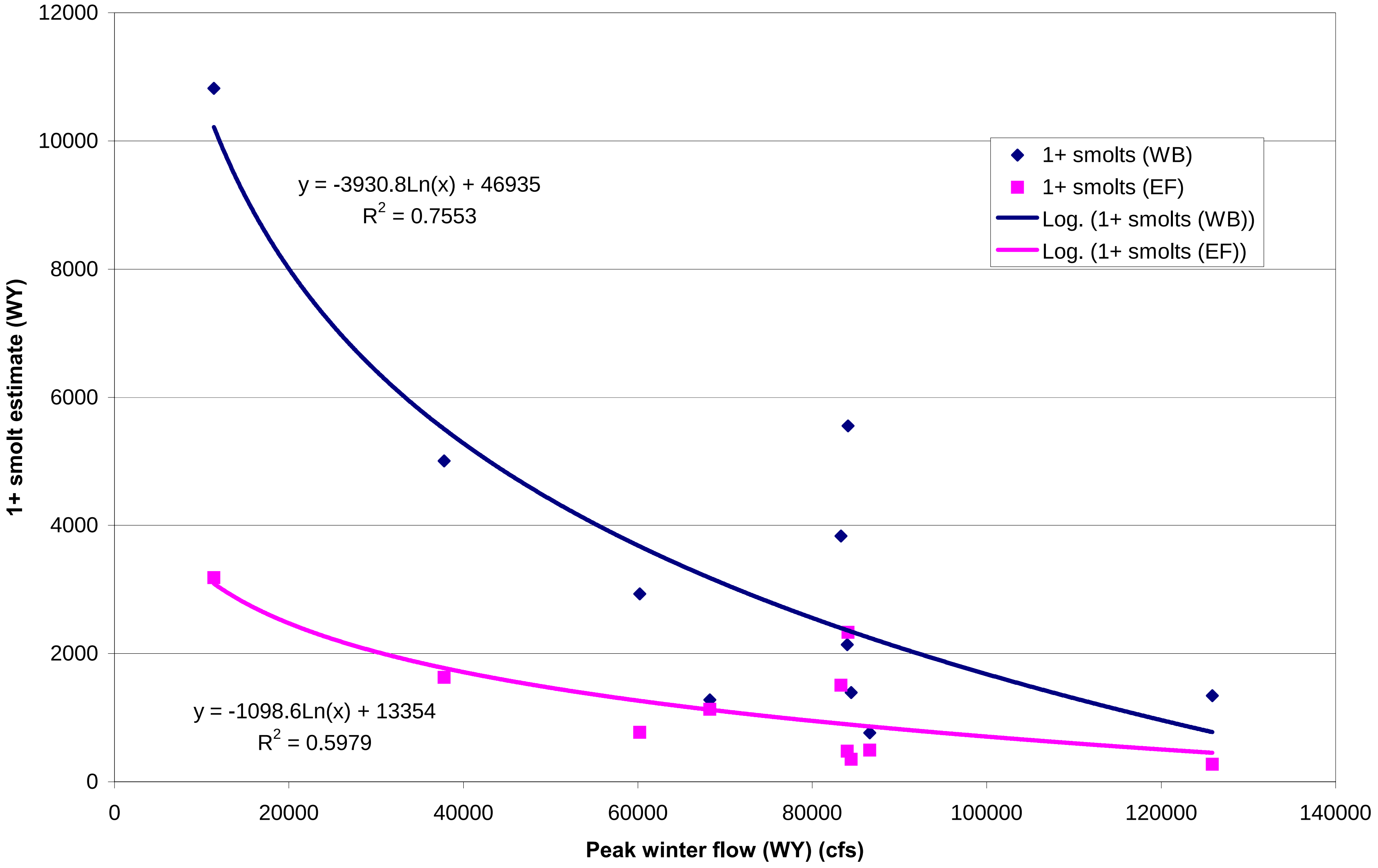

Figure 9. Estimated numbers of 1+ coho salmon smolts versus peak winter flow (cfs) from the preceding water year, West Branch Mill Creek and East Fork Mill Creek, WY 1996 to 2005.

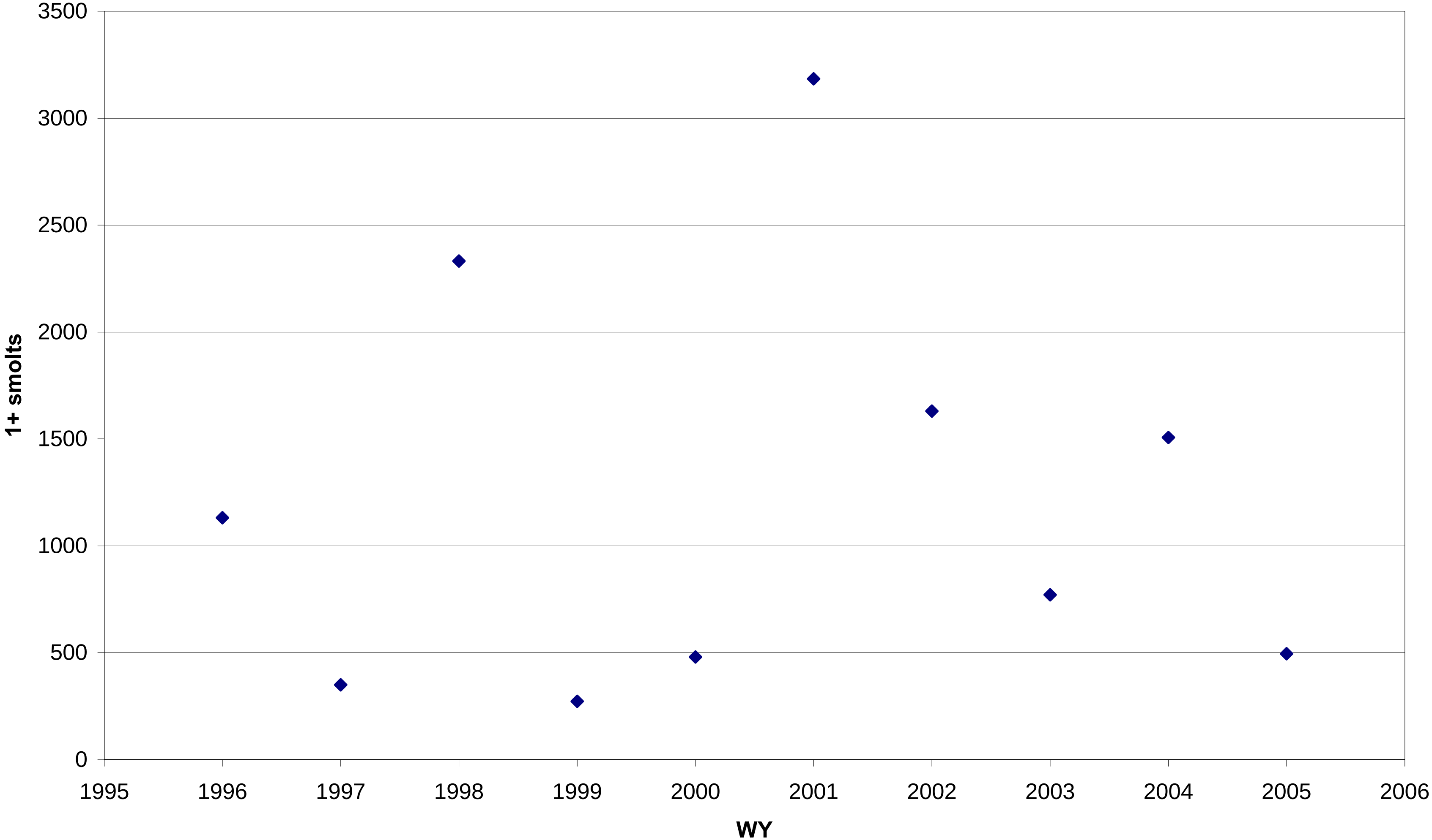

Figure 10. Estimated numbers of coho salmon 1+ smolts versus water year, East Fork Mill Creek.

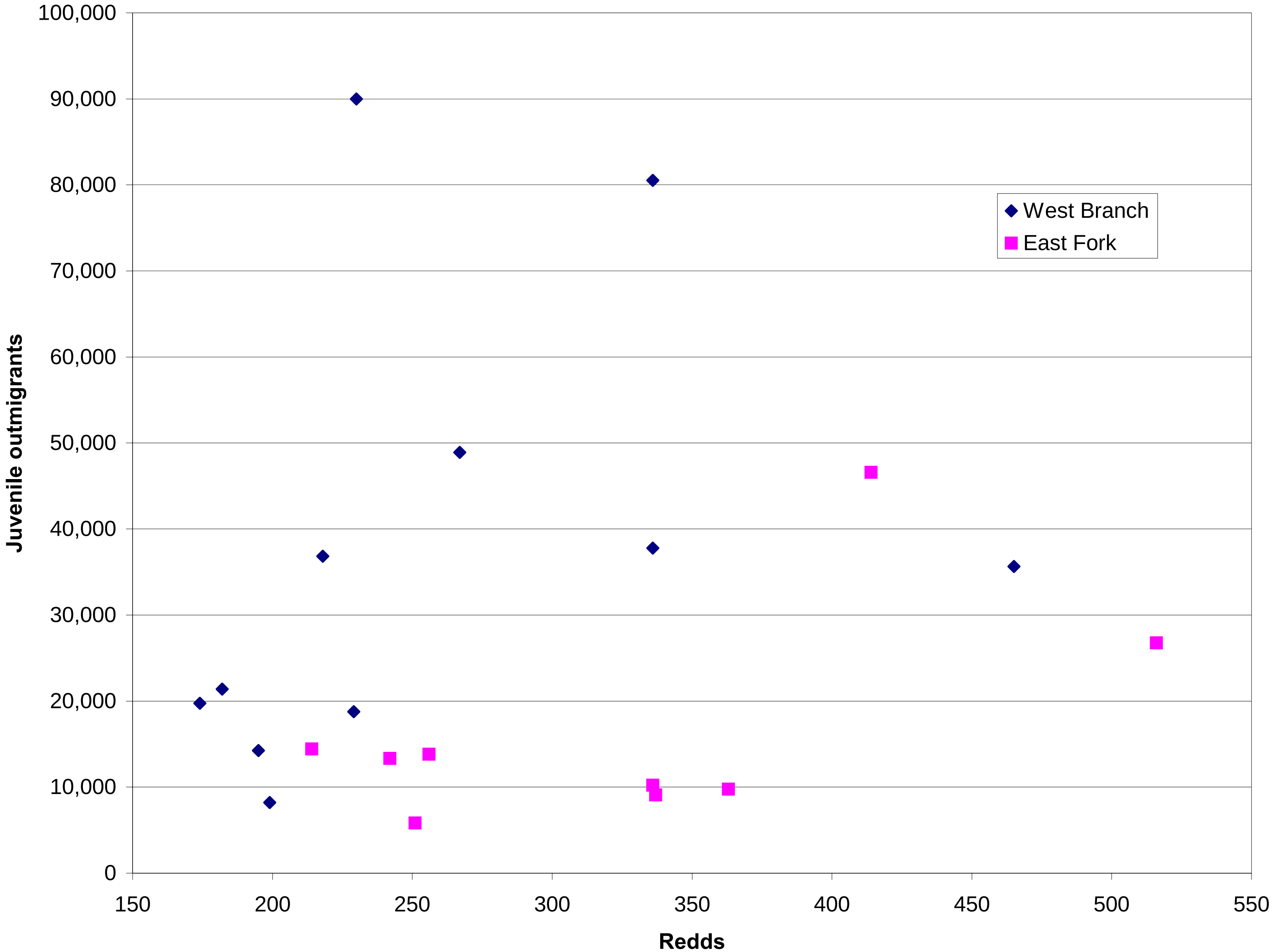

Figure 11. Estimated number of Chinook salmon redds versus number of juvenile outmigrants trapped, East Fork and West Branch Mill Creek, WY 1995 to 2005.

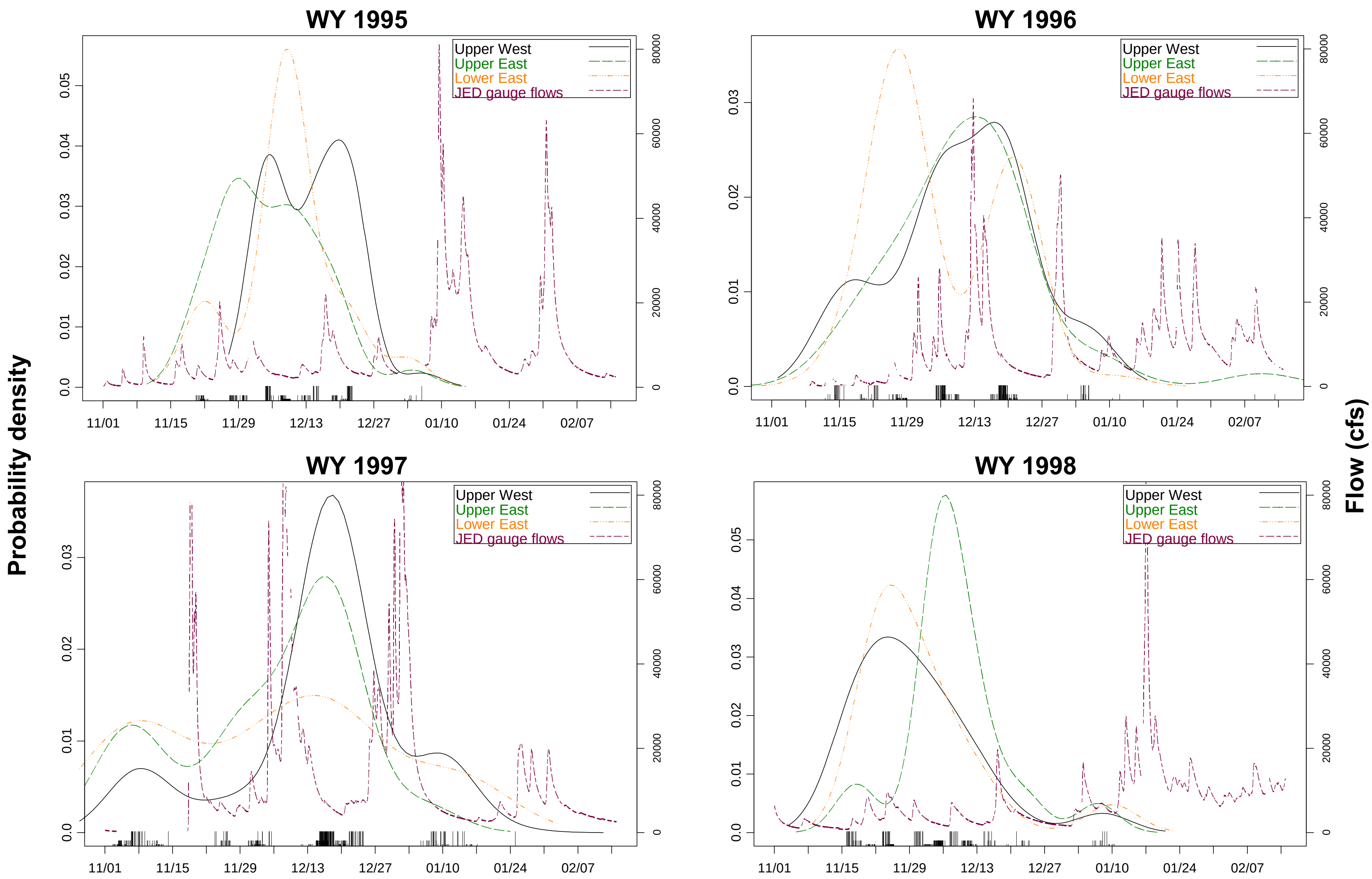

Figure 12a. Spawn timing and flow versus date. Primary y-axis values are probability densities based on smoothing techniques, Bowman and Azzalini (1997).

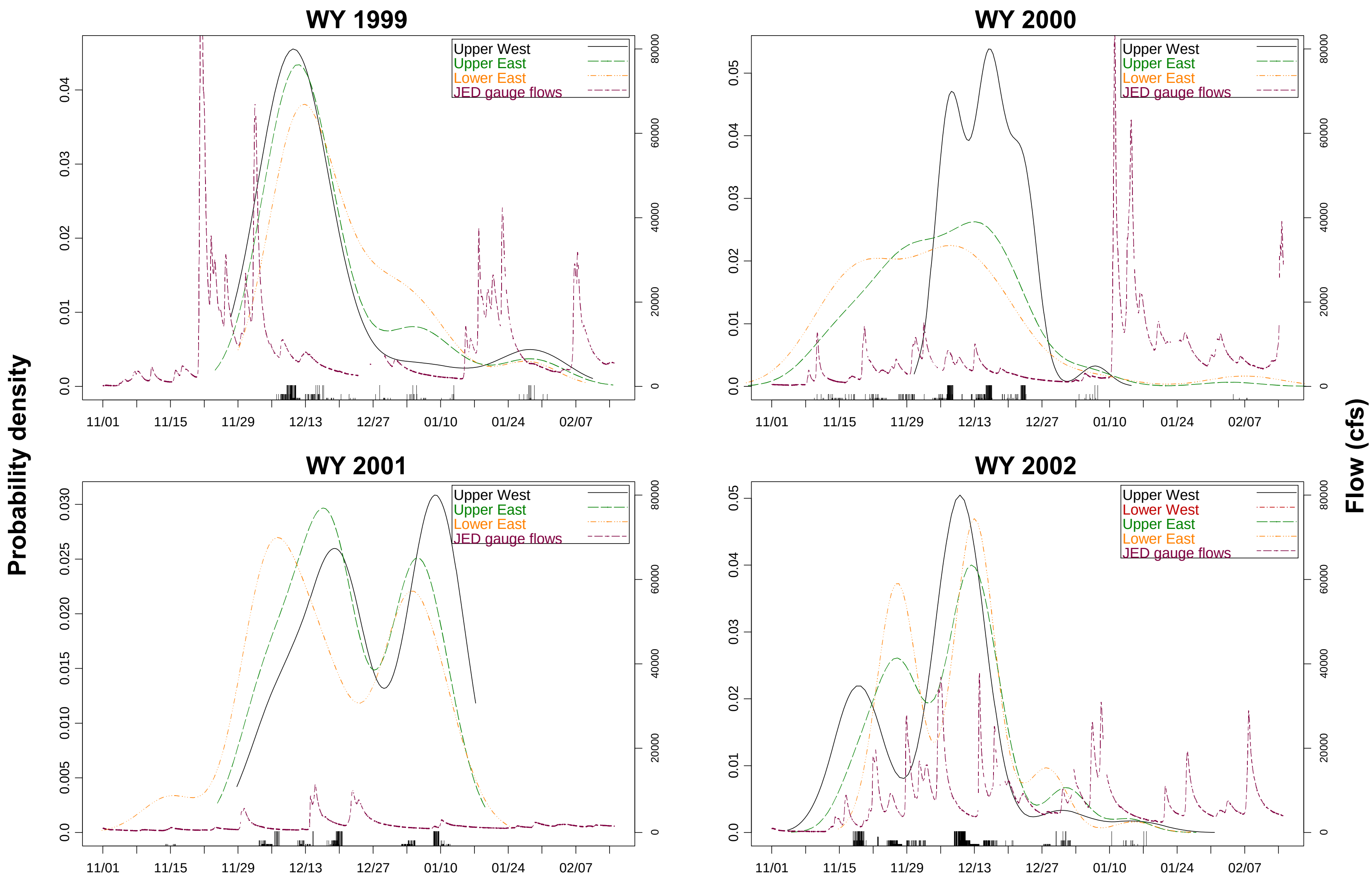

Figure 12b. Spawn timing and flow versus date. Primary y-axis values are probability densities based on smoothing techniques, Bowman and Azzalini (1997).

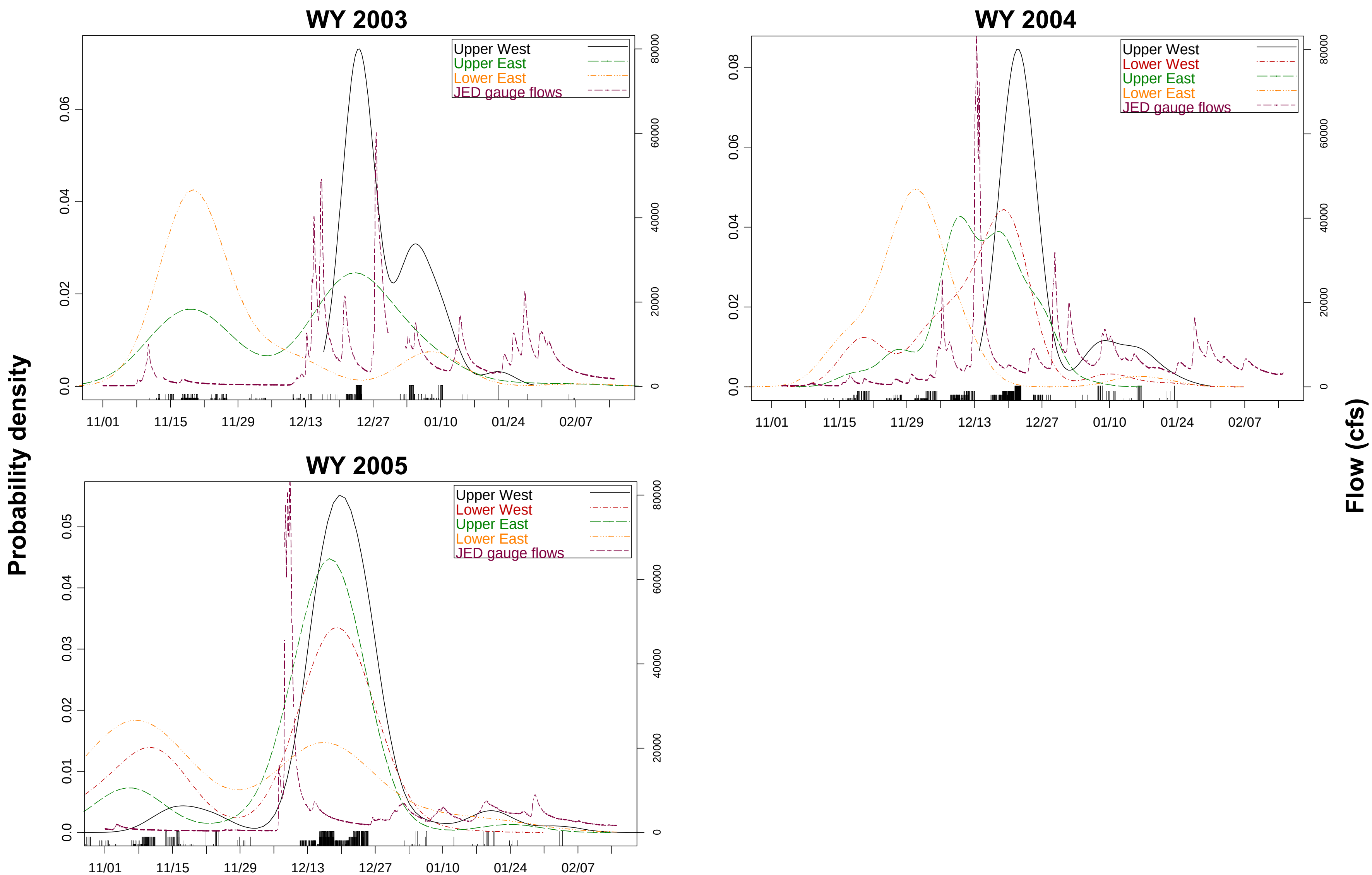

Figure 12c. Spawn timing and flow versus date. Primary y-axis values are probability densities based on smoothing techniques, Bowman and Azzalini (1997).

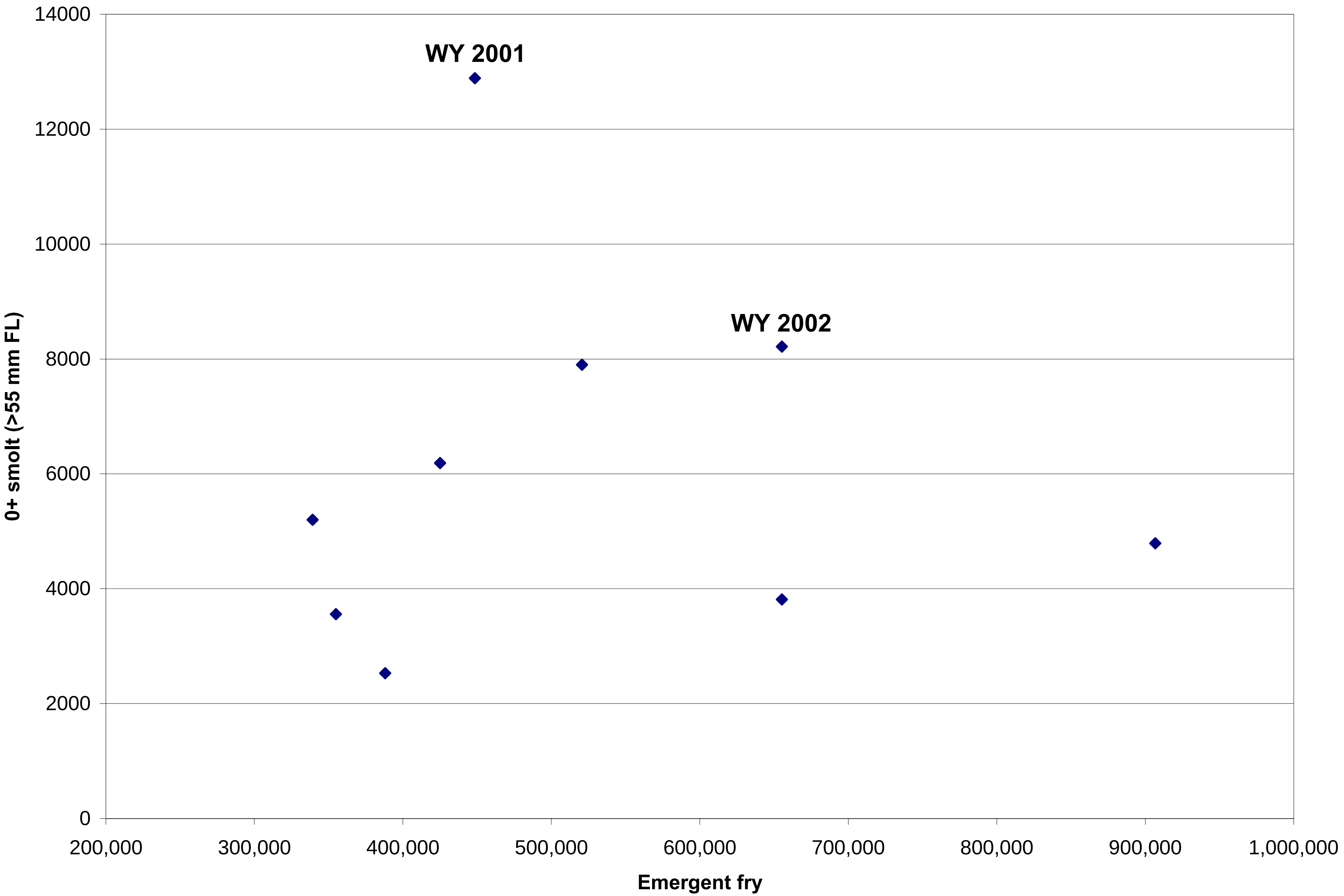

Figure 13. Estimated number of Chinook salmon 0+ smolts (>55 mm FL) based on outmigrant trapping versus estimated number of emergent fry (assuming a constant survival to emergence of 0.5 and fecundity of 3,900 eggs/female), West Branch Mill Creek, WY 1995 to 2005.

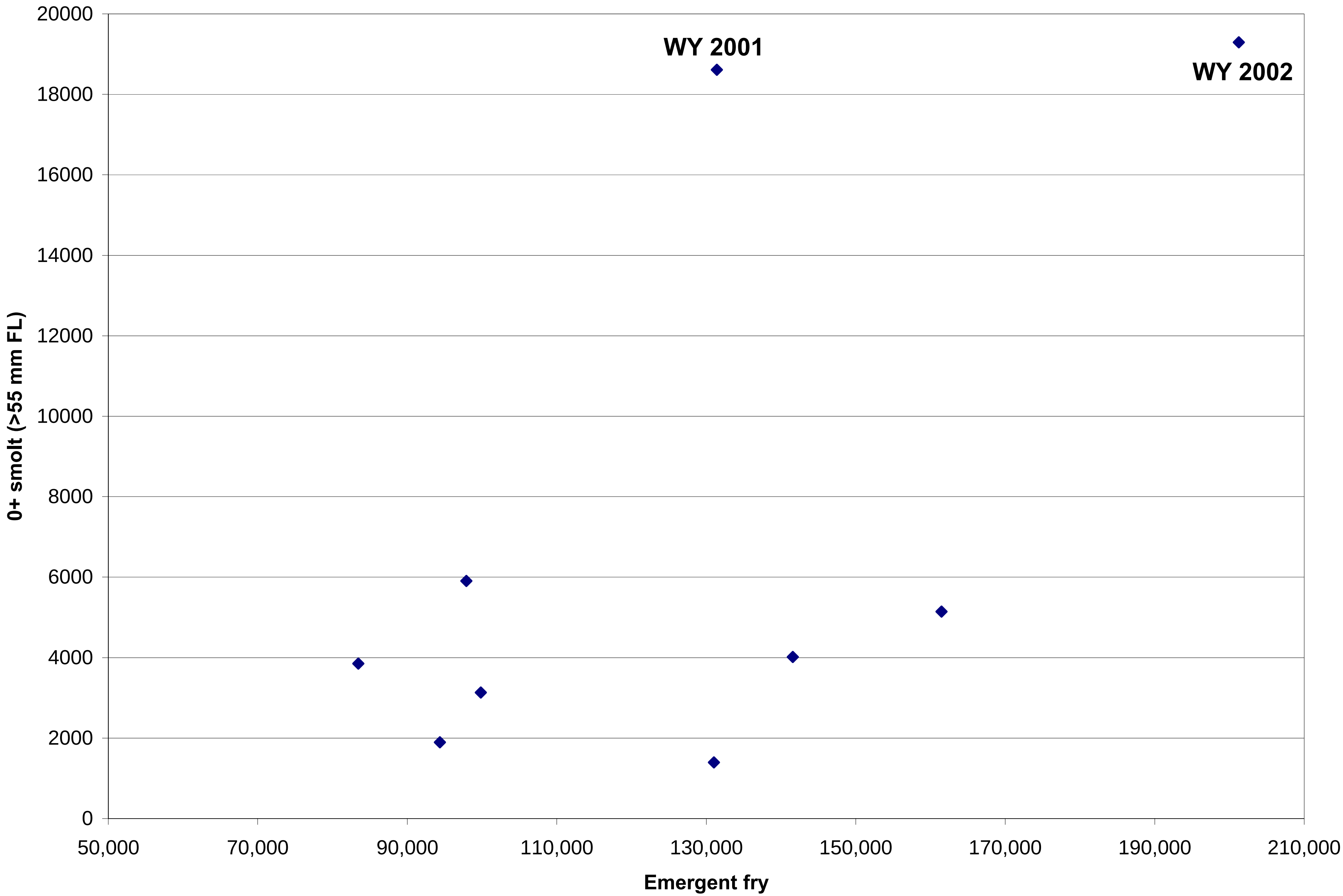

Figure 14. Estimated number of Chinook salmon 0+ smolts (>55 mm FL) based on outmigrant trapping versus estimated number of emergent fry (assuming a constant survival to emergence of 0.1 and fecundity of 3,900 eggs/female), East Fork Mill Creek, WY 1995 to 2005.

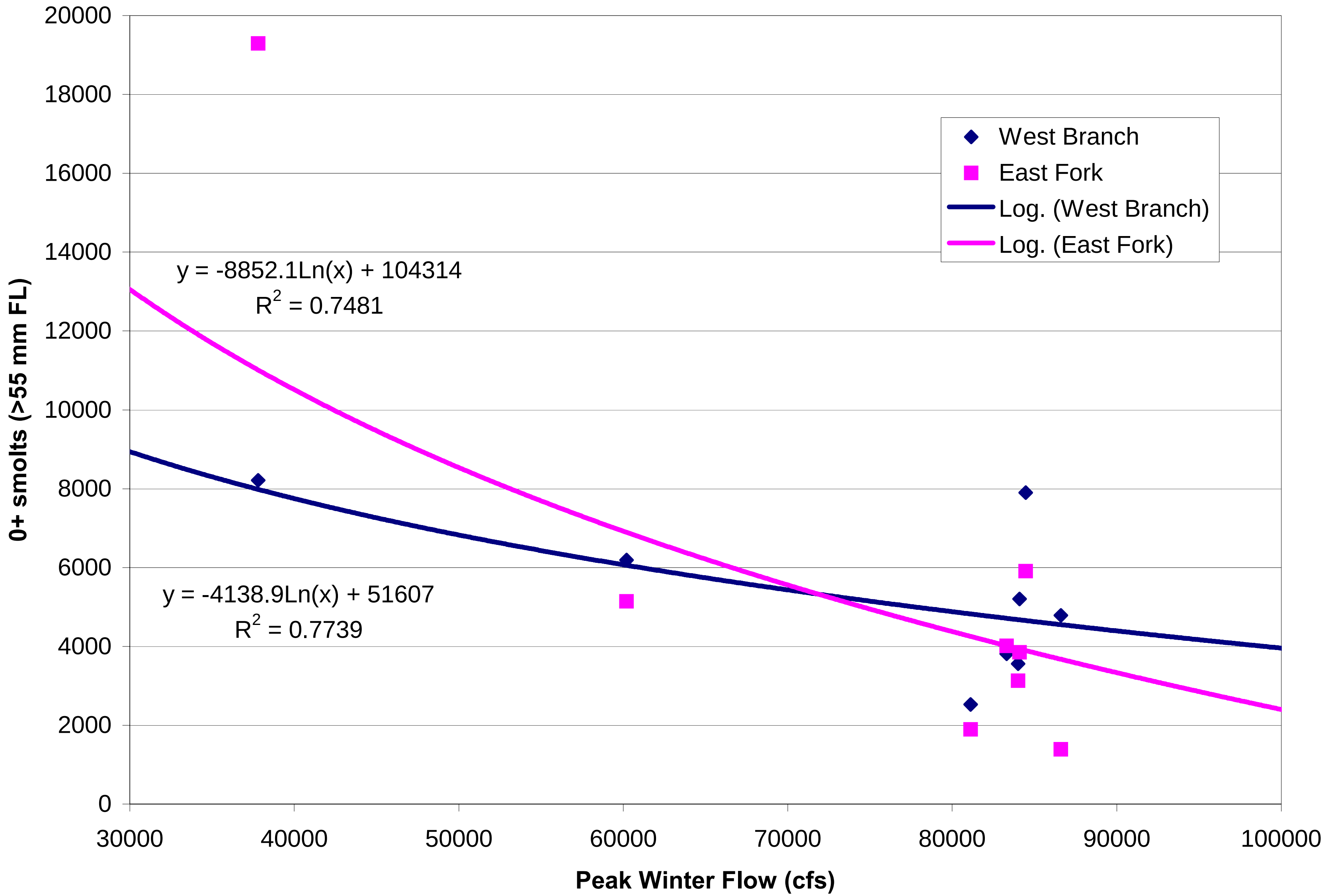

Figure 15. Estimated numbers of Chinook salmon 0+ smolts versus peak winter flow (cfs) from the same water year, West Branch Mill Creek and East Fork Mill Creek, WY 1995 to 2005.

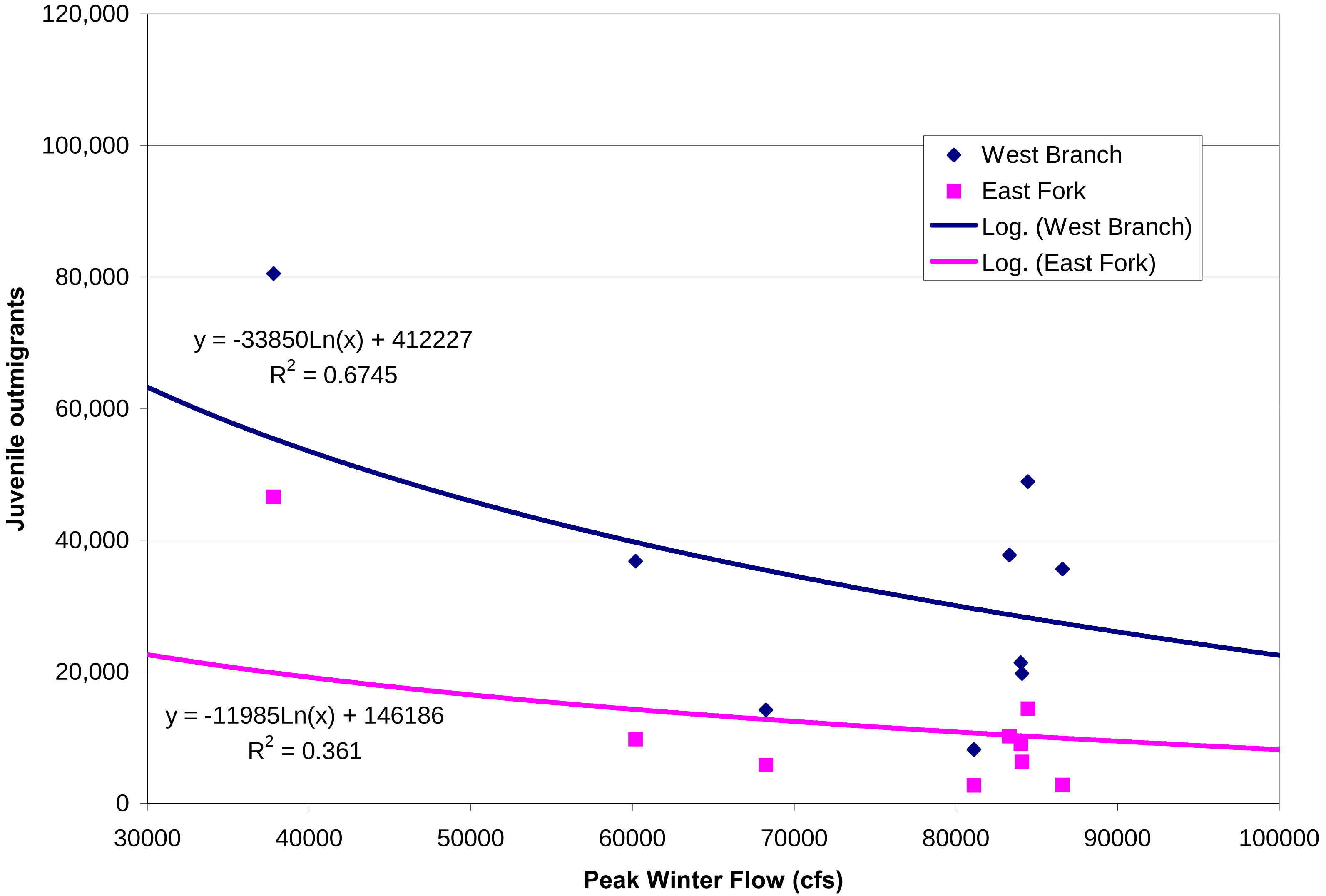

Figure 16. Estimated numbers of Chinook salmon juveniles versus peak winter flow (cfs) from the same water year, West Branch Mill Creek and East Fork Mill Creek, WY 1995 to 2005.

