Habitat Expansion Agreement

for

Central Valley Spring-Run Chinook Salmon and California Central Valley Steelhead

Questionnaire Instructions

The attached questionnaire is intended to solicit information needed by the Steering Committee to review projects relative to the criteria established in the Habitat Expansion Agreement. For each proposed action (project), please complete the questionnaire to the fullest extent possible. Please provide citations where applicable and provide a full reference for each citation at the end of this questionnaire (Section X. Supporting Documents). Specific instructions follow.

I. Contact Information

Provide the name of the agency or group making the proposal as well as a contact person for the project. Include contact information such as mailing address, phone number, and email address.

II. Project Description

Provide a descriptive name for the action (project). If the action is listed in the *Working List of Potential Habitat Expansion Actions* (provided during the January 2009 meetings of HEA parties), please include the reference number associated with the action. The project location should specify the watershed or subwatershed (e.g., Deer Creek, Beegum Creek) as well as specific areas within the watershed where the project will be located and what portions of the watershed will benefit from the project. Please include geographic coordinates of the project location(s), if applicable. The project description should be a narrative that provides as much detail as possible about the project.

III. Species Limiting Factors

In this section, indicate the factors that currently limit production of spring-run Chinook salmon and/or steelhead in your watershed. The intent is that the environmental and biological objectives of your project address these limiting factors in some way. Please check one or more of the limiting factors that apply to your watershed. In the second column, describe how and where the factor limits spring-run Chinook salmon and/or steelhead. For each factor that you check, please rank its effect on spring-run Chinook salmon and/or steelhead using the drop-down box in the last column. Finally, we also ask that you describe the source of your conclusions, such as a watershed assessment or other document. Please provide enough information that we can find the document if we need it.

IV. Project Objectives—Environmental

Environmental objectives describe how the project is intended to address the limiting factors to achieve the biological objective described in the next section. Environmental objectives should be as specific and quantitative as possible (e.g., reduce gravel embeddedness in the watershed from 75% to 25% by fencing riparian areas to exclude cattle and allow riparian forest to reestablish). Describe how you think environmental objectives relate specifically to the biological objectives. In the last column, we ask you to describe the environmental objectives as either the primary or secondary focus of the project. For example, a project to plant trees might have a primary focus on riparian/floodplain function with a secondary focus on temperature or water quality.

V. Project Objectives—Biological

Biological objectives describe the anticipated biological response from the project and should be as quantitative as possible. Indicate which species and life stages are the focus of the project. Describe specifically the general condition of the target species in your watershed relative to the historical abundance. The condition of the species should be indicated using the categories in the drop-down box. Species condition categories are defined on the last page of this form. Biological objectives should include the following information: (1) an estimate of the expected contribution of the project in terms of potential adult returns, to the extent possible (and an explanation of how the estimate was developed); and (2) an explanation of how the biological objective for the species is addressed by the action relative to the environmental limiting factors (e.g., the biological objective of an action might be to increase egg incubation survival in a watershed that is currently limited by sediment levels).

VI. Project Cost

To the extent possible, estimate the capital cost of the project, the annual operating and maintenance (O&M) cost, a description of annual O&M activities, and the project lifetime (i.e., how many years O&M activities are expected, including indefinitely, and how long until you expect the project to provide benefits). Provide any confirmed or potential funding partners, or opportunities for cost sharing with other funders or between projects. Also, identify any confirmed or potential partners that might provide maintenance support for the project (funding support or labor support).

VII. Schedule

Describe the project schedule, including a potential start date, construction period, and environmental and biological response times (i.e., the expected time to realize environmental and biological benefits). The last points refer to the maturation period for the project during which time environmental conditions develop. For example, it may take 50–100 years before full environmental benefits (e.g., shading, channel stability, water quality) of planting riparian trees are realized.

VIII. Feasibility

Describe the feasibility and challenges of the project. Feasibility issues should include primarily technical issues, success of projects utilizing similar technology, and particular challenges posed by the specific project. Other issues of feasibility that may be included are challenges associated with property ownership, permitting, zoning, and other social-economic-legal issues.

IX. Project Support

Describe the support or potential conflicts associated with the project. Specifically, provide supporting and cooperating entities (e.g., agencies, non-governmental organizations). Are there cooperating agencies or groups, aside from the potential funding partners mentioned previously? Describe the degree of local support and any known opposition or conflicts with other parties.

X. Supporting Documents

Provide full references for each citation used to support the information presented in this questionnaire for your project. At a minimum, a reference should include the author(s) name; name of agency/organization (if applicable); title of the document; volume and title of journal, if the document is taken from a professional journal; and publisher, date, and location of publication.

Questionnaire

for

Information on Potential Projects to Support Spring-Run Chinook Salmon and Steelhead in the Sacramento River Basin for the Habitat Expansion Agreement

DUE: Thursday, April 30, 2009

Send completed questionnaires to hea@water.ca.gov

I. Contact Information

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II. Project Description

Project Name:	Lower Yuba River Narrows Gravel Rehabilitation Project
Reference No. or New:	
Project Location:	The Narrows reach is an approximately a six-mile span of potentially high quality spring-run Chinook salmon spawning habitat located on the lower Yuba River from Englebright Dam to the State Route 20 Bridge in Yuba County, CA.

