Study 38

Vegetation Roughness Effects in SJRRP Affected Reaches

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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### 1. Objectives/Scope Statement:

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. Quantification of the increase in river stage due to an increase in vegetation roughness in SJRRP affected reaches

### 2. Scope Definition:

- 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.
**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

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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:

<table>
<thead>
<tr>
<th>Milestone Dates</th>
<th>Resource Assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 1, 2013</td>
<td>Blair Greimann</td>
</tr>
<tr>
<td>Dec 1, 2013</td>
<td>Blair Greimann</td>
</tr>
<tr>
<td>Jan 1, 2014</td>
<td>Blair Greimann</td>
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<tr>
<td>Mar 1, 2014</td>
<td>Blair Greimann</td>
</tr>
<tr>
<td>May 1, 2014</td>
<td>Dan Dombroski, Elaina Gordon, Victor Huang</td>
</tr>
<tr>
<td>Jul 1, 2014</td>
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<td>Aug 1, 2014</td>
<td>Blair Greimann</td>
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<td>Aug 1, 2014</td>
<td>Dan Dombroski</td>
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<td>Sep 30, 2014</td>
<td>Dan Dombroski</td>
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<td>Oct 1, 2013 to Dec 30, 2015</td>
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<tr>
<td>May 1, 2014</td>
<td>Blair Greimann</td>
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### 4. Cost Estimate:

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<thead>
<tr>
<th>FY</th>
<th>Task List and/or Organization Code</th>
<th>Estimated Staff Days</th>
<th>Estimated $</th>
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<td>Total Prior FY Actuals</td>
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<td>SL2</td>
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<td>FY14</td>
<td>1. Data Report for facies mapping</td>
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<tr>
<td></td>
<td>2. Temperature analysis</td>
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<tr>
<td></td>
<td>3. Vegetation roughness effects</td>
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</tr>
<tr>
<td></td>
<td>4. Hydraulic and Sediment Transport Analysis of Rearing Habitat</td>
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<td>30</td>
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<tr>
<td></td>
<td>5. Spawning habitat framework</td>
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<tr>
<td></td>
<td>6. Meetings and Coordination</td>
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<td>7. Review for 1 - 5</td>
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<td>8. Project Management and Fees</td>
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<tr>
<td>FY15</td>
<td>9. Temperature analysis</td>
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<td>10. Hydraulic and Sediment Transport Analysis of Rearing Habitat</td>
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<td>11. Review</td>
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</table>

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 | $ | $ | $ |

### 5. Roles and Responsibilities:

- 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.