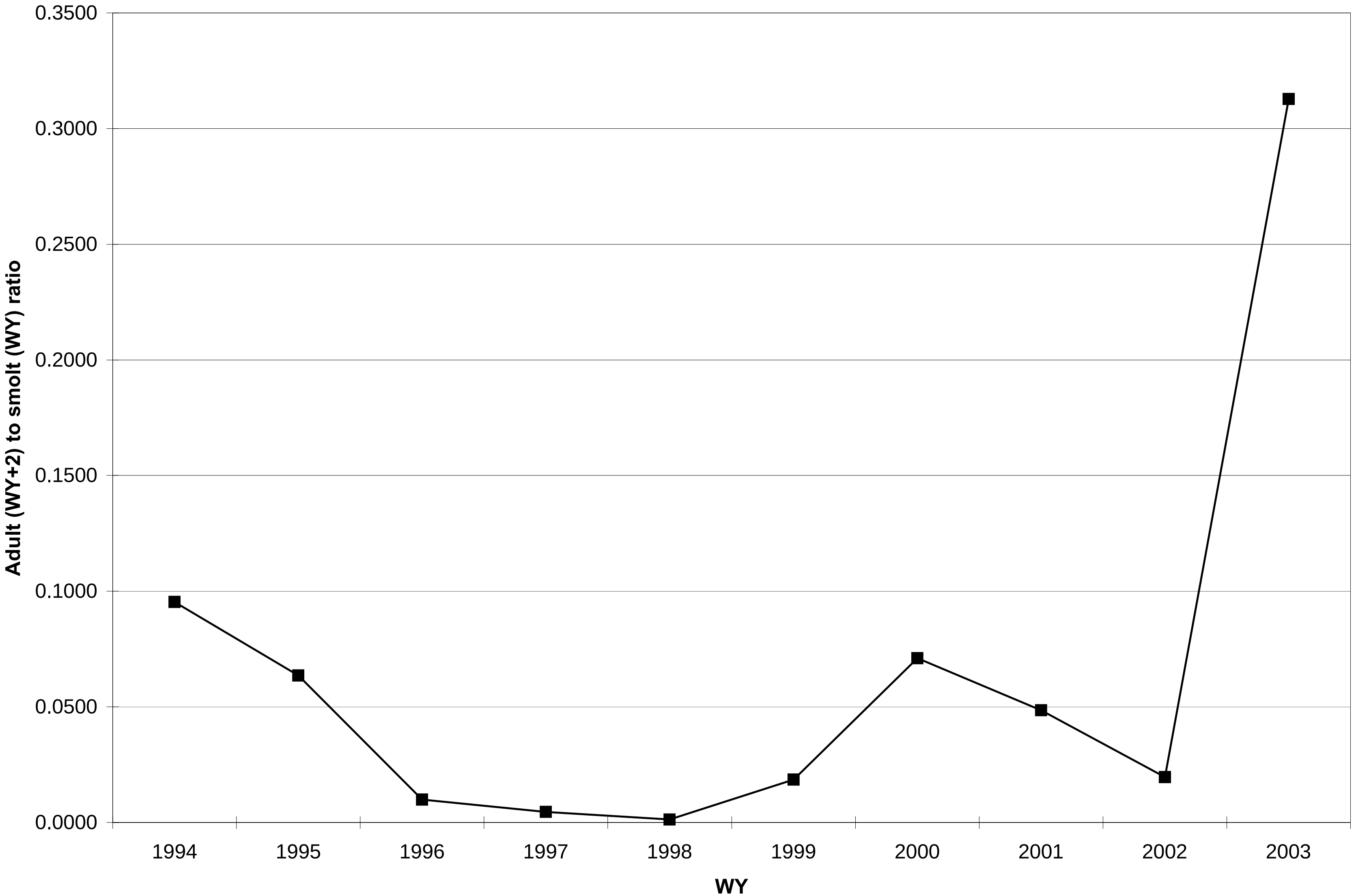

Figure 17. Coho salmon smolt to adult ratios based on smolt estimates from WY 1994 to 2003 and on adult estimates from WY 1996 to 2005 (twice the estimated number of redds), Mill Creek (West Branch and East Fork combined). (Adult estimates from WY 2005 based on raw redd counts rather than estimates.)

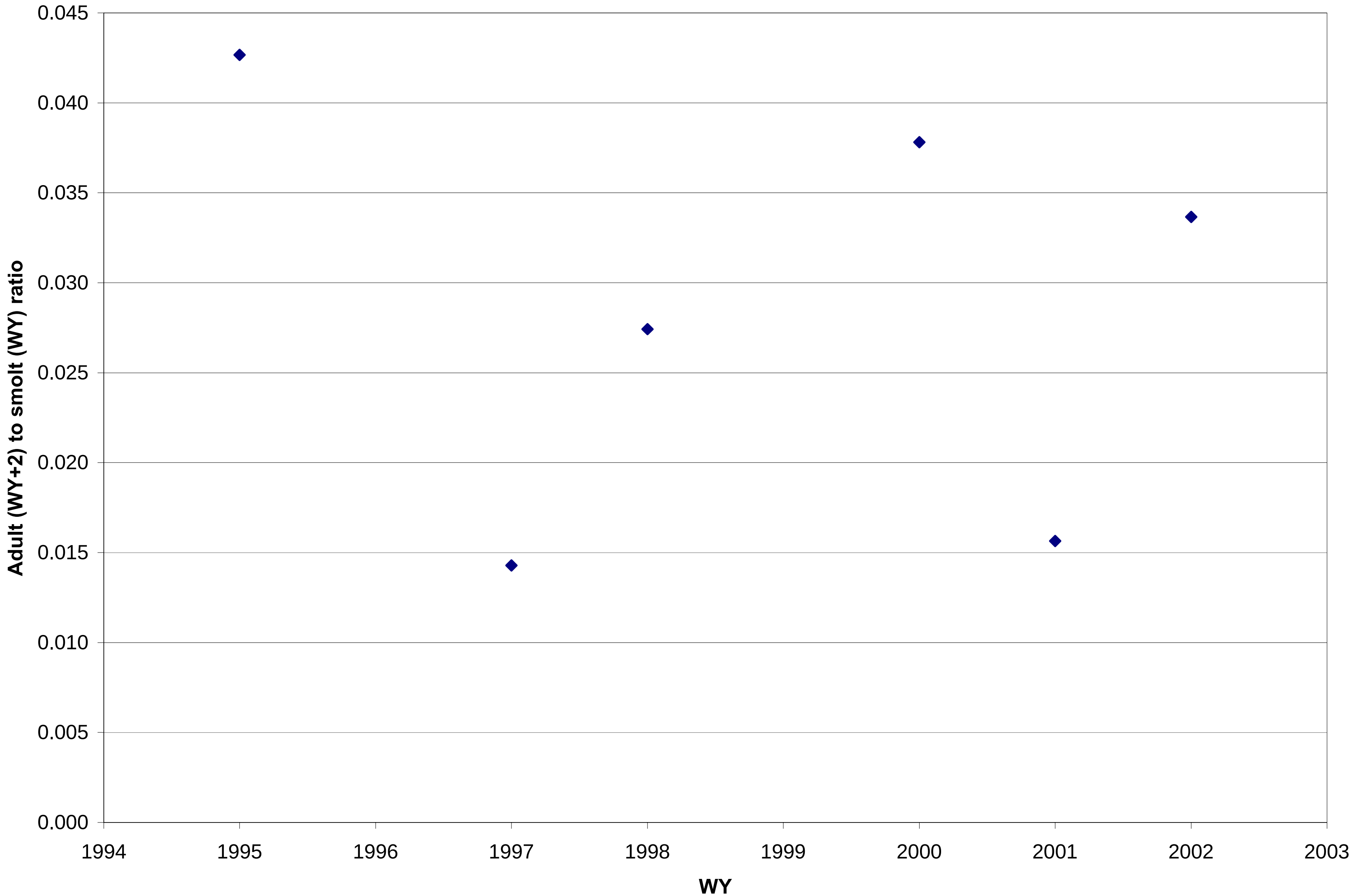

Figure 18. Chinook salmon smolt to adult ratios based on smolt estimates from WY 1995 to 2002 and on 3-year old adult estimates from WY 1998 to 2005 (twice the estimated number of redds produced by 3-year olds), West Branch Mill Creek. (Adult estimates from WY 2005 based on raw redd counts rather than estimates.)

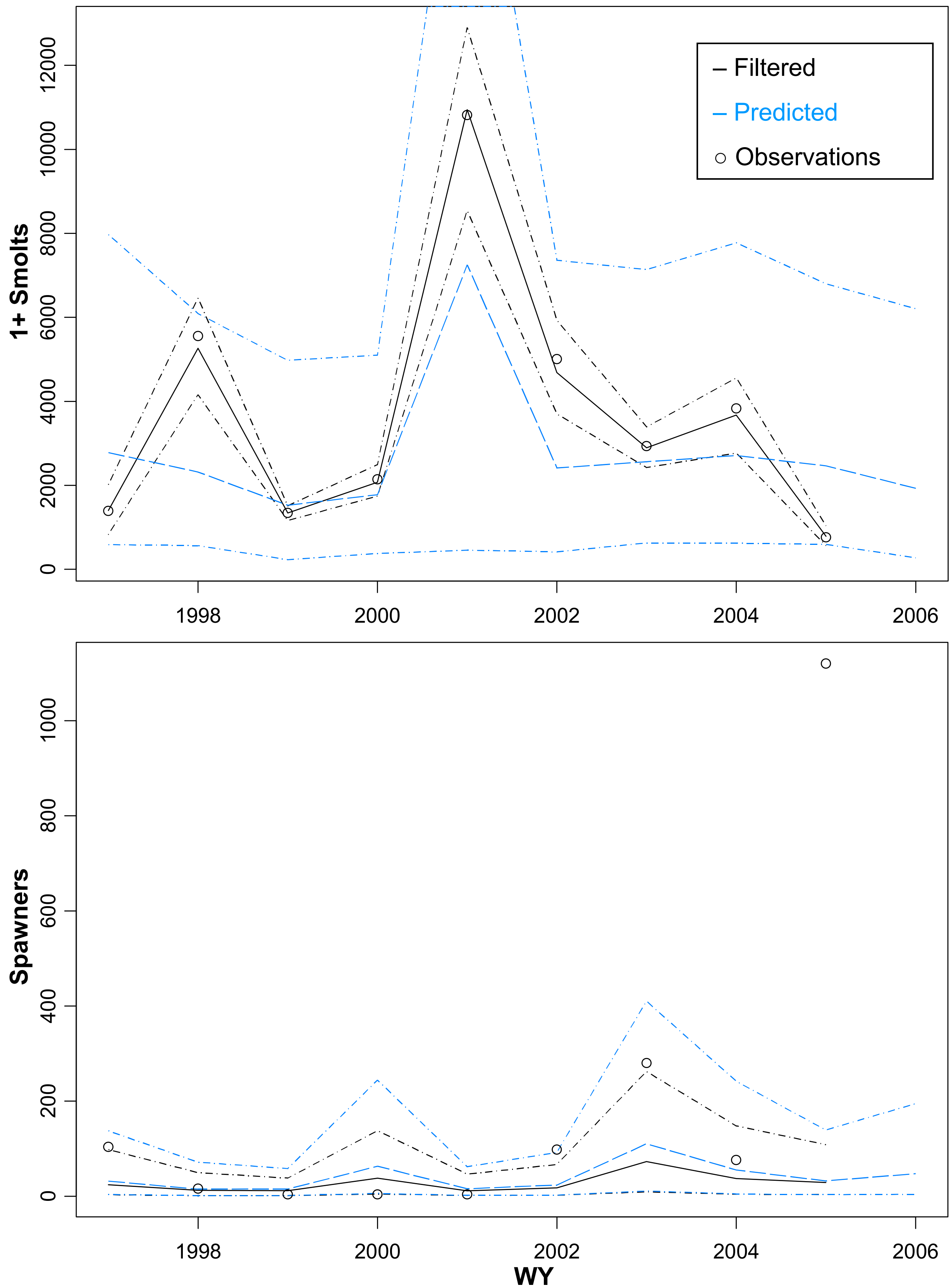

Figure 19. Filtered and predicted estimates of coho salmon 1+ smolts and spawners based on state-space modeling. Solid or long-dashed lines represent point estimates, and short-dashed lines represent 95% confidence intervals.

Appendices

Appendix A

Glossary of terms used for the coho and Chinook salmon population models

Appendix A. Glossary of terms used for the coho and Chinook salmon population models.

Terms	Definitions
Beverton-Holt model	Stock-production model that the user may select within the population dynamics models. It is a model commonly used in management of Pacific salmon, based on Beverton and Holt (1957). This model allows production to increase until reaching a certain stock level; above this stock level, production remains constant, at the limit defined by the carrying capacity, K. The population dynamics models allow the user to choose between two versions: Version 1 is the “original” form; Version 2 is a form that allows production to approach carrying capacity at a faster rate (i.e., it allows a steeper curve).
Carrying capacity, K	A density-dependent term used in stock-production models that represents the population size limit for a given life-stage. This term represents density-dependent factors such as spawning gravel area, or abundance of over-wintering refugia.
Cohort	Members of a life-stage that were spawned in the same year.
Density-dependent	Factors affecting the population that are dependent on the population size, such as habitat area.
Density-independent	Factors affecting the population regardless of population size, such as temperature, disease, or stranding.
Hockey stick model	A stock-production model that is a piece-wise linear function with a slope of r for the density-independent phase, and with a slope of zero for the density-dependent phase (once reaching carrying capacity) (Barrowman and Myers 2000).
Rate of population increase, *r*	An input parameter needed in stock-production models. It is a density-independent term that represents the net effect of births and/or deaths, resulting from factors such as fecundity, or dependence of egg survival on spawning gravel quality. Depending on the life-stage of interest and the stock-production model selected, the input parameter *r* represents the fraction of adults spawning, fecundity, or density-independent survival rate.
Linear model	A stock-production model that the user may select within the population dynamics models. This stock-production model assumes a linear relationship between two life-stages, where *r* is the slope of the line.
Life-stage	Temporal stages (or intervals) of a fish’s life that have distinct anatomical, physiological, and/or functional characteristics that contribute to potential differences in use of the environment.

Life-step	Interval between a production and stock life-stage (i.e., adult to female spawner)
Production	Output from a stock-production model at a particular life-step.
Stock	Input value required by the stock-production models. It is the first required value entered into the population dynamics model spreadsheets; for example, stock would be the number of fry, for a fry-to-juvenile step.
Stock-production model	Relates the number of individuals P in some cohort at one development stage, as a function (F) of the number of individuals S in that cohort at an earlier development stage: $P = F(S)$. The population dynamics models allow the user to choose from the following four stock-production models: (1) Linear (2) Hockey stick, (3) Beverton-Holt 1 (Beverton and Holt 1957), 4) Beverton-Holt 2, and (5) Superimposition.
Superimposition model	A stock-production model that the user may select within the population dynamics models. The values for this model are based on fecundity, suitable spawning gravel area, and average redd size. This model is used to estimate the number of deposited eggs based on the number of female spawners.

Appendix B

Coho salmon population dynamics model parameters and values under current conditions in the Mill Creek Study Area.

Appendix B. Coho salmon population dynamics model parameters and values under current conditions in the Mill Creek Study Area.

Sub reach	Life-stage	Parameter	Value	Source	Comments
Initial population size	**Returning adults to mainstem Mill Creek as female spawners**	Sex ratio (females to males)	1:1	Howard and McLeod (2005a)	Approximately 1:1 sex ratio based on spawning survey data
		Pre-spawning survival	1.0	Assumption	Assumed pre-spawning survival was typically high
		Proportion of female spawners to the West Branch	0.5	Howard and McLeod (2005a)	Proportion of female spawners default based on spawning survey results; assumes one female per redd.
		Proportion of female spawners to the East Fork	0.5	Howard and McLeod (2005a)	Proportion of female spawners default based on spawning survey results (Howard and McLeod 2005); assumes one female per redd.
West Branch sub reach	**Female spawner to deposited eggs**	Suitable spawning gravel area	3,010 m^2	Field reconnaissance data (Stillwater Sciences 2005, unpubl. data)	Based on densities of observed spawners and reconnaissance-level mapping of West Branch, 2005 field visit.
		Mean redd area	2.8 m^2	Burner (1951)	Mean redd area based on literature
		Fecundity	2,300	Rowdy Creek Hatchery (1998, unpubl. data)	Assumed fecundity of 2,300 eggs/female based on Rowdy Creek Hatchery data (1993 to 1998)
	Deposited eggs to emergent fry	Survival rate	0.5	Assumption	Assumed to be 0.5, conservative estimate given likely high gravel quality in West Branch (Waldvogel 2005).
	Emergent fry to early summer 0+	Maximum fry density	2.5 fish/m^2	C. Howard (2006, unpublished data)	These data were used to form a product of 25,000 fish, the estimated carrying capacity based on graphical analysis of 0+juveniles versus emergent fry.
		Suitable habitat area	10,000 m^2		
		Density-independent survival rate	0.8	Howard and McLeod (2005b)	Density-independent survival rate assumed high; potential losses due to disease and predation.
	Early summer 0+ fry to late summer 0+	Density-independent survival rate	0.8	C. Howard (2006, unpubl. data)	Density-independent survival rate based on potential losses due to stranding.
	Late summer 0+ to spring 1+ smolts	Maximum juvenile density	0.35	Howard and McLeod (2005b)	Product used to match carrying capacity determined from graphical analysis of 1+ smolts versus 0+ juveniles.
		Suitable habitat area	15,800 m^2		
		Density-independent survival rate	0.8	Assumption	Assumed density-independent survival to be high; majority of winter mortality is likely due to density-dependent effects which happen during peak flow events.
East fork sub reach	**Female spawner to deposited eggs**	Suitable spawning gravel area	3,340 m^2	Field reconnaissance data (Stillwater Sciences 2005, unpubl. data)	Based on densities of observed spawners and reconnaissance-level mapping of East Fork, 2005 field visit.

Sub reach	Life-stage	Parameter	Value	Source	Comments
		Mean redd area	2.8 m^2	Burner (1951)	Mean redd area based on literature
		Fecundity	2,300	Rowdy Creek Hatchery (1998, unpubl. data)	Assumed fecundity of 2,300 eggs/female based on Rowdy Creek Hatchery data (1993 to 1998)
	Deposited eggs to emergent fry	Survival rate	0.1	Field reconnaissance data (Stillwater Sciences 2005, unpubl. data)	Assumed to be 0.1, estimate based on likely low gravel quality in East Fork, based on ocular estimate from field visit.
	Emergent fry to early summer 0+	Maximum fry density	0.51 fish/m^2	C. Howard (2006, unpubl. data)	Product of density and area to match the estimated carrying capacity from graphical analysis of 0+ versus expected emergent fry.
		Suitable habitat area	23,700 m^2		
		Density-independent survival rate	0.8	Howard and McLeod (2005a, 2005b)	Density-independent survival rate assumed high; potential losses due to disease and predation.
	Early summer 0+ to late summer 0+	Density-independent survival rate	0.9	Assumption	Density-independent survival rate assumed to be high; summer mortality assumed to be low.
	Late summer 0+ to 1+spring smolts	Maximum juvenile density	0.1 fish/m^2	C. Howard (2006, unpubl. data)	Product matches carrying capacity determined from time series of 1+ trapping estimates, highest estimates.
		Suitable habitat area	23,700 m^2		
		Density-independent survival rate	0.8	Assumption	Professional judgment.
Downstream of West Branch and North Fork	**Migrant emergent fry from upstream to adults produced from emergent fry**	Density-independent survival rate	0.0001	Assumption	
	Migrant early summer 0+ from upstream to adults produced from migrant early summer 0+	Density-independent survival rate	0.001	Assumption	
	Migrant late summer 0+ juveniles from upstream to adults produced from late summer 0+ juveniles	Density-independent survival rate	0.005	Assumption	
	Spring 1+ smolts from upstream to adults produced from spring 1+	Density-independent survival rate	0.032	Chris Howard (2006, unpubl. data)	Survival based on ratio of returning adults to the estimate of smolts (from both branches/forks) two years prior, adults returning from WY 1997 to 2004.

Sub reach	Life-stage	Parameter	Value	Source	Comments
	smolts				

Appendix C

Chinook salmon population dynamics model parameters and values under current conditions in the Mill Creek Study Area.

Appendix C. Fall Chinook salmon population dynamics model parameters and values under current conditions in the Mill Creek Study Area.

Sub reach	Life-stage	Parameter	Value	Source	Comments
Initial population size	**Returning adults to mainstem Mill Creek to total female spawners**	Proportion of females	0.5	Waldvogel (2005)	Based on observed sex ratio of 1.1 to 1 (females to males) in the West Branch of Mill Creek, 1980 to 2002.
		Pre-spawning survival	0.8	Assumption	Pre-spawning survival assumed high, since Mill Creek is relatively low in the Smith River watershed.
		Proportion of female spawners to the West Branch	0.5	C. Howard (2006, unpubl. data)	Average fraction of spawner based on data from WY 1995 to 2005.
		Proportion of female spawners to the East Fork	0.5		
West Branch sub reach	**Female spawner to deposited eggs**	Suitable spawning gravel area	4840 m^2	Field reconnaissance data (Stillwater Sciences 2005, unpubl. data)	Based on densities of observed spawners and reconnaissance-level mapping of West Branch, 2005 field visit.
		Mean redd area	4.5 m^2	Burner (1951)	Mean redd area based on literature.
		Fecundity	3,900	Rowdy Creek Hatchery (1998, unpubl. data)	Assumed fecundity of 3,900 eggs/female based on Rowdy Creek Fish Hatchery data from WY 1994 to 1998.
	Deposited eggs to emergent fry	Survival rate	0.5	Field reconnaissance data (Stillwater Sciences 2005, unpubl. data)	Based on visual assessment of gravel quality observed during field reconnaissance visit in 2005.
	Emergent fry to 0+ smolts (> 55 mm)	Maximum fry density	0.6 fish/m^2	C. Howard (2006, unpubl. data)	Density and suitable habitat area parameterized to produce 6,000 0+ smolts, carrying capacity determined from graph of 0+ smolts versus emergent fry.
		Suitable habitat area	10,000 m^2		
		Density-independent survival rate	0.8	Assumption	Density-independent survival assumed to be high; mortality primarily due to density-dependent effects.
East Fork sub reach	**Female spawner to deposited eggs**	Suitable spawning gravel area	5360 m^2	Field reconnaissance data (Stillwater Sciences 2005, unpubl. data)	Based on densities of observed spawners and reconnaissance-level mapping of West Branch, 2005 field visit.
		Mean redd area	4.5 m^2	Burner (1951)	Mean redd area based on literature.
		Fecundity	3,900	Rowdy Creek Hatchery (1998, unpubl. data)	Assumed fecundity of 3,900 eggs/female based on Rowdy Creek Fish Hatchery data from WY 1994 to 1998.

Sub reach	Life-stage	Parameter	Value	Source	Comments
	Deposited eggs to emergent fry	Survival rate	0.1	Field reconnaissance data (Stillwater Sciences 2005, unpubl. data)	Based on visual assessment of gravel quality observed during field reconnaissance visit in 2005.
	Emergent fry to 0+ smolts (> 55 mm)	Maximum fry density	0.5 fish/m^2	C. Howard (2006, unpubl. data)	Density and suitable habitat area parameterized to produce 5,000 0+ smolts, carrying capacity determined from graph of 0+ smolts versus emergent fry.
		Suitable habitat area	10,000 m^2		
		Density-independent survival rate	0.8	Assumption	Density-independent survival assumed to be high; mortality primarily due to density-dependent effects.
Below West Branch and East Fork	**Migrant emergent fry from upstream to returning adults**	Density-independent survival rate	0.0001	Assumption	Survival assumed to be low.
	0+ smolts from upstream to returning adults	Density-independent survival rate	0.024	C. Howard (2006, unpubl. data)	Based on the ratio of 3-year old returning adults to number of 0+ smolts (>55 mm FL).

Appendix D

Model sensitivity analyses, coho salmon population model, Mill Creek.

Appendix D. Model sensitivity analyses, coho salmon population model, Mill Creek.

Table D-1. Based on current conditions.

Relation	Parameter	Parameter values					One-step responses					Steady-state responses				
Adults returning to Mill Creek to total female spawners	Proportion of Females	0 25	0 38	0 50	0 67	1 00	318	331	337	339	344	317	331	337	339	344
	Pre-spawning survival	0 50	0 75	1 00	1 33	2 00	318	331	337	339	344	317	331	337	339	344
Total female spawners to West Branch female spawners	Proportion of Spawners to West Branch	0 25	0 38	0 50	0 67	1 00	334	335	337	331	240	334	335	337	331	236
West Branch female spawners to deposited eggs	Suitable spawning gravel area (m²)	1505	2258	3010	4012	6020	336	337	337	337	337	336	337	337	337	337
	Mean redd area (m²)	1 40	2 10	2 80	3 73	5 60	337	337	337	337	336	337	337	337	337	336
	Fecundity (#eggs/female)	1150	1725	2300	3066	4600	333	335	337	339	344	333	335	337	339	344
West Branch, Deposited eggs to emergent fry	Density-independent survival	0 25	0 38	0 50	0 67	1 00	333	335	337	339	344	333	335	337	339	344
West Branch, Emergent fry to early summer 0+	Suitable habitat area (m²)	5000	7500	10000	13330	20000	298	317	337	363	414	297	317	337	363	416
	Density (fish/m²)	1 25	1 88	2 50	3 33	5 00	298	317	337	363	414	297	317	337	363	416
	Density-independent survival	0 40	0 60	0 80	1 07	1 60	333	335	337	339	339	333	335	337	339	339
West Branch, Early summer 0+ to late summer 0+	Density-independent survival	0 40	0 60	0 80	1 07	1 60	297	317	337	357	357	296	316	337	357	357
West Branch, Late summer 0+ to spring 1+ smolts	Suitable habitat area (m²)	7900	11850	15800	21061	31600	262	299	337	387	486	257	299	337	388	490
	Density (fish/m²)	0 18	0 26	0 35	0 47	0 70	262	299	337	387	486	257	299	337	388	490
	Density-independent survival	0 40	0 60	0 80	1 07	1 60	297	317	337	357	357	296	316	337	357	357
East Fork female spawners to deposited eggs	Suitable spawning gravel area (m²)	1670	2505	3340	4452	6680	337	337	337	337	337	337	337	337	337	337
	Mean redd area (m²)	1 40	2 10	2 80	3 73	5 60	337	337	337	337	337	337	337	337	337	337
	Fecundity (#eggs/female)	1150	1725	2300	3066	4600	321	332	337	337	338	319	332	337	337	338
East Fork, Deposited eggs to emergent fry	Density-independent survival	0 05	0 08	0 10	0 13	0 20	321	332	337	337	338	319	332	337	337	338
East Fork, Emergent fry to early summer 0+	Suitable habitat area (m²)	11850	17775	23700	31592	47400	318	327	337	344	344	318	327	337	345	345
	Density (fish/m²)	0 26	0 38	0 51	0 68	1 02	318	327	337	344	344	318	327	337	345	345
	Density-independent survival	0 40	0 60	0 80	1 07	1 60	321	332	337	337	337	319	332	337	337	337
East Fork, Early summer 0+ to late summer 0+	Density-independent survival	0 40	0 60	0 80	1 07	1 60	317	327	337	346	346	317	327	337	347	347
East Fork, Late summer 0+ to spring 1+ smolts	Suitable habitat area (m²)	11850	17775	23700	31592	47400	305	321	337	358	401	304	320	337	359	402
	Density (fish/m²)	0 05	0 08	0 10	0 13	0 20	305	321	337	358	401	304	320	337	359	402
	Density-independent survival	0 40	0 60	0 80	1 07	1 60	317	327	337	346	346	317	327	337	347	347
Below West Branch and East Fork, Migrant emergent fry from upstream to adults produced from emergent fry	Density-independent survival	0 0001	0 0001	0 0001	0 0001	0 0002	334	336	337	338	342	334	336	337	338	342
Below West Branch and East Fork, Migrant early summer 0+ from upstream to adults produced from migrant early summer 0+	Density-independent survival	0 0005	0 0008	0 0010	0 0013	0 0020	337	337	337	337	337	337	337	337	337	337
Below West Branch and East Fork, Migrant late summer 0+ juveniles from upstream to adults produced from late summer 0+ juveniles	Density-independent survival	0 0025	0 0038	0 0050	0 0067	0 0100	297	317	337	363	416	296	317	337	364	418
Below West Branch and East Fork, Spring 1+ smolts from upstream to adults produced from spring 1+ smolts	Density-independent survival	0 02	0 02	0 03	0 04	0 06	210	274	337	421	590	196	271	337	423	595

Appendix D. Model sensitivity analyses, coho salmon population model, Mill Creek.

Table D-2. Based on revised marine conditions (survival from 1+ smolt to adult of 0.006).

Relation	Parameter	Parameter values					One-step responses					Steady-state responses				
Adults returning to Mill Creek to total female spawners	Proportion of Females	0 25	0 38	0 50	0 67	1 00	29	42	55	71	101	0	0	55	109	125
	Pre-spawning survival	0 50	0 75	1 00	1 33	2 00	29	42	55	71	101	0	0	55	109	125
Total female spawners to West Branch female spawners	Proportion of Spawners to West Branch	0 25	0 38	0 50	0 67	1 00	38	47	55	64	83	0	0	55	97	87
West Branch female spawners to deposited eggs	Suitable spawning gravel area (m²)	1440	2160	2880	3839	5760	54	54	55	55	55	50	53	55	56	57
	Mean redd area (m²)	1 40	2 10	2 80	3 73	5 60	55	55	55	54	54	57	56	55	53	50
	Fecundity (#eggs/female)	1150	1725	2300	3066	4600	33	45	55	68	94	0	0	55	103	105
West Branch, Deposited eggs to emergent fry	Density-independent survival	0 25	0 38	0 50	0 67	1 00	33	45	55	68	94	0	0	55	103	105
West Branch, Emergent fry to early summer 0+	Suitable habitat area (m²)	5000	7500	10000	13330	20000	55	55	55	55	55	55	55	55	55	55
	Density (fish/m²)	1 25	1 88	2 50	3 33	5 00	55	55	55	55	55	55	55	55	55	55
	Density-independent survival	0 40	0 60	0 80	1 07	1 60	33	45	55	64	64	0	0	55	103	103
West Branch, Early summer 0+ to late summer 0+	Density-independent survival	0 40	0 60	0 80	1 07	1 60	33	45	55	64	64	0	0	55	126	126
West Branch, Late summer 0+ to spring 1+ smolts	Suitable habitat area (m²)	7900	11850	15800	21061	31600	52	53	55	56	57	29	42	55	70	96
	Density (fish/m²)	0 18	0 26	0 35	0 47	0 70	52	53	55	56	57	29	42	55	70	96
	Density-independent survival	0 40	0 60	0 80	1 07	1 60	33	45	55	64	64	0	0	55	126	126
East Fork female spawners to deposited eggs	Suitable spawning gravel area (m²)	1200	1800	2400	3199	4800	54	54	55	55	55	53	54	55	55	55
	Mean redd area (m²)	1 40	2 10	2 80	3 73	5 60	55	55	55	54	54	55	55	55	54	53
	Fecundity (#eggs/female)	1150	1725	2300	3066	4600	50	52	55	58	63	0	39	55	87	123
East Fork, Deposited eggs to emergent fry	Density-independent survival	0 05	0 08	0 10	0 13	0 20	50	52	55	58	63	0	39	55	87	123
East Fork, Emergent fry to early summer 0+	Suitable habitat area (m²)	11850	17775	23700	31592	47400	55	55	55	55	55	55	55	55	55	55
	Density (fish/m²)	0 26	0 38	0 51	0 68	1 02	55	55	55	55	55	55	55	55	55	55
	Density-independent survival	0 40	0 60	0 80	1 07	1 60	50	52	55	57	57	0	39	55	79	79
East Fork, Early summer 0+ to late summer 0+	Density-independent survival	0 40	0 60	0 80	1 07	1 60	50	52	55	57	57	0	39	55	79	79
East Fork, Late summer 0+ to spring 1+ smolts	Suitable habitat area (m²)	11850	17775	23700	31592	47400	54	55	55	55	55	52	55	55	55	55
	Density (fish/m²)	0 05	0 08	0 10	0 13	0 20	54	55	55	55	55	52	55	55	55	55
	Density-independent survival	0 40	0 60	0 80	1 07	1 60	50	52	55	57	57	0	39	55	79	79
Below West Branch and East Fork, Migrant emergent fry from upstream to adults produced from emergent fry	Density-independent survival	0 0001	0 0001	0 0001	0 0001	0 0002	55	55	55	55	55	55	55	55	55	55
Below West Branch and East Fork, Migrant early summer 0+ from upstream to adults produced from migrant early summer 0+	Density-independent survival	0 0005	0 0008	0 0010	0 0013	0 0020	55	55	55	55	55	55	55	55	55	55
Below West Branch and East Fork, Migrant late summer 0+ juveniles from upstream to adults produced from late summer 0+ juveniles	Density-independent survival	0 0025	0 0038	0 0050	0 0067	0 0100	49	52	55	59	66	42	44	55	125	180
Below West Branch and East Fork, Spring 1+ smolts from upstream to adults produced from spring 1+ smolts	Density-independent survival	0 00	0 00	0 01	0 01	0 01	33	44	55	69	97	0	0	55	121	158

Appendix E

Model sensitivity analysis,
Chinook salmon population model, Mill Creek (based on current conditions).

Appendix E. Model sensitivity analysis, Chinook salmon population model, Mill Creek (based on current conditions).

Relation	Parameter	Parameter values					One-step responses					Steady-state responses				
Adults returning to Mill Creek to total female spawners	Proportion of Females	0 26	0 39	0 52	0 70	1 05	270	273	276	281	289	270	273	276	281	290
	Pre-spawning survival	0 50	0 75	1 00	1 33	2 00	270	273	276	281	289	270	273	276	281	290
Total female spawners to West Branch female spawners	Proportion of Spawners to West Branch	0 25	0 38	0 50	0 67	1 00	273	275	276	278	279	273	275	276	278	280
West Branch female spawners to deposited eggs	Suitable spawning gravel area (m²)	2420	3630	4840	6452	9680	276	276	276	276	276	276	276	276	276	276
	Mean redd area (m²)	2 25	3 38	4 50	6 00	9 00	276	276	276	276	276	276	276	276	276	276
	Fecundity (#eggs/female)	1950	2925	3900	5199	7800	271	274	276	280	288	271	274	276	280	289
West Branch, Deposited eggs to emergent fry	Density-independent survival	0 25	0 38	0 50	0 67	1 00	271	274	276	280	288	271	274	276	280	289
West Branch, Emergent fry to 0+ smolts	Suitable habitat area (m²)	5000	7500	10000	13330	20000	205	241	276	324	420	201	239	276	327	427
	Density (fish/m²)	0 30	0 45	0 60	0 80	1 20	205	241	276	324	420	201	239	276	327	427
	Density-independent survival	0 40	0 60	0 80	1 07	1 60	271	274	276	279	279	271	274	276	279	279
East Fork female spawners to deposited eggs	Suitable spawning gravel area (m²)	2680	4020	5360	7145	10720	276	276	276	276	276	276	276	276	276	276
	Mean redd area (m²)	2 25	3 38	4 50	6 00	9 00	276	276	276	276	276	276	276	276	276	276
	Fecundity (#eggs/female)	1950	2925	3900	5199	7800	275	276	276	277	279	275	276	276	277	279
East Fork, Deposited eggs to emergent fry	Density-independent survival	0 05	0 08	0 10	0 13	0 20	275	276	276	277	279	275	276	276	277	279
East Fork, Emergent fry to 0+ smolts	Suitable habitat area (m²)	5000	7500	10000	13330	20000	217	247	276	316	396	214	245	276	318	402
	Density (fish/m²)	0 25	0 38	0 50	0 67	1 00	217	247	276	316	396	214	245	276	318	402
	Density-independent survival	0 40	0 60	0 80	1 07	1 60	275	276	276	277	277	275	276	276	277	277
Below West Branch and East Fork, Migrant emergent fry from upstream to returning adult	Ocean survival	0 0001	0 0001	0 0001	0 0001	0 0002	270	273	276	281	289	270	273	276	281	290
Below West Branch and East Fork, 0+ smolts from upstream to returning adult	Ocean survival	0 01	0 02	0 02	0 03	0 05	144	210	276	364	540	138	207	276	369	554

From: Staples, Rose
Sent: Monday, October 10, 2011 5:03 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Subject: Don Pedro RWG Meeting Reference - Mill Creek Model link Not Working- Have Uploaded to Website

I understand several of you experienced problems downloading the document using the "Mill Creek Model" link I forwarded earlier today. I was able to download a copy—and have now uploaded it to the Don Pedro Relicensing website (www.donpedro-relicensing.com) under the ANNOUNCEMENT tab. Thank you.

ROSE STAPLES
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Executive Assistant, Hydropower Services

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From: Staples, Rose
Sent: Thursday, October 13, 2011 7:22 PM
To: 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Barnes, Peter - SWRCB'; 'Beuttler, John - CSPA'; 'Blake, Martin'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brenneman, Beth - BLM'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Buckley, Mark'; 'Burley, Silvia-CVMT'; 'Burt, Charles - CalPoly'; 'Cadagan, Jerry'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cismowski, Gail - SWRCB'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, Kevin - TBMI'; 'Day, P - MF'; 'Denean - BVR'; 'Derwin, Maryann Moise'; Devine, John; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Grader, Zeke'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hackamack, Robert'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hayden, Ann'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Holm, Lisa'; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hudelson, Bill - StanislausFoodProducts'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Hume, Noah - Stillwater'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Kordella, Lesley - FERC'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; 'Looker, Mark - LCC'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Madden, Dan'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Martin, Ramon - USFWS'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan - CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Paul, Duane - Cardno'; 'Pavich, Steve-Cardno'; 'Pinhey, Nick - City of Modesto'; 'Pool, Richard'; 'Porter, Ruth - RHH'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Ridenour, Jim'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sander, Max - TNC'; 'Sandkulla, Nicole - BAWSCA'; 'Saunders, Jenan'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shipley, Robert'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Sill, Todd'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; Staples, Rose; 'Steindorf, Dave - AW'; 'Steiner, Dan'; 'Stone, Vicki -TBMI'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'Terpstra, Thomas'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Vierra, Chris'; 'Villalabos, Ruben'; 'Walters, Eric - MF';

'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; 'Wheeler, Douglas - RHH'; 'Wilcox, Scott - Stillwater'; 'Williamson, Harry (NPS)'; 'Willy, Alison - FWS'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'

Subject: Don Pedro Study Plans - Most Recent Versions - Status of Uploading

An Updated Study Plan with the most recent versions of the Don Pedro Project study plans will be uploaded to the Don Pedro Project relicensing website tomorrow—and I will notify you when that has been done—and the location of the document. Thank you.

ROSE STAPLES
CPS CAP

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Executive Assistant, Hydropower Services

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From: Staples, Rose
Sent: Friday, October 14, 2011 1:42 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Subject: Don Pedro Updated Study Plan Is Now Available on Website

Today we have e-filed with FERC an UPDATED STUDY PLAN, which consists of a set of CLEAN Study Plans (Appendix A) and a set of the REDLINE Study Plans (Appendix B). We have also uploaded a copy of the filing to the relicensing website. You will note that these files are in a .pdf format—but we will also be uploading, by the end of the day, a set of the CLEAN Study Plans in WORD format.

You will also note a different look to the DOCUMENTS section of the website. We have "collapsed" all the individual files so when you access the Document sections, only the major section headings appear. To locate the Updated Study Plan, you will click on STUDIES, which will open three sub-headings (Proposed Study Plan, RWG Study Plan Development, and the new Updated Study Plan). Click on CONTENT: UPDATED STUDY PLAN, and the two Updated Study Plan file names should pop. If not, please let me know.

Thank you!

ROSE STAPLES
CPS CAP

HDR Engineering, Inc.
Executive Assistant, Hydropower Services

970 Baxter Boulevard, Suite 301 | Portland, ME 04103
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rose.staples@hdrinc.com | hdrinc.com

From: Staples, Rose
Sent: Tuesday, October 18, 2011 6:48 PM
To: 'Peter Barnes'
Cc: Loy, Carin
Subject: Copy of Report Referenced
Attachments: TID-MID_1992_Lower Tuolumne Predator Abundance Report.pdf

Carin Loy has provided the attached report, in response to your query of Monday, October 17th. I will also be uploading the document to the relicensing website, under INTRODUCTION/ANNOUNCEMENTS.

In regards to your question regarding verification of the due date for comments on the Proposed Study Plan, originally stated by FERC as Sunday, October 23, I have my query out to them, outlining the Monday, October 24 due date (and the reasoning for same), and the effect of that date on the filing date of the Revised Study Plan, which would then be Wednesday, November 23. I will do another query today, and advise you as soon as a response is received.

ROSE STAPLES
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From: Peter Barnes [mailto:PBarnes@waterboards.ca.gov]
Sent: Tuesday, October 18, 2011 3:31 PM
To: Loy, Carin
Subject: RE: Don Pedro Relicensing Reference

Thank you. Were you ever able to determine the correct date by which comments need to be submitted?

Sincerely,

Peter Barnes
Engineering Geologist
Division of Water Rights
State Water Resources Control Board
Phone: (916) 445-9989
Email: pbarnes@waterboards.ca.gov

>>> "Loy, Carin" <Carin.Loy@hdrinc.com> 10/17/2011 4:43 PM >>>
Hi Peter,
We will scan the document and send it to you tomorrow.

Regards,
Carin Loy

From: Peter Barnes [PBarnes@waterboards.ca.gov]
Sent: Monday, October 17, 2011 3:06 PM
To: Loy, Carin; Staples, Rose
Subject: Don Pedro Relicensing Reference

Do you know where I could find a copy of the following study referenced below. It has been referenced a number of times in the proposed study plans. Thank you.

Turlock Irrigation District and Modesto Irrigation District (TID/MID). 1992. Lower Tuolumne River Predation Study Report. Appendix 22 to Turlock Irrigation District and Modesto Irrigation District Pursuant to Article 39 of the License for the Don Pedro Project, No. 2299 Vol. VII. Prepared by T. Ford, Turlock and Modesto Irrigation Districts and EA Engineering, Science, and Technology, Lafayette, California.

Sincerely,

Peter Barnes
Engineering Geologist
Division of Water Rights
State Water Resources Control Board
Phone: (916) 445-9989
Email: pbarnes@waterboards.ca.gov

From: Staples, Rose
Sent: Tuesday, October 18, 2011 8:09 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Subject: 1992 Report Reference Uploaded to Don Pedro Relicensing Website

We have been asked for a copy of the 1992 report referenced in several of the Don Pedro Project proposed study plans:

LOWER TUOLUMNE RIVER
PREDATION STUDY REPORT

A copy has just been uploaded to the Don Pedro Project Relicensing Website Announcement Page (accessed via the INTRODUCTION tab).