Project Description:

Englebright Dam was constructed in 1941 on the lower Yuba River to trap hyrdaulic mining debris left from the gold rush in California. The dam has been blocking the natural recruitment of spawning gravels in the Narrows reach for over 65 years. In many areas of this reach, the spawning gravels are completely absent and have been replaced by a bedrock substrate. Spring-run Chinook salmon have been observed to migrate and hold in this area of river, but spawning success has been largely impacted by a lack of suitable spawning substrate as a result of gravel impoundment at Englebright Dam. Gravel injection at this site is expected to expand available spawning habitat primarily for spring-run Chinook salmon, as suitable flow regimes already exist. A pilot gravel injection project

II. Project Description

was successfully completed in the Narrows reach during November 2007. Approximately 361 cubic yards of spawning gravels were injected below the Narrows II powerhouse. Aerial redd surveys conducted in 2008 positively identified spring-run Chinook salmon utilizing the pockets of gravel created by this pilot project. However, additional gravels are needed to fully rehabilitate this reach. This can be accomplished through the injection of approximately 54,000 cubic yards of gravel in the Narrows reach (Englebright-SR20) over several years. Preliminary estimates of this river section indicate that this activity can provide additional spawning habitat for over 4,850 spring-run Chinook salmon.

III. Species Limiting Factors

In this section, describe the limiting factors for spring-run Chinook salmon and steelhead in your watershed. The last page of this questionnaire defines the limiting factors.

Limiting Factors	Description (from back page)	Rank
☒ **Channel Form**	Channel incision and slope have been affected by land use, hydraulic mining and hydropower practices.	High
☒ **Channel Unit Types**	Natural channel morphological units have been altered by land use, hydraulic mining and hydropower practices.	High
☒ **Substrate**	Spawning gravel substrate has been completely lost in many sections of the lower Yuba River due to impoundment by Englebright Dam.	Critical
☒ **Structure**	Natural channel form and unit types synonomous with spawning habitat values (i.e. pool, riffle, bank structure, LWD retention, etc.) have been altered by land use, hydraulic mining and hydropower practices.	High
☐ **Flow**		Select Rank
☐ **Temperature**		Select Rank
☐ **Water Quality**		Select Rank
☒ **Passage**	Englebright Dam blocks access to the majority of historic spring-run Chinook salmon spawning habitat. Daguerre Point Dam creates passage difficulties for both adult and juvenile salmonids.	High
☐ **Riparian/Floodplain**		Select Rank

Source Documents:

Pasternack, Greg. 2009. SHIRA-based river analysis and field-based manipulative sediment transport experiments to balance habitat and geomorphic goals on the lower Yuba River. Final Report. U.C. Davis Cooperative Ecosystems Studies Unit

Available from http://pasternack.ucdavis.edu/LYR3_Pasternack_FINAL.pdf

Additional Notes:

III. Species Limiting Factors

IV. Project Objectives—Environmental

In this section, describe how your project will affect one or more of the limiting factors for spring-run Chinook salmon or steelhead described above.

Limiting Factor	Description and Objective	Focus
☒ **Channel Form**	Gravel injection will decrease channel incision and restore natural slope, thus serving to self-regulate additional gravel loss.	Secondary
☒ **Channel Unit Types**	Gravel injection will improve spawning habitat by restoring natual channel morphological units.	Secondary
☒ **Substrate**	Gravel injection will restore natural spawning substrate absent in this reach.	Primary
☒ **Structure**	Gravel injection will restore natural channel form and unit types synonomous with spawning habitat values (i.e. pool, riffle, bank structure, LWD retention, etc.).	Primary
☐ **Flow**		Select Focus
☐ **Temperature**		Select Focus
☐ **Water Quality**		Select Focus
☐ **Passage**		Select Focus
☐ **Riparian/Floodplain**		Select Focus

V. Project Objectives—Biological

In this section, describe the objective(s) of your project relative to the goal of providing habitat for spring-run Chinook salmon and steelhead. Indicate the species and life stage that are targeted by the project. (It is okay to have more than one species/life stage target).

Target Species: ☒ Spring-Run Chinook Salmon **Population Status Specific to Watershed:** Stable

Target Life Stages:

☒ Spawning ☒ Egg Incubation ☒ Summer Rearing ☒ Winter Rearing

☐ Juvenile Emigration ☐ Adult Immigration ☒ Adult Holding

Description of Project Objectives:

The objective of this project is to restore gravel recruitment below Englebright Dam. This process is a critical step to restoring historic spring-run Chinook salmon populations on the lower Yuba River. Gravel injection will serve to restore historic spawning areas currently under-utilized. This process will also serve to restore several other natural river channel unit, form and structural functions; including a reduction of channel incision, restoration of natural

V. Project Objectives—Biological

slope for gravel retention, and restoration of natural pool/run/riffle mesohabitat interactions.

