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: Friday, February 27, 2009

Send completed questionnaires to hea@water.ca.gov

I. Contact Information

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II. Project Description

Project Name:	Antelope Creek valley floor channel analysis
Reference No. or New:	NS-4b
Project Location:	Antelope Creek from Edwards Diversion Dam, (lat 40.187116 long -122.134773), downstream to confluences with the Sacramento River (approximately 3 - 4 channels).

Project Description:

In the 2001 AFRP Final Restoration Plan, this Evaluation is identified; "Evaluate the creation of a more defined stream channel to facilitate fish passage by minimizing water infiltration into the streambed and maintaining flows to the Sacramento River." The multiple channels in lower Antelope Creek have been brought up several times in looking at recent proposed projects, particularly the juvenile bypass system to be constructed at the Edwards dam.

Snapshot habitat surveys were conducted by CDFG in February 1993. The flow in New Creek was 8 cfs, with a distance of 4.1 miles to the river. Although New Creek originates from Antelope Creek, it empties into Salt Creek,

II. Project Description

a tributary to the Sacramento River upstream of the Antelope Creek confluence. Craig Creek was 81 cfs with a distance of 1.8 miles to the river. Downstream of Craig Creek, the flow was 55 cfs in Antelope Creek (no records for how much flowed down Butler Slough). The distance in Antelope Creek from Craig Creek confluence to the Sacramento River is about 9 miles. If, or how, the lower system has changed during the past 16 years is unknown. It is also unknown if the the different channels are natural or created by past land management. In determining how the channels operate, and if anything can be done to restore aquatic habitat in lower Antelope Creek, additional water rights, flooding issues, etc. need to be considered.

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**	Below Edwards dam, Antelope Creek divides into many different channels. During low water years, as the water is divided, stranding of juvenile salmonids occurs, and adult migration is delayed. When Antelope Creek overflows into New Creek at the Edwards diversion dam, the water drains into another stream, Salt Creek. This multi-channel issue is identified in the 2001 Final AFRP Restoration Plan as an Evaluation needing to be completed.	Critical
☐ **Channel Unit Types**		Select Rank
☐ **Substrate**		Select Rank
☐ **Structure**		Select Rank
☒ **Flow**	Flow is an issue downstream of the Edwards dam. In low water years the stream can be dry spring through fall. What additional water rights occur downstream of the Edwards dam is unknown.	Critical
☒ **Temperature**	The temperature limiting factor is related to flow. Temperatures become lethal in the valley floor once the air temperature rises and flow is diverted.	High
☐ **Water Quality**		Select Rank
☒ **Passage**	Adult passage is affected by the multiple channels in the lower section, the amount of flow diverted at Edwards dam, and the partial barrier in the CDFG Tehama Wildlife Area. In addition, juvenile passage is affected by the current crossing structure in the Tehama Wildlife Area, the lack of a bypass from the two diversion canals at Edwards dam, and the multiple channels below Edwards dam.	Critical
☐ **Riparian/Floodplain**		Select Rank

Source Documents:

Additional Notes:

III. Species Limiting Factors

IV. Project Objectives—Environmental

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

Limiting Factor	Description and Objective	Focus
☒ **Channel Form**	Assessing the valley floor channels will assit in determing what is natural and what has been influenced by past/current land management. This information will help determine what can and cannot be implemented for improving channel function.	Primary
☐ **Channel Unit Types**		Select Focus
☐ **Substrate**		Select Focus
☐ **Structure**		Select Focus
☒ **Flow**	Assessing the valley floor channels will assist in determining what can be done to minimize the water being diverted down different channels, thereby increasing flow for juvenile emigration and adult immigration. However this needs to be done in light of water rights and flooding issues.	Primary
☒ **Temperature**	Assessing the valley floor channels will assist in determining what can be done to minimize the water being diverted down different channels, thereby decreasing water temperature.	Primary
☐ **Water Quality**		Select Focus
☒ **Passage**	Assessing the valley floor channels will assist in determining what can be done to minimize the water being diverted down different channels, thereby minimizing adult migration delays and juvenile stranding in channels that do not have enough water for emigration.	Primary
☐ **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:** Decreasing

Target Life Stages:

☐ Spawning ☐ Egg Incubation ☐ Summer Rearing ☐ Winter Rearing

☒ Juvenile Emigration ☒ Adult Immigration ☐ Adult Holding

Description of Project Objectives:

Assessing the valley floor channels will assist in determining what can be done to minimize the water being diverted down different channels/maximize water moving through less channels. The ultimate goal is getting adults to holding and spawning habitat without delay; and getting juveniles out to the Sacramento River without stranding or dying due to high water temperatures.

Target Species: ☒ Steelhead **Population Status Specific to Watershed:** Relative to Historical

Target Life Stages:

☐ Spawning ☐ Egg Incubation ☐ Summer Rearing ☐ Winter Rearing

☒ Juvenile Emigration ☐ Adult Immigration

Description of Project Objectives:

Assessing the valley floor channels will assist in determining what can be done to minimize the water being diverted down different channels/maximize water moving through less channels. The ultimate goal is getting adults to holding and spawning habitat with out delay; and getting juveniles out to the Sacramento River without stranding or dying due to high water temperatures.

VI. Project Cost

Capital Cost: estimated $150,000

Annual Operation and Maintenance Cost:

Annual Operation and Maintenance Description:

Project Lifespan: 2 - 3 years for assessment; unknown for implementing recommendations.

Project Partners (Funding):

Project Partners (Maintenance):

VII. Schedule

Proposed Start:	2009
Expected Time to Completion:	2011 or 2012 for assessment
Expected Time to Realize Environmental Benefits:	Depends on what is needed on ground and when implemented.
Expected Time to Realize Biological Benefits:	Depends on what is needed on ground and when implemented.

VIII. Feasibility

Technical Feasibility:	Should not be difficult, many consulting firms with past experience.
Technical Challenges:	Obtaining permission from all the landowners for access.
Related Projects:	Two passage projects upstream. Juvenile fish bypass at Edwards Dam and road crossing in the CDFG Tehama Wildlife Area. These have been submitted on other Questionnaires NS-4a, and NS-5.
Ownership or Permitting Challenges:	Unknown
Conflicts with Cultural, Zoning, or Other Issues:	None identified at this time.

IX. Project Support

Supporting Entities:	
Cooperating Entities:	USFWS, CDFG, NMFS, TCRCD
Degree of Local Support:	High within agencies
Known Opposition:	None known at this time.

X. Supporting Documents

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

USFWS. 2001. Final Restoration Plan for the Anadromous Fish Restoration Program.

USFWS. 2008. Internal document of Limiting Factors developed for 10 year CVPIA Implementation Strategy.

X. Supporting Documents

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.