ROSE STAPLES
CPS CAP

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rose.staples@hdrinc.com | hdrinc.com

DON PEDRO PROJECT
FISHERIES STUDY REPORT
FERC ARTICLE 39, PROJECT NO. 2299

APPENDIX 22

LOWER TUOLUMNE RIVER PREDATION STUDY REPORT

Prepared for

Turlock Irrigation District
333 E. Canal Drive
Turlock, California 95381

Modesto Irrigation District
1231 11th Street
Modesto, California 95342

Prepared by

EA Engineering, Science, and Technology
41 Lafayette Circle
Lafayette, California 94549

5 February 1992

EXECUTIVE SUMMARY

The purpose of this report is to estimate the abundance of predator species in the lower Tuolumne River and to estimate the predation rates of those resident piscivores. Predation of juvenile chinook salmon is a potentially major source of mortality in the lower Tuolumne River. As measured in other freshwater streams, piscivores may remove 55 percent to 85 percent of the juvenile salmon population. There are a variety of potential influences to the degree of predation (e.g., streamflow, turbidity, predator population size and density, habitat availability, cover/refuge availability, and others).

The lower Tuolumne River was categorized into two general strata; Stratum 1 (RM 25-52) consisted of alternating riffle and run-pool habitats (with occasional deep and/or wide pools, termed "special run-pools"), while Stratum 2 (RM 0-25) is almost uniformly run-pool. Replicated study sites in Stratum 1 consisted of three riffle, three special run-pool, and five run-pool habitats, while Stratum 2 study sites replicated four run-pool habitats. To estimate bass population abundance, sites were electrofished and "captured" fish were identified and systematically marked for mark-recapture population studies. Several methods of estimating abundance were utilized, and are detailed in the text. Predatory rates were assessed by irrigation of predatory bass stomachs, and subsequent stomach contents identification and analysis. Concurrently-collected water samples were analyzed for turbidity, because turbidity plays a role in the predation efficiency of bass.

Population estimates for largemouth bass ranged from 1-139 fish per acre of stream surface (6-758 fish per mile of river shoreline) and from 1-16 fish per acre (2-158 fish per shoreline mile) for smallmouth bass. These ranges are approximates in light of the assumptions used in the population estimation methods. Bass predation rates averaged from zero to 3.62 chinook salmon ingested per day (assuming a slow rate of digestion) or from zero to 5.31 salmon ingested per day (assuming a faster digestion rate).

CONTENTS

1. INTRODUCTION

A study of predation on juvenile chinook salmon by predatory fishes was conducted on the Tuolumne River in the spring of 1990. Its goals were (1) to estimate the total number of the different predator species in the river and (2) to estimate the rate of predation by the major predators on juvenile salmon. This study was prompted by a study carried out in 1987 by CDFG in which almost 70 percent of 90,000 coded-wire-tagged juvenile chinook salmon released just below La Grange Dam died in the three days it took them to travel downstream to the San Joaquin River confluence (Preliminary Summary Smolt Survival Index Study, Appendix 25). Water temperatures were considered optimal during this period for outmigrating juvenile salmon, leaving predation the most plausible explanation for the high mortality. This study was conducted to test whether the number of predators and the rates of consumption were high enough to explain some or all of this mortality.

In spring 1989, a pilot predation study (Attachment A) was undertaken to get preliminary estimates of predator densities and consumption rates and the variances of the estimates, in order to determine the level of effort needed to complete the full study. The results of the pilot study led to some important methodological improvements for the full study. Among the changes were use of an electrofishing boat to permit the sampling of deeper habitat types and use of a multiple mark-recapture method for population estimates.

Analyses of these data are still in progress. This report includes preliminary results, with a brief discussion.

2. METHODS

2.1 RIVER STRATIFICATION

The lower section of the Tuolumne River, where the study areas are located, extends from La Grange Dam at river mile (RM) 52.2 to its confluence with the San Joaquin River (RM 0.0). This portion of the river is a meandering, low-gradient stream that flows through agricultural and urban environments.

The lower Tuolumne River was divided into two strata. Stratum 1, the upper half of the river (RM 25-52) has alternating riffle and run-pool habitats. Stratum 2, the lower half of the river (RM 0-25) is almost uniformly run-pool (see Figure 1).

Stratum 1 was further sub-stratified into three predominant habitat types: riffles, run-pools, and special run-pools. ("Special run-pool" designates an area of the river that is especially deep and/or wide, resulting in conditions that are more lake-like than stream-like. These areas are generally the result of in-river gravel mining.) The stratification was based on 1986 aerial photos and on riffle

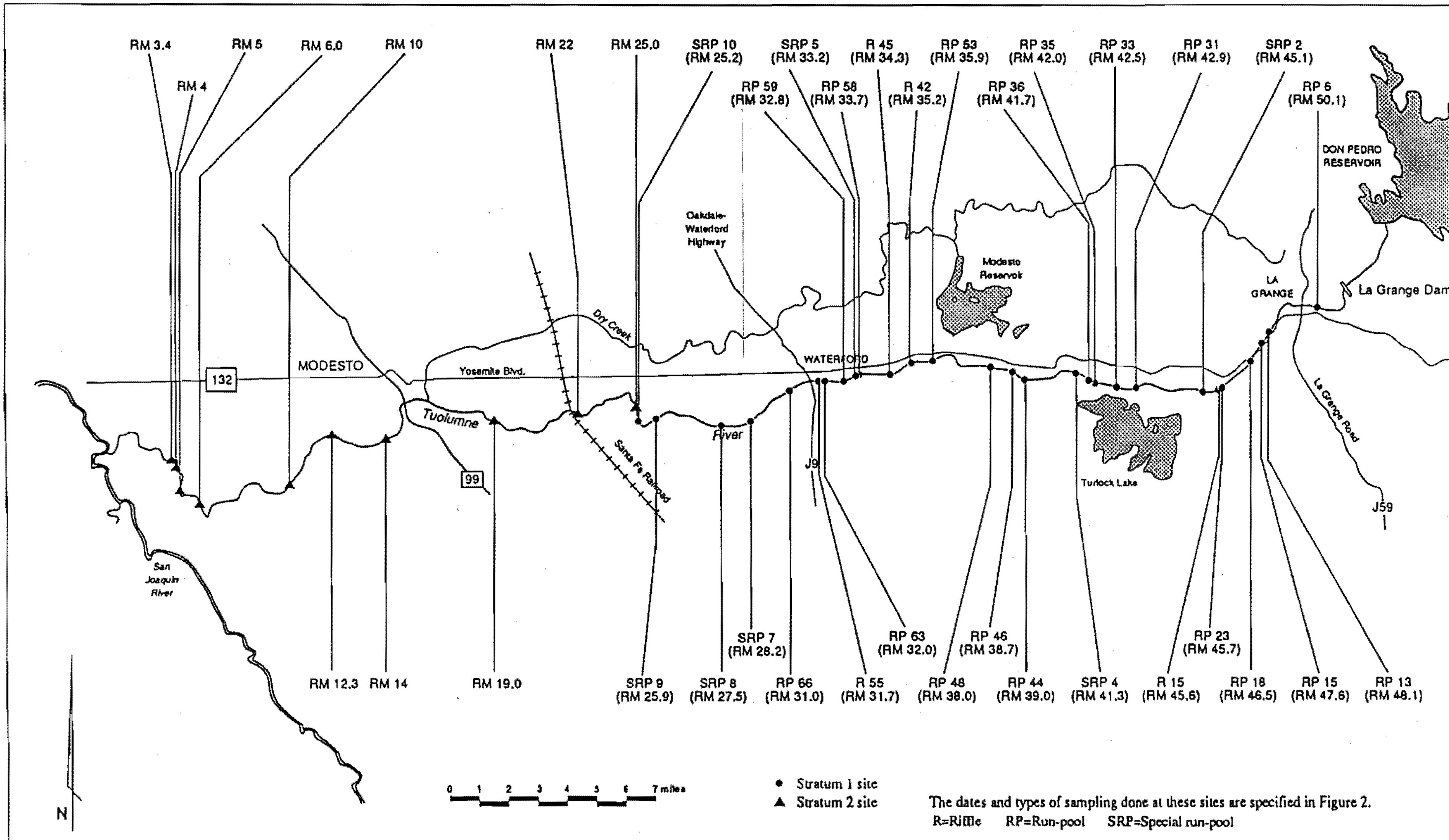


Figure 1. Locations of predator censuses and predation rate sampling, January - May 1990.

designations made by CDFG and TID/MID in the early 1980s. The stratification designations were checked by ground-truthing a subsample of habitat units.

2.2 PREDATOR POPULATION ESTIMATE SAMPLING

2.2.1 Field Data Collection

In Stratum 1, replicate study sites were selected at random from the three habitat types. Three riffles, three special run-pools, and five run-pool sites were selected. A larger number of run-pool sites were selected because they appear to have greater variability in depth, available cover, and flow characteristics than do riffles or special run-pools. In Stratum 2, four run-pool sites were selected randomly by river mile. If a site in Stratum 2 proved inaccessible, it was discarded and another random selection was made. Separate study sites were selected for the predator population estimate and predation rate parts of the study to minimize the stress on the fish in the population sites.

Except when habitat units were prohibitively large, study sites encompassed entire habitat units; i.e., the study site boundaries were the natural boundaries of the habitat unit. When habitat units were too long to be worked as a whole (as with some of the special run-pools), only a portion of the unit was sampled. In these cases, boundaries were defined by clear breaks in habitat within the unit, e.g., channel constrictions and/or vegetative cover breaks.

Because of limited depth and/or poor boat accessibility, the run-pools in Stratum 2 (below Charles Road [RM 24.9]) and all of the riffles were sampled using a 3,500-watt generator in a barge shocker. The run-pools and special run-pools in Stratum 1 were sampled using a boat shocker equipped with a 5,000-watt generator. All of the run-pools and special run-pools were sampled at night to increase capture rates. Run-pools and special run-pools were not blocked to prevent migration, because bass are territorial and do not move far from their territories.

A multiple mark-recapture method (Schnabel census) for estimating numbers of fish was used (Seber 1982). A site was electrofished, and all predators were collected. All predators large enough to consume juvenile salmon (≥ 100 mm) were anesthetized with MS-222, weighed, measured, and tagged with individually numbered Floy tags. The fish were redistributed throughout the study site.

The run-pools and special run-pools were sampled approximately every fifth day for a total of four or five times in the course of the study (Figure 2). Care was taken to ensure that for a given site, the electrofishing effort and the area sampled remained equal for every sampling run. The tag numbers of recaptured fish were recorded, and all newly captured fish were given tags. The lengths and weights of all new fish were recorded. Again, all fish were returned to the site. On the final run, fish weights and lengths were recorded and recaptures were noted, but no new tags were attached.

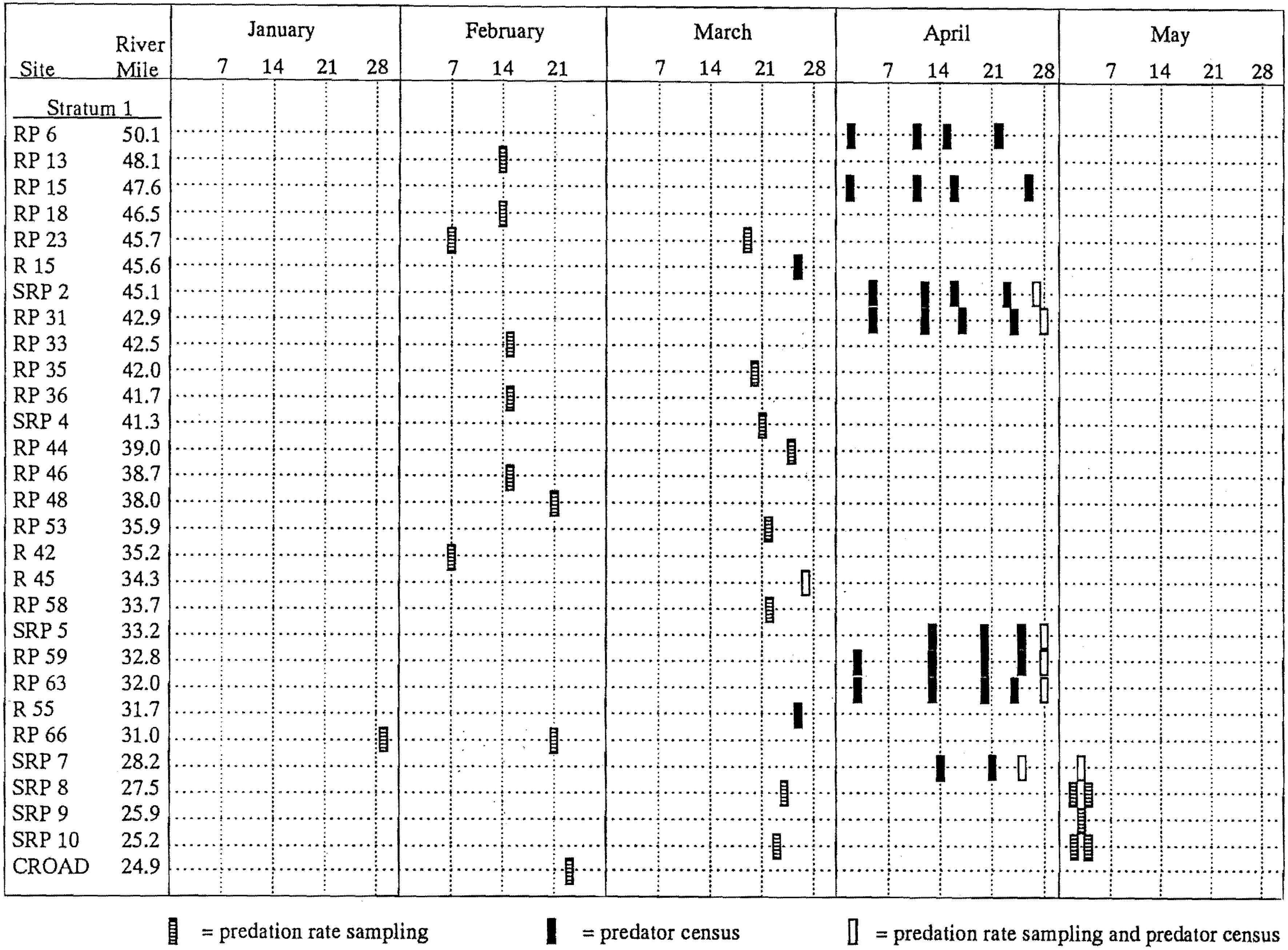
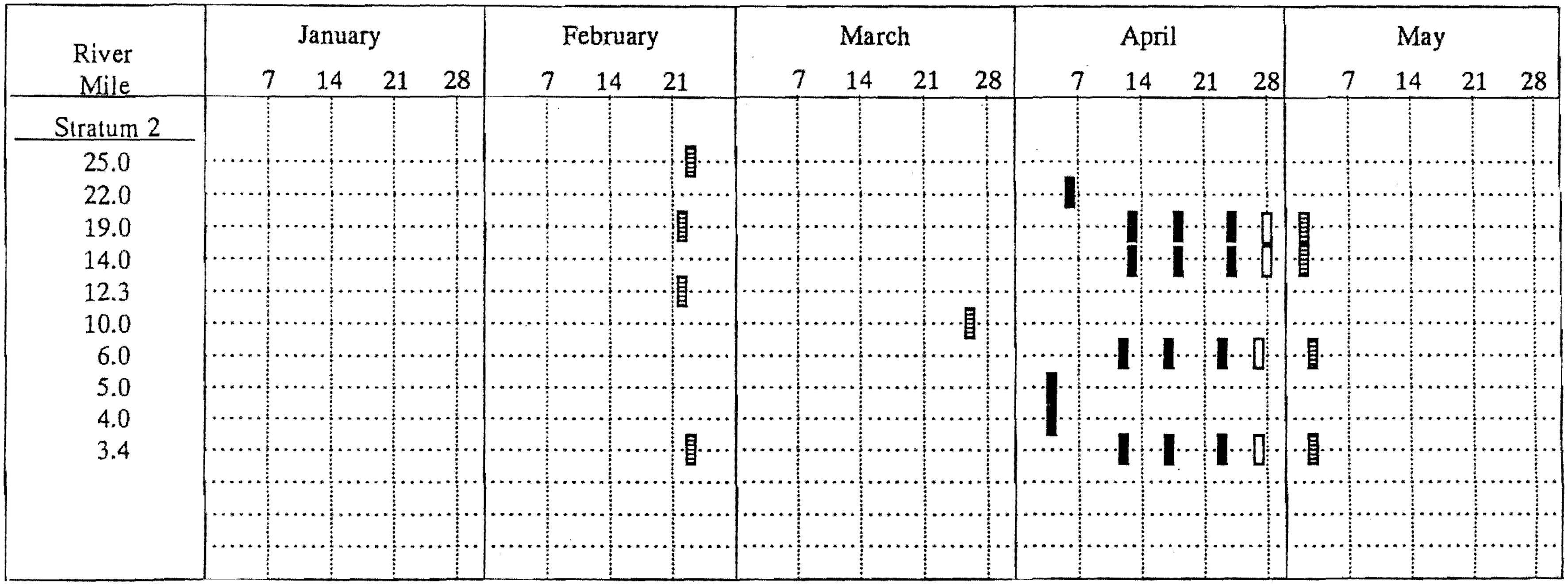


Figure 2. Dates of predation rate sampling and predator censuses in two strata of the lower Tuolumne River, January - May 1990.



= predation rate sampling = predator census = predation rate sampling and predator census

Figure 2 (cont.)

A different sampling method was used in the three riffles in Stratum 1 that were selected for population estimate sites. Because access to these sites was easier and it was feasible to put up blocking nets at both ends of the riffles, they were sampled using a three-pass reduction method for estimating populations (Seber 1982). This method yielded population estimates without repeated site visits. These riffles (R15, R45, and R55) were sampled on 26-27 March 1990 (Figure 2).

2.2.2 Data Analysis

The mark-recapture data have been analyzed with statistical models to get estimates of predator abundances in each study site. These population estimates are used to estimate, for each habitat type, average predator species population numbers, per unit "bank distance" and per acre of water surface. (Habitat bank distance is defined as the total riverbank distance included in a habitat type unit. For example, one river mile will have at least 2 miles of riverbank available as habitat, and there may be considerably more, depending on bank complexity.) Bank distance is an appropriate measure of habitat availability for species, such as largemouth bass and smallmouth bass, which set up territories near banks. The water surface area is more appropriate for species, like squawfish, that do not utilize the banks as extensively. The final habitat-type estimates are being extrapolated to estimate predator densities for the river as a whole.

The information on predator densities will be used in conjunction with predation rates (Section 2.3) to estimate total potential chinook salmon losses due to predation.

2.2.3 Population Models

In most cases, recaptures were sufficient to use an unmodified Schnabel census model, which estimates capture probabilities separately for each sampling run (Model 1 below). In some cases recapture rates were too low to estimate capture probabilities separately for each run, and a model which assumes equal capture probabilities for all runs was used (Model 2 below). At one site, low recaptures necessitated using a model which estimates the capture probability by pooling recapture data with those from a morphologically similar site (Model 3 below). These models all assume one population in a site, in which all fish for a given sampling run have an equal probability of capture. In addition, all three models assume that there is no immigration or outmigration between sampling runs. A general description of the models and their assumptions follows:

Model 1: Capture Probabilities Different, One Sample Site

If enough tagged fish were recaptured in all sampling runs at a given site, a model making no assumptions about consistency of capture probabilities between sampling runs was used: predator abundance is estimated by solving iteratively for N in Equation 1:

$$N = \frac{m}{1 - \prod_i (1-P_i)} \tag{1}$$

where N is the population size, m is the number of distinct fish captured, and $P_i = n_i/N$ (n_i is the number of captured fish in sample i). The i-th capture probability is estimated as P_i (Equation 1 corresponds to Equation 4.4 in Seber 1982).

The variance of the estimate of N($\hat{N}$) is obtained, following maximum likelihood theory, as:

$$\text{var}(\hat{N}) = [(\hat{N}-m)^{-1} - \hat{N}^{-1} - \Sigma_i n_i \{ (\hat{N}-n_i) \hat{N} \}^{-1}]^{-1} \tag{2}$$

This formula is equivalent to the variance estimate listed in Cormack (1979), even though the derivations are different.

Model 2: Capture Probabilities Equal Within a Sampling Site

If too few tagged fish were recaptured in a sampling run at a given site, it was not possible to estimate the capture probabilities separately, and a simpler model was used. This model is based on the assumption that probabilities of capture are equal for all sampling runs. The abundance is estimated by solving iteratively for N in the following equation:

$$N = \frac{m}{1 - (1-P)^s} \tag{3}$$

where N is the population size, m is the number of distinct fish captured, s is the number of samples taken and P = n/(sN) (n is the sum of captured fish over all samples, whether newly captured or recaptured). P is the estimated capture probability (Equation 3 corresponds to Equation 6 in Cormack 1979).

The variance of the estimate of N is obtained, following maximum-likelihood theory, as:

$$\text{var}(\hat{N}) = [(\hat{N}-m)^{-1} - \hat{N}^{-1} - n \{ (\hat{N}s-n) \hat{N} \}^{-1}]^{-1} \tag{4}$$

While equation (4) is functionally different from equation (2), it gives an almost identical variance, which agrees with observations made by Cormack (1979).

Model 3: Capture Probabilities Equal, Multiple Sample Sites

In one case, too few fish were recaptured at a site to estimate capture probability, even assuming equal probabilities among sampling runs. In such a case, if the sample site is taken to be similar to another site with adequate recapture, it is possible to pool capture information from both sites and to estimate the capture probability for the site with low recaptures. This approach assumes that the capture probabilities are equal both for all samples and for both sites. Estimates of abundance are obtained by solving for the N_i in the following equations:

$$N_i = \frac{m_i}{1 - (1-P)^{s_i}}, \ i=1, 2, \ldots r \qquad (5)$$

where N_i is the population size at the i-th site, m_i is the number of unique fish captured at site i, s_i is the number of samples taken at site i, and $P = n/(\Sigma_i s_i N_i)$ (n is the sum of captured fish over sites and samples, both new captures and recaptures). P, again, is the estimated capture probability.

The variances of the estimates of N_i are obtained following maximum likelihood theory:

$$\text{var}\,(\hat{N}_i) = D_i^{-1}\,[\,1 + (D_i d)^{-1} w_i^2] \qquad (6)$$

where $D_i = (\hat{N}_i - m_i)^{-1} - \hat{N}^{-1}$, $w_i = s_i/(1-p)$, and $d = nP^{-2} - (1-P)^{-2}\,(n - \Sigma_i s_i \hat{N}_i) - \Sigma_i D_i^{-1} w_i^2$.

2.3 PREDATION RATE SAMPLING

2.3.1 Field Collection

Study sites were selected in Strata 1 and 2 as described for predator population sampling in Section 2.2.1. Separate sites were selected for predation rate sampling to minimize stress on the fish at the population sampling sites.

Again, all three riffles, in Stratum 1, and the run-pools, in Stratum 2 (RM 25 and below), were sampled using a 3,500-watt generator in a barge shocker. The run-pools and special run-pools in Stratum 1 were sampled with a boat shocker equipped with a 5,000-watt generator.

The predation rate sites were sampled in a single electrofishing pass. All predators large enough to consume juvenile salmon were collected. Predators were anesthetized with MS-222, weighed, and measured, and their stomachs were pumped to yield stomach contents (fish of species whose stomachs cannot be pumped were sacrificed). The stomach contents were put into Whirl-Pak bags that were labeled with site, date, and fish identification number and preserved in 80 percent ethanol for later inspection. Fish were released into the study site.

Predation sampling began in late January and was carried out in February and March (see Figure 2). The first predation rate sampling of run-pools (at eight sites over approximately 10 days in February), was done during daylight hours. However, night electrofishing, done for the predator census, proved to be much more effective at capturing predatory fish, and subsequent predation rate sampling was all done at night.

In both the riffles (one-day predation census sampling) and the run-pool and special run-pool predator census sites, samples of prey were collected from the stomachs of predatory fish in the last predator census population sample, since no further marking was to be done, and the sites were not to be revisited. The riffle samples were collected in the last week of March; the run-pool and special run-pool samples in late April (see Figure 2).

The final predation rate sampling, carried out in run-pools and special run-pools during the first week of May, was timed to coincide with a pulse flow (a temporary increase in river discharge that had been jointly arranged between TID/MID, the California Department of Fish and Game (CDFG), and the United States Fish and Wildlife Service (USFWS), for a smolt survival study by CDFG) (TID/MID 1986). The pulse flow began on 29 April and was decreased gradually starting on 4 May. Coincident with the pulse flow, CDFG released 93,600 salmon smolts at La Grange. All of these fish were implanted with coded wire tags. The purpose of this sampling was to try to estimate predation rates during this highly concentrated juvenile outmigration.

Turbidity Sampling

Water turbidity samples were taken in a period prior to the pulse flow and during the pulse flow to assess the effects of turbidity on predation and, in particular, to see if the pulse flow increased turbidity sufficiently to reduce predation rates. On each day of sampling, 8-10 samples were taken at approximately 5-mile intervals along the river, from Basso Bridge (5 miles below La Grange Dam, [RM 47.5]) to McCleskey Ranch (5 miles above the mouth of the Tuolumne River, [RM 6.0]); occasionally access to the regular sampling sites was restricted, and alternative sites were chosen in the vicinity.

In general, three samples were collected at each site from approximately the middle depth of the water column as far out from shore as possible. Samples were collected in glass vials and stored on ice for transportation back to the laboratory. The samples were left on ice until they could be processed, to retard any algal growth or decomposition that might affect their turbidity. As soon as possible, samples were measured for turbidity in nephelometric turbidity units (NTU), using standard procedures, on a Turner Designs Model 40-100 nephelometer. Five individual readings were taken on each vial, for a total of 15 readings per sample site. The average of these 15 values was used in the turbidity analysis for comparisons between sites and dates.

2.3.2 Data Analysis

The stomach sample contents were analyzed to determine what, and how much, each predator had consumed. The contents were removed from the field samples and inspected to identify the prey organism(s). When possible, the standard lengths (from tip of snout to end of spine) of fish prey were measured. Total lengths (or carapace lengths of crayfish) were measured. In both cases an estimate was made of the percentage of the prey organism digested. This was done to aid in estimating digestion rates/gut evacuation rates and to calibrate the expected accuracy of prey organism identification: positive identification of fish could be made if the degree of digestion was less than 25 percent, and less reliably if digestion was between 25 and 75 percent. Identification could not be made if the fish was more than 75 percent digested.

Macroinvertebrates recovered from the samples were noted and saved, but not counted or identified. Other occasional prey items (e.g., amphibians, reptiles) were noted, but not included for purposes of predation rate assessment.

An analysis is being carried out to estimate predation rates based on the amount of predation by the major predator species on the most commonly utilized prey species. The data will be divided by strata and by date of collection: either base flow or pulse flow. It may be necessary, to group sites and/or sampling dates. Care will be taken to make sure that sites or sampling dates are not grouped if significant temporal or spatial trends in the data are noticed.

The stomach samples collected during the pulse flow were screened with a magnet during analysis for coded wire tags, either implanted in prey fish or loose in the sample.

3. RESULTS

3.1 PREDATOR POPULATION ESTIMATES

The predator population estimates for each study site are summarized in Table 1. Estimates for largemouth bass in the run-pools in Stratum 1 range from 29 to 150 largemouth bass per site: 29 in RP 15, 79 in RP59, 99 in RP6, and 150 in RP31. Estimates of largemouth bass in special run-pools in Stratum 1 ranged from 133 to 181 for the sites studied. The models estimated 133 fish in SRP 7, 135 in SRP 5, and 181 in SRP 2. The estimates in the Stratum 2 sites were smaller than those in Stratum 1. There were 25 largemouth bass estimated at RM 19, 21 at RM 14, 11 at RM 6, and 17 at RM 3.4.

At most sites, smallmouth bass densities were too low to obtain reliable population estimates. The exceptions to this were RP6 ($\hat{N}$ = 29), SRP5 ($\hat{N}$ = 23), and SRP7 ($\hat{N}$ = 9). Of the three riffles

TABLE 1 POPULATION ESTIMATES FOR LARGEMOUTH BASS AND SMALLMOUTH BASS BY STUDY SITE, LOWER TUOLUMNE RIVER

	Predator Abundance	SE	Site Area (acres)	Site Bank Distance (feet)[a]	Abundance per Acre	Abundance per Bank Mile[a]
	Largemouth Bass					
Stratum 1						
RP6	99[b]	92	3.4	1808	2 - 56	20 - 558
RP15	29[c]	25	4.4	3763	1 - 12	6 - 76
RP31	150[b]	141	2.1	2028	4 - 139	23 - 758
RP59	79[b]	24	2.4	1782	23 - 43	163 - 305
SRP2	181[b]	31	6.8	6666	22 - 31	119 - 168
SRP5	135[b]	27	8.7	4445	12 - 19	128 - 192
SRP7	133[b]	19	15.0	6278	8 - 10	96 - 128
Stratum 2						
RM 19	25[d]	17	2.3	1770	3 - 18	24 - 125
RM 14	21[c]	12	2.0	1519	5 - 17	31 - 115
RM 6	11[b]	3	2.9	2121	3 - 5	20 - 35
RM 3.4	17[b]	9	3.7	2546	2 - 7	17 - 54
	Smallmouth Bass					
Stratum 1						
RP6	29[c]	25	3.4	1808	1 - 16	12 - 158
SRP5	23[c]	19	8.7	4445	0 - 5	5 - 50
SRP7	9[c]	7	15.0	6278	0 - 1	2 - 13

a Equals the distance of bank on both sides of the sites *and around islands.*

b Model 1 used for abundance estimate

c Model 2 used for abundance estimate

d Model 3 used for abundance estimate

that were sampled for predator population estimates, only one, R45, contained a predator, a 199-mm smallmouth bass.

For largemouth bass, Model 1 was used at 8 sites and Model 2 at 2 sites. Model 3 (in which capture probability data from one site are applied to another site in which capture information is too low to estimate capture probability independently) was used in only one case, for the estimation of largemouth bass population, at RM 19, for which recapture data were pooled with those from RM 14.

For the three sites for which there were smallmouth bass recapture data, Model 2 was used to estimate populations.

The areas included in each of the run-pools and special run-pools and the bank distances in each study site were calculated from the Tuolumne River GIS database (see Attachment D). Measurements for each site are included in Table 1. Using these areas and bank distances, population estimates for each study site were extrapolated to produce estimates of the largemouth bass population in the entire lower river. The numbers of smallmouth bass in the study sites were insufficient to provide reliable extrapolations for the whole river.

Two estimates for each habitat type and for the total were calculated (see Table 2). The first estimates were calculated based on the area of the study sites sampled, and the second estimates were based on the bank distances contained in the study sites. The area-based estimates are 5,230 largemouth bass in the Stratum 1 run-pools, 2,621 in the Stratum 1 special run-pools, and 2,279 in Stratum Two. The area-based estimate for the whole river is 10,130 largemouth bass with a combined standard error of 2,391. The estimates based on bank distances are 6,822 in Stratum 1 run-pools, 2,115 in Stratum 1 special run-pools, and 2,137 in Stratum 2. The distance-based total estimate is 11,074 with a combined standard error of 1,938.

3.2 PREDATION RATE ESTIMATES

For this report, evaluation of predation rates has been restricted to predation by the two most significant piscine predators: largemouth bass and smallmouth bass, and to their predation on juvenile chinook salmon. All of the run-pool data for Stratum 1 have been grouped together. The same is true of the special run-pool data in Stratum 1. Data from all the sites in Stratum 2 were grouped, since they are all run-pool habitat. In all cases the data have been grouped by date of field collection: (1) early predation--samples collected between late January and late March; (2) pre-pulse-flow predation--samples taken in late April, just prior to the pulse flow (these samples were taken on the last sampling runs in the predator population sites and will henceforth be refered to as pre-pulse samples); and (3) pulse-flow predation, samples taken during the pulse flow. Sampling during the pulse flow was restricted to Stratum 2 and to special run-pools in Stratum 1.

TABLE 2 BLACK BASS POPULATION ESTIMATES, LOWER TUOLUMNE RIVER

	Abundance (based on area)	Standard Error	Abundance (based on bank distance)	Standard Error
Stratum 1				
Run-Pools	5,230	2,121	6,822	1,862
Special Run-Pools	2,621	758	2,115	236
Stratum 2	2,279	802	2,137	481
Totals	10,130	2,391	11,074	1,938

3.2.1 Predation Ratios

Predation rates are calculated in two steps. The first is to calculate a predation ratio (by species, habitat type, and sampling time), which is the average number of prey fish per predator sampled. For example, during the early sampling in run-pools of Stratum 1, 26 largemouth bass were caught, of which two had a total of 4 juvenile chinook salmon in their stomachs; in this case, 4 salmon in 26 largemouth bass (4/26) = 0.15. The 95 percent lower and upper confidence intervals for this ratio (assuming that the data are Poisson-distributed) are 0.04 and 0.38 (Johnson and Kotz 1969). All predation ratios are calculated similarly and are summarized in Table 3, along with the upper and lower 95 percent confidence intervals.

Early Sampling

In the run-pools in Stratum 1 during the early samplings, 18 smallmouth bass were caught with a total of 3 salmon in their stomachs. The predation ratio was 0.17. In the same sites, 26 largemouth bass had consumed 4 salmon. This predation ratio was 0.15. No predation by either largemouth or smallmouth bass was documented in the special run-pools during the early samplings, nor was any predation documented in any of the Stratum 2 sites during early sampling. Only one predator was found in the three Stratum 1 riffles sampled, a 199-mm smallmouth bass whose stomach contained no salmon.

Pre-pulse Sampling

During pre-pulse sampling, no predation was documented in Stratum 1 run-pools. Out of 60 largemouth bass in special run-pools whose stomachs were pumped during the pre-pulse sampling, only 2 salmon were found, for a predation ratio of 0.03. Predation by smallmouth bass was not detected in these sites at this time.

In Stratum 2 during the pre-pulse period, no predation by largemouth bass was documented; the smallmouth bass predation ratio was 0.17.

Pulse Flow Sampling

The Stratum 1 run-pools were not sampled during the pulse flow. In the special run-pools 88 salmon were found in the stomach samples of 134 largemouth bass, for a predation ratio of 0.66. Only 9 smallmouth bass were caught in the special run-pools during the pulse flows, but they had consumed 15 salmon; the predation ratio was 1.67 .

TABLE 3 SUMMARY OF PREDATION RATE STUDY DATA, LOWER TUOLUMNE RIVER, JANUARY-MAY 1990

												Average Predation Rate[a]	
Stratum	Species[b]	Site Type[c]	Sample Time[d]	Predators Captured	Predators with Salmon in Stomach	Predators w/o Salmon in Stomach	Largest Number of Salmon in One Predator	Total Salmon Prey	Average Consumption Per Predator	Lower 95% Confidence Interval	Upper 95% Confidence Interval	Low Digestion Rate	High Digestion Rate
1	LMB	RP	Early	26	2	24	3	4	0.15	0.04	0.38	0.24	0.36
1	SMB	RP	Early	18	1	17	3	3	0.17	0.03	0.47	0.35	0.51
1	LMB	RP	Pre-pulse	7	0	7	0	0	0	-	-	-	-
1	SMB	RP	Pre-pulse	9	0	9	0	0	0	-	-	-	-
1	LMB	SRP	Early	58	0	58	0	0	0	-	-	-	-
1	SMB	SRP	Early	1	0	1	0	0	0	-	-	-	-
1	LMB	SRP	Pre-pulse	60	2	58	1	2	0.03	0.004	0.11	0.05	0.07
1	SMB	SRP	Pre-pulse	1	0	1	0	0	0	-	-	-	-
1	LMB	SRP	Pulse Flow	134	40	94	9	88	0.66	0.53	0.82	1.06	1.57
1	SMB	SRP	Pulse Flow	9	5	4	5	15	1.67	0.93	2.74	3.62	5.31
2	LMB	RP	Early	13	0	13	0	0	0	-	-	-	-
2	SMB	RP	Early	13	0	13	0	0	0	-	-	-	-
2	LMB	RP	Pre-pulse	9	0	9	0	0	0	-	-	-	-
2	SMB	RP	Pre-pulse	6	1	5	1	1	0.17	0.004	0.89	0.35	0.51
2	LMB	RP	Pulse Flow	18	0	18	0	0	0	-	-	-	-
2	SMB	RP	Pulse Flow	9	1	8	1	1	0.11	0.003	0.62	0.24	0.35

a. Chinook salmon consumed per predator per day; low digestion rate, 15 hours for largemouth bass, 11 hours for smallmouth bass; high digestion rate 10 hours for largemouth bass, 7.5 hours for smallmouth bass.

b. LMB, largemouth bass; SMB, smallmouth bass.

c. RP, run-pool; SRP, special run-pool.

d. Early sampling was done from 29 January to 27 March; Pre-pulse from 25 April to 28 April; Pulse Flow from 2 May to 4 May.

In Stratum 2, no predation by largemouth bass was seen during the pulse flow. The predation ratio for smallmouth bass was 0.11.

Figures 3 through 8 give length-frequency histograms for all largemouth and smallmouth bass sampled for predation rate. The length frequencies of fish that had consumed salmon are indicated in the histograms.

3.2.2 Gastric Evacuation and Predation Rate

The second step in calculating a predation rate (on a daily average basis) is to adjust the predation ratio with the gastric evacuation time for the food items. Gastric evacuation rates are affected by several factors, including predator and prey species (Beyer and Burley 1988), predator size (Swenson and Smith 1973), size and type of meal (Fange and Grove 1979), and water temperature (Hunt 1960; Seaburg and Moyle 1964; Molnar et al. 1967; Lewis et al. 1974). Lewis et al. found that for largemouth bass between 200 and 400 g held at 18 C (64 F), 30 hours was required for complete emptying of the stomach. Seaburg and Moyle (1964) found that largemouth bass held at 64-74 F (17.8-23.3 C) took 7 hours to reduce volume in their stomachs by 36 percent. Beyer and Burley (1988) concluded that evacuation rates for smallmouth bass are faster than for largemouth bass, and are in the range of 23 hours for a 200 mm fish to digest 5 grams of prey.

For our study, an estimate is also needed for the time it takes for the salmon prey to become unrecognizable in a stomach sample. Based on the literature and field observations, we estimate that 10-15 hours are required before chinook salmon juveniles become unrecognizable in the stomachs of largemouth bass at the temperatures during the pulse flow (approximately 17 C). For smallmouth bass, assuming that 25 percent less time is required, 7.5-11 hours are probably sufficient to render prey fish unrecognizable. With these gastric evacuation rates, it is possible to estimate the average number of salmon caught per predator per day ($\hat{f}$) by solving equation 8:

$$\hat{f} = \hat{\lambda}/d \qquad (8)$$

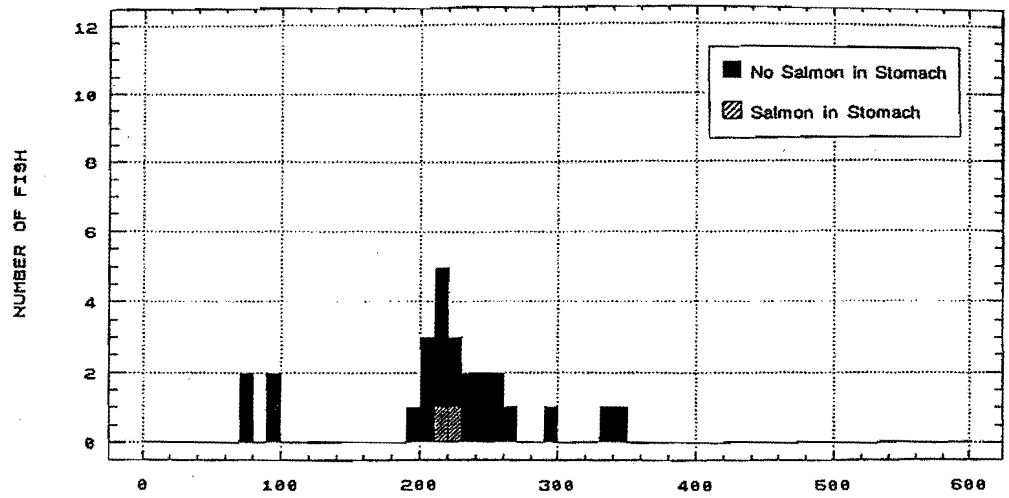
where $\hat{\lambda}$ is the average number of fish recognizable as salmon present in a predator's stomach, and d is the fraction of a day required to render a salmon unrecognizable.

