

Study 39

Hydraulic and Sediment Transport Analysis of Juvenile Salmon Rearing Opportunities

**Final
2014 Monitoring and Analysis Plan**



2014 Study Proposal

SJRRP Hydraulic and Sediment Support Scope

The scope items identified in this proposal by the Sedimentation and River Hydraulics Group present to the following 2014 Monitoring and Analysis Plan studies:

- **Scope Item 1: Study 37 – Facies Mapping**
- **Scope Item 2: Study 19 – Two-Dimensional Temperature Modeling of Gravel Pits in Reach 1A**
- **Scope Item 3: Study 38 – Vegetation Roughness Effects in SJRRP Affected Reaches**
- **Scope Item 4: Study 39 – Hydraulic and Sediment Transport Analysis of Juvenile Salmon Rearing Opportunities**
- **Scope Item 5: Study 40 – Spawning Habitat Framework**

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Project Management Plan (PMP)

Job Name: San Joaquin River Restoration Program Hydraulic and Sediment Support	Date Submitted: 8-1-13
Team Leader: (name/code/telephone/fax) Blair Greimann / 303-445-2560	Client Group or Region: San Joaquin River Restoration Program / Mid-Pacific Region
	Client Office: MP Region – San Joaquin River Restoration Program, CA
	Client Contact: (name/code/telephone/fax) Katrina Harrison/ 916-978-5465

1. Objectives/Scope Statement: (list features, deliverables, and objectives)

The San Joaquin River Restoration Program (SJRRP) is intended to restore a sustainable salmon population to the San Joaquin River. The Sedimentation and River Hydraulics Group (SRH) has been requested to assist on the following tasks to support the program:

1. Hydraulic and Sediment Transport Analysis of juvenile salmon rearing opportunities

2. Scope Definition:

1. Hydraulic and Sediment Transport Analysis of juvenile salmon rearing opportunities. It is anticipated that there will be two phases of analysis. The first phase will be an assessment of potential opportunities in Reaches 1, 2a, 3, and 4a for increasing the area for salmon rearing. The second phase will include a detailed analysis of a select number of locations. The hydraulic analysis will include depth and velocity analysis of with and without project alternatives using SRH-2D. The sediment transport analysis will be site specific and could include a geomorphic assessment, SRH-1D and/or SRH-2D modeling depending upon site conditions. SRH will assist SJRRP on the identification of potential opportunities for increasing rearing habitat. There will be also a qualitative assessment of the likely plan form and sediment transport conditions at the site. The end product of Phase 2 will be a technical report documenting the hydraulic and sediment transport implications of implementing the proposed project at the site.

3. Schedule:

	Milestone Dates	Resource Assigned
Start Date	October 1, 2013	Blair Greimann

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1. Objectives/Scope Statement: (list features, deliverables, and objectives)

The San Joaquin River Restoration Program (SJRRP) is intended to restore a sustainable salmon population to the San Joaquin River. The Sedimentation and River Hydraulics Group (SRH) has been requested to assist on the following tasks to support the program:

1. Complete the data report for facies mapping
2. Temperature Analysis of floodplain and gravel pit interactions
3. Quantification of the increase in river stage due to an increase in vegetation roughness in SJRRP affected reaches
4. Hydraulic and Sediment Transport Analysis of juvenile salmon rearing opportunities
5. Spawning habitat framework