Target Species: ☒ Steelhead

Population Status Specific to Watershed: Stable

Target Life Stages:

☒ Spawning ☒ Egg Incubation ☒ Summer Rearing ☒ Winter Rearing

☐ Juvenile Emigration ☐ Adult Immigration

Description of Project Objectives:

Steelhead escapement to the lower Yuba River is currently unknown, but monitoring activities have observed adult and juvenile steelhead to be present. Adult spawning activity and yearly emigrations have been observed. Restoration of historic spawning areas will likely improve habitat conditions for this species.

VI. Project Cost

Capital Cost:	$3,000,000 (estimated) for initial 54,000 cu yards
Annual Operation and Maintenance Cost:	Unknown
Annual Operation and Maintenance Description:	Annual replentishment of gravel substrate will be necessary for the period that Englebright Dam blocks natural downstream gravel movement.
Project Lifespan:	The project would have a lifespan corresponding with the continued operation of Englebright Dam.
Project Partners (Funding):	Unknown
Project Partners (Maintenance):	Unknown

VII. Schedule

Proposed Start:	Once permits and funding are secured (possibly November 2009).
Expected Time to Completion:	One month
Expected Time to Realize Environmental Benefits:	Immediate
Expected Time to Realize Biological Benefits:	Immediate

VIII. Feasibility

Technical Feasibility:	A pilot gravel injection project was successfully completed in November 2007.
Technical Challenges:	None. All were addressed during pilot project activities.
Related Projects:	A number of restoration projects are in various stages of completion to address passage, spawning and rearing components of a complete river rehabilitation.
Ownership or Permitting Challenges:	The property is owned jointly by PGE, YCWA and USACE. Permits were successfully acquired for the pilot project. No significant challenges forseen.
Conflicts with Cultural, Zoning, or Other Issues:	None identified at this time.

IX. Project Support

Supporting Entities:	U.C. Davis, NMFS, USFWS, USACE, CDFG, PGEYCWA, Yuba River Accord Management Team, Yuba River Technical Working Group, South Yuba River Citizens League
Cooperating Entities:	U.C. Davis, NMFS, USFWS, USACE, CDFG, PGE, YCWA
Degree of Local Support:	High at this time.
Known Opposition:	None identified at this time.

X. Supporting Documents

Please provide a full reference for each citation used to support the information presented in this questionnaire.

Pasternack, Greg. 2009. SHIRA-based river analysis and field-based manipulative sediment transport experiments to balance habitat and geomorphic goals on the lower Yuba River. Final Report. U.C. Davis Cooperative Ecosystems Studies Unit

Available from http://pasternack.ucdavis.edu/LYR3_Pasternack_FINAL.pdf.

Definitions of Limiting Factors for Spring-Run Chinook Salmon and Steelhead

Channel Form

This attribute describes changes to the channel, including incision, aggradation, diking, armoring, and other modifications of the channel adversely affecting spring-run Chinook salmon and steelhead.

Channel Unit Types

Examples of geomorphic features of the channel that form habitat types for spring-run Chinook salmon and steelhead are pools, riffles, glides, and runs. This attribute describes changes in the frequency and size of such features. For example, removal of large wood may reduce the frequency of pools, presence of steps, or retention of gravel for riffles.

Substrate

This attribute describes changes in the composition of the substrate of the stream, including increase in fine sediment and lack of gravel recruitment.

Structure

This attribute describes the loss of structural elements in the stream such as large wood, boulders, undercut banks, and so on. Loss of structure results in a simplification of the channel and influences Channel Form and Channel Unit Types.

Flow

This attribute addresses modification of the flow regime, including decrease in summer low flow, increased "flashiness," and dewatering of the channel as a result of withdrawals.

Temperature

Change in water temperature can be attributable to human actions such as removal of riparian shading. This attribute describes the increase in summer water temperature and the loss of temperature refugia (springs or groundwater) as a result of human actions.

Water Quality

This attribute pertains to the input to the stream of toxins or pollutants that produce adverse impacts on spring-run Chinook salmon or steelhead. This can include chemical pollutants such as fertilizer and pesticides and nutrient sources such as cattle and feedlots.

Passage

This relates to the effect of impediments to adult or juvenile migration of spring-run Chinook salmon or steelhead, including dams, culverts, channel dewatering, and other structural and channel modifications. Please describe the location of the passage impediment and describe the extent of impediment (i.e., a complete or partial blockage to migration).

Riparian/Floodplain

This attribute describes the loss of functionality of the riparian forest/vegetation and the connection of the stream to the floodplain during high water and flooding.

Population Condition Definitions for Section V. Project Objectives—Biological

Increasing

Adult returns of the target species to the watershed have generally been increasing over the last several years; expectations are that the species is displaying characteristics of a rebuilding or healthy population.

Stable

Adult returns of the target species to the watershed show no clear trend over the last several years.

Decreasing

Adult returns of the target species to the watershed are declining over the last several years; the decline in abundance is a cause of concern and characteristic of a potentially unhealthy population.

Intermittent

Adult returns of the target species are occasionally seen in the watershed, but there is no viable or sustained population in the basin.

Extirpated

The population has been eliminated from the watershed although the species was present in the past.

Never Present

The species has never been known to occur in the watershed.