For example, the predation ratio for largemouth bass in Stratum 1 run-pools during early sampling was 0.15. If 10 hours (0.42 days) is the evacuation time, the average predation rate, $\hat{f}$, is :

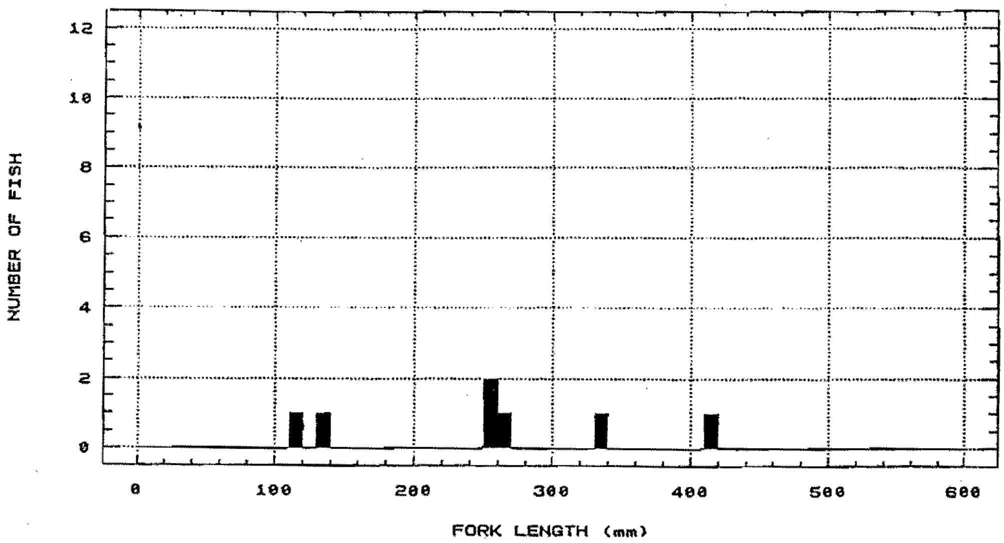
$$\hat{f} = 0.15/0.42 = 0.36 \text{ salmon per predator per day.}$$

Table 3 includes the ranges of average predation rates for largemouth and smallmouth bass by habitat types and times. During early sampling, predation rates for largemouth bass in Stratum 1

a. Early



b. Pre - Pulse Flow

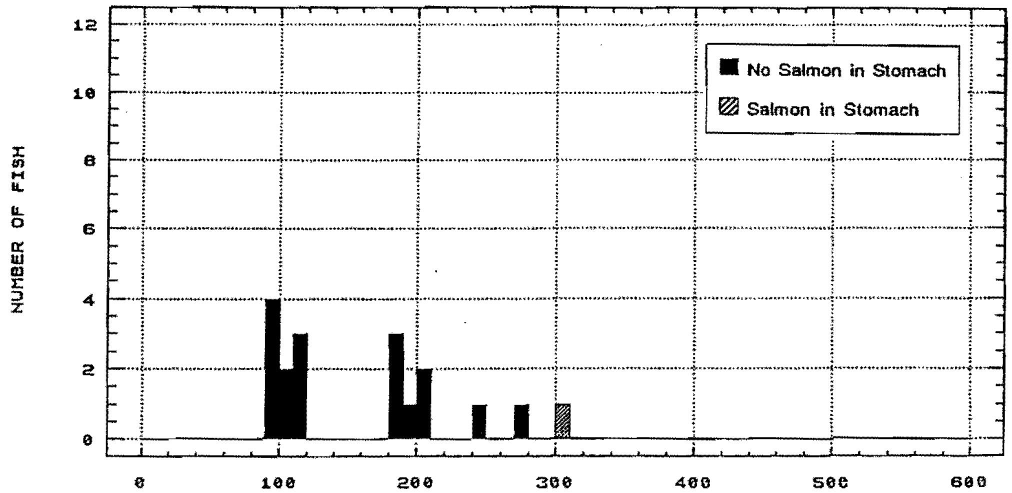


c. Pulse Flow

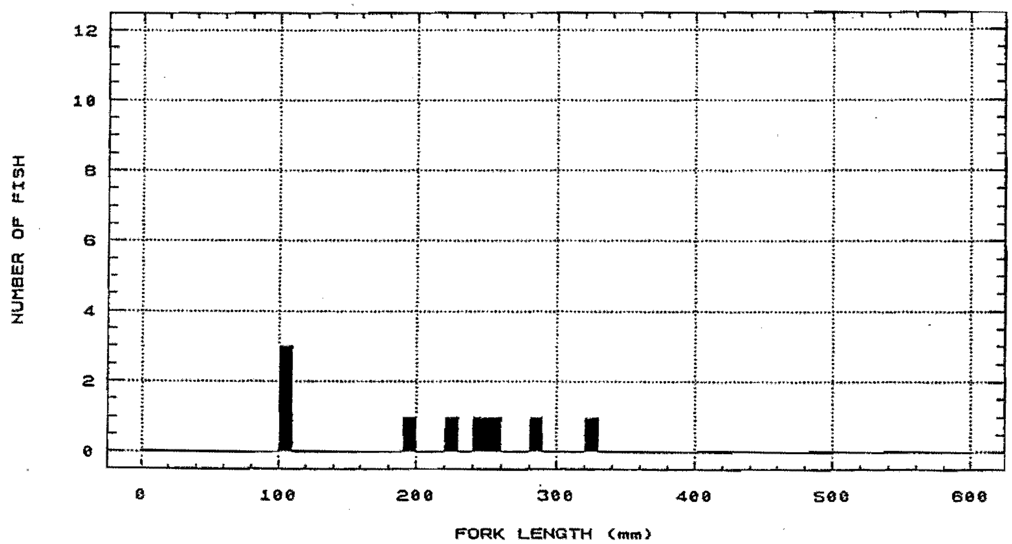
Run-pools were not sampled during the pulse flow.

Figure 3. Length frequencies of largemouth bass collected in Stratum 1 run-pools during predation rate studies, lower Tuolumne River, 1990.

a. Early



b. Pre - Pulse Flow



c. Pulse Flow

Run-pools were not sampled during the pulse flow.

Figure 4. Length frequencies of smallmouth bass collected in Stratum 1 run-pools during predation rate studies, lower Tuolumne River, 1990.

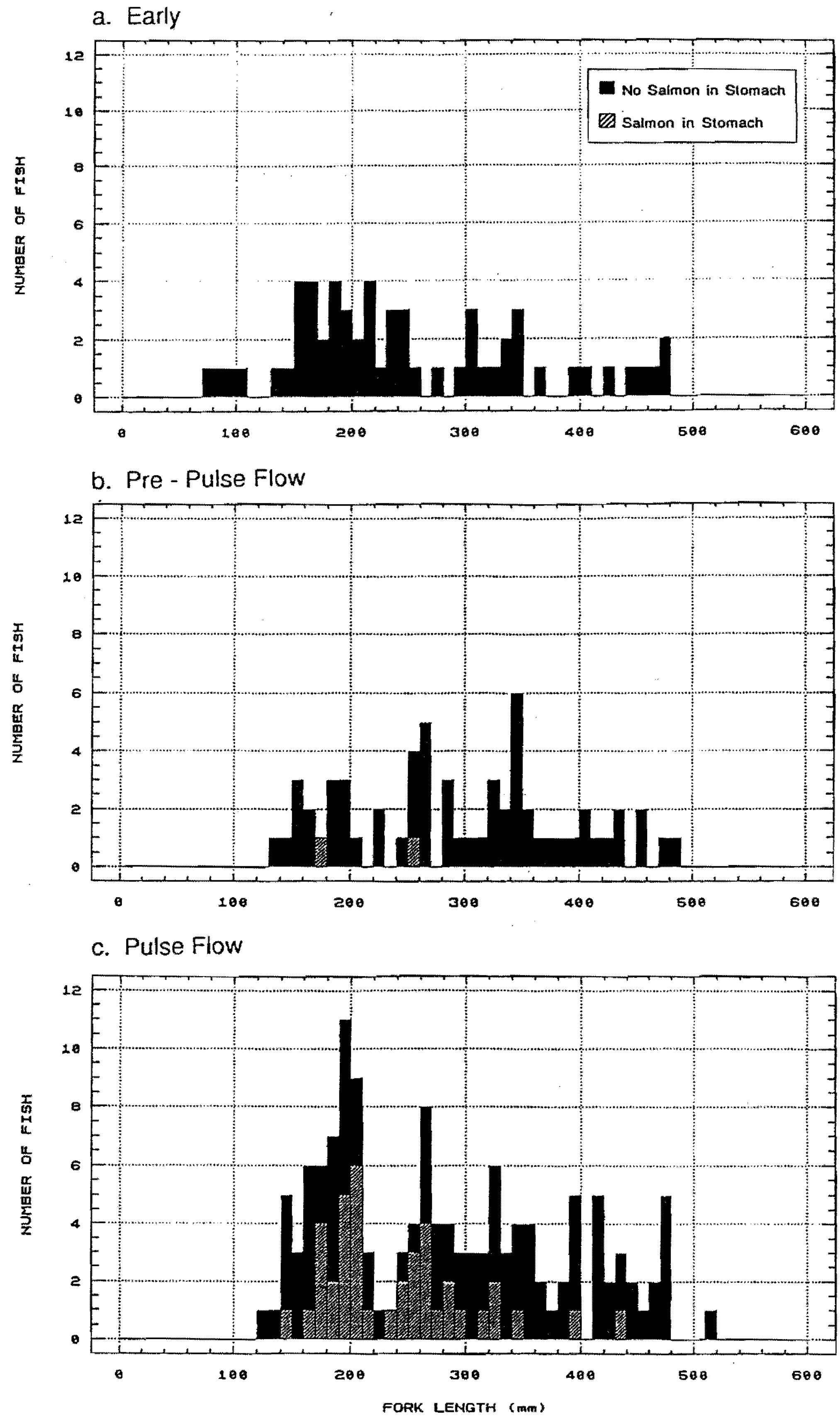


Figure 5. Length frequencies of largemouth bass collected in Stratum 1 special run-pools during predation rate studies, lower Tuolumne River, 1990.

a. Early

Only one predator caught; no histogram produced.

b. Pre - Pulse Flow

Only one predator caught; no histogram produced.

c. Pulse Flow

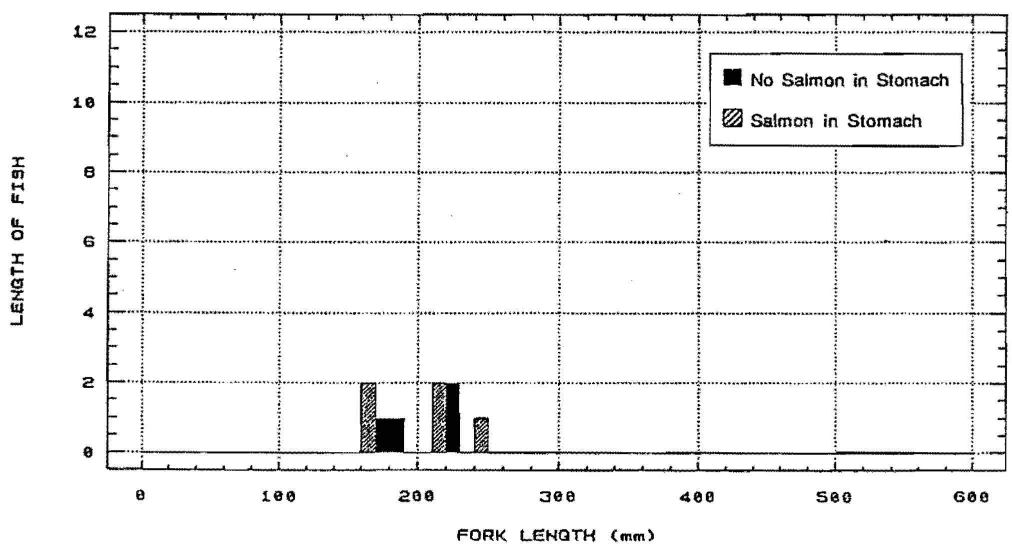


Figure 6. Length frequencies of smallmouth bass collected in Stratum 1 special run-pools during predation rate studies, lower Tuolumne River, 1990.

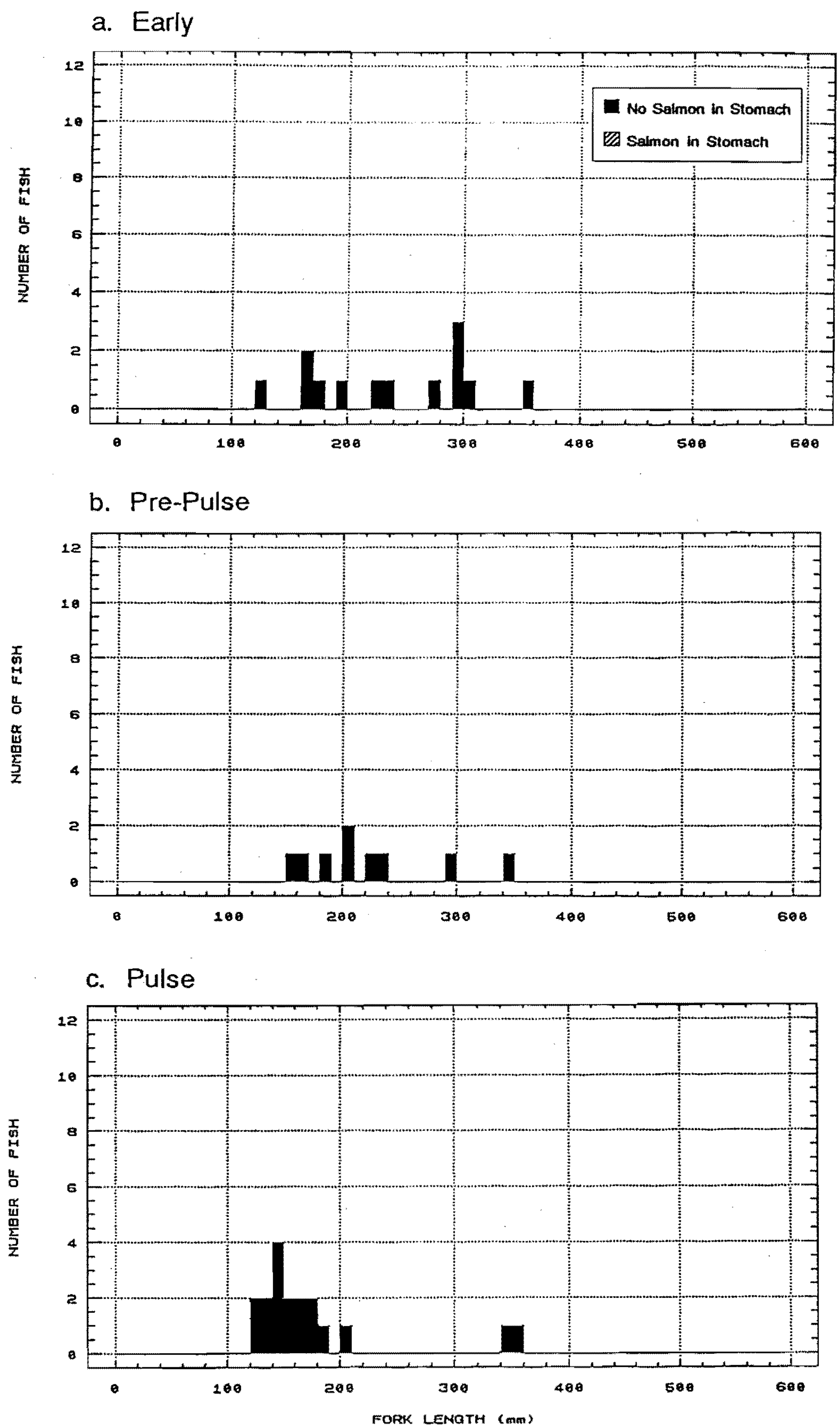


Figure 7. Length frequencies of largemouth bass collected in Stratum 2 run-pools during predation rate studies, lower Tuolumne River, 1990.

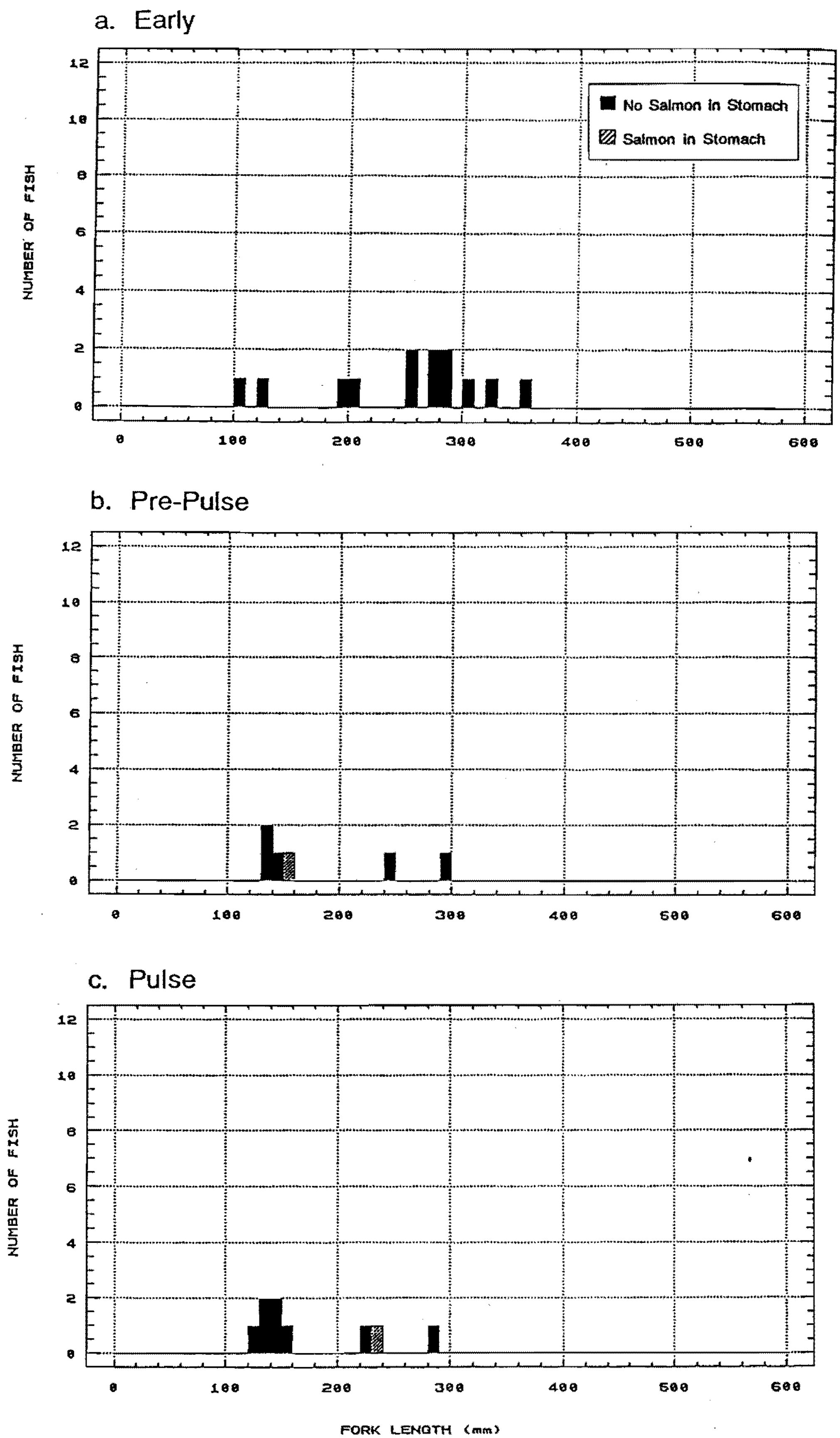


Figure 8. Length frequencies of smallmouth bass collected in Stratum 2 run-pools during predation rate studies, lower Tuolumne River, 1990.

run-pools ranged from 0.24 to 0.36 salmon per predator per day. Predation by smallmouth bass in the same sites and times was 0.35 to 0.51 salmon per predator per day. At the same times, predation by either of these predators on salmon in the special run-pools and in all of Stratum 2 was not detected.

During the pre-pulse sampling, neither largemouth nor smallmouth bass were detected preying on salmon in Stratum 1 run-pools. Predation by largemouth bass in special run-pools occurred at a very low rate (0.05-0.07 salmon per predator per day), and smallmouth bass predation was not detected. At this time in Stratum 2, largemouth bass predation was not detected, but smallmouth predation had increased (from undetected during early sampling) to 0.35-0.51 salmon per predator per day.

During the pulse flow, average predation by largemouth bass increased to 1.1-1.6, and smallmouth bass average predation to 3.6-5.3 salmon per predator per day in the special run-pools of Stratum 1. Largemouth bass predation in Stratum 2 was still not detected, and the smallmouth rate remained about the same as during the pre-pulse period: 0.24-0.35.

3.3 TURBIDITY: EFFECTS OF PULSE FLOW AND EFFECTS ON PREDATION

The data collected during the water turbidity sampling is summarized in Figure 9. (Attachment B shows longitudinal profiles of turbidity on representative dates of sampling. Attachment C shows the changes in turbidity over time at the given locations or areas.) In general, turbidity increases downstream. This is an expected phenomenon: the relatively clear water from the upstream reservoirs continually gathers more suspended sediment as it moves downstream. Agricultural return flows also contribute to the turbidity increases downstream. The spikes in turbidity in late March were of unknown origin, but they appeared to take about 5 days to move through the river and they were attenuated in the process (see Attachment B).

The effects of the pulse flow in late April and early May on the water turbidity are clearly visible in the figures. The turbidity pulse was slight in the river above Turlock Lake State Recreation Area (see Attachment C), and became more pronounced the farther downstream it traveled. The turbidity peak appeared to reach its highest level during the pulse flow, around the Modesto area (about 5.5 NTU at Riverdale Park [RM 12.3]) and was attenuated somewhat below there.

The turbidity in the area of the special run-pools between run-pool 66 (RM 31) and RM 25 peaked at about 2.5 NTU during the pulse flow. Comparing this turbidity with the predation rate data for the special run-pools during the pulse flow, it is clear the turbidity pulse that accompanies a pulse flow of this magnitude is not enough to impair the success of sight-feeding predators. Turbidity would have to be artificially increased to reduce predation during a pulse flow.

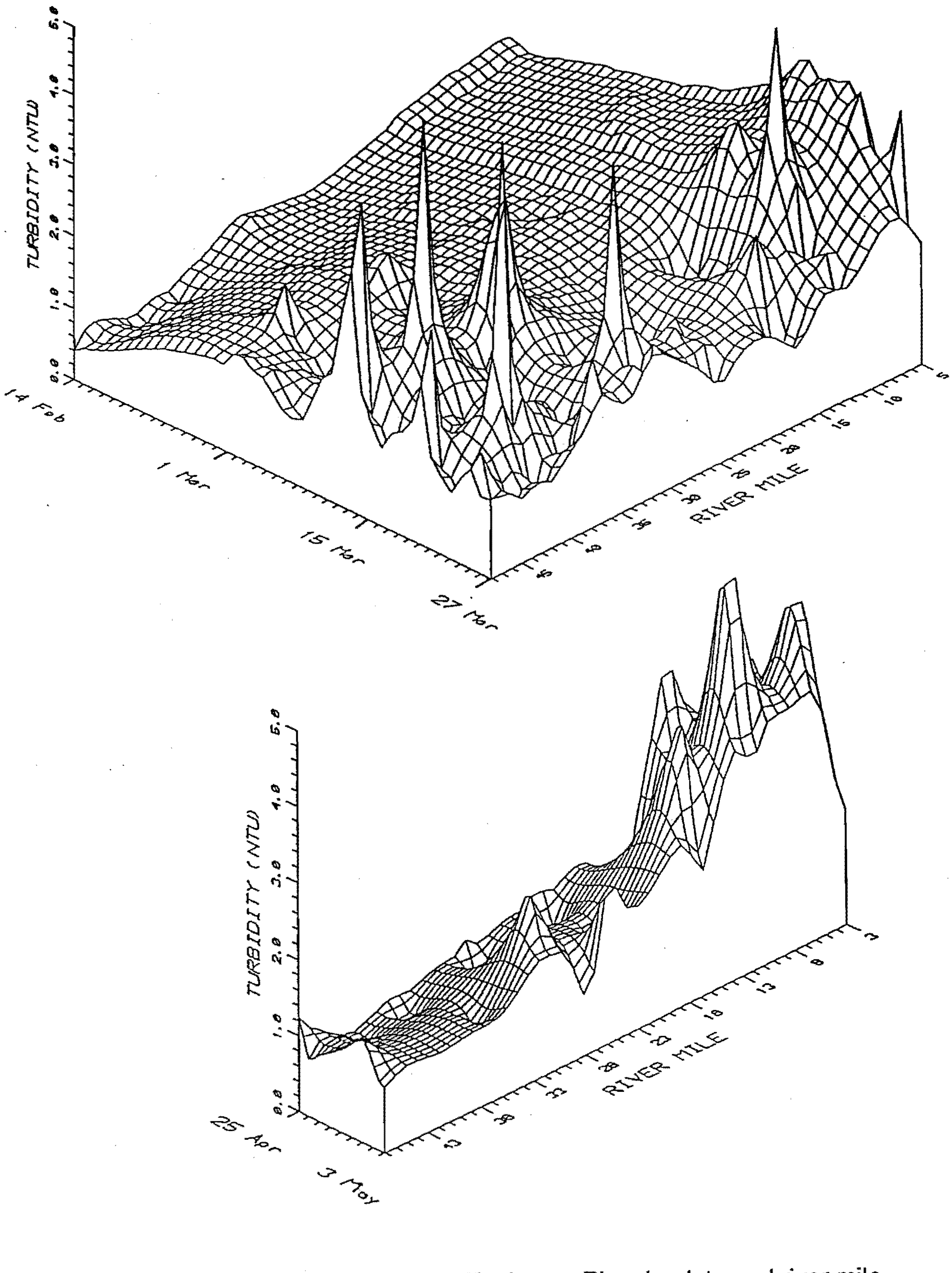


Figure 9. Water turbidity in the lower Tuolumne River by date and river mile for a period before and during the pulse flows, spring 1990.

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ATTACHMENT A:

PILOT STUDY REPORT: PREDATION BY PISCIVOROUS FISH IN THE TUOLUMNE RIVER, 1989

ATTACHMENT A: PILOT STUDY REPORT: PREDATION BY PISCIVOROUS FISH IN THE LOWER TUOLUMNE RIVER

A.1 INTRODUCTION

Predation has been implicated as a significant mortality factor for juvenile salmon (Foerster and Ricker 1941; Johnson 1965; Neave 1953; Peterman 1978; Poe and Rieman 1988; Ricker 1941, 1962). Salmon fry and smolts are subject to a variety of predators, including fish, birds, and mammals (Alexander 1979). Some studies indicate that as much as 55-85 percent of juvenile salmon (fry or smolts) can be removed by piscivorous fish in freshwater streams (Foerster 1968; Hunter 1959; Neave 1953). Piscivorous predation is an important component of chinook fry and smolt mortality, and is thus an important management concern. The pilot predation study was carried out to assess piscivorous fish predation in the Tuolumne River.

The level of predation on juvenile salmon is a function of several factors, which include predator density and prey density. In some situations the percentage mortality from predation actually decreases as salmon fry numbers increase (Hunter 1959; Neave 1953). Other data, however, do not show this "swamping effect" on predators caused by large prey populations (Neave 1953). In a review of the data from some previous experiments, Peterman (1978) concluded that because predators are often not saturated, one must determine how predation mortality varies with prey density in order to evaluate the effectiveness of salmon management programs.

Other factors that influence the level of predation include water flow, turbidity, cover, hatchery releases, size of predator, and water temperature. At low flows, salmon fry and smolts would be concentrated in a smaller area and therefore more susceptible to predation. The amount of cover would affect the vulnerability of salmon juveniles to predation. Turbidity is one aspect of cover, and at high turbidity levels, juvenile salmonids become less susceptible to predation by sight-feeding predators. High mortality of juvenile salmon has been reported for hatchery-released salmon (Buchanan et al. 1981). The size and type of prey has been shown to vary with the size of the predator: for example, Moyle and Li (1979) noted a transition in the diet of Sacramento squawfish from primarily insects to crayfish and fish at approximately 200 mm Standard Length. Water temperature may affect the structure of a predator population by regulating the abundance and size availability of prey (Adams et al. 1982).

The impact of predation on salmon fry and smolts by piscivorous predators in the Tuolumne River is not known, but in other areas these predators have been shown to cause significant mortality of chinook smolts (Poe and Rieman 1988). Frequently implicated predators on rearing and emigrating chinook salmon include squawfish (*Ptychocheilus* spp.), sculpins (*Cottus* spp.), smallmouth bass (*Micropterus dolomieui*), largemouth bass (*Micropterus salmoides*), rainbow trout (*Oncorhyncus mykiss*) and coho salmon (*Oncorhynchus kisutch*) (Patten 1971; Meacham and Clark 1979; Buchanan et al 1981; Poe and Rieman 1988). Although squawfish (*Ptychocheilus* spp.) have often been implicated as predators on salmon (Borgeson 1979; Jeppson and Platts

1959; Palmer et al. 1986; Poe and Rieman 1988; Steigenberger and Larkin 1974; Thompson 1959), other researchers have argued that squawfish are only a significant problem under unusual circumstances; e.g., below dams, near diversion facilities, and on hatchery-produced fish (Buchanan et al. 1981).

The three main objectives of the Tuolumne River pilot predation study were to obtain preliminary data on (1) the piscivorous predator population (species, abundance), (2) the rates of predation, and (3) the variability inherent in sites, timing of surveys, and numbers of fish examined. The preliminary data will permit the development of a comprehensive study plan which can be implemented in a future study for evaluating the species, numbers, and sizes of fish that prey on chinook salmon and the rates of predation through the rearing and emigration period. These data, combined with an estimate of fry/smolt production and density, can be used to evaluate the impact of piscivorous fish predation on chinook salmon juveniles in the Tuolumne River.

The pilot predation study was conducted in the lower Tuolumne River, below La Grange dam. The Tuolumne River Summer Flow Study Report (Appendix 27) was used to provide some additional preliminary information on fish species composition and distribution.

A.2 METHODS

Predation field studies were conducted during the months of April and May 1989 to coincide with the greatest potential chinook smolt outmigration. Nine sampling sites were randomly selected in the lower Tuolumne River (Figure A-1).

Electrofishing gear and gill nets were used to capture fish. Electrofishing gear alone was used to capture fish for estimating predation rates in the three sampling periods between April 11 and May 2. During this period, population estimates were not attempted.

A combination of electrofishing and gill netting was used at the Zanker site (RM 46.4) on 17 May for a capture-reduction estimate of predator abundances and predation-rate sampling. On 18 May a similar capture-reduction estimate was attempted at the McCleskey Farm (RM 6.0) site, but the gill nets clogged quickly with floating debris, and a capture-reduction population estimate could not be obtained. Table A-1 lists the locations of sampling sites and dates.

The electrofishing gear consisted of a gasoline-powered DC generator with three anodes mounted on a tow barge. In the predation-rate efforts, one electrofishing pass was completed at each sampling site on each sampling date. For the predator abundance sampling at the Zanker Farm (RM 46.4) site, a three-pass capture-reduction technique was used.

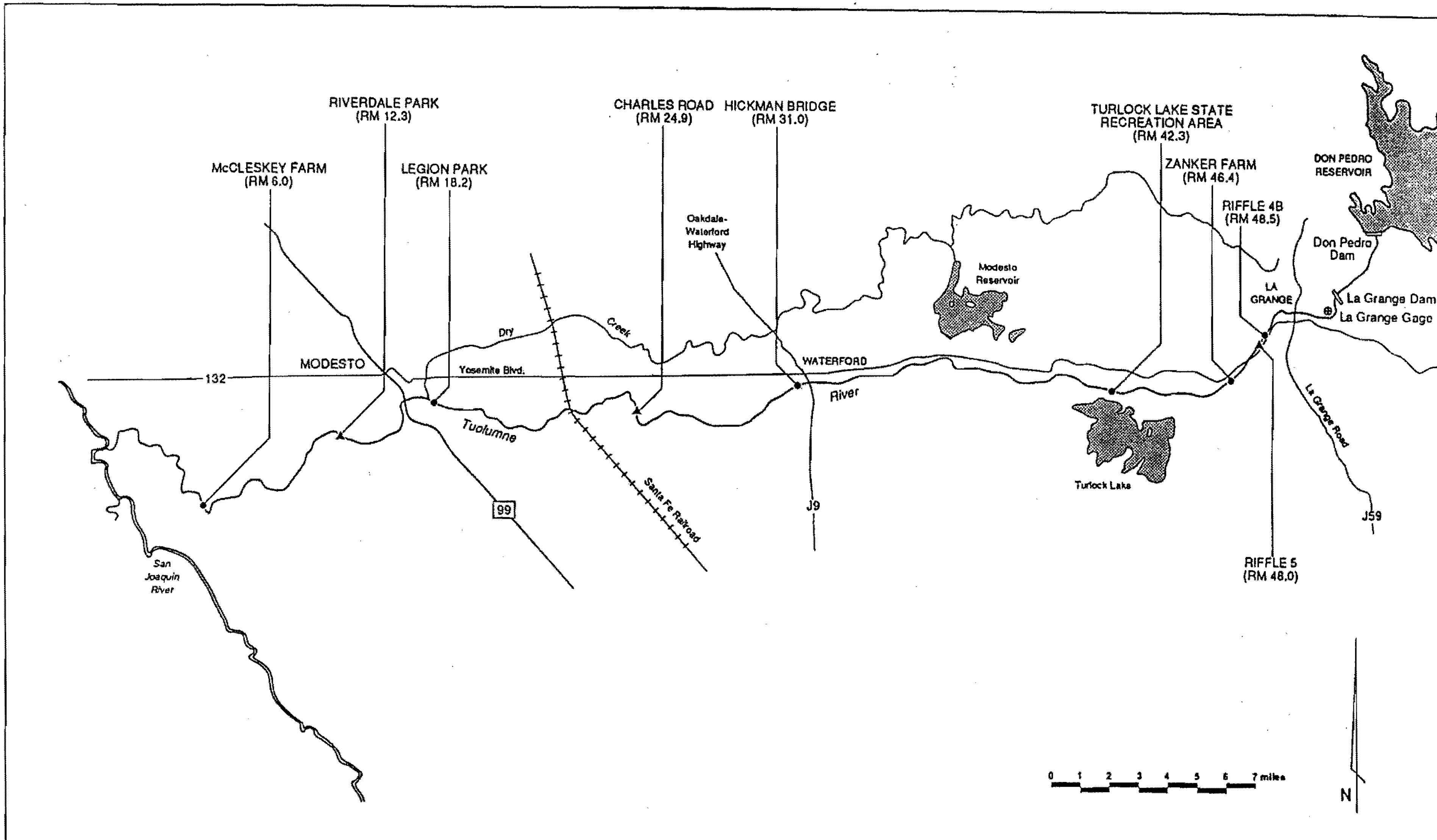

Figure A-1 Nine predation study sites sampled in the lower Tuolumne River, below La Grange Dam, 1989.

TABLE A-1 SITES SAMPLED ALONG THE TUOLUMNE RIVER TO GATHER DATA ON PREDATOR POPULATIONS AND PREDATION RATES, APRIL-MAY 1989

		Date			
Site	River Mile	Wk1	Wk2	Wk3	Wk5
Riffle 4B	48.5	11-Apr	18-Apr	29-Apr	
Riffle 5	48			30-Apr	
Zanker Farm	46.4				17-May
Turlock State Lake Recreation Area	42	12-Apr	18-Apr	30-Apr	
Hickman Bridge	31		19-Apr	1-May	
Charles Road	24.9			1-May	
Legion Park	18.2			1-May	
Riverdale Park	12.3		20-Apr	2-May	
McCleskey Farm	6	13-Apr	20-Apr	2-May	

A.2.1 PREDATION RATE

During each electrofishing pass, all fish of piscivorous species captured were placed into live wells for stomach pumping. Before its stomach was pumped, each fish was measured to Fork Length (mm) and weighed (g). Once the stomachs were pumped, the fish were put back into live wells to ensure their recovery and subsequently returned to the river.

A.2.1.1 Stomach Sample Collection

All predators captured were examined for the presence of juvenile chinook salmon in their stomachs. Stomachs were pumped by holding the fish in a vertical position, head down, and injecting water into the fish's stomach, which forced the fish to regurgitate the food items. All food items were placed in sealed containers in an 80 percent alcohol solution. In some fish (e.g., some squawfish and catfish), stomach pumping was not completely effective. In these cases the fish were sacrificed, and the entire stomach was removed and placed in a sealed container containing an 80 percent alcohol solution. All stomach samples were taken to the EA laboratory for examination.

A.2.1.2 Processing of Laboratory Samples

All preserved stomach samples were processed at the EA laboratory. The numbers of salmon and crayfish were enumerated for each sample. Other aquatic invertebrates were not identified, but the samples were re-preserved for future processing.

A.2.1.3 Analysis of Fry Counts From Stomach Samples

Although counts were made for a given species by date and location, these numbers were generally too small to be of much use at that level. Thus, it was most reasonable to pool the counts over dates and over the upper half and the lower half of the Tuolumne River. These data are presented as "upper stratum" and "lower stratum" data. The upper stratum of the river, river miles (RM) 25-52), contains all the riffle areas and included the following sites for this study: Riffle 4B (RM 48.5), Riffle 5 (RM 48.0), Zanker Farm (RM 46.4), Turlock State Lake Recreation Area (RM 42.3), and Hickman Bridge (RM 31.0). All other sites were included in the lower stratum of the river (RM 1-25), where the habitat consists mainly of run-pools. At this level of analysis, the preliminary data were quite useful.

Because many, if not most, potential predators caught had no fry in their stomachs, it was thought reasonable to assume a Poisson distribution for the number of fry in the stomachs of fish caught. It was also assumed that the numbers of fish in the stomachs of different fish were independent.

A.2.1.4 Gastric Evacuation Time

To estimate the number of prey items eaten per predator per day from the number of fry found in predators' stomachs, an estimate of the gastric evacuation time is needed. The gastric evacuation time is the time it takes an ingested food item to become unidentifiable through digestion by the predator. A review of the literature was carried out to determine, as far as possible, evacuation rates for salmon young for the predator species and environmental conditions involved.

A.2.2 PREDATOR ABUNDANCE

A.2.2.1 Capture-Reduction Technique

The capture-reduction technique for estimating the density of predatory fish (used at the Zanker Farm (RM 46.4) site on May 17) involved blocking (with 1/4-inch-mesh gill nets) the upper and lower ends of a river section approximately 80 meters in length and driving fish (with an electroshocker powered by a gasoline-powered electric generator on a tote barge) into a series of size-graded gill nets located at the upper end of the section (Figure A-2). Fish were removed from the gill nets immediately after each pass and kept in live wells. This procedure was repeated until the reduction of captures on sequential passes was sufficient to estimate the population size. The stomachs of all predatory fish species were pumped and preserved for later analysis. All fish were then returned to the river. Water temperature and electrical conductivity were recorded on each data sheet. The capture-reduction technique was attempted at the McCleskey Farm (RM 6.0) site, but it was not completed, because the blocking nets very quickly became clogged with suspended organic matter.

A.3 RESULTS

A.3.1 PREDATION RATES

A.3.1.1 Predation on Chinook Juveniles

Twelve potential chinook salmon predator species (two of which are native species) were captured during the pilot study. The numbers of potential predators collected at the various sites in the upper and lower strata and examined for stomach contents are presented in Tables A-2 and A-3.