2. Scope Definition:

1. Complete the data report for facies mapping. In July of 2013, data on the sediment facies present in Reach 1A from Friant Dam to Sycamore Island were collected. The TSC will work with Andy Shriver to complete a report summarizing the methodology and available data. The report will also provide a brief comparison between the previous facies mapping of Stillwater Science performed in 2002.
2. Temperature Analysis of floodplain and gravel pit interactions. A temperature analysis using SRH-2D of two different areas will be completed. The first area will be the gravel pits in Sycamore Island Reach of Reach 1A. There are several temperature sensors in this area that have been recording water temperatures for the last few years and these will be used to calibrate and/or verify model results. The second area will be in the location of the proposed floodplain study being conducted by Fresno State. This data will be collected in spring of 2014. The end product will be a report summarizing both cases, but there will likely be an interim draft report summarizing only the modeling at Sycamore Island.
3. Vegetation roughness effects in SJRRP affected reaches. SRH-2D will be used to quantify potential increases in river stage given increases in riparian growth in reaches affected by SJRRP restoration flows. It is expected that the analysis will be performed in Reaches 2a and 4a. The existing conditions 2D model in those reaches will be used as a starting condition. The potential increase in vegetation will be estimated using analogs to surrounding reaches. Various methods will be used to predict the increase in river stage due to increasing vegetation density. The end product will be a technical report documenting the effect of vegetation roughness in Reaches 2a and 4a.
4. Hydraulic and Sediment Transport Analysis of juvenile salmon rearing opportunities. It is anticipated that there will be two phases of analysis. The first phase will be an assessment of potential opportunities in Reaches 1, 2a, 3, and 4a for increasing the area for salmon rearing. The second phase will include a detailed analysis of a select number of locations. The hydraulic analysis will include depth and velocity analysis of with and without project alternatives using SRH-2D. The sediment transport analysis will be site specific and could include a geomorphic assessment, SRH-1D and/or SRH-2D modeling depending upon site conditions. SRH will assist SJRRP on the identification of potential opportunities for increasing rearing habitat. There will be also a qualitative assessment of the likely plan form and sediment transport conditions at the site. The end product of Phase 2 will be a technical report documenting the hydraulic and sediment transport implications of implementing the proposed project at the site.
5. Spawning habitat framework. SRH will provide support to the SJRRP on developing this framework which would address three major areas:
 - a. Characterization of existing bed material and hydraulic conditions as they are related to spawning habitat. This will be a review and summary of the of the available bed material data and GIS database of the depth and velocity at a variety of flows using an existing SRH-2D model of Reach 1A.
 - b. Conceptual plan or plans for improving spawning habitat. Based upon input from the SJRRP and Spawning Habitat subgroup, SRH will develop conceptual level plans for increase the available spawning habitat in Reach 1A. The end product of this will be a technical report summarizing the plan for increasing spawning habitat and may also describe various alternatives.
 - c. Plan for monitoring change and success of improvements. SRH will assist in the development of

3. Schedule:	Milestone Dates	Resource Assigned
Start Date	October 1, 2013	Blair Greimann
Produce draft report for Task 1	Dec 1, 2013	Blair Greimann
Finalize report for Task 1	Jan 1, 2014	Blair Greimann
Assist on assessment of rearing opportunities in Reaches 1, 2a, 3, and 4a (Task 4)	Mar 1, 2014	Blair Greimann
Produce draft report for Task 2 (only including Sycamore Island model)	May 1, 2014	Dan Dombroski, Elaina Gordon, Victor Huang
Begin temperature simulation for floodplain habitat (Task 2)	Jul 1, 2014	Dan Dombroski, Elaina Gordon, Victor Huang
Begin analysis of select alternatives for rearing habitat improvement (Task 4)	Aug 1, 2014	Blair Greimann
Produce draft report for Task 3	Aug 1, 2014	Dan Dombroski
Finalize report for Task 3	Sep 30, 2014	Dan Dombroski
Assist on development of spawning habitat framework (Task 5)	Oct 1, 2013 to Dec 30, 2015	Blair Greimann, Elaina Gordon
Begin analysis of select alternatives for rearing habitat improvement (Task 4)	May 1, 2014	Blair Greimann

4. Cost Estimate:		Estimated Staff Days			Estimated \$		
FY	Task List and/or Organization Code	SL1	SL2	SL3	SD \$	Fee \$	Non-labor \$
	Total Prior FY Actuals						
FY14	1. Data Report for facies mapping			15	\$13,680		\$2,000
	2. Temperature analysis		35	25	\$48,560		\$2,000
	3. Vegetation roughness effects		35	5	\$30,320		\$4,000
	4. Hydraulic and Sediment Transport Analysis of Rearing Habitat		20	30	\$42,080		
	5. Spawning habitat framework		20	25	\$37,520		
	6. Meetings and Coordination		12	15	\$22,512		\$4,000
	7. Review for 1 - 5		10	15	\$21,040		
	8. Project Management and Fees			10	\$9,120	\$1,000	
FY15	9. Temperature analysis		15	10	\$20,760		
	10. Hydraulic and Sediment Transport Analysis of Rearing Habitat		15	25	\$34,800		
	11. Review			5	\$4,680		
Fiscal Year 2014 Totals			132	140	\$224,800	\$1,000	\$12,000
Fiscal Year 2015 Totals			132	140	\$60,200	\$-	\$-
Total PMP Budget = \$298,000					\$	\$	\$
Earned Value: Yes [No]							

5. Roles and Responsibilities: (list of the key players, their titles, and roles)

- Blair Greimann – Project Management, analysis of rearing habitat areas
- Dan Dombroski – assessment of vegetation roughness effects, assistance on temperature modeling
- Elaina Gordon – assessment of vegetation roughness effects, assistance on temperature modeling
- Victor Huang – assistance on temperature modeling
- Potential new hire - analysis of rearing habitat areas

6. Quality Control: TSC peer review will be performed in accordance with the TSC Operating Guidelines.

7. Change Management: Change Order Form X___ Thresholds: Schedule X___ Cost X___

- If the TSC cannot perform the tasks within funding available or within schedule, a revised budget will be submitted to SJRRP for approval.