



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

Name: Randy Benthin, Senior Environmental Scientist
Organization: California Department of Fish and Game
Address: 601 Locust Street
City, State, Zip Code: Redding, CA 96001
Phone Number: (530) 225-2372
Email Address: rbenthin@dfg.ca.gov

II. Project Description

Project Name: Mill Creek TNC Water Rights Purchase
Reference No. or New: NS-51
Project Location: Mill Creek, Tehama County
The Valley reach of Lower Mill Creek from River Mile 0 (RM) (coordinates: 40.0373292N, 122.1155868W) to RM 5.8 (coordinates 40.0548555N, 122.0307310W).
Water is diverted for agricultural purposes (or returned to the creek for Chinook Flows) at two locations: Ward Dam, located at RM 3.0 (coordinates 40.0531670N, 122.0753935W) and Los MoLinos Mutual Water Company Upper Diversion Dam, located at RM 5.8 (coordinates 40.0548555N, 122.0307310W).

II. Project Description

Project Description:

In 1920, the Tehama County Superior Court of the State of California adjudicated entitlements to all Mill Creek flow below 203 cubic feet per second (cfs). As such, water right holders on Mill Creek legally divert a significant portion of the surface water flow for agricultural beneficial use. During dry or critically dry years, the agricultural demand for surface water can reduce Mill Creek flow and expose in-stream barriers to Chinook and steelhead migrations. Since 1990, Mill Creek flows have been augmented through water leases, groundwater exchange programs and facility operational changes. These efforts have proven beneficial in providing passage flows for spring-run Chinook and steelhead in dry and critically dry water years. In 2007, a Long-Term Cooperative Management Plan for Mill Creek was formalized to create a management structure through which any new leases, water right purchases or transfers, easement agreements and other water use arrangements would provide for Chinook Flows while protecting and preserving irrigation water and the recognition of surface water rights. The Management Committee implementing this Long-Term Agreement is comprised of Los Molinos Mutual Water Company (LMMWC), California Department of Water Resources (CDWR), California Department of Fish and Game (CDFG), and Mill Creek Conservancy (MCC).

In 2006 and again in 2008, two adjudicated water rights became available for purchase. The Nature Conservancy (TNC) was able to quickly acquire these rights with an understanding they would eventually re-sell them to an appropriate entity who would administer them pursuant to the terms within the Long-Term Cooperative Management Plan. TNC purchased the two water rights, equal to approximately 18 cubic feet-per-second, or nearly 10% of Mill Creek base flow. The entities being considered for resale and transfer of the water rights include DFG, DWR, LMMWC, or MCC. Regardless of who eventually ends up owning the water rights it's understood the acquired water rights will be managed to benefit Chinook salmon in general but will specifically benefit of Central Valley spring-run Chinook and Steelhead.

This Project is requesting the necessary funds to purchase these two water rights from TNC and include them in the Mill Creek Cooperative Management Plan for the benefit of Chinook flows. These acquired rights would be administered by LMMWC as Water Master for Mill Creek. The increased flow provided by these water rights would allow additional spring-run Chinook and steelhead adults to access the creek during dry and critically dry years. These increased flows would also increase survival of outmigrating juvenile and yearling salmon and steelhead smolts, thus increasing adult returns.

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.

<u>Limiting Factors</u>	<u>Description (from back page)</u>	<u>Rank</u>
<input type="checkbox"/> Channel Form		Select Rank
<input type="checkbox"/> Channel Unit Types		Select Rank
<input type="checkbox"/> Substrate		Select Rank
<input type="checkbox"/> Structure		Select Rank
<input checked="" type="checkbox"/> Flow	Agricultural diversions in the valley reach of Mill Creek can reduce flows, thus impeding both upstream and downstream salmonid passage during critical migration times.	Critical
<input checked="" type="checkbox"/> Temperature	Reduced flows in the valley reach of Mill Creek from agricultural	High

III. Species Limiting Factors

diversions can increase water temperatures through partially dewatered channels. This thermal barrier can inhibit adult salmonid attraction and migration into Mill Creek.