Of the fish of 12 species examined, only five smallmouth bass (9 percent of all smallmouth bass captured in the two strata) and two largemouth bass (4 percent) were found to contain chinook fry

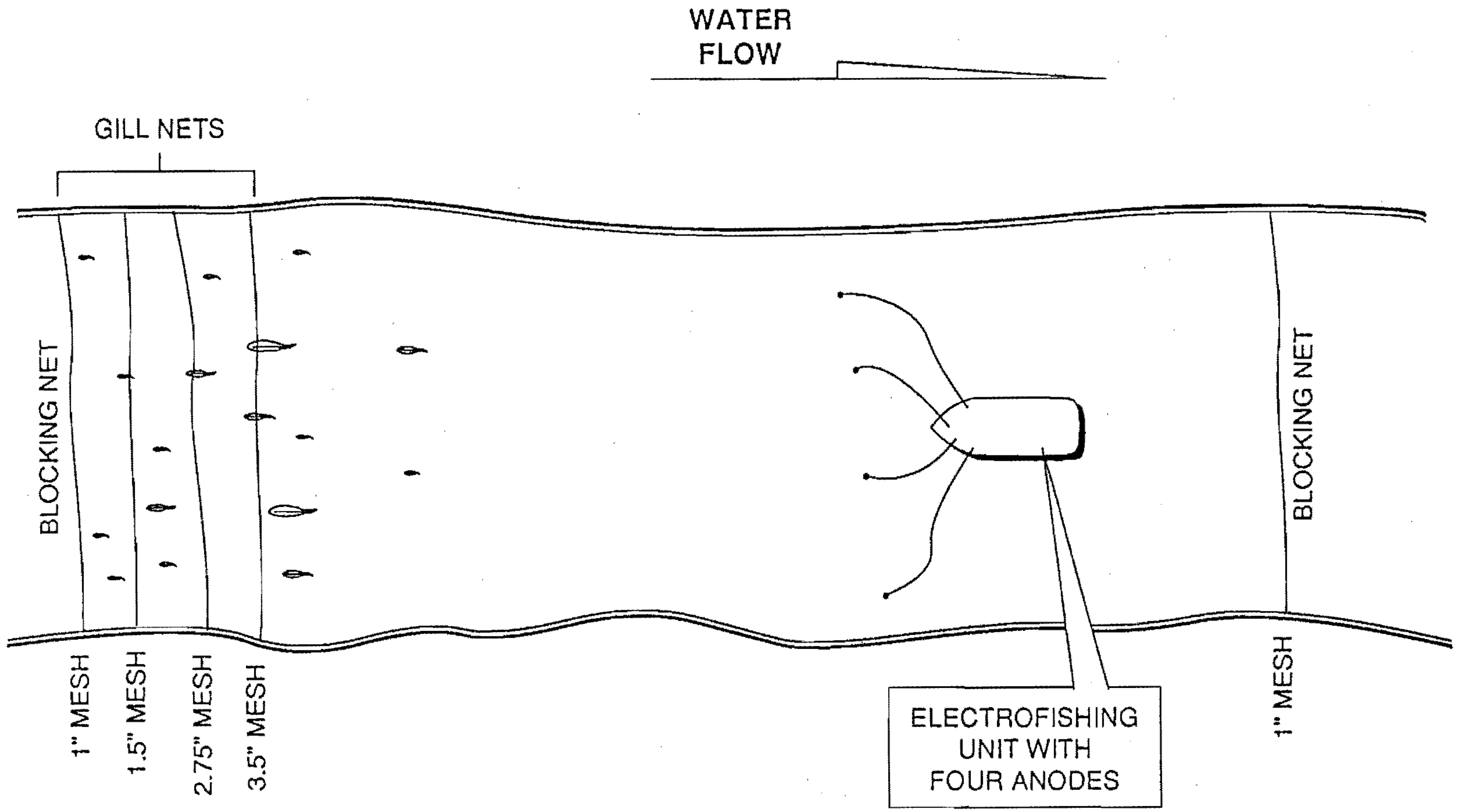

Figure A-2 Capture-reduction technique used to estimate fish populations at the Zanker Farm site and attempted at the McCleskey Farm site

TABLE A-2 NUMBERS OF POTENTIAL PREDATORS EXAMINED FOR CHINOOK SALMON IN STOMACHS AT UPPER-SECTION SITES, APRIL-MAY 1989

	Site					
Species (N=native species)	R4B	R5	Zanker	TLSRA	Hickman	All
Smallmouth bass (*Micropterus dolomieui*)	4	0	5	7	14	30
Largemouth bass (*Micropterus salmoides*)	1	1	14	2	2	20
Striped bass (*Morone saxatilus*)	0	0	0	0	0	0
Bluegill (*Lepomis macrochirus*)	2	1	1	3	7	14
Redear sunfish (*Lepomis microlophus*)	0	0	7	5	1	13
Green sunfish (*Lepomis cyanellus*)	4	0	4	2	4	14
Warmouth (*Lepomis gulosus*)	0	0	0	1	0	1
Channel catfish (*Ictalurus punctatus*)	0	0	0	0	0	0
White catfish (*Ictalurus catus*)	0	0	0	0	6	6
Brown bullhead (*Ictalurus nebulosus*)	5	0	0	9	9	23
Sacramento squawfish (N) (*Ptychocheilus grandis*)	6	0	0	42	20	68
Riffle sculpin (N) (*Cottus asper*)	1	0	0	0	0	1
Total	23	2	31	71	63	190

TABLE A-3 NUMBERS OF POTENTIAL PREDATORS EXAMINED FOR CHINOOK SALMON IN STOMACHS AT LOWER-SECTION SITES, APRIL-MAY 1989

Species (N=Native)	Site: Charles Road	Legion Park	Riverdale Park	McCleskey Farm	All
Smallmouth bass	1	0	10	17	28
Largemouth bass	3	4	18	11	36
Striped bass	0	0	0	8	8
Bluegill	2	9	8	8	27
Redear sunfish	0	1	6	10	17
Green sunfish	1	0	7	12	20
Warmouth	0	0	0	0	0
Channel catfish	0	0	0	11	11
White catfish	1	1	3	13	18
Brown bullhead	1	0	0	0	1
Sacramento squawfish (N)	0	0	0	0	0
Riffle sculpin (N)	0	0	0	0	0
Total	9	15	52	90	166

or smolts in their stomachs. These seven fish constituted 3.7 percent of the 190 predatory fish examined in the upper stratum. All of these fish were collected in the upper stratum of the river; no predation on salmon was found in the 149 fish examined in the lower stratum. The five smallmouth bass ranged in fork length from 168 to 267 mm and in weight from 60 to 280 g. The median fork length (253 mm) of the five smallmouth bass with salmon present in their stomachs was significantly higher ($P < 0.05$) than the median fork length (166 mm) of the 53 smallmouth bass without salmon (Figure A-3). The weight-length relationship of smallmouth bass examined is presented in Figure A-4. The two largemouth bass with salmon in their stomachs were 160 and 222 mm in fork length and 55 and 170 g in weight, respectively. There was no significant difference ($P > 0.05$) between the median fork length of largemouth bass with salmon present (191 mm, n=2) and salmon absent (202 mm, n=54) in their stomachs (Figure A-5). The weight-length relationship for largemouth bass examined is presented in Figure A-6.

A summary of the stomach content data is provided below:

	Number Examined	Number with Salmon	Number of Salmon
Smallmouth bass			
Upper Stratum	30	5	10
Lower Stratum	28	0	0
Total	58	5	10
Largemouth bass			
Upper Stratum	20	0	0
Lower Stratum	36	2	3
Total	56	2	3

The numbers of predators containing salmon by date and site and the numbers of salmon found in their stomachs are presented in Table A-4.

The weight-length relationships for all other species examined are presented in the section on predation on crayfish.

Daily predation rates were estimated in two steps. First, the predation ratio (by species) was calculated by dividing the total number of fry in the stomachs of predators by the number of predators captured. In the upper stratum sites of the Tuolumne River, 10 chinook salmon smolts were found in the stomachs of the 30 smallmouth bass examined. The estimated predation ratio was 10/30, or 0.33. The lower and upper 95 percent confidence intervals, assuming a Poisson distribution for the estimate, are 0.16 and 0.61 (Johnson and Kotz 1969). The predation ratio for largemouth bass, in the upper section, based on the presence of three young salmon in the stomachs of 20 bass, was 3/20 or about 0.15.

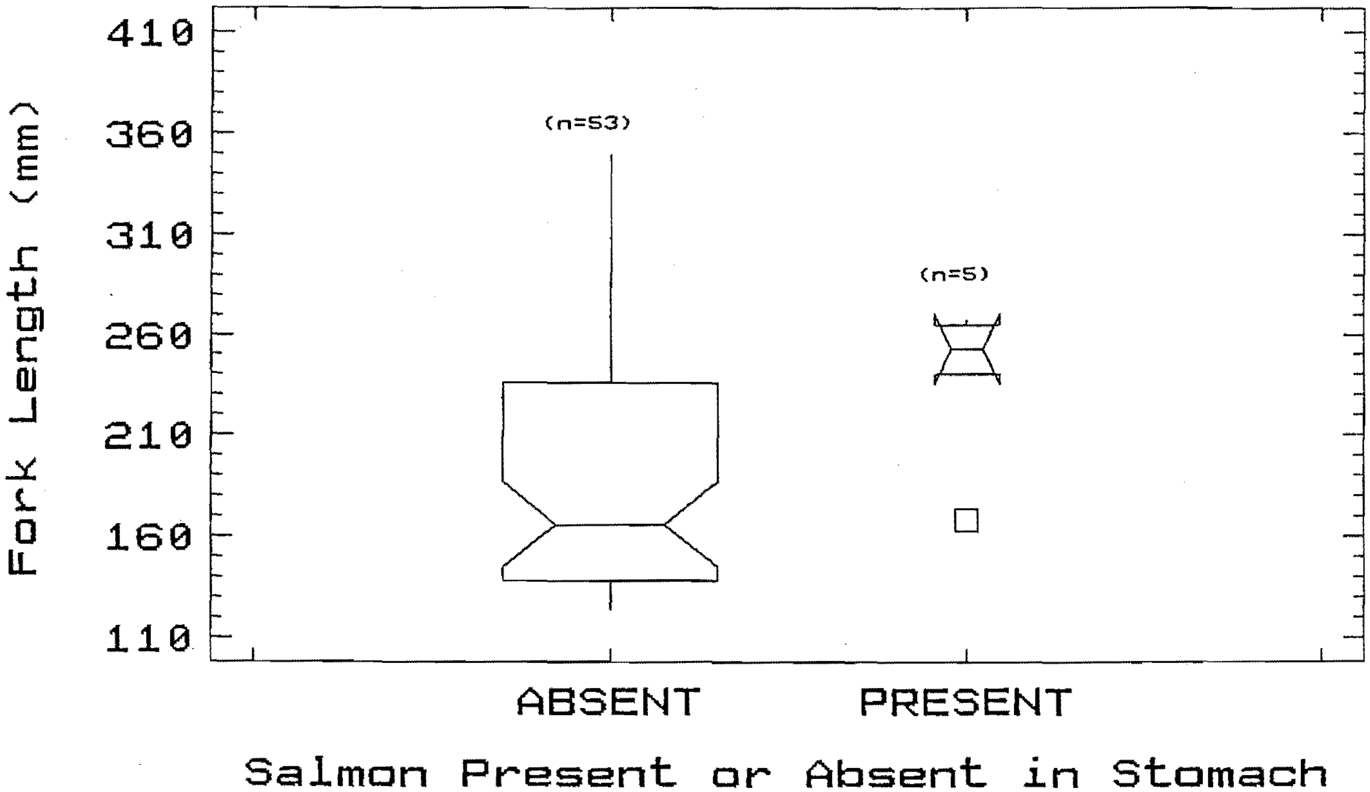

Figure A-3 Notched box-and-whisker plot of the fork length of smallmouth bass with and without salmon in stomach contents.

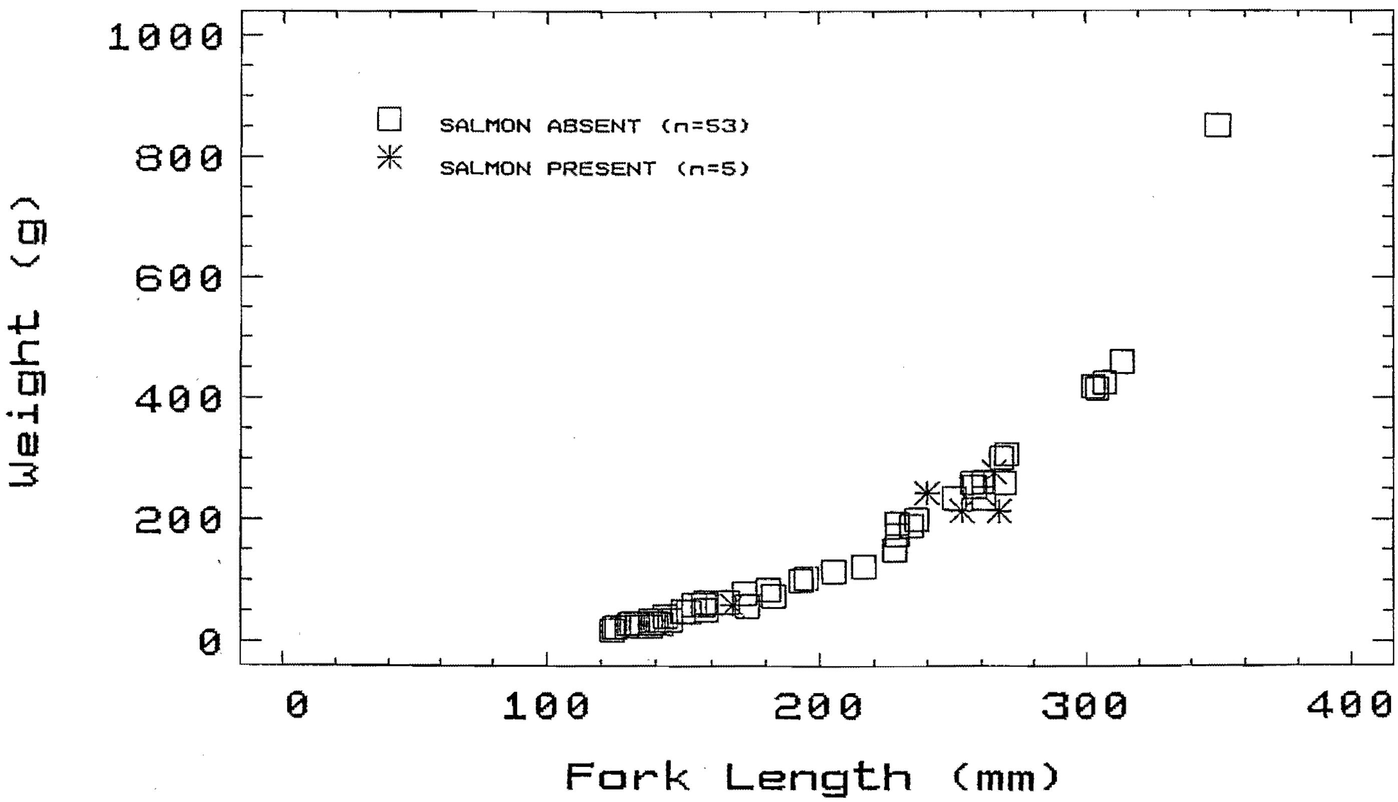

Figure A-4 Weight-length relationship of smallmouth bass with and without salmon in stomach contents.

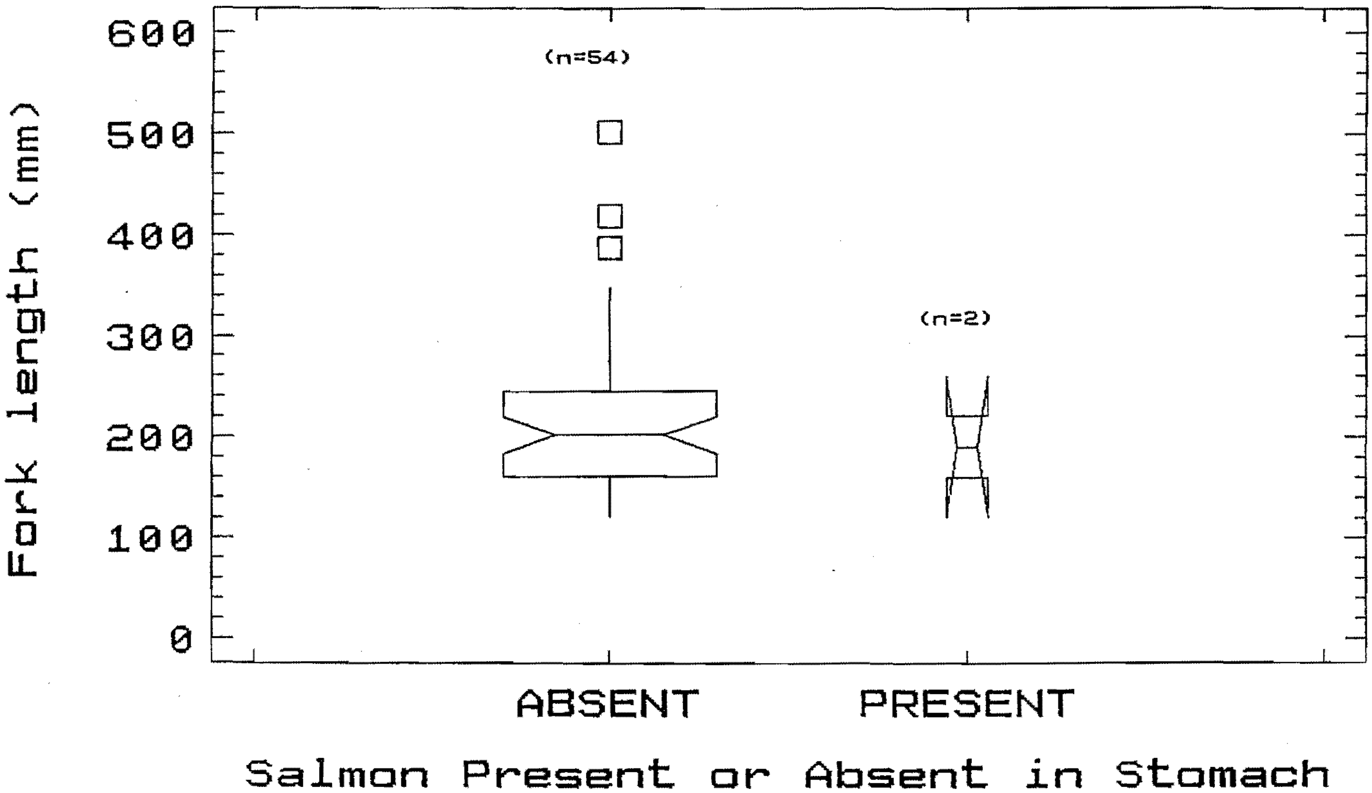

Figure A-5 Notched box-and-whisker plots of the fork length of largemouth bass with and without salmon in stomach contents.

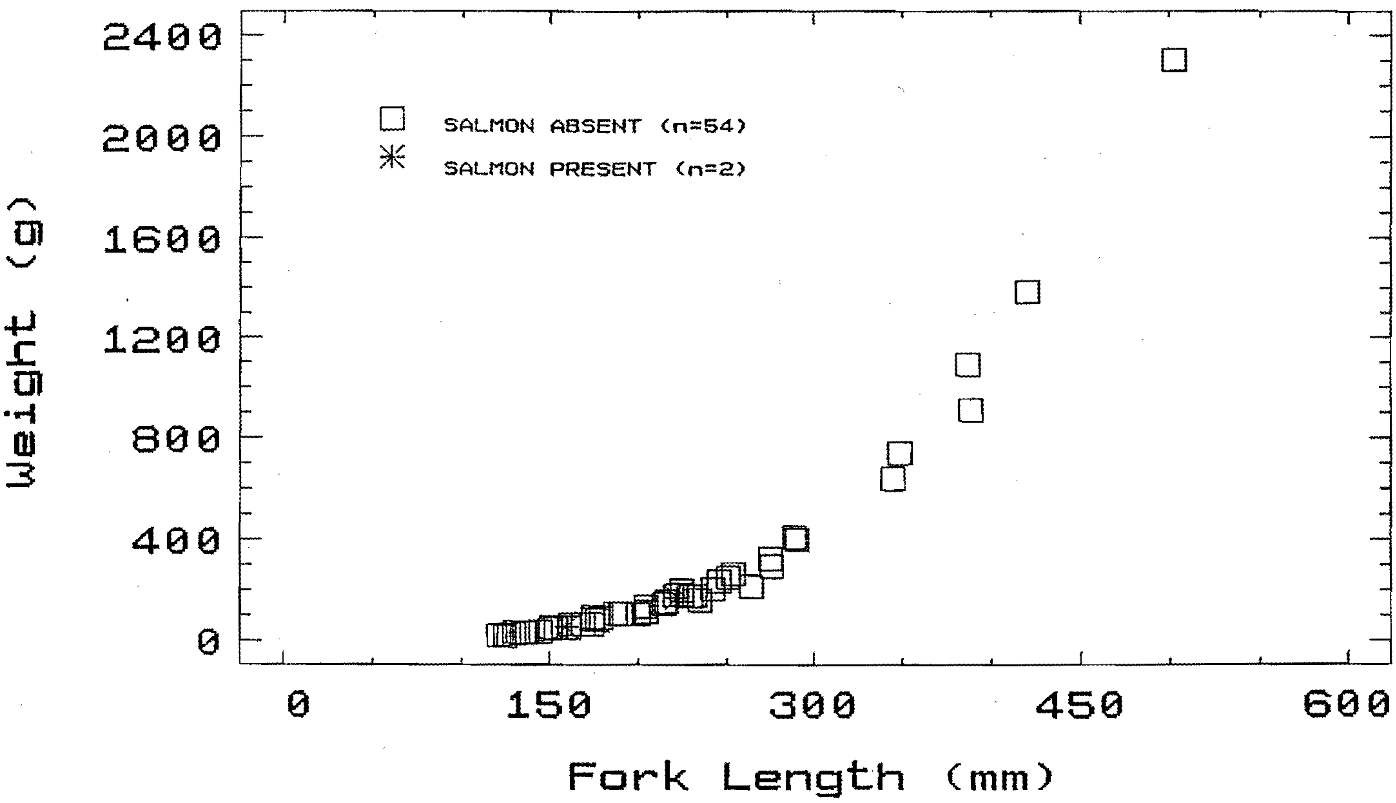

Figure A-6 Weight-length relationship of largemouth bass with and without salmon in stomach contents.

TABLE A-4 NUMBER OF PREDATORS WHICH CONTAINED SALMON, BY SAMPLING DATE AND SITE, UPPER SECTION OF THE LOWER TUOLUMNE RIVER, APRIL-MAY 1989

Species	Number with Salmon	Number of Salmon	Sampling Date	Sampling Site
Smallmouth bass	1	2	19-Apr	TLSRA
Largemouth bass	1	1	19-Apr	HICKM
Smallmouth bass	2	4	19-Apr	HICKM
Smallmouth bass	2	4	30-Apr	TLSRA
Largemouth bass	1	2	17-May	ZANKE

The second step in calculating the daily predation rate was to adjust the predation ratio with the gastric evacuation time for the food items. Many factors affect gastric evacuation time, including predator and prey species (Beyer and Burley 1988), predator size (Swenson and Smith 1973; Jobling et al. 1977), size and type of meal (Fange and Grove 1979), and water temperature (Molnar et al. 1967; Durbin and Durbin 1980). Steigenberger and Larkin (1974) found that squawfish held at 10-12 degrees Celsius showed an evacuation time for sockeye salmon (*Oncorhynchus nerka*) smolts of 7.1 hours. They found that most squawfish cleared their stomach contents in about 24 hours, and that half had done so between 12 and 18 hours. These researchers also found that the evacuation times for squawfish that were force-fed rainbow trout decreased with water temperature, from 20 hours at 4-6 C to 2-2.5 hours at 24 C. They concluded that evacuation times decreased with increasing temperature, increased with larger weights of food, and did not differ with the size of the predator fish. Beyer and Burley (1988) found that evacuation times for smallmouth bass decreased with increases in water temperature, food weight, and predator weight. The gastric evacuation times for fingerling bass as prey may be similar for related predator species: 48-72 hours for smallmouth bass, as compared to 48-84 hours for largemouth bass (Lane and Jackson 1969). It should be kept in mind that smallmouth bass prefer colder and faster-moving water (Ferguson 1958; Scott and Crossman 1973) and may therefore have different metabolisms and evacuation times. Beyer and Burley (1988) concluded that smallmouth bass evacuation times were faster than those for largemouth bass and that evacuation time was between 3 and 78 hours over the range of variables tested (temperature, predator weight, prey weight, etc.). Because evacuation time estimates vary so much with the several factors involved, the results are presented over a range of evacuation times. If f is the average number of fry caught by the predator per day, and d is the average number of days that fry evidence remains in the stomach, then fd is the average number of salmon present in the fish's stomach, estimated as $\hat{\lambda}$. Assuming that d is known, we estimate f by

$$\hat{f} = \hat{\lambda} / d$$

If the the evacuation time = 24 hours (d=1) then $\hat{f} = \hat{\lambda}$. In the above smallmouth bass example, the number of prey items eaten per day per smallmouth bass is equal to 0.33. If the gastric evacuation time is only 12 hours (d=0.5) then the number of prey items eaten per smallmouth bass per day is equal to 0.33/0.5, or 0.66.

Assuming an evacuation time of 18 hours (d=0.75) for both smallmouth bass and largemouth bass, the estimated rate of predation for smallmouth bass, 0.44, was over twice as high as that estimated for largemouth bass, 0.20. The estimated numbers of salmon eaten per predator per day, for the expected range of evacuation times for smallmouth bass and largemouth bass, are shown in Figure A-7.

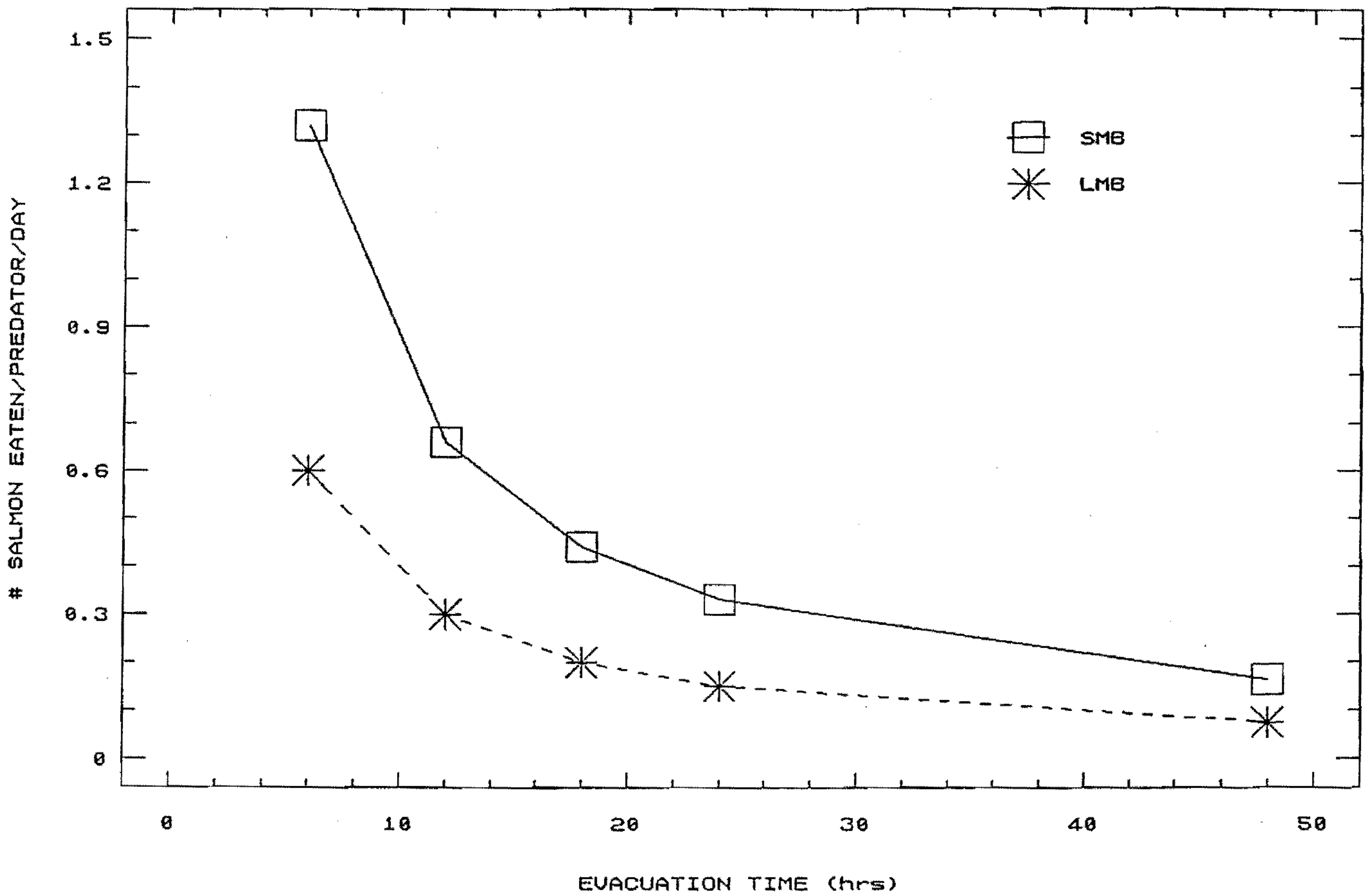

Figure A-7 Estimated numbers of salmon eaten per predator (LMB, SMB) per day, for various possible evacuation times.

A.3.1.2 Predation on Crayfish

Daily predation rates on crayfish by predatory fish were calculated in the same manner as the predation rates on chinook juveniles. Of the 190 fish examined in the upper stratum, 17 percent had crayfish in their stomachs; of the 160 fish examined in the lower stratum, 33 percent had crayfish in their stomachs. Crayfish were found in the stomachs of all predatory species except redear sunfish, warmouth, and riffle sculpin. (It should be noted that only one warmouth and one riffle sculpin were captured and examined.) A summary of the stomach data relating to the occurrence of crayfish in predator stomachs is presented in Table A-5. In the upper stratum of the river, squawfish (0.64), brown bullhead (0.60), white catfish (0.66), and smallmouth bass (0.60) had the highest estimated predation ratios. In the lower stratum- channel catfish (1.09), striped bass (0.78), and largemouth bass (0.78) had the highest daily predation ratios for crayfish. The daily rates of predation by predator species in the upper and lower strata, assuming a gastric evacuation time of 24 hours (d=1), are shown in Figures A-8 and A-9.

A.3.1.3 Predator Densities

Seven of the 12 potential predatory species were collected at the Zanker Farm (RM 46.4) site on 17 May. Centrarchids constituted the most abundant family of fish in the electrofished section, and bluegill were the most abundant of these. The population estimates and 95 percent confidence intervals for the potential predatory species species captured at the Zanker Farm site were the following:

Species (N=Native)	Population Estimate	Interval Lower	Interval Upper
Smallmouth bass	5	5	6
Largemouth bass	18	16	25
Bluegill	95	67	135
Redear sunfish	62	58	69
Green sunfish	34	23	63
Brown bullhead	11	10	16
Sacramento squawfish (N)	7	7	9

A.4 DISCUSSION

Of the 12 potential predatory species examined, only two, smallmouth and largemouth bass, were found to contain chinook juveniles. Of the smallmouth bass examined, 8.6 percent contained one or more chinook salmon juveniles. Palmer et al. (1986) reported that of 1,683 smallmouth bass examined from John Day reservoir, 1.8 percent contained a chinook juvenile. In that study, the

TABLE A-5 NUMBERS OF PREDATORY FISH AND CRAYFISH PREDATION NUMBERS IN THE UPPER (U) AND LOWER (L) SECTIONS OF THE LOWER TUOLUMNE RIVER, APRIL-MAY 1989

	Predatory Fish					
	Number Examined		Number Containing Crayfish		Number of Crayfish	
Species (N=Native)	U	L	U	L	U	L
Smallmouth bass	30	28	7	9	9	10
Largemouth bass	20	36	2	18	3	22
Striped bass	0	8	0	4	0	6
Bluegill	14	27	0	2	0	2
Redear sunfish	13	17	0	0	0	0
Green sunfish	14	20	1	9	2	9
Warmouth	1	0	0	0	0	0
Channel catfish	0	11	0	9	0	12
White catfish	6	13	2	3	2	4
Brown bullhead	23	1	6	0	7	0
Sacramento squawfish (N)	68	0	15	0	22	0
Riffle sculpin (N)	1	0	0	0	0	0
Total	190	166	33	54	45	65
Total	356		87		110	

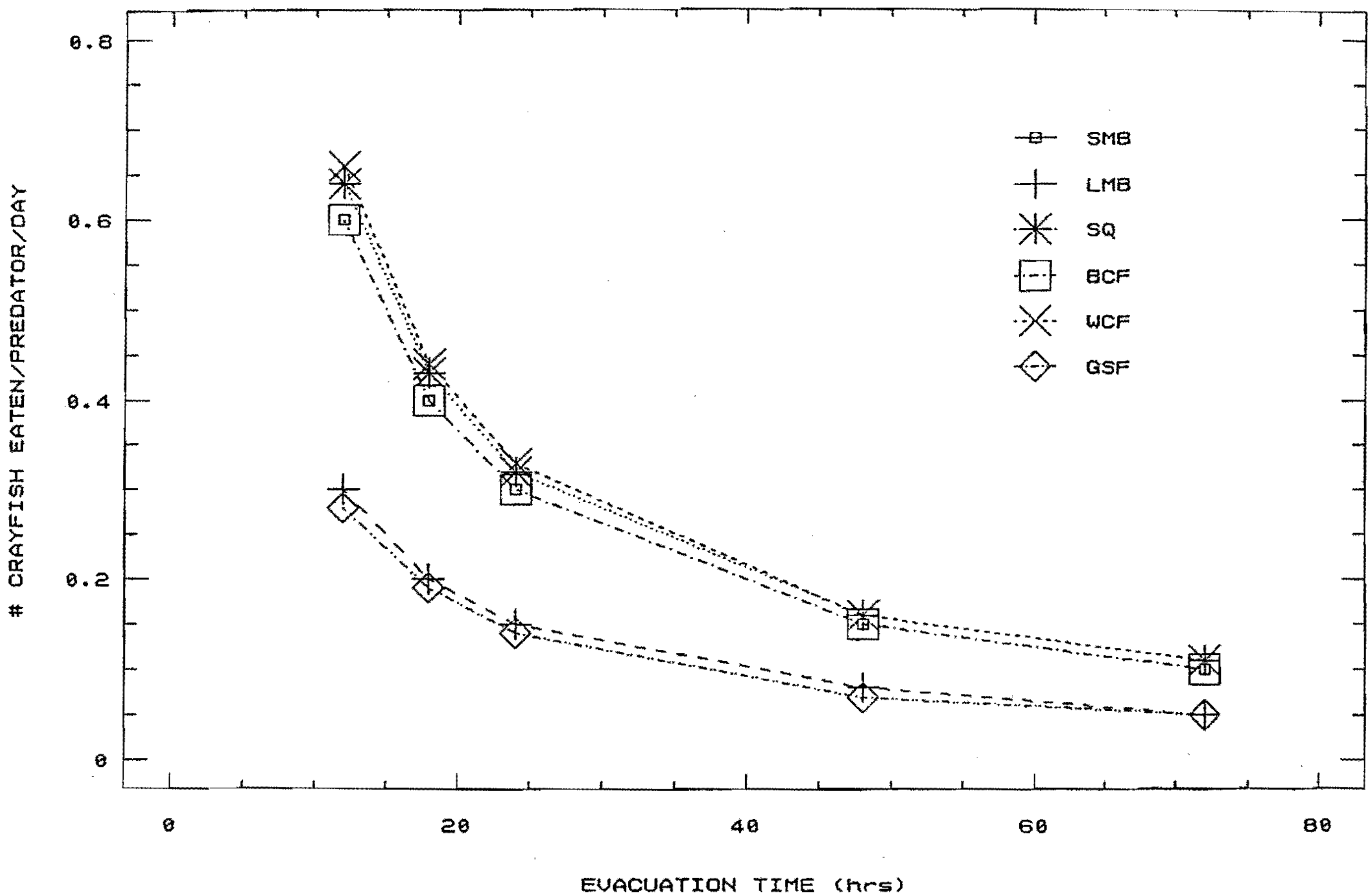

Figure A-8 Estimated numbers of crayfish eaten in the upper river section per predator per day, for various evacuation times.

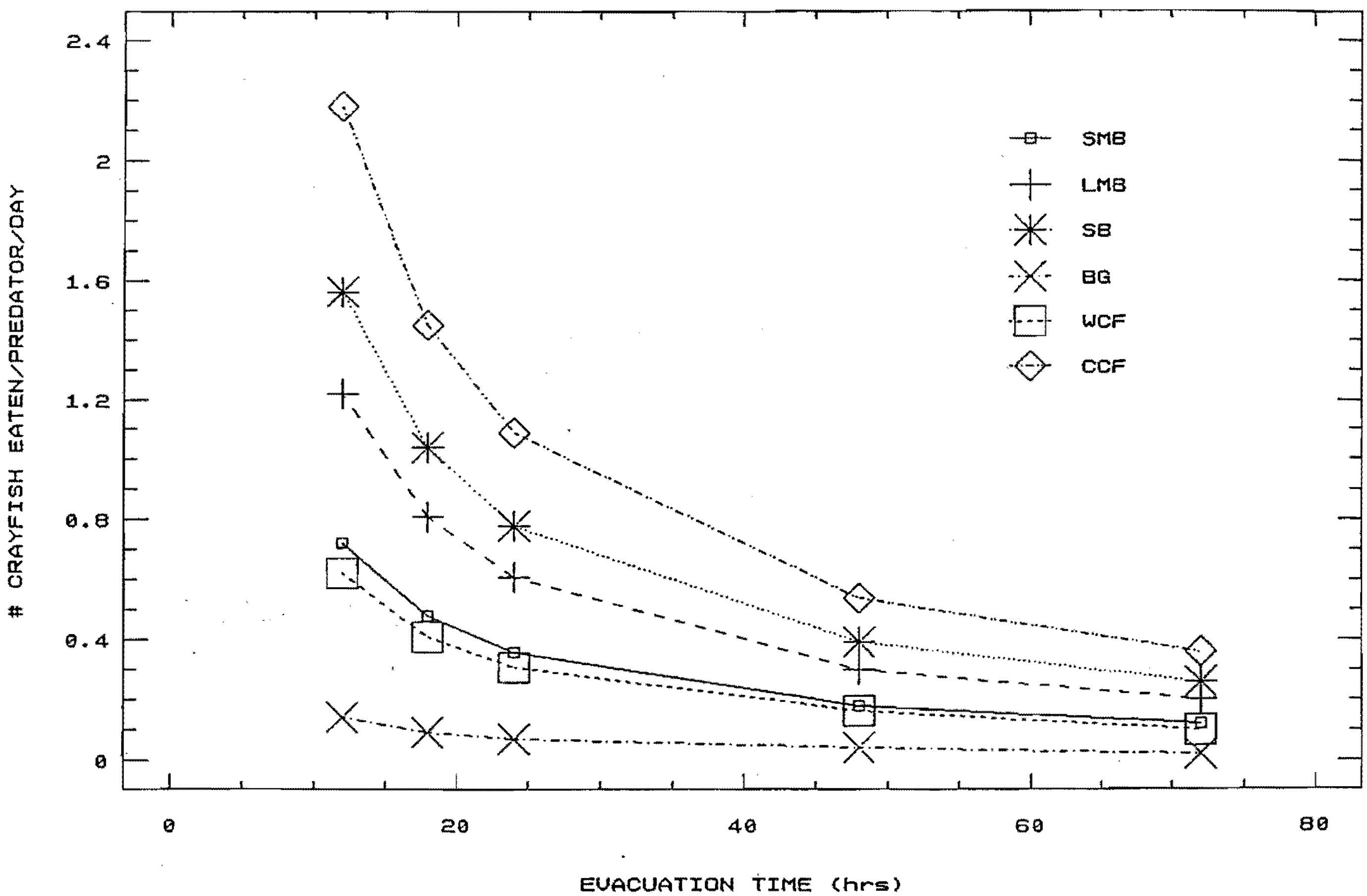

Figure A-9 Estimated numbers of crayfish eaten in the lower river section per predator per day, for various evacuation times.

smallest smallmouth bass found to have ingested a salmonid was 94 mm in fork length; in this study, the smallest was 168 mm long.

Of the 68 Sacramento squawfish examined in this study, none contained chinook salmon in their stomachs. Palmer et al. (1986) found that 19 percent of the northern squawfish examined from John Day Reservoir contained chinook juveniles; of these, the smallest northern squawfish found to have consumed a fish of any species was 113 mm in fork length, while the smallest that contained a salmonid was 256 mm long. The range in fork lengths of Sacramento squawfish in the lower Tuolumne River was from 112 to 625 mm.

Smallmouth bass are suited to cooler and faster-flowing water than largemouth bass. It was expected that more smallmouth bass would be collected in the upper stratum and more largemouth bass in the lower stratum of the river. In the upper stratum (assuming that evacuation rates are the same for the two species), smallmouth bass preyed at approximately twice the rate of largemouth bass on both chinook juveniles and crayfish (see Figures A-7 and A-8). In the lower stratum, largemouth bass showed a higher predation rate on crayfish than did smallmouth bass (Figure A-9). For both species however, the rate of predation on crayfish was greater in the lower stratum than in the upper section: overall, twice as high. The variability in predation rates on both salmon and crayfish in the upper and lower strata of the lower Tuolumne River indicate that an estimate of the entire invertebrate food base at different sites along the river would be very useful in understanding predation.

This pilot study was conducted over a relatively short period, approximately one month. Salmon juveniles are generally present in the system from as early as January to as late as June, and predation can occur over this entire time period. The amount of predation and the times of predation depend in part on the seasonal movements of the predators. For example, Sacramento squawfish may migrate upstream to spawn in the spring, and they may pose more of a threat of predation then than earlier in the year.

One problem encountered during the study was obtaining population estimates with the available gear. A capture-reduction method was satisfactory when used in a shallow (<3.5 feet deep) reach of the river. When water depth increases, a tote barge electrofisher is less effective. In addition, it is difficult to keep debris out of the nets in deeper water, especially in the lower strata of the river where there are high levels of organic debris. For these reasons, the use of a boat electrofisher and a multiple-mark-recapture population estimation procedure (e.g., Jolly-Seber, Schnabel Census [Seber 1982]) is recommended for the censusing of predators.

