<table>
<thead>
<tr>
<th>Preparer Information</th>
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<tbody>
<tr>
<td>PrepName_1A</td>
<td>Walter N Heady</td>
</tr>
<tr>
<td>PrepEmail_1B</td>
<td><a href="mailto:heady@biology.ucsc.edu">heady@biology.ucsc.edu</a></td>
</tr>
<tr>
<td>PrepPhone_1C</td>
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<tr>
<td>ProjectTitle_4</td>
<td>Effects of habitat heterogeneity on the growth, survival and movement of juvenile steelhead (Oncorhynchus mykiss) with implications for management</td>
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<th>CALFed Fellow contact information</th>
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<tbody>
<tr>
<td>FelTitle_5A</td>
<td>Mr Heady</td>
</tr>
<tr>
<td>FelLast_5B</td>
<td>Heady</td>
</tr>
<tr>
<td>FelFirst_5C</td>
<td>Walter</td>
</tr>
<tr>
<td>FelInit_5D</td>
<td>N</td>
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<tr>
<td>FellInstitution_5E</td>
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<tr>
<td>FelDepartment_5F</td>
<td>Ecology and Evolutionary Biology</td>
</tr>
<tr>
<td>FelStreetAddr_5G</td>
<td>100 Shaffer Rd</td>
</tr>
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</tr>
<tr>
<td>FelState_5I</td>
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<tr>
<td>FelZip_5J</td>
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</tr>
<tr>
<td>FelPhone_5K</td>
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</tr>
<tr>
<td>FelFax_5L</td>
<td>831 459 3383</td>
</tr>
<tr>
<td>FelEmail_5M</td>
<td><a href="mailto:heady@biology.ucsc.edu">heady@biology.ucsc.edu</a></td>
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<th>Research Mentor (for additional please see #8)</th>
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<tbody>
<tr>
<td>RMTitle_6A</td>
<td>Dr Mark</td>
</tr>
<tr>
<td>RMLastName_6B</td>
<td>Carr</td>
</tr>
<tr>
<td>RMFirstName_6C</td>
<td>Mark</td>
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<td>RMPHONE_6K</td>
<td>831 459 3958</td>
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<tr>
<td>RMFax_6L</td>
<td>831 459 3383</td>
</tr>
<tr>
<td>RMEmail_6M</td>
<td><a href="mailto:carr@biology.ucsc.edu">carr@biology.ucsc.edu</a></td>
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<tr>
<td>CMTtitle_7A</td>
<td>Dr Joseph</td>
</tr>
<tr>
<td>CMLastName_7B</td>
<td>Merz</td>
</tr>
<tr>
<td>CMFirstName_7C</td>
<td>Joseph</td>
</tr>
<tr>
<td>CMInit_7D</td>
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<tr>
<td>CMInstitution_7E</td>
<td>East Bay Municipal Utilities District</td>
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Major goals of my research are to 1) determine the effects of water temperature, streamflow and food availability on juvenile steelhead growth, survival and movement, 2) determine how habitat features such as instream wood, gravel complexes, or side channels affect community structure of fresh water macro-invertebrates and fish, and in turn 3) relate these results to how habitat qualities affect steelhead at the individual level such as growth, movement and survival, as well as at the population level 4) determine how water management regimes and their timing, and habitat restoration or enhancement efforts affect juvenile steelhead 5) provide information and tools to the East Bay Municipal Utility District (EBMUD) and CALFED for use in water management to efficiently provide water to customers while maximizing habitat and productivity for threatened steelhead.
I am currently examining benthic and drift macro-invertebrate samples collected from two side channels on the Mokelumne River created as habitat enhancements. I am examining how these newly created habitats are colonized by fresh water macro-invertebrates (a preferred food of juvenile steelhead) and how the macro-invertebrate community develops through time (succession). This information is necessary for our understanding of the ecology of these systems and to help direct restoration and habitat enhancement efforts in the future. By comparing macro-invertebrate community structure (i.e. diversity and abundance of taxa) to concurrent diet samples collected from within the side channels I can relate the colonization and success of these habitats to benefits to steelhead. This in turn relates habitat management actions to the management of sensitive species such as steelhead. I hope to expand this aspect of the research. I am preparing results of my study to present at the 4th Biennial CALFED Science Conference 2006.


PROJECT MODIFICATIONS: Please explain any substantial modifications in research plans, including new directions pursued. Describe major problems encountered, especially problems with experimental protocols and how they were resolved. Describe any ancillary research topics developed.

I am interested in examining the role of habitat heterogeneity on community structure of aquatic macro-invertebrates and fish. I am then interested in examining how the resulting community structuring from habitat features such as instream wood and side channels affect individual growth and population level dynamics of sensitive species such as Oncorhynchus mykiss. Results could help direct restoration and other management actions to benefit such sensitive species.
Results could help restoration and habitat enhancement efforts to benefit sensitive species. Results could also direct water management to benefit sensitive species, ecosystem functions, and buffer extreme stream flows while still providing ample and reliable water for customers.
**PUBLICATIONS**: List any publications, presentations, or posters that have resulted from this funded research. Give as many details as possible, including status of paper (e.g., in review; in press), journal name, conference location and date of presentation. Please note (as outlined in the conditions of the award) that each fellow is required to submit an abstract for an oral or poster presentation at each State of the Estuary conference and CALFED Science Conference during the duration of the fellowship.

**Publications:**

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<tr>
<td>15 minute oral presentation at:</td>
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<tr>
<td>4th Biennial CALFED Science Conference 2006</td>
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<tr>
<td>Making Sense of Complexity: Science for a Changing Environment</td>
</tr>
<tr>
<td>OCTOBER 23-25, 2006</td>
</tr>
<tr>
<td>Sacramento Convention Center</td>
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<tr>
<td>1400 J Street, Sacramento, California</td>
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</table>
East Bay Municipal Utilities District EBMUD

Dr. Joseph Merz is my community advisor on my project. EBMUD has been very helpful in letting me come out for their field work to help familiarize myself with the system. They have also been very supportive in letting me view data to help direct my research. I am performing lab analysis on field samples that EBMUD collected. This benefits EBMUD by getting the work done and statistically analyzed and provides me with something to present at the CALFED symposium, as well as act as a pilot study to direct my project. Dr. Merz has been incredibly helpful through this whole process.

I received both the Friends of Long Marine Lab Student Research and Education Award and the STEPS Institute Awards for Graduate and Undergraduate Environmental Research.

Juvenile steelhead, rainbow trout, oncorhynchys mykiss, growth, movement, survival, habitat features, habitat heterogeneity, community, macro-invertebrates, PIT tag, instream wood, side channel,
### PATENTS: List any patents associated with your project.

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### Additions: Additional information can be added here. Please begin the text with the number of the question you are adding to.

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