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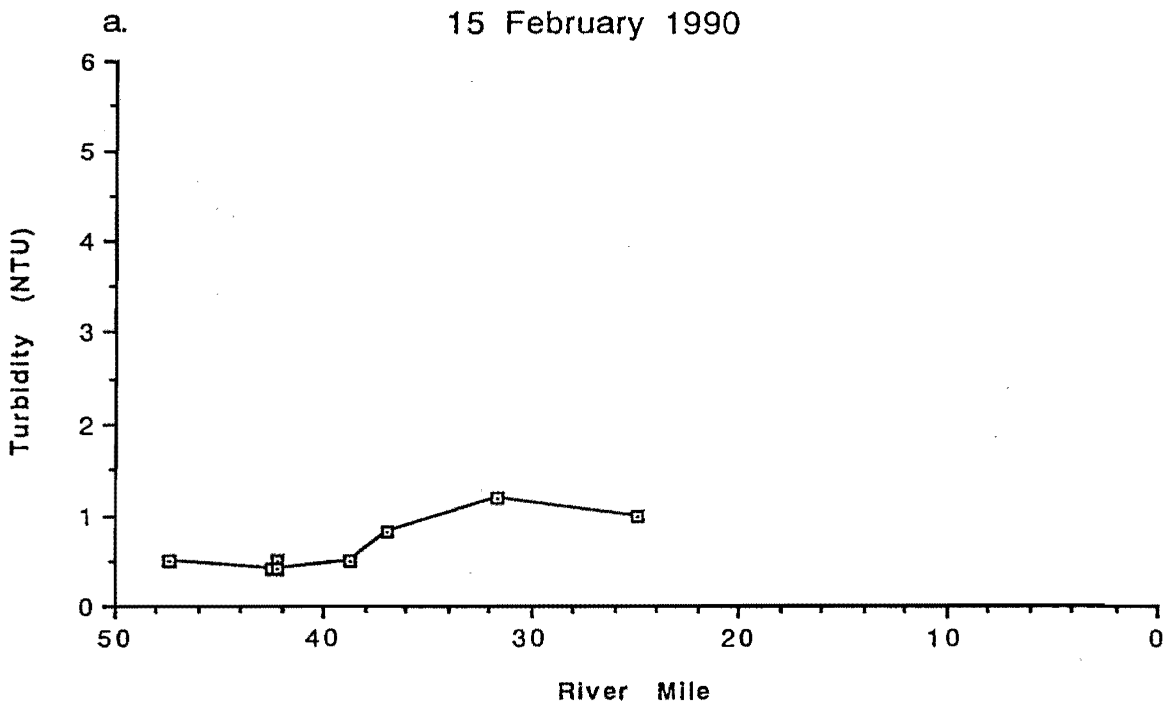
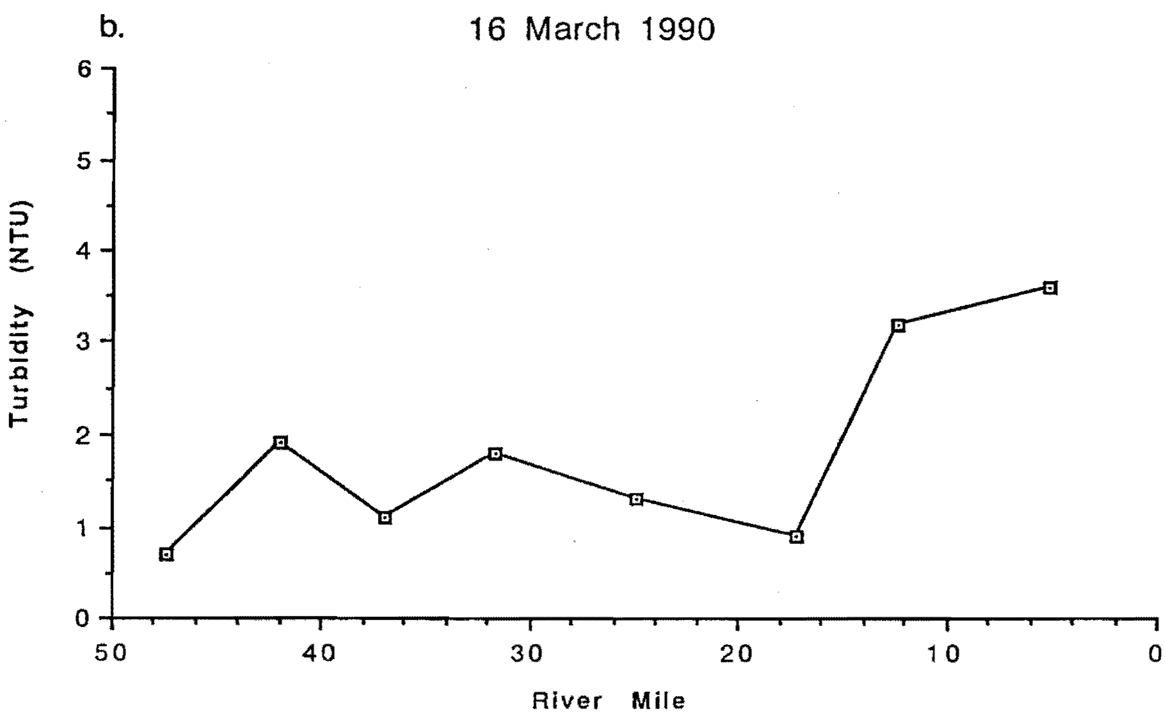
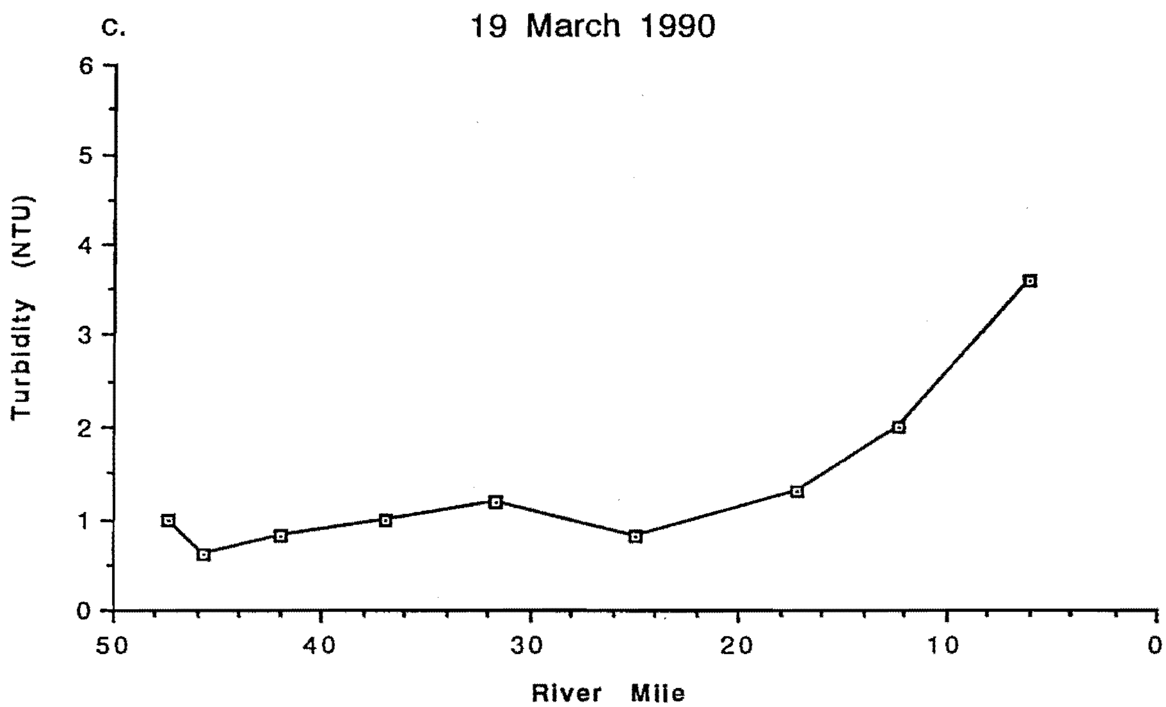
ATTACHMENT B:

LONGITUDINAL PLOTS OF TURBIDITY, BASED ON GRAB SAMPLES, IN THE LOWER TUOLUMNE RIVER, BASSO BRIDGE TO MCCLESKEY RANCH, FEBRUARY-MAY 1990

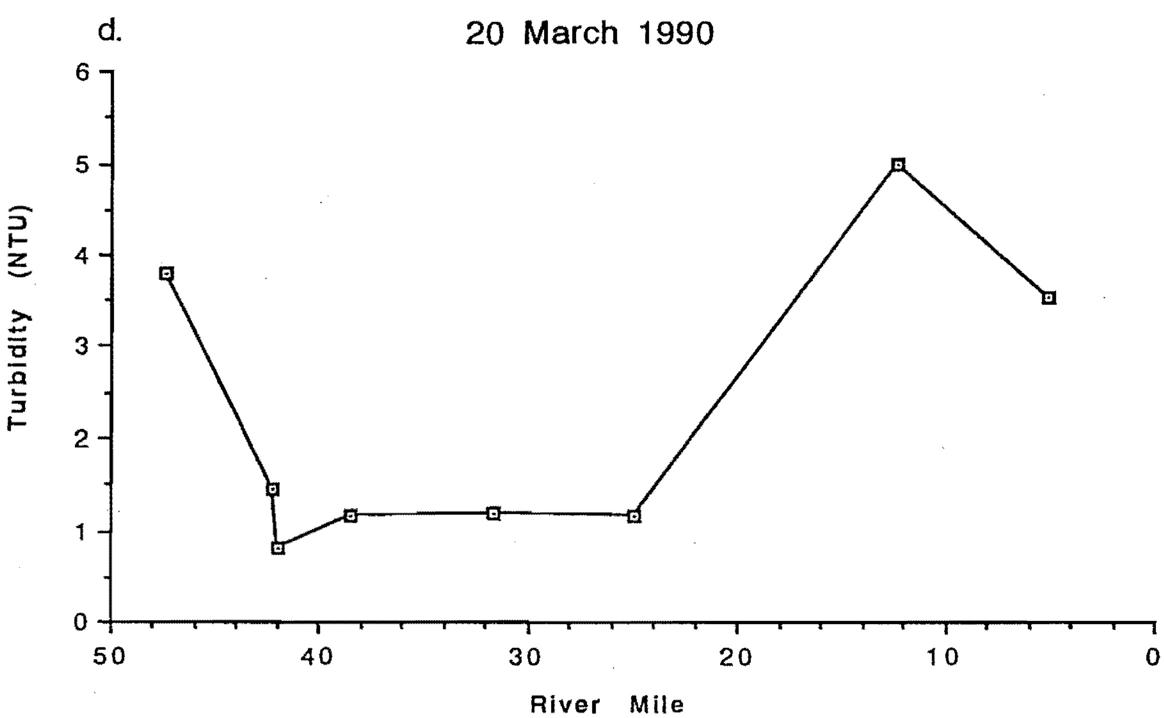
These are longitudinal turbidity plots on specified dates. Turbidity is plotted in Nephelometric Turbidity Units (NTU) (see methods in Section 2.3.1). Note the pulse of turbidity that starts on 20 March and moves through the river over the next five days.


a.
15 February 1990
Turbidity (NTU)
River Mile


b.
16 March 1990
Turbidity (NTU)
River Mile

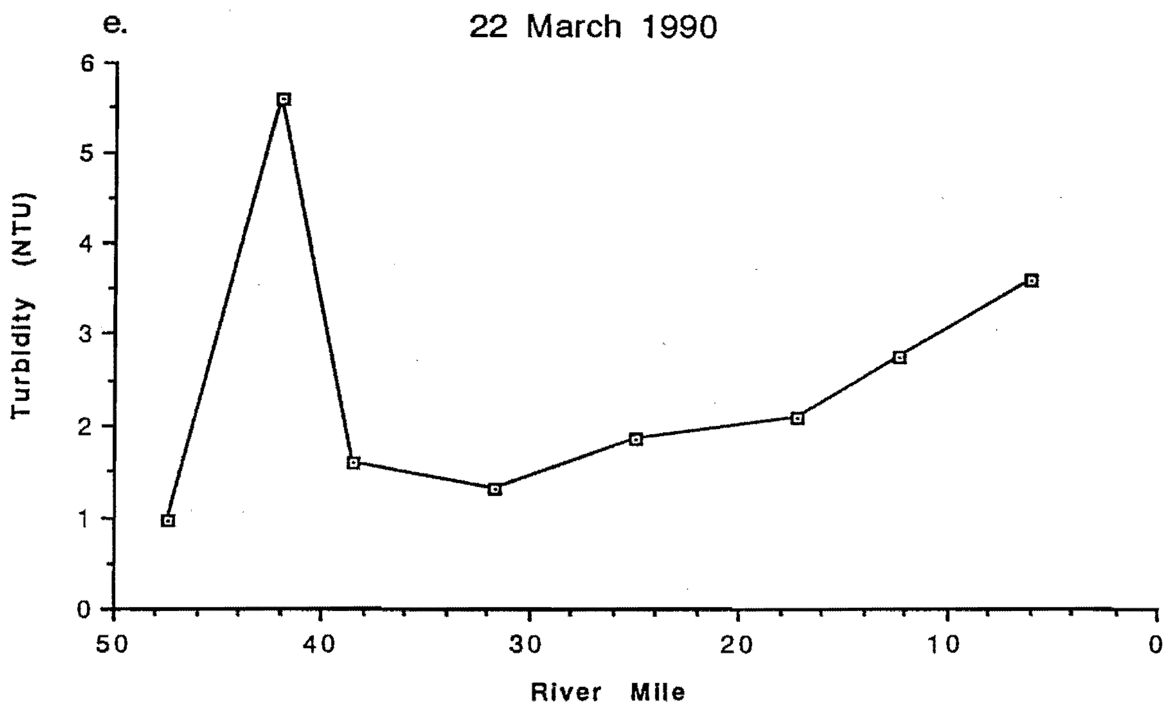


c.
19 March 1990
Turbidity (NTU)
0
1
2
3
4
5
6
50
40
30
20
10
0
River Mile

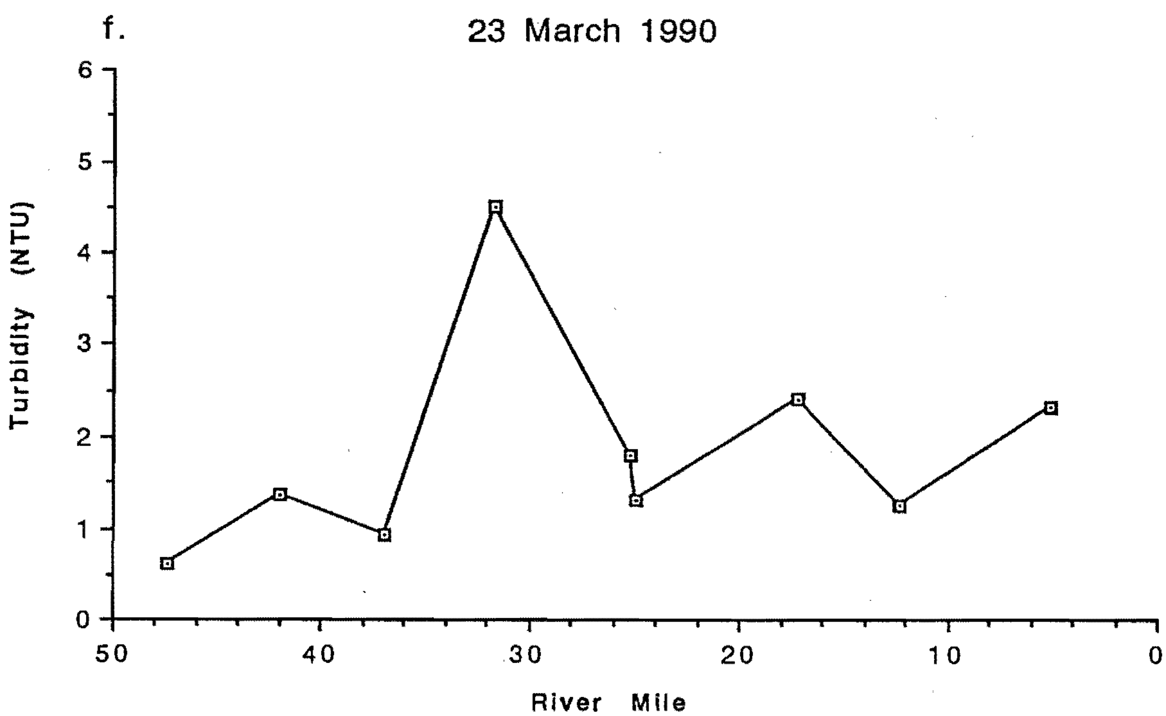


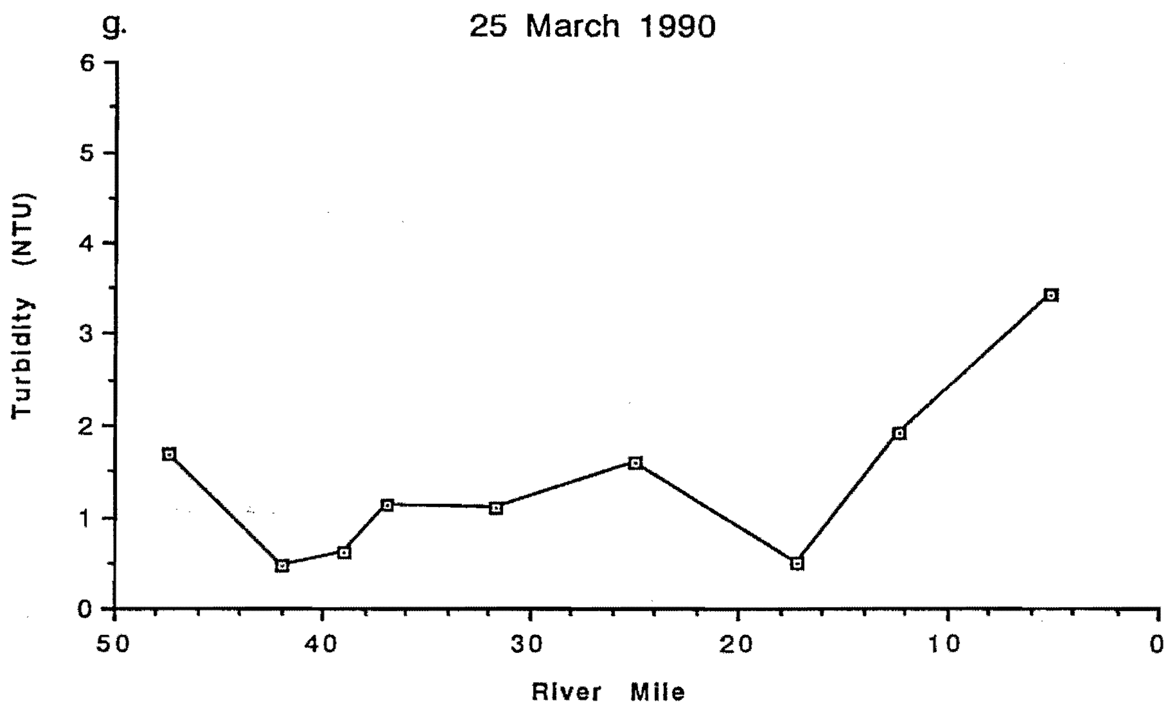
d.
20 March 1990
Turbidity (NTU)
0
1
2
3
4
5
6
50
40
30
20
10
0
River Mile

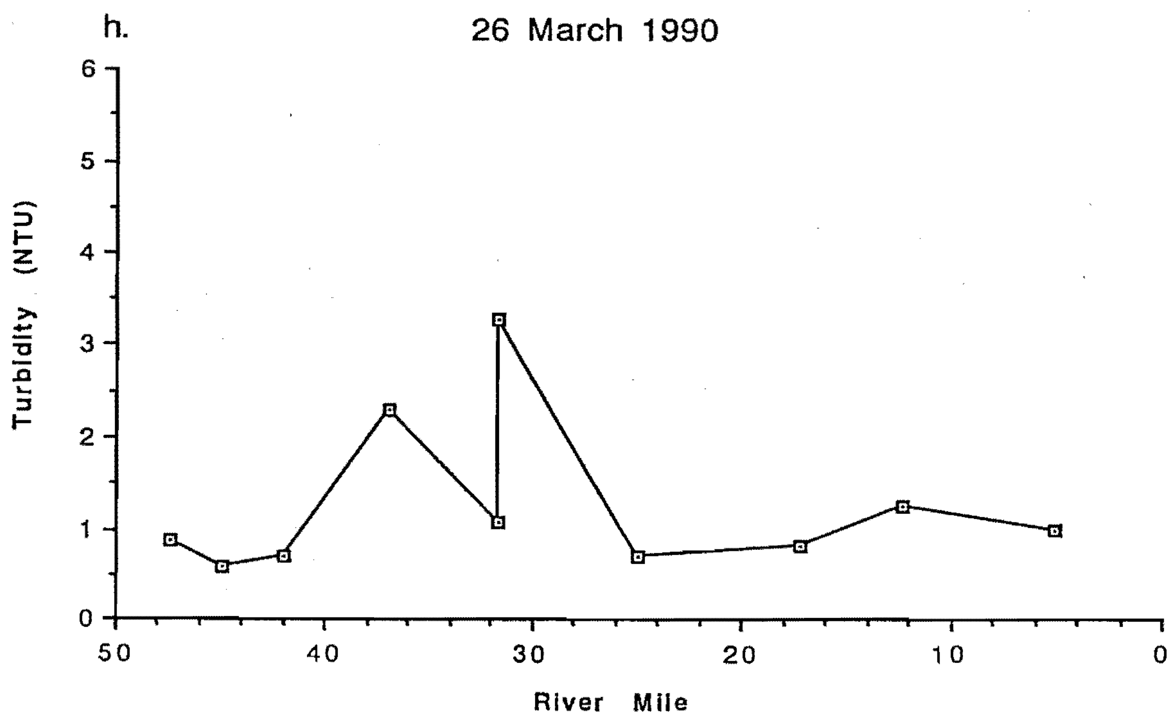
e.

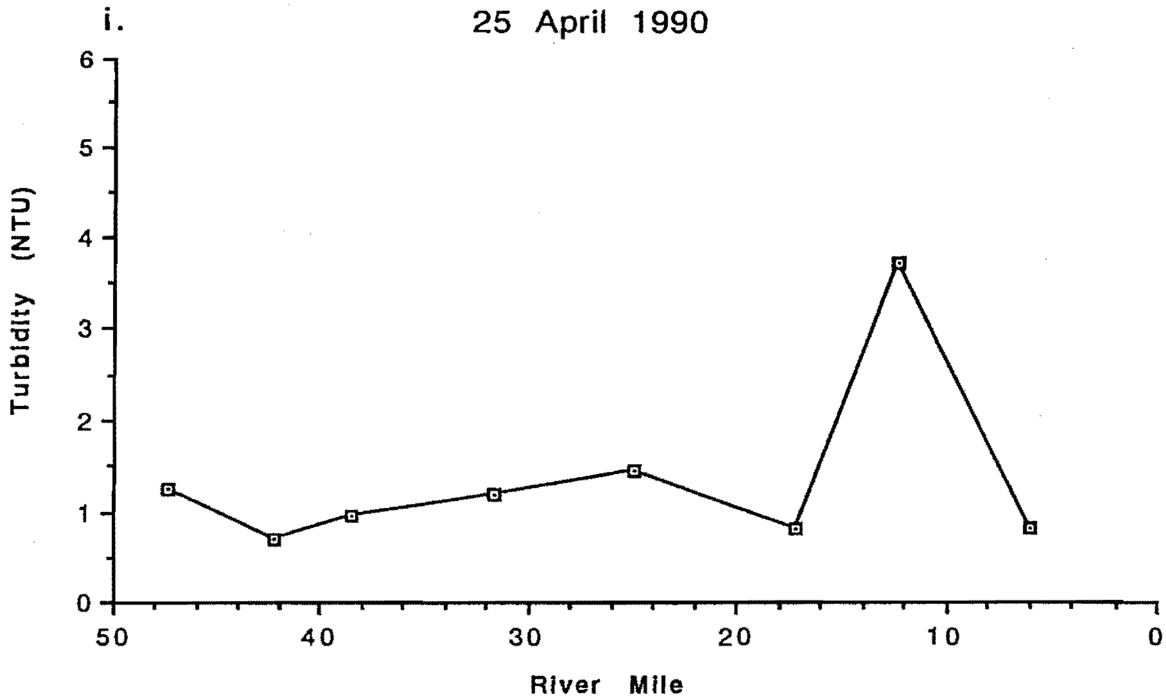

22 March 1990
6
5
4
3
2
1
0
Turbidity (NTU)
50
40
30
20
10
0
River Mile

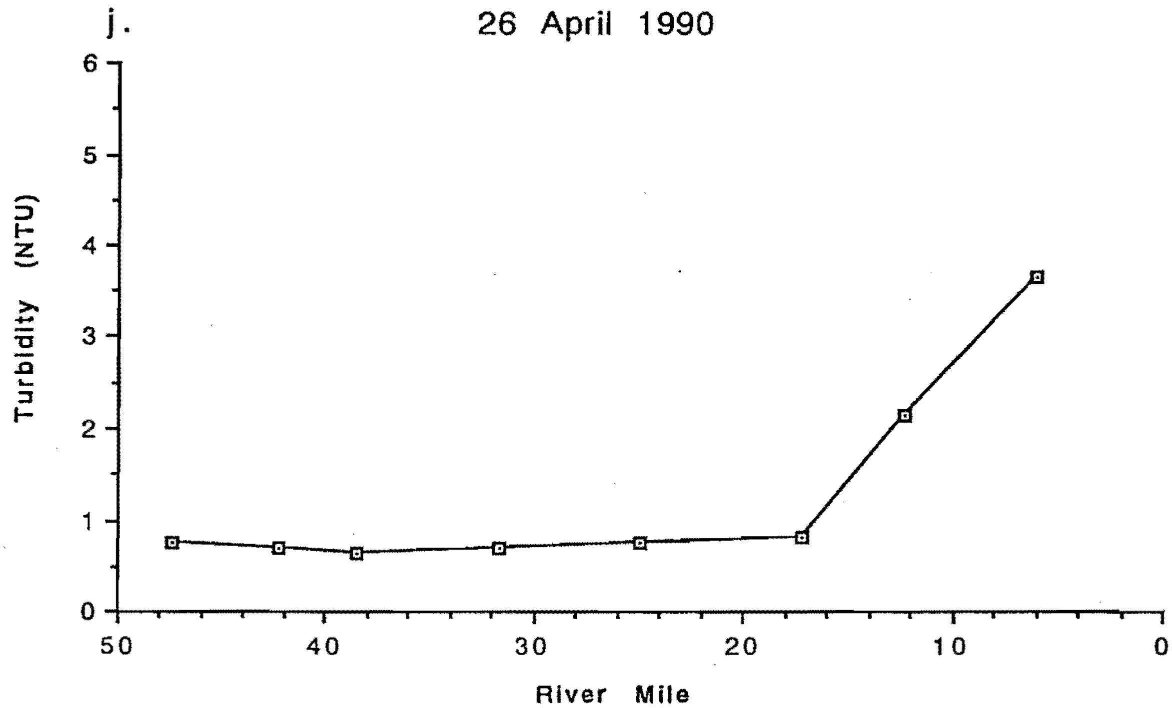
f.

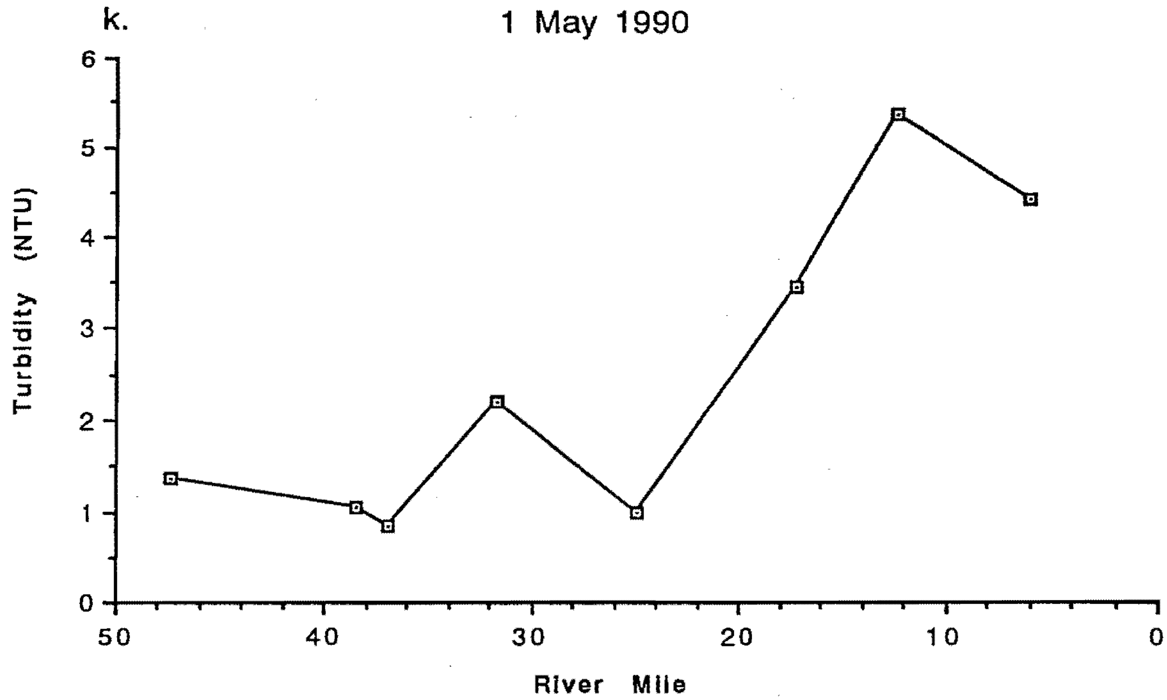

23 March 1990
6
5
4
3
2
1
0
Turbidity (NTU)
50
40
30
20
10
0
River Mile

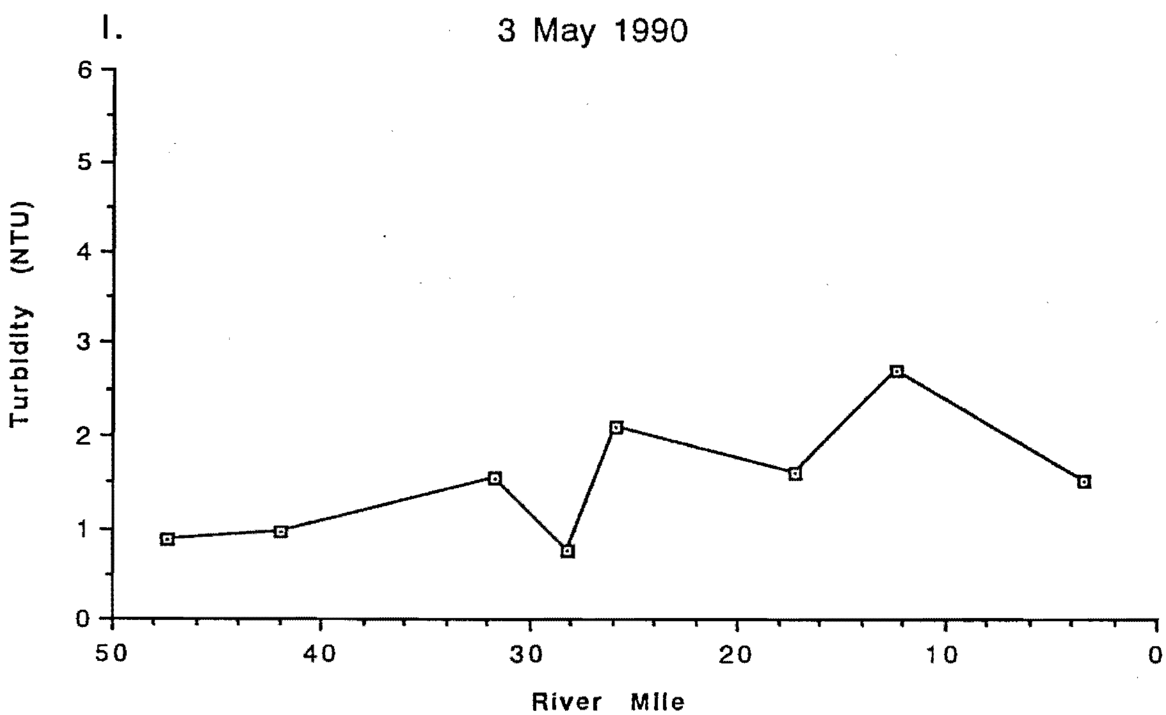

g.
25 March 1990
Turbidity (NTU)
River Mile
6
5
4
3
2
1
0
50
40
30
20
10
0


h.
26 March 1990
Turbidity (NTU)
River Mile
6
5
4
3
2
1
0
50
40
30
20
10
0


i.
25 April 1990
Turbidity (NTU)
6
5
4
3
2
1
0
50
40
30
20
10
0
River Mile


j.
26 April 1990
Turbidity (NTU)
6
5
4
3
2
1
0
50
40
30
20
10
0
River Mile

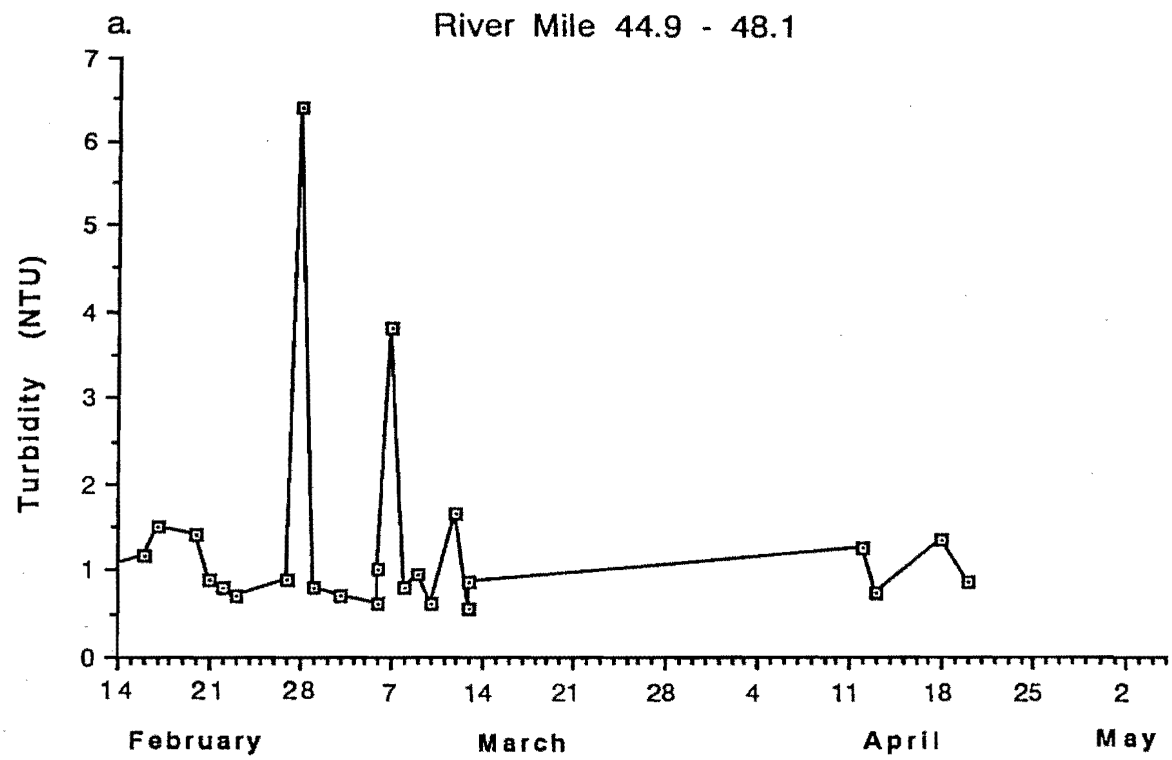

k.
1 May 1990
Turbidity (NTU)
River Mile
6
5
4
3
2
1
0
50
40
30
20
10
0

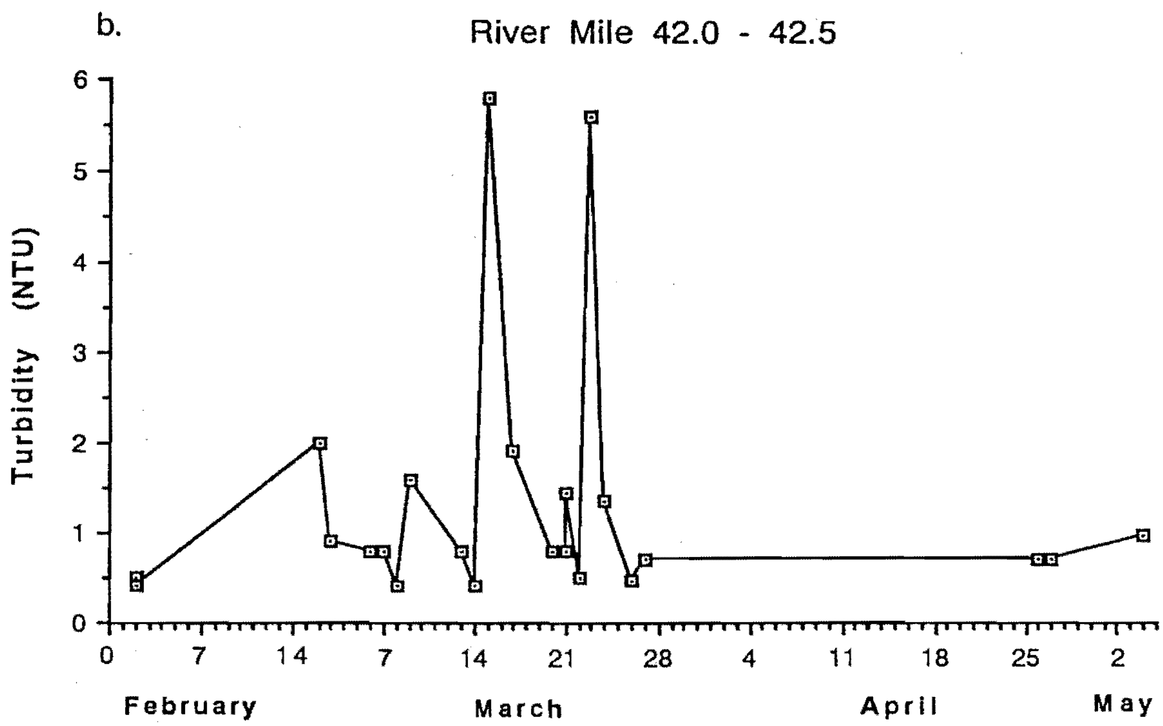

l.
3 May 1990
Turbidity (NTU)
River Mile
6
5
4
3
2
1
0
50
40
30
20
10
0

ATTACHMENT C:

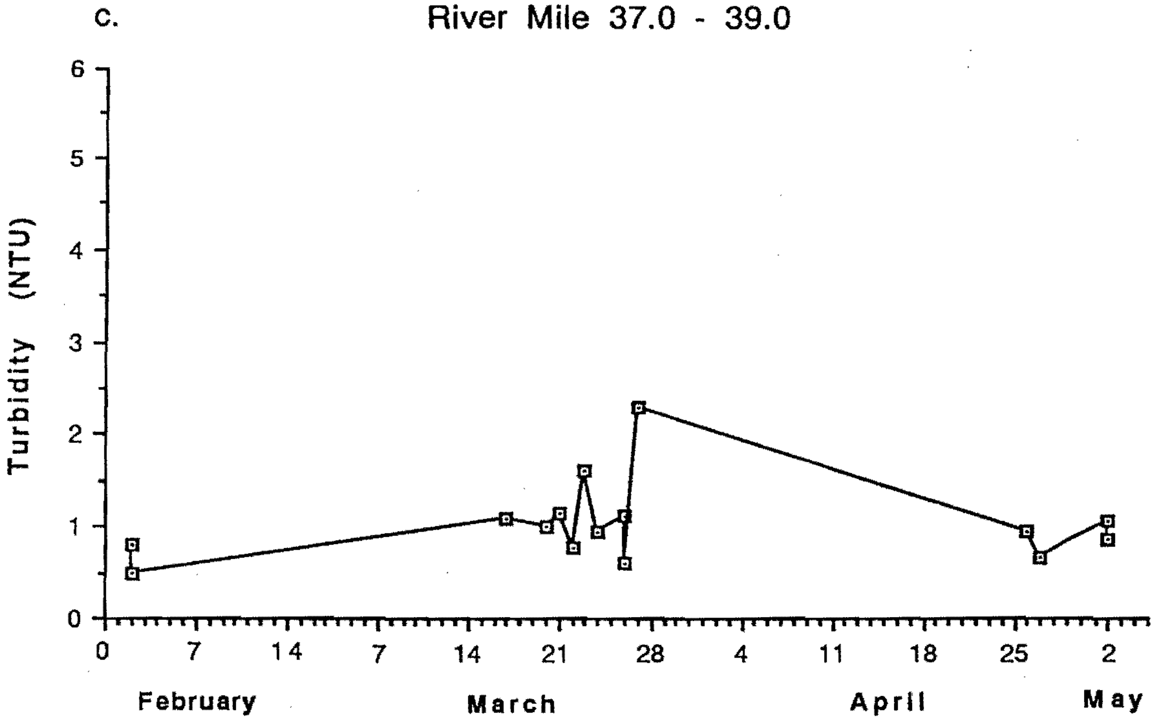
TIME SERIES OF TURBIDITIES, BASED ON GRAB SAMPLES, AT VARIOUS LOCATIONS IN THE LOWER TUOLUMNE RIVER, 1990

These graphs plot the changes in water turbidity with time at the specified locations or areas. Turbidity is plotted in Nephelometric Turbidity Units (NTU) (see methods in Section 2.3.1). Often several locations are included in a single plot. This was done because during the field collection it was sometimes necessary to replace a standard site with one near by.

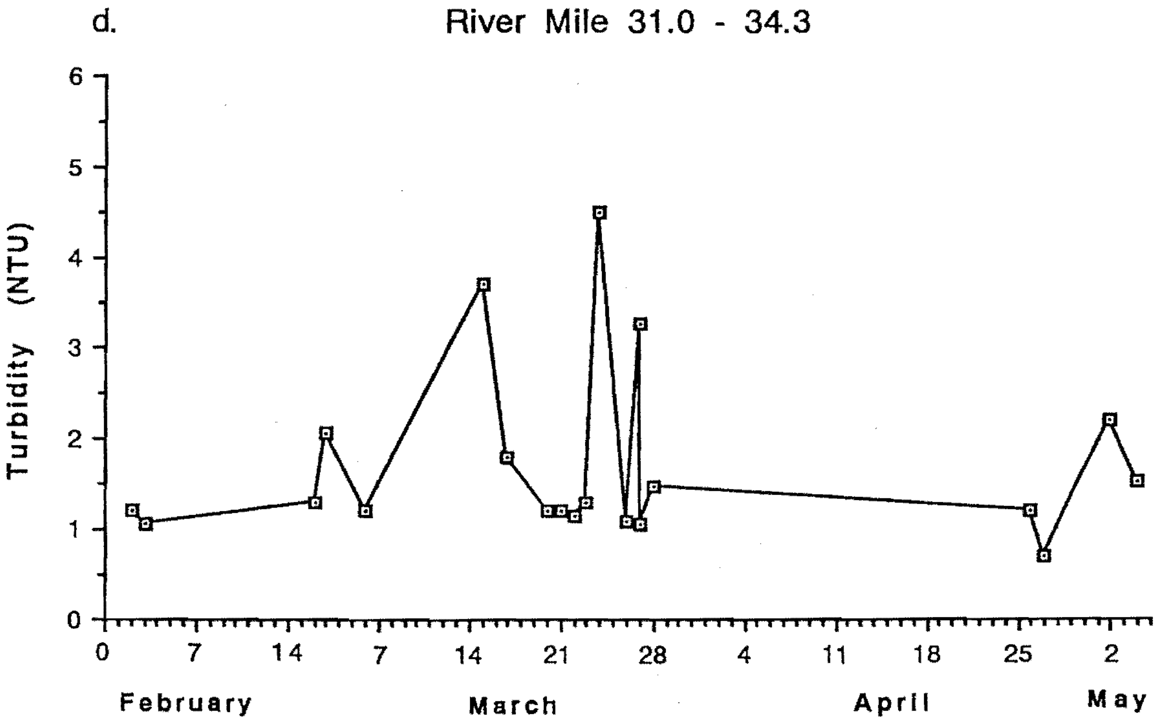

a.
River Mile 44.9 - 48.1
Turbidity (NTU)
0
1
2
3
4
5
6
7
14
21
28
7
14
21
28
4
11
18
25
2
February
March
April
May


b.
River Mile 42.0 - 42.5
Turbidity (NTU)
0
1
2
3
4
5
6
0
7
14
7
14
21
28
4
11
18
25
2
February
March
April
May

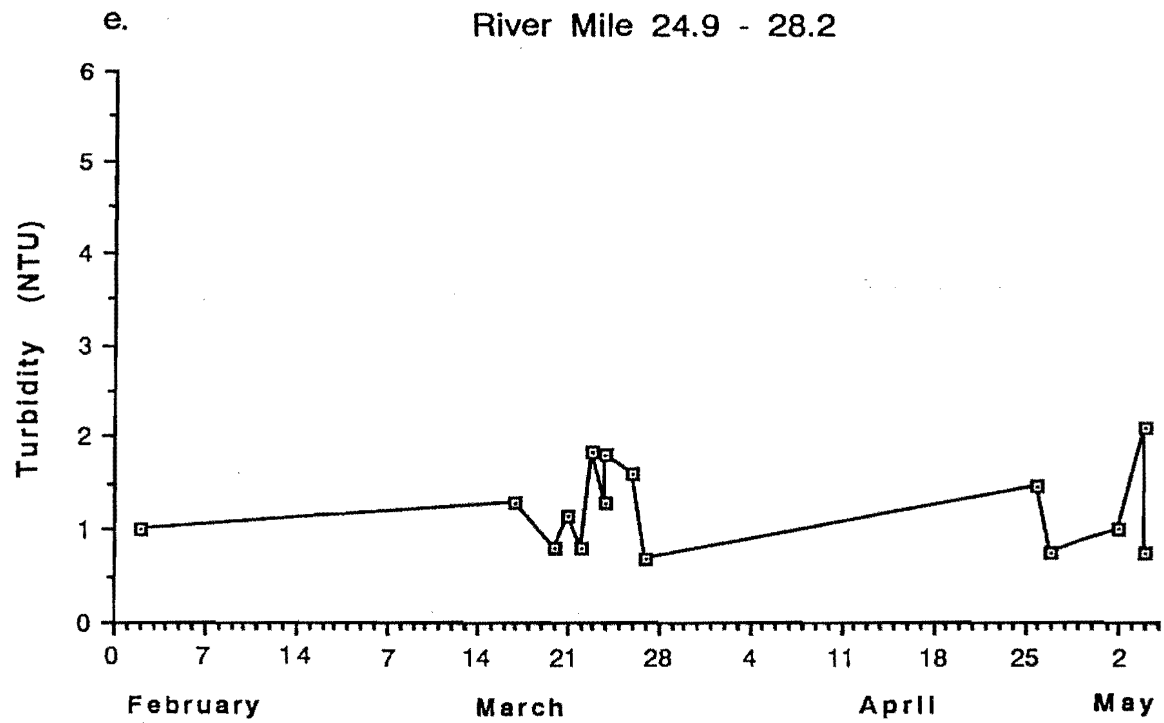
c.


River Mile 37.0 - 39.0
Turbidity (NTU)
0
1
2
3
4
5
6
0
7
14
7
14
21
28
4
11
18
25
2
February
March
April
May

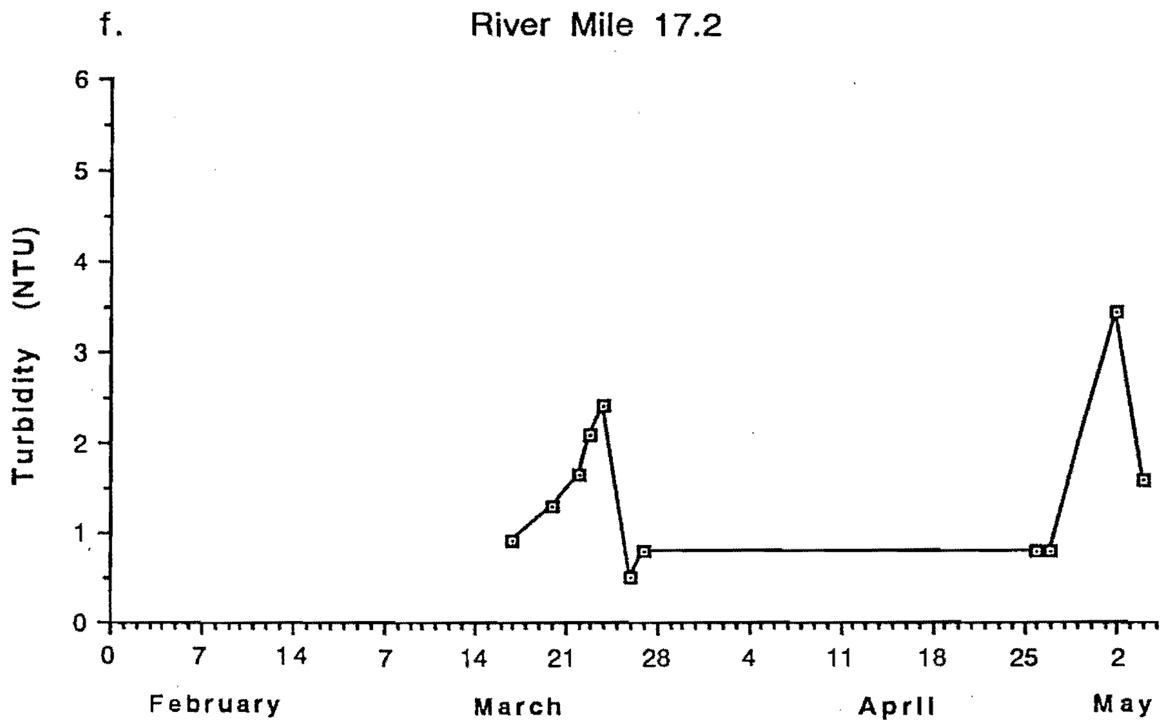
d.


River Mile 31.0 - 34.3
Turbidity (NTU)
0
1
2
3
4
5
6
0
7
14
7
14
21
28
4
11
18
25
2
February
March
April
May

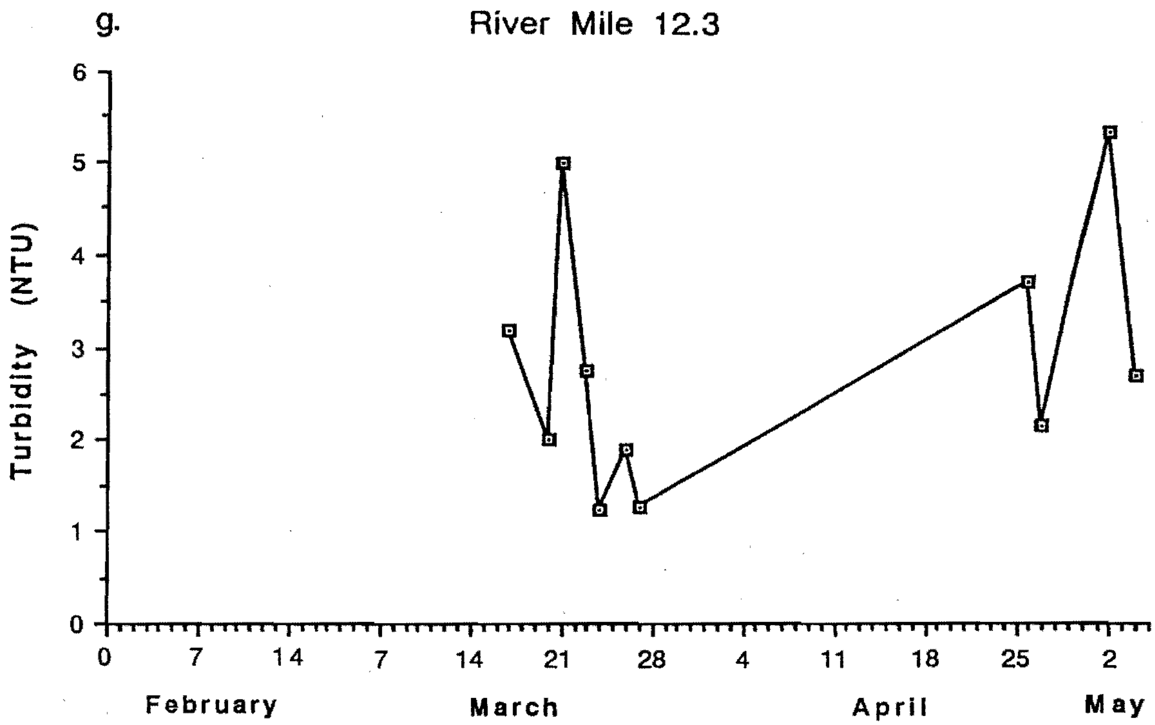
e.


River Mile 24.9 - 28.2
Turbidity (NTU)
6
5
4
3
2
1
0
0
7
14
7
14
21
28
4
11
18
25
2
February
March
April
May

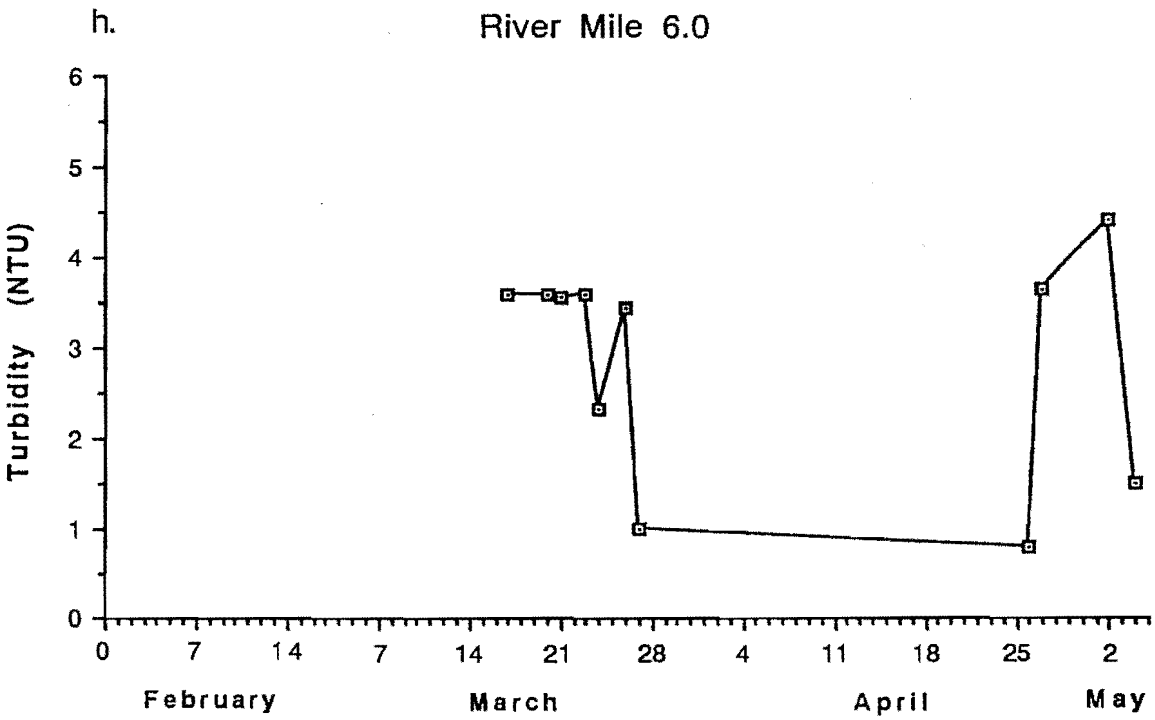
f.


River Mile 17.2
Turbidity (NTU)
6
5
4
3
2
1
0
0
7
14
7
14
21
28
4
11
18
25
2
February
March
April
May

g.


River Mile 12.3
Turbidity (NTU)
0
1
2
3
4
5
6
0
7
14
7
14
21
28
4
11
18
25
2
February
March
April
May

h.


River Mile 6.0
Turbidity (NTU)
0
1
2
3
4
5
6
0
7
14
7
14
21
28
4
11
18
25
2
February
March
April
May

ATTACHMENT D:

GIS METHODS FOR TUOLUMNE RIVER MAP

ATTACHMENT D: GIS METHODS FOR TUOLUMNE RIVER MAP

Creation of a geographic information system (GIS) map layer (or coverage) for the channel features of the Tuolumne River involved the following tasks: (1) obtaining aerial photographs of the river channel at appropriate scales, dates, and times to show flow levels of interest, (2) using aerotriangulation to identify control points for the photographs and register them to a coordinate system, (3) using photogrammetric techniques to compile coordinates for the map of the river itself, and (4) using an error-checking procedure to verify that the map features were as complete and as correct as possible. The resulting GIS database can be used to produce maps of the river features at various scales, or it can also be used in analyses of the river where the location, areal extent, or interrelationship of river features are important.

D.1 AERIAL PHOTOGRAPHY

Aerial photographs were obtained that cover various portions of the river between 1986 and 1991 at different flow levels (Table B-1). Photographs taken between 1986 and 1990 were printed at relatively large scales (1:2,160, 1:2,400, 1:4,800) with color film. These photographs were taken in conjunction with EA's superimposition studies in order to map riffle areas with enough detail to capture salmon redd information for a census. The photographs do not contain either complete coverage of the river or the 60 percent overlap required for stereo compilation of the "wetted perimeter" of the river (the shoreline, or water's edge), so they could not be used to create an accurate base map. However, they were useful in adding wetted perimeters at higher flow levels to a base map created photogrammetrically.

Two sets of photographs were made in 1991 at 1:24,000 scale, which cover the Tuolumne River from La Grange Dam to its confluence with the San Joaquin River. The first set was made on 19 January, using black and white film, at an estimated release from La Grange Dam of 100 cfs. These black and white photographs, representing a low flow level, were used as the primary base for mapping.

The second set of photographs was made on 20 May with color infrared film. These photographs will be used to study the riparian vegetation and to provide the wetted perimeter at 550 cfs.

TABLE D-1 AERIAL PHOTOGRAPHY

Average Daily Flows at La Grange Dam	Date	Notes	Photo Series	Scale	Film Type	Stereo (yes or no)	Coverage
100 cfs	11-09-88	negatives only	KAVP 3412	1:2160	color	no	Riffle areas only
105 cfs	11-19-88	negatives only	KAVP 3421	1:2400	color	no	Riffle areas only
89 cfs	11-30-88	negatives only	KAVP 3430	1:2160	color	no	Riffle areas only
91 cfs	01-11-89	negatives	KAVP 3448	1:2160	color	no	Riffle areas only
93 cfs	01-15-89	negatives	KAVP 3457	1:2160	color	no	Riffle areas only
____	11-18-89	w/ control	KAVP 3696	1:2160	color	no	Riffle areas only
____	01-03-90	prints	KAVP 3727	1:2160	color	no	Riffle areas only
231 cfs	11-26-86	w/ control	AV 2992	1:2400	color	no	Upper half of river
226 cfs	02-25-87	w/ control	AV 3035	1:4800	color	no	Lower half of river
96 cfs	01-19-91	w/ control	AV 3988	1:24000	black & white	yes	La Grange Dam to San Joaquin
622 cfs	05-20-91	w/ control	AV 4056	1:24000	color infrared	yes	La Grange Dam to San Joaquin

D.2 AEROTRIANGULATION

Control for the 1:24,000 scale river map was obtained from USGS 7.5-minute quadrangle maps in the following fashion: as many individual features, such as road intersections or buildings, as possible were located on both the 19 January 1991 photographs and the USGS quadrangles. X, Y, and Z coordinates for these initial control points were determined from the quadrangles and assigned to the corresponding points on the photographs. Next, additional control points were calculated through aerotriangulation, a process that constructs a mathematical model to represent geometric relationships between object space, perspective photo centers, and photographic images. All image points were measured in a comparator and represented by coordinates on the image. These coordinates, along with camera and ground control information, were manipulated using numerical techniques. The output of these computations consisted of the ground coordinates and elevations of additional points on the photographs, elements of exterior orientation of each photograph, and the measures of reliability of calculated coordinates. Two additional types of control points were identified through aerotriangulation, those for which only X and Y coordinates and those for which only Z coordinates were known. The process was carried out to provide a minimum of six control points for each photograph. The control points established for each photographic model were then used in the stereo compilation process to collect coordinate values for the river features.

D.3 STEREO COMPILATION

Each pair of photographs, with control points identified, was placed in a Zeiss C120 stereo compiler. This machine is used to create a planimetrically correct base map from aerial photographs viewed in stereo, because it can correct for changes in altitude between photographs and tip and tilt within photographs as well as for vertical relief on the ground. The machine operator first orients the photographs with respect to one another, bringing the area of overlap of the adjacent photographs into a virtual 3-dimensional image. Next, he orients the 3-dimensional mathematical model to the ground control points on the photographs. He then traces the river features, collecting X, Y, and Z coordinates for each point compiled; these coordinates are read into a file that will eventually be used in the geographic information system. Four types of lines were compiled into the Tuolumne River file: (1) Wetted Perimeter - the line that represents the water/land interface, either at the river bank or around an island; (2) Historical Bank - the line delineating the formerly active floodplain; (3) Coincident Line - any line that represents both the current wetted perimeter and the historical bank; and (4) Feature Line - the line that separates either within-stream underwater features, such as the border between a riffle and a run-pool or between-bank features such as unvegetated and vegetated bars (see Figure B-1). EA provided a large-scale photomosaic of the Tuolumne River, with all riffles and run-pools identified. The stereo compiler operator used the photomosaic as an aid to interpret river features, but recorded all lines as he saw them on the 1:24,000-scale photographs.

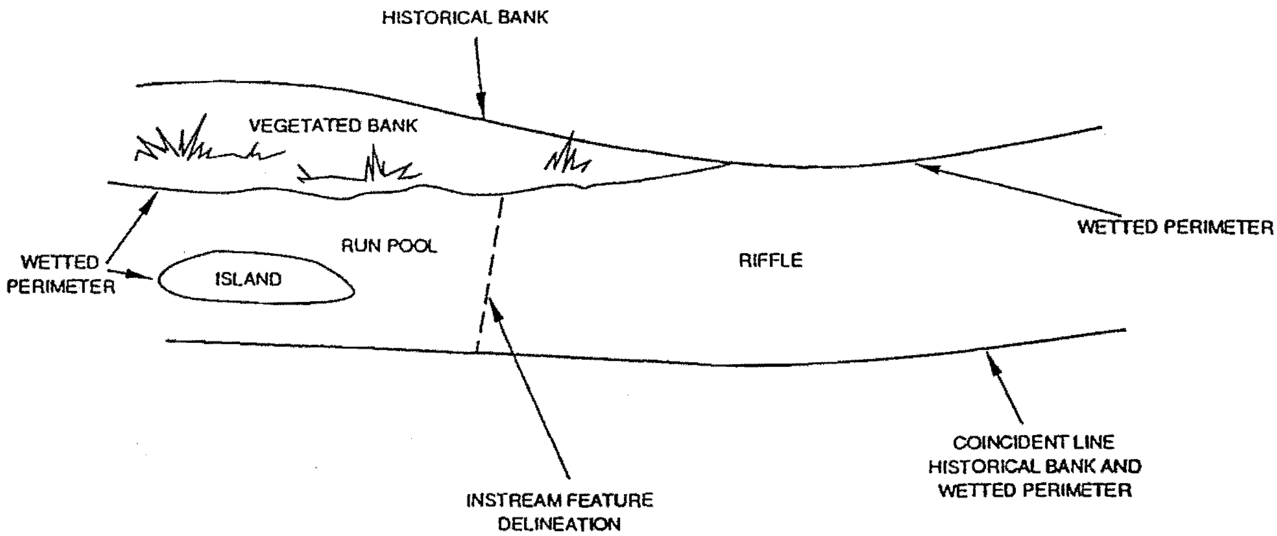


Figure D-1 Example of line and polygon classification.

D.4 TRANSLATION TO ARC/INFO

The data were translated into ARC/INFO format with a standard conversion program, and the resulting data file was processed in the ESRI ARC/INFO geographic information system. The Tuolumne River coverage contains both line and polygon attributes for all channel features, as well as the inherent geographic relationships between and among features. Each line, for example, has a length attribute and an identification code to identify its line type (wetted perimeter, historical bank, coincident line, or channel feature delimiter). Each line is also related to the polygons it delineates, having a unique polygon to its left and one to its right. Each polygon has an identification number and a type attribute (e.g,. Riffle, Run-Pool, Vegetated Island) and is bounded by lines whose types can be identified. Table B-2 is a data dictionary for the line codes and polygon attributes for the river map.

D.5 VERIFICATION OF THE GIS MAP LAYER

The locations and identifications of all channel features within the GIS coverage were verified by plotting the river map at photo scale and comparing the plotted lines to the photographs. A map of the Tuolumne River with both color-coded lines (representing line type codes) and labeled polygons was generated. This plot was compared to the large-scale aerial photographs by EA field personnel who are knowledgeable about the river and who also understand and have experience with aerial photography. Both the linework and the polygon attribute codes were verified, changes were noted, and corrections were made to the digital data file. The final GIS coverage contains linework and feature identifications that are both complete and correct.

D.6 ADDITION OF 225-CFS DATA

Channel features and wetted surface area of parts of the river at a flow of 225 cfs was prepared by digitizing two sets of photographs. The 26 November 1986 color photographs cover Stratum 1 of the river, from river mile 25 to La Grange Dam, at 1:2,400 scale. Stratum 2, the reach from the confluence with the San Joaquin River to river mile 25, was mapped for this flow level from 1:4,800 scale photographs made on 25 February 1987. Actual discharge varies along the river: gaging stations located along the river reported the following flow levels:

TABLE D-2 DATA DICTIONARY FOR THE TUOLUMNE RIVER BASE MAP

Historic Bank: (Line)

ID: **999**

—Where the historic bank is naturally formed, digitize the top of the bank;

—Where the historic bank has been artificially constructed (i.e. riprap, levee, dyke) digitize the bottom of the bank (in some cases this may be the water's edge);

—(By definition, all other polygons, lines, or points describing river attributes will be within or be bounded by the river's historic banks)

100 Wetted Perimeter: (Line)

ID: **100 WP**

—This line will define the wetted perimeter (shoreline) of the river when flows are 100 cfs;

—This line will also constitute the wetted perimeters (shorelines) of all instream features (gravel bars, islands, sand bars)

Coincident Historic Banks and Wetted Perimeter: (Line)

ID: **199**

—This line code should be used when the historic bank is the same as the wetted perimeter

Vegetated Bank: (Polygon)

ID: **VB**

—Exposed areas of established vegetation which exist between the historic bank and the wetted perimeter

Unvegetated Bank: (Polygon)

ID: **UVB**

—Exposed areas with no established vegetation that are found between the historic bank and the wetted perimeter

Bedrock Outcroppings: (Polygon)

ID: **BRO**

—These areas consist of exposed bedrock either on the banks or in midstream; (most of these areas are in the upstream section of the river)

Riffle: (Polygon)

ID: **R or R#**

—Area of higher stream gradient, fast-moving and in many cases turbulent flow, constrictions in the channel, gravel bed bottoms, and, in some cases, evidence of salmon spawning nests;

—(Some downstream riffles do not have numbers associated with them)

Run Pool: (Polygon)

ID: **RP or RP#**

—Areas of laminar (smooth, untubulent) flow over an even bottom

Special Run Pool: (Polygon)

ID: **SRP or SRP#**

—Areas similar to run pools except that they are larger and often deeper and have slow-moving water with little or no distinguishable current. (Most of these areas represent modification of the stream bed by gravel excavation)

Bedrock Chute: (Polygon)

ID: **BRC**

—Areas characterized by a riverbed consisting of exposed bedrock, large boulders, concrete slabs, and/or concrete pilings

Saturated Lowland: (Polygon)

ID: **SL**

—Areas with soil which is habitually saturated, but which are dominated by terrestrial vegetation rather than aquatic vegetation;

—Often characterized by low slope

Vegetated Island: (Polygon)

ID: **VI**

—Exposed areas of established vegetation with the wetted perimeter defining the banks

Unvegetated Island: (Polygon)

ID: **UVI**

—Exposed areas with no established vegetation which exist within the wetted perimeter

ID: **BD** = Beaver Dam

ID: **BF** = Bridge Foundation

ID: **SI** = Stream Inlet

ID: **BLDG** = Building

ID: **TR** = Tailrace

ID: **SC** = Side Channel

	26 NOV 1986	25 FEB 1987	19 JAN 1991	20 MAY 1991
Stratum 1				
La Grange Dam	231 cfs	226 cfs	96 cfs	622 cfs
Hickman Bridge	633 cfs	296 cfs	139 cfs	---
Stratum 2				
9th St. Bridge	1,010 cfs	355 cfs	159 cfs	667 cfs
(Dry Creek	16 cfs	13 cfs	0 cfs)	---

The two sets of photographs were compared to the 100-cfs base map and the 1:24,000 scale photographs by EA personnel knowledgeable about the river. Areas where the wetted surface of the river changed between the 100-cfs and 225-cfs flow levels were identified; the new river perimeter was delineated on aerial photographs; and new polygons were classified, using the assumption that a river feature extends from bank to bank (see Figure B-2). If the water level rose enough to cover an island that had been surrounded by a run-pool, the new area would become part of that run-pool; similarly, if the dry area adjacent to a riffle at 100 cfs was inundated at 225 cfs, the new area would be classified as part of the riffle at 225 cfs.

The wetted perimeter for the 225-cfs flow level was added to the existing 100-cfs coverage using one of two methods. If a photograph contained at least four control points that were outside the extent of the new river features, the lines were digitized in ARC/INFO directly from the photograph. The 225-cfs wetted- perimeter lines thus created were then copied directly into the 100-cfs river coverage.

If the control for a given photograph was insufficient, the lines were manually transferred to a 1:24,000 scale base map of the 100-cfs wetted perimeter and channel features, that map was placed on a tablet, and the 225-cfs lines were digitized directly into the 100-cfs river coverage.

In either case, the 225-cfs and 100-cfs wetted-perimeter lines were then plotted together at photo scale (1:4,800) for verification. Any areas where the transformation from photographic coordinates failed were edited either by shifting and rotating lines to approximate their correct positions or by transferring them to a base map and digitizing them. All linework and feature identifications were carefully checked, errors were identified, and changes were made to the GIS coverage.

The final GIS coverage indicates wetted perimeters for both the 100-cfs and the 225-cfs levels of flow. Polygons are identified for both levels of flow (for example, an area that changed from vegetated bar to riffle at the higher water level is coded as VB for the 100-cfs flow level and as R for the 225-cfs flow level). A complete river map for either the 100-cfs or the 225-flow level can be created from this coverage by plotting the attributes associated with the particular level of flow.

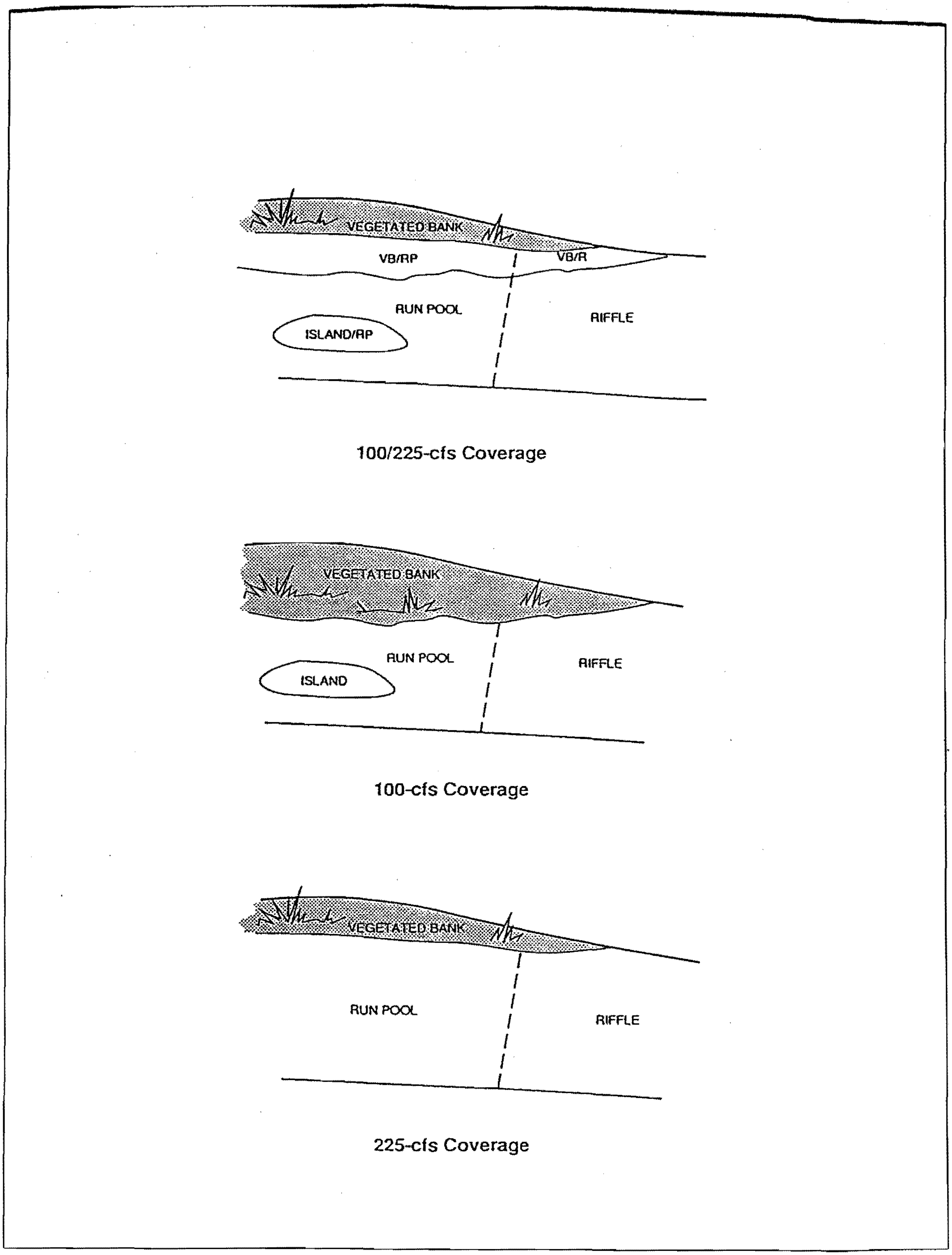


Figure D-2 Line and polygon classifications at two different flow levels.

A new coverage can be created for either flow by eliminating all lines that separate polygons on the basis of flow alone. For example, lines that are necessary for the 100-cfs coverage but do not exist in the 225-cfs coverage would be retained in the former and eliminated from the lattter. The line in Figure B-2 that separates vegetated bank from riffle at 100 cfs, where the area changed from vegetated bank to riffle at 225 cfs, is an example of this. That line must be included in the 100-cfs coverage, because there it separates two different polygon types, but it should not be included in the 225-cfs coverage, because there it would separate the parts of a single riffle.

From: Staples, Rose
Sent: Wednesday, October 19, 2011 4:47 PM
To: 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Barnes, Peter - SWRCB'; 'Beuttler, John - CSPA'; 'Blake, Martin'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brenneman, Beth - BLM'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Buckley, Mark'; 'Burley, Silvia-CVMT'; 'Burt, Charles - CalPoly'; 'Cadagan, Jerry'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cismowski, Gail - SWRCB'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, Kevin - TBMI'; 'Day, P - MF'; 'Denean - BVR'; 'Derwin, Maryann Moise'; Devine, John; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Grader, Zeke'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hackamack, Robert'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hayden, Ann'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Holm, Lisa'; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hudelson, Bill - StanislausFoodProducts'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Hume, Noah - Stillwater'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Kordella, Lesley - FERC'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; 'Looker, Mark - LCC'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Madden, Dan'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Martin, Ramon - USFWS'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan - CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Paul, Duane - Cardno'; 'Pavich, Steve-Cardno'; 'Pinhey, Nick - City of Modesto'; 'Pool, Richard'; 'Porter, Ruth - RHH'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Ridenour, Jim'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sander, Max - TNC'; 'Sandkulla, Nicole - BAWSCA'; 'Saunders, Jenan'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shipley, Robert'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Sill, Todd'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; Staples, Rose; 'Steindorf, Dave - AW'; 'Steiner, Dan'; 'Stone, Vicki -TBMI'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'Terpstra, Thomas'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Vierra, Chris'; 'Villalabos, Ruben'; 'Walters, Eric - MF';

'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; 'Wheeler, Douglas - RHH'; 'Wilcox, Scott - Stillwater'; 'Williamson, Harry (NPS)'; 'Willy, Alison - FWS'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'

Subject: Due Date Confirmation for Comments on Don Pedro Proposed Study Plan: Monday, October 24

With the FERC filing deadline for comments on the Don Pedro Project's *Proposed Study Plan* falling on a Sunday (October 23), we sought clarification from FERC as to the actual deadline—and its effect on the filing of the *Revised Study Plan.* I received confirmation today from Jim Hastreiter that the comments filing date would slide over one day to Monday, October 24th.

The deadline for the filing of the *Revised Study Plan, which is to be 30 days after the original filing date (October 23) for comments, would then be Tuesday, November 22.*

ROSE STAPLES
CPS CAP

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From: Staples, Rose
Sent: Thursday, October 20, 2011 6:04 PM
To: 'Porter, Ruth M.'; Devine, John
Cc: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

Douglas P.; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Subject: RE: Don Pedro Updated Study Plan Is Now Available on Website

Ruth, thank you for your query. The October 14, 2011 e-filing with FERC of the Don Pedro UPDATED STUDY PLAN document can be accessed on FERC's E-Library at P-2299-000. The link (second highlight) below should take you directly to the document. The document is also available on the Don Pedro Relicensing website, in the DOCUMENTS/STUDIES section.

```
Acceptance for Filing
---------------------
The FERC Office of the Secretary has accepted the following electronic submission
for filing (Acceptance for filing does not constitute approval of any application
or self-certifying notice):

-Accession No.: 201110145077
-Docket(s) No.: P-2299-000
-Filed By: Turlock Irrigation District and Modesto Irrigation District -Signed
By: Robert Nees -Filing Type: ILP Initial or Updated Study Report -Filing Desc:
ILP Updated Study Plan of Turlock Irrigation District and Modesto Irrigation
District under P-2299, Don Pedro Project.
-Submission Date/Time: 10/14/2011 12:50:20 PM -Filed Date: 10/14/2011 12:50:20 PM

Your submission is now part of the record for the above Docket(s) and available
in FERC's eLibrary system at:
http://elibrary.ferc.gov/idmws/file_list.asp?accession_num=20111014-5077

If you would like to receive e-mail notification when additional documents are
added to the above docket(s), you can eSubscribe by docket at:
https://ferconline.ferc.gov/eSubscription.aspx
```

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From: Porter, Ruth M. [mailto:ruth.porter@hoganlovells.com]
Sent: Thursday, October 20, 2011 5:09 PM
To: Devine, John
Cc: Staples, Rose; Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail -

SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan - CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas P.; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Subject: RE: Don Pedro Updated Study Plan Is Now Available on Website

John,

There is no record of this filing in FERC Docket No. P-2299-075 on October 13th (the date of the transmittal letter) or October 14th (the date of the e-mail below). Can you please confirm that this was filed with the Commission?

Ruth Porter

Counsel for Restore Hetch Hetchy

From: Staples, Rose [mailto:Rose.Staples@hdrinc.com]
Sent: Friday, October 14, 2011 1:42 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry;

Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan - CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth M.; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler, Douglas P.; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB
Subject: Don Pedro Updated Study Plan Is Now Available on Website

Today we have e-filed with FERC an UPDATED STUDY PLAN, which consists of a set of CLEAN Study Plans (Appendix A) and a set of the REDLINE Study Plans (Appendix B). We have also uploaded a copy of the filing to the relicensing website. You will note that these files are in a .pdf format—but we will also be uploading, by the end of the day, a set of the CLEAN Study Plans in WORD format.

You will also note a different look to the DOCUMENTS section of the website. We have “collapsed” all the individual files so when you access the Document sections, only the major section headings appear. To locate the Updated Study Plan, you will click on STUDIES, which will open three sub-headings (Proposed Study Plan, RWG Study Plan Development, and the new Updated Study Plan). Click on CONTENT: UPDATED STUDY PLAN, and the two Updated Study Plan file names should pop. If not, please let me know.

Thank you!

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CPS CAP

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Executive Assistant, Hydropower Services

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207.239.3857 | f: 207.775.1742
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From: Staples, Rose
Sent: Monday, October 31, 2011 6:51 PM
To: 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Barnes, Peter - SWRCB'; 'Beuttler, John - CSPA'; 'Blake, Martin'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brenneman, Beth - BLM'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Buckley, Mark'; 'Burley, Silvia-CVMT'; 'Burt, Charles - CalPoly'; 'Cadagan, Jerry'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cismowski, Gail - SWRCB'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, Kevin - TBMI'; 'Day, P - MF'; 'Denean - BVR'; 'Derwin, Maryann Moise'; Devine, John; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Grader, Zeke'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hackamack, Robert'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hayden, Ann'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Holm, Lisa'; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hudelson, Bill - StanislausFoodProducts'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Hume, Noah - Stillwater'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Kordella, Lesley - FERC'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; 'Looker, Mark - LCC'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Madden, Dan'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Martin, Ramon - USFWS'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan - CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Paul, Duane - Cardno'; 'Pavich, Steve-Cardno'; 'Pinhey, Nick - City of Modesto'; 'Pool, Richard'; 'Porter, Ruth - RHH'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Ridenour, Jim'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sander, Max - TNC'; 'Sandkulla, Nicole - BAWSCA'; 'Saunders, Jenan'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shipley, Robert'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Sill, Todd'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; Staples, Rose; 'Steindorf, Dave - AW'; 'Steiner, Dan'; 'Stone, Vicki -TBMI'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'Terpstra, Thomas'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Vierra, Chris'; 'Villalabos, Ruben'; 'Walters, Eric - MF';

'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; 'Wheeler, Douglas - RHH'; 'Wilcox, Scott - Stillwater'; 'Williamson, Harry (NPS)'; 'Willy, Alison - FWS'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'

Subject: Conf Call ONLY Don Pedro Water & Aquatic; No meeting or conf call Recreation, Cultural & Terrestrial this week

There will be no Resource Work Group meetings this week. These meetings were originally scheduled for November 3 (Water & Aquatic; Terrestrial) and November 4 (Recreation; Cultural). The number and scope of the comments received requires that we spend the limited time available addressing comments, revising study plans, and finalizing the Revised Study Plan document for submittal to FERC on November 22. The Districts appreciate the substantial commitment of time and the effort made by all the relicensing participants that have been engaged in the process. The prior meetings and comments have materially improved the study plans.

There were a significant number of detailed comments on study plans covering the **Water& Aquatic Resource area**. The Districts believe a conference call to discuss several of these studies may be beneficial. The Districts are proposing to conduct a conference call on Thursday, November 3 from 2 PM to 5 PM Pacific time. The call-in number is provided below.

The Districts look forward to continuing the excellent dialogue that has taken place over the last several months as we move forward with the relicensing of Don Pedro.

Call-in Number 866-994-6437
Conference Code 5424697994

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From: Staples, Rose
Sent: Thursday, November 03, 2011 10:46 AM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Subject: Info Regarding Today's Don Pedro Water & Aquatic RWG Conference Call

In regards to this afternoon's Don Pedro Relicensing **Water & Aquatic RWG Conference Call**, there is no set agenda--and the call may not last the full three hours. From the Districts' perspective, we do have a few questions/clarifications that we would like to go over. And if any of the Relicensing Participants have further questions or items to clarify, we could also cover those items. We appreciate all the effort that went into preparing the comments. The Districts are busy preparing their Revised Study Plan which must be filed with FERC on Tuesday, November 22. We have slotted three hours for today's call, not knowing what parties might want to cover; it may take considerably less time than that, so we would ask that you please plan to join the call promptly at 2 PM. Thank you.

Thursday, November 3 – 2:00 p.m. Pacific
Call-in Number 866-994-6437
Conference Code 5424697994

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From: Staples, Rose
Sent: Tuesday, November 22, 2011 5:59 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Subject: Don Pedro Revised Study Plan document e-filed with FERC today

TID-MID Don Pedro Project FERC No. 2299-75's ***Revised Study Plan*** document was e-filed with FERC today, with Attachment D-3 going in CD form via Express Mail.

A copy of the document filed (cover letter, RSP, Appendices A-C, and Appendix D-minus Attachment D-3 due to size) is available on FERC's E-Library at www.ferc.gov (docket #2299-75).

An announcement of the e-filing has also been placed on the Relicensing website at www.donpedro-relicensing.com (INTRODUCTION tab/Announcement section in upper right corner). A copy of this document was attached to the announcement. And for reference in the future, a copy will also be uploaded, within a few days, to the DOCUMENTS/STUDIES section of the website.

Announcements

Revised Study Plan filed with FERC today! NEW

by Rose Staples

Please note that ***Attachment 3 to Appendix D***, which is the Tuolumne Stream and Reservoir Water Temperature Data (in CD form) is 75 MB as a zip file, which is why we have not tried to electronically file it—or upload it to the website. If you are interesting in receiving a copy of this data, please email me at Rose.Staples@hdrinc.com with your mailing address and quantity of CDs wanted—and we will mail you them to you.

Thank you.

ROSE STAPLES
CAP-OM

HDR Engineering, Inc.
Executive Assistant, Hydropower Services

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From: Staples, Rose
Sent: Friday, December 09, 2011 5:36 PM
To: Alves, Jim - City of Modesto; Anderson, Craig - USFWS; Asay, Lynette - N-R; Aud, John - SCERD; Barnes, James - BLM; Barnes, Peter - SWRCB; Beuttler, John - CSPA; Blake, Martin; Bond, Jack - City of Modesto; Boucher, Allison - TRC; Boucher, Dave - Allison - TRC; Bowes, Stephen - NPS; Bowman, Art - CWRMP; Brenneman, Beth - BLM; Brewer, Doug - TetraTech; Brochini, Anthony - SSMN; Brochini, Tony - NPS; Buckley, John - CSERC; Buckley, Mark; Burley, Silvia-CVMT; Burt, Charles - CalPoly; Cadagan, Jerry; Carlin, Michael - SFPUC; Catlett, Kelly - FOR; Charles, Cindy - GWWF; Cismowski, Gail - SWRCB; Costa, Jan - Chicken Ranch; Cowan, Jeffrey; Cox, Stanley Rob - TBMWI; Cranston, Peggy - BLM; Cremeen, Rebecca - CSERC; Day, Kevin - TBMI; Day, P - MF; Denean - BVR; Derwin, Maryann Moise; Devine, John; Donaldson, Milford Wayne - OHP; Dowd, Maggie-SNF; Drekmeier, Peter - TRT; Edmondson, Steve - NOAA; Eicher, James - BLM; Fety, Lauren - BLM; Findley, Timothy - Hanson Bridgett; Freeman, Beau - CalPoly; Fuller, Reba - TMTC; Furman, Donn W - SFPUC; Ganteinbein, Julie - Water-Power Law Grp; Giglio, Deborah - USFWS; Goode, Ron - NFMT; Gorman, Elaine - YSC; Grader, Zeke; Gutierrez, Monica - NOAA-NMFS; Hackamack, Robert; Hastreiter, James L - FERC; Hatch, Jenny - CT; Hayat, Zahra - MF; Hayden, Ann; Hellam, Anita - HH; Heyne, Tim - CDFG; Holden, James ; Holm, Lisa; Horn, Jeff - BLM; Horn, Tini; Hudelson, Bill - StanislausFoodProducts; Hughes, Noah; Hughes, Robert - CDFG; Hume, Noah - Stillwater; Jackman, Jerry ; Jackson, Zac - USFWS; Jennings, William - CSPA; Jensen, Art - BAWSCA; Jensen, Laura - TNC; Johannis, Mary; Johnson, Brian - CalTrout; Justin; Keating, Janice; Kempton, Kathryn - NOAA-MNFS; Kinney, Teresa; Koepele, Patrick - TRT; Kordella, Lesley - FERC; Lein, Joseph; Levin, Ellen - SFPUC; Lewis-Reggie-PRCI; Linkard, David - TRT /RH; Looker, Mark - LCC; Loy, Carin; Lwenya, Roselynn, BVR; Lyons, Bill - MR; Madden, Dan; Manji, Annie; Marko, Paul ; Marshall, Mike - RHH; Martin, Michael - MFFC; Martin, Ramon - USFWS; Mathiesen, Lloyd - CRRMW; McDaniel, Dan -CDWA; McDevitt, Ray - BAWSCA; McDonnell, Marty - SMRT; McLain, Jeffrey - NOAA-NMFS; Means, Julie - CDFG; Mills, John - TUD; Morningstar Pope, Rhonda - BVR; Motola, Mary - PRCI; O'Brien, Jennifer - CDFG; Orvis, Tom - SCFB; Ott, Bob; Ott, Chris; Paul, Duane - Cardno; Pavich, Steve-Cardno; Pinhey, Nick - City of Modesto; Pool, Richard; Porter, Ruth - RHH; Powell, Melissa - CRRMW; Puccini, Stephen - CDFG; Raeder, Jessie - TRT; Ramirez, Tim - SFPUC; Rea, Maria - NOAA-NMFS; Reed, Rhonda - NOAA-NMFS; Richardson, Kevin - USACE; Ridenour, Jim; Robbins, Royal; Romano, David O - N-R; Roos-Collins, Richard - Water-Power Law Grp for NHI; Roseman, Jesse; Rothert, Steve - AR; Sander, Max - TNC; Sandkulla, Nicole - BAWSCA; Saunders, Jenan; Schutte, Allison - HB; Sears, William - SFPUC; Shipley, Robert; Shumway, Vern - SNF; Shutes, Chris - CSPA; Sill, Todd; Slay, Ronn - CNRF/AIC; Smith, Jim - MPM; Staples, Rose; Steindorf, Dave - AW; Steiner, Dan; Stone, Vicki -TBMI; Stork, Ron - FOR; Stratton, Susan - CA SHPO; Taylor, Mary Jane - CDFG; Terpstra, Thomas; TeVelde, George A ; Thompson, Larry - NOAA-MNFS; Vasquez, Sandy ; Verkuil, Colette - TRT/MF; Vierra, Chris; Villalabos, Ruben; Walters, Eric - MF; Wantuck, Rick - NOAA-NMFS; Welch, Steve - ARTA; Wesselman, Eric - TRT; Wheeler, Dan; Wheeler, Dave; Wheeler,

Douglas - RHH; Wilcox, Scott - Stillwater; Williamson, Harry (NPS); Willy, Alison - FWS; Wilson, Bryan - MF; Winchell, Frank - FERC; Wood, Dave - FR; Wooster, John -NOAA; Workman, Michelle - USFWS; Yoshiyama, Ron; Zipser, Wayne - SCFB

Subject: Forwarding of CCSF Socioeconomic Study Plan as Requested by Donn Furman

Attachments: CCSF Socioeconomic Study Plan.pdf

I am forwarding to you a copy of the CCSF Socioeconomic Study Plan filed with FERC yesterday, as requested by Donn Furman (see email below). Thank you.

ROSE STAPLES
CAP-OM

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From: Donn.W.Furman@sfgov.org [mailto:Donn.W.Furman@sfgov.org]
Sent: Friday, December 09, 2011 4:09 PM
To: Staples, Rose
Cc: Devine, John
Subject: Re: FW: Don Pedro RPCL Email Group

Rose-

Please forward the attached document to the email list for the Don Pedro Relicensing Participants. Thanks.

Donn W. Furman

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CITY AND COUNTY OF SAN FRANCISCO

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December 8, 2011

Honorable Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington DC 20426

Re: *Turlock Irrigation District and Modesto Irrigation District*, Project No. 2299-075
Don Pedro Project CCSF Socioeconomics Study Plan

Dear Secretary Bose:

The City and County of San Francisco ("CCSF" or "San Francisco") respectfully submits for the Commission's information, its proposed Socioeconomics Study Plan – San Francisco Bay Area, consistent with the findings of the Commission's Scoping Document 2 ("SD2") issued July 25, 2011. SD2 presented a list of issues to be addressed in the Environmental Impact Statement for the Don Pedro Project relicensing. This list included the socioeconomic impacts on the people dependent upon the water delivery system owned and operated by CCSF should additional water be required for environmental mitigation at the project. The attached Study Plan directly addresses this issue and will assist the Commission in developing an adequate record to assess the direct impacts of any modification in project operations on the ability of CCSF to provide the water necessary to protect the jobs and living conditions of nearly 2.5 million people living in the San Francisco Bay Area.

This study will assess the effects of potential changes in Don Pedro Project operations on the economic well-being of the residents, businesses, workers, and community organizations in the Bay Area. Economic well-being and welfare will also be evaluated through case studies detailing what changes in water availability would mean to various classes of consumers, such as families, small businesses, and large employers. The study plan methodologies proposed are consistent with, and will expand upon, information filed by CCSF in the 2009 Administrative Law Judge proceeding before the Commission on the Don Pedro Project.

The importance of this study and its results cannot be overestimated in the decision making process that lies before the Commission. Determinations by the Commission on what will be included in a new Don Pedro Project license have the potential to affect the lives of millions of people for decades to come. The new license must be based on a complete record that includes the potential direct impacts to the people served by CCSF. The results of the proposed Socioeconomics Study Plan are critical for the new license to be consistent with the Federal Power Act's requirement that the project adopted be best adapted to the public interest and a comprehensive plan for, among other things, beneficial public uses including water supply.

On November 22, 2011, Turlock Irrigation District and Modesto Irrigation District ("Districts"), co-licensees for the Don Pedro Project, filed their Revised Study Plan for the relicensing effort. The socioeconomic study plan included in that filing focused on the baseline economic values and benefits supported by the Project in the region. As the Districts stated in that same filing, consumers who rely on CCSF water supply may be significantly impacted by potential reductions in water supply that could result from relicensing of the Project. The Districts' filing also indicated that CCSF would be conducting an independent assessment of socioeconomic impacts to San Francisco and its Bay Area consumers, given its intimate knowledge of the role a reliable water supply plays in the Bay area. The attached Socioeconomics Study Plan – San Francisco Bay Area is consistent with that understanding as previously presented to the Commission.

CCSF is filing this Socioeconomics Study Plan, so that the Commission is aware of CCSF's study effort, and to facilitate evaluation by, and comments from, the participants in the relicensing of the Don Pedro Project. CCSF believes that this level of transparency and willingness to consider all comments on the elements of this study should ensure that the results will be of significant value to the Commission in this proceeding, as it moves forward to develop a license that truly balances all the issues related to the Don Pedro Project, including the water supply for the San Francisco Bay Area.

Very truly yours,

DENNIS J. HERRERA
City Attorney

/s/ Donn W. Furman

Donn W. Furman
Deputy City Attorney

cc: FERC Service List
Don Pedro Project email list
Jim Hastreiter, FERC

STUDY PLAN

CITY AND COUNTY OF SAN FRANCISCO PUBLIC UTILITIES COMMISSION

DON PEDRO HYDROELECTRIC PROJECT FERC NO. 2299

Socioeconomics Study Plan – San Francisco Bay Area

December 2011

The City and County of San Francisco ("CCSF" or "San Francisco"), through the San Francisco Public Utilities Commission ("SFPUC"), owns and operates a regional water system that serves nearly 2.5 million people primarily in San Francisco and the south San Francisco bay region ("Regional Water System"). In addition to serving residents and businesses in the CCSF, the SFPUC provides water to thirty cities, water agencies and other water users that comprise its 26 wholesale customers in San Mateo, Santa Clara and Alameda Counties. Some of these wholesale customers are totally dependent on the Regional Water System for water; all are dependent on the Regional Water System for a significant portion of their water needs. The wholesale customers that depend on purchases of wholesale water from San Francisco are member agencies of the Bay Area Water Supply and Conservation Agency ("BAWSCA"). The Regional Water System transports water across the state from the Sierra Nevada to the Bay Area almost entirely by gravity. The water conveyance system extends about 167 miles from Yosemite National Park to San Francisco, and develops water supply from three principal areas: the Tuolumne River watershed, Alameda Creek watershed, and several smaller watersheds in the San Francisco Peninsula. In 2008, the SFPUC adopted level of service goals to meet customer needs. Those level of service goals included meeting a demand of 265 mgd in normal and wet years, of which about 85% is from the Tuolumne River Watershed and about 15% is from the combined Alameda and Peninsula watersheds. This level of service goal is based on historic deliveries in normal and wet years. The demand for water deliveries from the Regional Water System can vary widely from year to year depending on climate, economic conditions, conservation measures, voluntary or mandatory rationing, and other factors.

The Don Pedro Project is located downstream from San Francisco's Hetch Hetchy System. When the Don Pedro Project was being developed, CCSF agreed to pay for most of the cost of the dam and reservoir in return for creation of a water bank account in the Don Pedro Reservoir. Under the Fourth Agreement between the Districts and CCSF, San Francisco receives water bank account credits when the calculated daily natural flow at La Grange exceeds the Districts' senior Tuolumne River water rights entitlements. These credits allow San Francisco at other times to divert water at its upstream storage reservoirs for municipal water supply in the Bay Area that it would otherwise have to release to meet District entitlements.

The economic benefits of the Don Pedro Project are enjoyed by the MID and TID service areas, the San Joaquin Central Valley region, and extend to the San Francisco Bay Area through the benefits of Project facilities to CCSF under the Fourth Agreement. The Bay Area's interest in these proceedings is in part to assure that water supply issues and resulting economic and social impacts are fully understood and appropriately balanced in any new license issued to the Districts for the Don Pedro Project.

As discussed in the Proposed Socioeconomic Study Plan filed by the Districts on July 25, 2011, the San Francisco Bay Area is a necessary part of the Socioeconomic Study Plan Area for the Don Pedro Project. *See* MID/TID Proposed Study Plan W&AR-15, p. 8. As also acknowledged in that plan, *id.*, p. 6, CCSF is uniquely qualified to analyze the socioeconomic impact of any changes in Project operations on the Bay Area having conducted just such analyses in other public forums. CCSF therefore submits the instant study plan of Bay Area socioeconomic impacts for the record in this proceeding.

1.0 PROJECT NEXUS

Changes to Project operations may have significant economic impacts in the San Francisco Bay Area. Don Pedro Reservoir provides up to 570,000 acre-feet ("AF") of credits to CCSF that can be used in its management of the Hetch Hetchy water system. Although water stored in the Don Pedro Reservoir does not belong to, and is not delivered to Bay Area water customers, those credits enable CCSF to deliver water reliably from the Hetch Hetchy System to customers in the San Francisco Bay Area.

San Francisco Bay Area water supply impacts have been a central issue with respect to the Don Pedro Project since it was originally licensed. As Scoping Document 2 acknowledges (at 30-1), the need to assure Bay Area water supply was the primary reason that the City and County of San Francisco helped finance the original construction of the Don Pedro Project. *See also Turlock Irrigation Dist.*, 76 FERC ¶ 61,117, at 61,606-607 (1996). The Commission has previously and repeatedly recognized that changes in the operation of the Don Pedro Project could have significant and potentially devastating impacts on the millions of people who live and work in the San Francisco Bay Area. Accordingly, it is crucial that the Bay Area water supply and socioeconomic impacts of any potential modification of the existing flow regime are studied as part of the pre-application and scoping processes for this relicensing, to assure that the Commission has an adequate record on which to establish appropriate terms and conditions, consistent with its Federal Power Act obligation to issue only a license that is best adapted to serve the public interest (16 U.S.C. § 808(a)(2)), and "best adapted to a comprehensive plan for improving or developing a waterway" (16 U.S.C. § 803(a)(1)).

2.0 RESOURCE MANAGEMENT GOALS OF AGENCIES WITH RESPONSIBILITY FOR THE RESOURCE TO BE STUDIED

Social and economic impacts of changes in available water supply to the San Francisco Bay Area has been a significant concern of the CCSF for decades. The CCSF has developed operational objectives and water system management goals to reduce the potential for water shortages that impact the social and economic welfare of millions of people in the San Francisco Bay Area. In recent years, CCSF has adopted defined resource management goals and objectives specific to this resource area, including a "water first" operation and a rationing objective of no greater than 20 percent water shortage in any one year of a drought.

CCSF's Water First Policy gives priority to the production of water supply over the production of hydropower generation in the operation of the Hetch Hetchy system. The Water First Policy was adopted in California in 2002 as part of the Wholesale Regional Water System Security and Reliability Act (Assembly Bill No. 1823), but has been the operational practice of the SFPUC since 1993 (CCSF 2008). The Water First Policy was also enacted into San Francisco's Charter by San Francisco voters in 2002.

In 2008, the SFPUC adopted levels of service goals when approving its Water System Improvement Project. The overall goals include maintaining a high quality and gravity-driven system, increasing delivery reliability, meeting customer water supply needs, and enhancing sustainability. In recognition that under current conditions, CCSF and its customers are vulnerable to shortages greater than 20 percent, the SFPUC adopted a level of service goal of rationing no greater than 20 percent of system deliveries during any year of a multi-year drought. The SFPUC has developed a water supply program to meets it rationing goals, and implementation of this program is currently underway as part of SFPUC's Water System Improvement Program. It should be noted that to meet these system-wide rationing goals of no greater than 20 percent shortage wholesale customers within the SFPUC's service area may incur shortages greater than 20 percent. A 20 percent system-wide shortage will not result in a uniform 20 percent shortage for all Regional Water System retail and wholesale customers.

3.0 STUDY GOALS AND OBJECTIVES

The primary objective of the study is to assess the effects of changes in Project operations on the economic well-being of the residents, businesses, workers and community organizations in the Bay Area. Economic well-being is broadly defined in the study and includes measures relevant to the use of water by businesses and households in the region. Measures of economic welfare used in the study reflect the diversity of water uses in the San Francisco Bay Area, and can include measures such as employment, sales, value added, income and economic surplus concepts like consumer willingness to pay (a measure of quality of life), and profit. Due to the sheer variety of the types of water users, an appropriate method for evaluating impacts to the Bay area water users is through a series of case studies. This approach, tailored to CCSF's specific circumstances, will detail what changes in water availability would mean to various types of customers, such as single-family residential, multi-family residential, and the wide variety of commercial and industrial customers.

The study will consider the socioeconomic effects of altering the reliability of Hetch Hetchy water supplies. The SFPUC has previously evaluated and continues to evaluate the use of alternative water supplies. In its recent planning studies, and as part of the Water System Improvement Program, these evaluations have included consideration of alternative water supplies in meeting dry-year needs and future demand in the service area. The CCSF will include relevant existing information from these studies in the socioeconomics study. While alternative supplies may be considered, it is important to note that a range of water management options have already been implemented in the Bay Area, and others have been identified for use in meeting future water needs and providing increased water supply reliability if there were no change in the operation of the Project. These management options include additional water conservation programs and alternative investments in water supplies. If additional management alternatives must be considered as a way to replace water supplies lost as a consequence of instream flow requirements, CCSF, consistent with its previous assessments of alternative water supplies, will incorporate these prior commitments that agencies are planning to make and consider the feasibility, cost and environmental consequences of implementing such alternatives.

The study will consider how changes in the reliability of Hetch Hetchy water supplies could limit future growth in the San Francisco Bay Area since BAWSCA already projects demand will outstrip supply in some of its members' service territories within a decade and for the whole by 2035 – even assuming no incremental instream flow requirements for Don Pedro beyond those existing in the baseline.

4.0 EXISTING INFORMATION AND NEED FOR ADDITIONAL INFORMATION

As noted, the SFPUC provides water to nearly 2.5 million people. This figure includes the SFPUC's retail water delivery service within the City and County of San Francisco to over 147,800 residential accounts and 21,600 non-residential accounts. Over 800,000 people live within CCSF, and workers who commute into the city increase CCSF's daytime population to close to 1 million. In addition, over 15.9 million people visited San Francisco in 2010.

The SFPUC also provides wholesale water to BAWSCA members, which include 24 cities and public water districts and two private water suppliers (Stanford University and California Water Service Company) in parts of Alameda, Santa Clara and San Mateo Counties. Member agencies of BAWSCA serve a population of nearly 1.7 million people, with over 370,000 residential accounts, 5,500 industrial accounts and 25,800 commercial accounts. Like San Francisco, a sizable workforce commutes into the communities served by these agencies. CCSF accounts for roughly two-thirds of the water delivered by the BAWSCA agencies.

Water delivered to the San Francisco Bay Area by CCSF serves many types of consumers. The socioeconomic study will distinguish among categories of uses, develop appropriate economic impacts measures for each sector, and measure outcomes resulting from a range of potential changes in Project operation that may affect CCSF water supplies.

4.1 The Demand for Water in the San Francisco Bay Area

4.1.1 Residential Use

The majority of water delivered by the Hetch Hetchy System is used by households. Residential per capita usage in both the CCSF retail and wholesale service areas is already significantly lower than in other regions in California. Water conservation has been a priority in the Bay Area for decades, and measures have been enacted to reduce water use across all sectors of the economy. For example, residential water use in CCSF has been limited by plumbing codes that require the installation of efficient appliances and outdoor irrigation systems. As a result, CCSF has some of the lowest levels of residential water use in the State. Current residential per capita use in San Francisco is about 50 gallons per capita per day. Residential water use in the BAWSCA service territory has also been significantly reduced as a result of conservation efforts, code requirements, economic incentives and limitations on water service. In 2009-2010, residential consumption among the BAWSCA agencies (excluding Stanford) was 78 gallons per capita per day (gpcpd), which is 25 percent below the pre-drought period of 1986-1987 and 32% below the level of 115 gpcpd in 1975-1976, in spite of continued population growth.

To implement their water conservation programs and facilitate other aspects of their operations, the SFPUC and BAWSCA collect extensive information on single- and multi-family residential water use in their service territories. This information is detailed in the SFPUC's 2010 Urban Water Management Plan and in the BAWSCA's 2009-2010 Annual Survey of its member agencies. The data contained in these studies will be the foundation of the residential analysis in the socioeconomic study.

To characterize the economic impact of water shortages on various types of residential customers in the Bay Area, it may be possible to combine and analyze existing information in new ways. In particular, CCSF will analyze data on residential water consumption to determine the responsiveness of demand to changes in price (i.e., the price elasticity of demand). Price elasticity is a basic element of calculating willingness to pay, which is a measure of the changes in the quality of life resulting from disruptions in water service.

Price elasticity will be identified by examining the actual water use choices of households and businesses across the Bay Area through the use of an econometric model of water demand. The econometric model isolates the influence of price on consumption by controlling for exogenous factors such as fluctuations in economic conditions and weather.

4.1.2 Commercial & Industrial Use

The area served by the Regional Water System is one of the largest centers of employment and economic activity in the United States. There are over 1.6 million jobs located in the SFPUC service territory. Firms in the service area produce over $280 billion in goods and services each year. As a result of the Mediterranean climate of the San Francisco Bay Area, economic activity in the region is largely dependent on a reliable supply of imported water.

The SFPUC and BAWSCA collect information on commercial and industrial water use in their service territories. Both agencies have studied patterns of water use by businesses, and have gathered information from their business customers on how they would cope with various levels of rationing (SFPUC, 2007).

Similar to the residential sector, it is necessary to gather information on the price elasticity of commercial and industrial demand. One source of information on price elasticities for these sectors is the academic literature (see, for example, Brozovic et al., 2007; Berkman and Sunding, 2008). There have been numerous studies examining price responsiveness in various industries, and the socioeconomic study will use this research to calibrate demands for various sectors. The study will control for the mix of industries by using data from the Bureau of Economic Analysis.

The study will also present the results of original research on commercial and industrial price elasticity using econometric methods similar to those described in the section on residential demand. Data will be gathered and used to estimate the parameters of a panel model. The results will be compared to the price elasticities found in the academic literature.

Reducing the amount of water available to commercial and industrial customers has the potential to reduce levels of output and jobs, particularly for rationing levels in excess of 20 percent. The socioeconomic study will address this important question in two ways. First, the socioeconomic study will present the results of original research on the relationship between economic output, jobs and water availability. Again, the likely approach will be to estimate the parameters of a panel model using year and location-fixed effects to control for unobservable factors. The results of this econometric modeling will be compared to those contained in the study of McLeod (1994), who estimated elasticities of output and jobs for various types of businesses in response to changes in water availability.

4.1.3 Demand Growth and Land Use Projections

The economy of the Bay Area is one of the most dynamic in the nation, and includes some of the country's most innovative and important businesses. Owing to factors including a strong economic base, several premier research universities, and temperate climate, the Bay Area is expected to grow in the coming decades. This population growth will affect the demand for reliable water supplies and place even more pressure on existing systems. BAWSCA reports that the number of people residing in its service territory is estimated to grow by approximately 300,000 persons, or 18 percent, by 2035.

The socioeconomic study will include a statistical analysis of per capita residential water demand, coupled with population and land use projections to 2035. One possible source of projected future conditions is the Association of Bay Area Governments (ABAG). ABAG land use projections detail expected changes in population, residential densities, and commercial and industrial development to 2035. By linking the residential demand model described above with the ABAG projections, it would be possible to fully characterize sectoral water demands out to the end of the ABAG planning period, taking into account changes in water rates, housing vintage, population densities, conservation programs and other factors. To the extent that wholesale customers use planning data and assumptions that are different than ABAG's, adjustments may be made to future conditions so that they best reflect expected growth in the service area.

4.2 The Supply of Water in the San Francisco Bay Area

The water system of the San Francisco Bay Area is a complex mix of infrastructure, water sources and institutions for the pricing and allocation of scarce water resources. This socioeconomic impact study will reflect these conditions in its calculation of the economic impacts of changes in Project operations.

4.2.1 Water Shortage Quantities and Allocation

To understand the economic effects of changes in Project operation, it is necessary to translate changes in Hetch Hetchy supplies into changes in end use. This translation has several elements: how shortfalls in delivery of Hetch Hetchy water are allocated among San Francisco and the wholesale customers, and how shortages are allocated among BAWSCA agencies. Mandatory reductions in end use that remain after the application of other water supplies used by the wholesale customers will be evaluated according to the methods described in the previous section.

4.2.2 Other Water Supply

Water agencies in the San Francisco Bay Area have access to a number of other water sources. These sources vary among agencies, and include local surface and groundwater supplies, Delta imports received from the State Water Project, banked groundwater from inside and outside the region, water transfers, recycled water and desalination. These water supplies are used today to meet existing demand. The availability of these water supply sources vary in their ability to meet additional needs reliably.

SFPUC and BAWSCA agencies have already developed information on the cost, feasibility and quantity of water available from potential alternative sources through various planning efforts including the Water System Improvement Program. BAWSCA's Long Term Reliable Water Supply Strategy Phase I Scoping Report details information on a wide range of potential supplies that may be developed at some point in the future. The study will start with this list and develop information on the costs of implementing other projects. The socioeconomic analysis will consider the feasibility, environmental impacts and additional burden on ratepayers resulting from the construction of such water supply projects necessary to address water shortages caused by instream flow requirements imposed on the Project.

4.3 Water Shortages and Lost Utility Revenues

In general, when water utilities are forced to reduce sales during periods of water shortage, they take in less revenue but also spend less on variable costs. If the marginal water rate exceeds variable cost, which is nearly always the case, then a mandatory reduction in sales creates a need to cover fixed costs by some means, either by increasing water rates or depleting reserves. In the Bay Area agencies benefit from the Regional Water System moving very high quality water by gravity; both treatment and energy costs are far lower than typical water utilities. As a result, variable costs of water service are relatively low in this service area. Lost revenues above variable costs are thus expected to be large, and should be included in the calculation of lost economic welfare.

5.0 STUDY METHODS AND ANALYSIS

5.1 Study Area

The primary study area for the socioeconomic study includes the City and County of San Francisco, and the service territories of the 26 BAWSCA members (see attached map). The study will also consider indirect economic impacts experienced by the State of California as a result of changes in economic activity within the San Francisco Bay Area resulting from changes in water supply availability.

5.2 General Concepts

The following general concepts will apply to the study:

- Water is essential to the quality of life and to economic activity. Disruptions in water supply have the potential to adversely impact individual consumers, job holders, businesses and governments.
- The study will quantify expected economic impacts of potential changes in Project operation affecting CCSF water supplies.
- Impacts will be measured from a variety of perspectives, including jobs, consumer welfare, economic activity and value added.
- Impacts will be described for a set of defined cases drawn from across the main sectors of demand.
- Primary sources of data will be preferred, and the study will clearly identify sources of data and other information.

5.3 Study Methods

The socioeconomic study will calculate changes in economic outcomes resulting from potential changes in the operation of the Project that may affect the Regional Water System and San Francisco Bay Area water supplies. Impacts will be measured in terms of economic surplus (i.e., consumer and producer surplus), economic activity and employment.

Changes in the availability of water can have significant consequences for urban economies and available life choices. Water is an essential input to many production processes, and mandatory conservation has been shown to affect the level of economic activity in water-short regions, and also to affect the pace of job creation. In addition to commercial and industrial impacts, mandatory conservation imposed on residential consumers can affect the quality of life as households lose access to water for outdoor irrigation, and in severe cases may even lack adequate water for some normal indoor uses such as daily bathing, clothes washing and the like.

5.3.1 Water balances

The socioeconomic study calculates impacts resulting from changes in end use and changes in the cost of alternative water supplies. The analysis starts with reductions in delivery of Hetch Hetchy water supplies and then allocates the shortage across CCSF and the BAWSCA member agencies. Changes in end use are calculated as the change in the SFPUC deliveries minus the increase in water available from other supply sources planned and financed for this purpose.

5.3.2 Consumer impacts

Consumer surplus is the theoretically correct measure of residential impacts of more frequent water shortages. Consumer surplus is defined as the difference between market price and the amount that consumers are actually willing to pay for a commodity. Economists frequently describe consumer surplus as the area underneath a demand curve and above market price. Consumer surplus can be used to capture the impacts of both incremental water shortages resulting from instream flow requirements, and expenditures on any feasible alternative water supplies that could be used to maintain consumption at close to baseline levels.

Consumer surplus measures the amount that households would be willing to pay to avoid residential water shortages. It is measured in terms of money, and reflects the diminution in the quality of life resulting from mandatory cutbacks in water service. For a given degree of rationing, consumer surplus loss is usually smaller for outdoor use than indoor use. The reason is that indoor uses such as bathing, cooking, dishwashing, clothes washing and the like are central to the quality of life, and to meeting basic human needs such as drinking water and personal hygiene. Outdoor use is valued by consumers, but will typically be curtailed before they will cut back significantly on indoor use. This socioeconomic study will develop estimates of the price elasticity of demand for the SFPUC service area as a means to gauge the economic significance of residential water supply losses. The study will also provide example cases in which the effects of water supply loss are described for a typical family.

5.3.3 Business impacts

The San Francisco Bay Area is home to a wide variety of industries. Water is an essential input in the economy, and the socioeconomic study will examine the implications of commercial and industrial water shortages. Impacts will be quantified using a variety of metrics, including producer surplus, economic activity and employment. The effects on a typical business resulting from water supply loss will be described.

Producer surplus is roughly equivalent to profit, and is the theoretical equivalent of consumer surplus used to measure outcomes in the residential sector. Profit can be affected by water shortages as firms adjust to rationing by investing in conservation devices, substituting for water when possible in production processes, and reducing operations in the face of significant shortages.

Employment is an important measure of economic activity, particularly in environments like the one at present where the economy is operating under conditions of an excess supply of labor. The job losses resulting from water shortages are closely related to changes in economic output.

While producer surplus is the theoretically preferred welfare measure to use in a cost-benefit setting, it falls short in other ways. For example, producer surplus is distinct from sales, which is a measure of the total economic activity of a sector. The study thus will also examine the impact of water shortages on regional sales and business net income as a way of capturing regional economic impacts.

Economic outcomes will also be expressed in terms of changes in output and employment. These changes include direct, indirect and induced impacts, the latter two categories including impacts that result from economic "ripple" effects including changes in spending by businesses and residents. Indirect and induced effects of changes in Project operations will be calculated using the IMPLAN modeling system which is based on a system of regional accounts and spending patterns.

5.3.4 Lost utility revenues

Lost consumer and producer surplus does not completely describe the economic welfare losses resulting from water shortages. It is also necessary to consider the need for affected water utilities to raise additional revenues as a result of lost sales. For nearly all water utilities, the majority of costs are fixed costs, meaning that they are unrelated to the amount of water sales. Fixed costs include the costs of infrastructure, treatment plants and the like. Marginal costs of water service are those costs that vary with the level of water sales. These costs include expenditures on chemicals and energy.

6.0 SCHEDULE

CCSF would work within the milestones of the ILP as follows:

First Study	Summer 2012
Initial Study Report	12/21/12

7.0 CONSISTENCY OF METHODOLOGY WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICES

The methods described in this study plan are consistent with accepted practices in economics and public finance.

8.0 DELIVERABLES

Three written deliverables and at least two workshops are anticipated. The first written deliverable would be a detailed outline of the proposed project, including data requirements, model specification, and impact measures. The first workshop would present the first written deliverable to relicensing participants and the public and provide opportunity for discussion and comment. The second written deliverable would be a draft report. The third written deliverable would be a final report. The second workshop is a presentation to relicensing participants and the public following completion of the draft study. There will be an opportunity for additional workshops as necessary.

9.0 LEVEL OF EFFORT AND COST

The cost of the proposed study is between $150,000 and $250,000.

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From: Staples, Rose
Sent: Thursday, December 22, 2011 6:37 PM
To: 'Alves, Jim - City of Modesto'; 'Anderson, Craig - USFWS'; 'Asay, Lynette - N-R'; 'Aud, John - SCERD'; 'Barnes, James - BLM'; 'Barnes, Peter - SWRCB'; 'Beuttler, John - CSPA'; 'Blake, Martin'; 'Bond, Jack - City of Modesto'; 'Boucher, Allison - TRC'; 'Boucher, Dave - Allison - TRC'; 'Bowes, Stephen - NPS'; 'Bowman, Art - CWRMP'; 'Brenneman, Beth - BLM'; 'Brewer, Doug - TetraTech'; 'Brochini, Anthony - SSMN'; 'Brochini, Tony - NPS'; 'Buckley, John - CSERC'; 'Buckley, Mark'; 'Burley, Silvia-CVMT'; 'Burt, Charles - CalPoly'; 'Cadagan, Jerry'; 'Carlin, Michael - SFPUC'; 'Catlett, Kelly - FOR'; 'Charles, Cindy - GWWF'; 'Cismowski, Gail - SWRCB'; 'Costa, Jan - Chicken Ranch'; 'Cowan, Jeffrey'; 'Cox, Stanley Rob - TBMWI'; 'Cranston, Peggy - BLM'; 'Cremeen, Rebecca - CSERC'; 'Day, Kevin - TBMI'; 'Day, P - MF'; 'Denean - BVR'; 'Derwin, Maryann Moise'; Devine, John; 'Donaldson, Milford Wayne - OHP'; 'Dowd, Maggie-SNF'; 'Drekmeier, Peter - TRT'; 'Edmondson, Steve - NOAA'; 'Eicher, James - BLM'; 'Fety, Lauren - BLM'; 'Findley, Timothy - Hanson Bridgett'; 'Freeman, Beau - CalPoly'; 'Fuller, Reba - TMTC'; 'Furman, Donn W - SFPUC'; 'Ganteinbein, Julie - Water-Power Law Grp'; 'Giglio, Deborah - USFWS'; 'Goode, Ron - NFMT'; 'Gorman, Elaine - YSC'; 'Grader, Zeke'; 'Gutierrez, Monica - NOAA-NMFS'; 'Hackamack, Robert'; 'Hastreiter, James L - FERC'; 'Hatch, Jenny - CT'; 'Hayat, Zahra - MF'; 'Hayden, Ann'; 'Hellam, Anita - HH'; 'Heyne, Tim - CDFG'; 'Holden, James '; 'Holm, Lisa'; 'Horn, Jeff - BLM'; 'Horn, Tini'; 'Hudelson, Bill - StanislausFoodProducts'; 'Hughes, Noah'; 'Hughes, Robert - CDFG'; 'Hume, Noah - Stillwater'; 'Jackman, Jerry '; 'Jackson, Zac - USFWS'; 'Jennings, William - CSPA'; 'Jensen, Art - BAWSCA'; 'Jensen, Laura - TNC'; 'Johannis, Mary'; 'Johnson, Brian - CalTrout'; 'Justin'; 'Keating, Janice'; 'Kempton, Kathryn - NOAA-MNFS'; 'Kinney, Teresa'; 'Koepele, Patrick - TRT'; 'Kordella, Lesley - FERC'; 'Lein, Joseph'; 'Levin, Ellen - SFPUC'; 'Lewis-Reggie-PRCI'; 'Linkard, David - TRT /RH'; 'Looker, Mark - LCC'; Loy, Carin; 'Lwenya, Roselynn, BVR'; 'Lyons, Bill - MR'; 'Madden, Dan'; 'Manji, Annie'; 'Marko, Paul '; 'Marshall, Mike - RHH'; 'Martin, Michael - MFFC'; 'Martin, Ramon - USFWS'; 'Mathiesen, Lloyd - CRRMW'; 'McDaniel, Dan -CDWA'; 'McDevitt, Ray - BAWSCA'; 'McDonnell, Marty - SMRT'; 'McLain, Jeffrey - NOAA-NMFS'; 'Means, Julie - CDFG'; 'Mills, John - TUD'; 'Morningstar Pope, Rhonda - BVR'; 'Motola, Mary - PRCI'; 'O'Brien, Jennifer - CDFG'; 'Orvis, Tom - SCFB'; 'Ott, Bob'; 'Ott, Chris'; 'Paul, Duane - Cardno'; 'Pavich, Steve-Cardno'; 'Pinhey, Nick - City of Modesto'; 'Pool, Richard'; 'Porter, Ruth - RHH'; 'Powell, Melissa - CRRMW'; 'Puccini, Stephen - CDFG'; 'Raeder, Jessie - TRT'; 'Ramirez, Tim - SFPUC'; 'Rea, Maria - NOAA-NMFS'; 'Reed, Rhonda - NOAA-NMFS'; 'Richardson, Kevin - USACE'; 'Ridenour, Jim'; 'Robbins, Royal'; 'Romano, David O - N-R'; 'Roos-Collins, Richard - Water-Power Law Grp for NHI'; 'Roseman, Jesse'; 'Rothert, Steve - AR'; 'Sander, Max - TNC'; 'Sandkulla, Nicole - BAWSCA'; 'Saunders, Jenan'; 'Schutte, Allison - HB'; 'Sears, William - SFPUC'; 'Shipley, Robert'; 'Shumway, Vern - SNF'; 'Shutes, Chris - CSPA'; 'Sill, Todd'; 'Slay, Ronn - CNRF/AIC'; 'Smith, Jim - MPM'; Staples, Rose; 'Steindorf, Dave - AW'; 'Steiner, Dan'; 'Stone, Vicki -TBMI'; 'Stork, Ron - FOR'; 'Stratton, Susan - CA SHPO'; 'Taylor, Mary Jane - CDFG'; 'Terpstra, Thomas'; 'TeVelde, George A '; 'Thompson, Larry - NOAA-MNFS'; 'Vasquez, Sandy '; 'Verkuil, Colette - TRT/MF'; 'Vierra, Chris'; 'Villalabos, Ruben'; 'Walters, Eric - MF'; 'Wantuck, Rick - NOAA-NMFS'; 'Welch, Steve - ARTA'; 'Wesselman, Eric - TRT'; 'Wheeler, Dan'; 'Wheeler, Dave'; 'Wheeler, Douglas - RHH'; 'Wilcox, Scott - Stillwater'; 'Williamson, Harry (NPS)'; 'Willy, Alison - FWS'; 'Wilson, Bryan - MF'; 'Winchell, Frank - FERC'; 'Wood, Dave - FR'; 'Wooster, John -NOAA'; 'Workman, Michelle - USFWS'; 'Yoshiyama, Ron'; 'Zipser, Wayne - SCFB'
Subject: FERC Study Plan Determination for Don Pedro Project Relicensing Issued Today

FERC has issued its Study Plan Determination for the Don Pedro Project Relicensing. A copy of the document is available on FERC's E-Library, under docket P-2299-075. It has also been uploaded to the relicensing website at www.donpedro-relicensing.com, both as an attachment to the Announcement under the INTRODUCTION section and also in the Studies section of the Documents tab. If you have any problems accessing the document, please let me know. Thank you.

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