<input type="checkbox"/> Water Quality		Select Rank
<input checked="" type="checkbox"/> Passage	Channel dewatering from agricultural diversions causes migration impediments at critical riffles.	High
<input type="checkbox"/> Riparian/Floodplain		Select Rank

Source Documents:

California Department of Fish and Game (CDFG). 1990. Central Valley Salmon and Steelhead Restoration and Enhancement Plan. Inland Fisheries Division.

California Department of Fish and Game (CDFG). 1993. Restoring Central Valley Streams: A Plan for Action. Inland Fisheries Division.

California Department of Fish and Game (CDFG). 1996. Steelhead Restoration and Management Plan for California. Inland Fisheries Division.

California Department of Fish and Game (CDFG). 1998. A Status Review of the Spring-run Chinook Salmon (*Oncorhynchus tshawytscha*) in the Sacramento River Drainage. Candidate Species Status Report 98-01.

California Resources Agency. 1989. Upper Sacramento River Fisheries and Riparian Habitat Management Plan. January 1989.

Mill Creek Management Committee. 2007. Agreement for the Implementation of a Long-Term Cooperative Management Plan for Mill Creek. Memorandum of Agreement between Los Molinos Mutual Water Company, Mill Creek Conservancy, California Department of Fish and Game, and California Department of Water Resources. October 2007.

Mill Creek Watershed Conservancy. 1997. Mill Creek Watershed Management Strategy Report. Prepared by CH2MHill. January 1997.

United States Fish and Wildlife Service. 2001. Final Restoration Plan for the Anadromous Fish Restoration Program.

United States Forest Service. 2000. Watershed Analysis for Mill, Deer, and Antelope Creeks. Lassen National Forest.

Additional Notes:

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.

<u>Limiting Factor</u>	<u>Description and Objective</u>	<u>Focus</u>
<input type="checkbox"/> Channel Form		Select Focus

IV. Project Objectives—Environmental

<input type="checkbox"/> Channel Unit Types		Select Focus
<input type="checkbox"/> Substrate		Select Focus
<input type="checkbox"/> Structure		Select Focus
<input checked="" type="checkbox"/> Flow	Increasing the instantaneous bypass flow by up to 18 cfs (combined total of the 2 rights) or providing pulsed flows will provide unimpeded creek access and passage for the later spring migrating adult spring-run Chinook, outmigrating juvenile spring-run Chinook, steelhead kelts and steelhead smolts. In addition, enhanced flows in the fall of up to 18 cfs, will allow creek access and passage for the earlier fall migrating adult steelhead and outmigrating spring-run Chinook yearlings.	Primary
<input checked="" type="checkbox"/> Temperature	As long as pre-diversion water temperatures remain within tolerance limits of migrating salmonids, increasing the instantaneous bypass flow and providing pulsed flows will decrease the rate of thermal warming in the post-diversion reach of lower Mill Creek. Decreased water temperatures will delay the formation of thermal barriers to upstream migration of adult spring-run Chinook and will prolong the duration of the spring migration period.	Secondary
<input type="checkbox"/> Water Quality		Select Focus
<input checked="" type="checkbox"/> Passage	Increased bypass flows in the late spring and early fall will provide passage over critical riffles in the post-diversion reach of lower Mill Creek.	Secondary
<input type="checkbox"/> 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** Stable
Specific to Watershed:

Target Life Stages:

- Spawning Egg Incubation Summer Rearing Winter Rearing
 Juvenile Emigration Adult Immigration Adult Holding

Description of Project Objectives:

In recent years, the estimated escapement of spring-run Chinook in Mill Creek has ranged from 350 to 1600 fish. Past estimates from the 1940's suggest that Mill Creek supported up to 3,500 spring-run Chinook. The habitat in upper Mill Creek has remained intact since these historical counts and still provides sufficient habitat for spring-run Chinook holding, spawning and early life stage development. The main factor in the watershed limiting stable or increasing adult returns is reliable passage flows into and out of the creek. During the spring, low flows in Mill Creek may cause in-stream barriers, particularly in dry and critically dry years. Augmenting instream flows at

V. Project Objectives—Biological

certain times will result in improved passage which will benefit migrating adult and juvenile spring-run Chinook during the late spring months (May 1 through June 15.) Improved passage from October 15 through November 30 will benefit out-migrating yearling spring-run Chinook. Therefore, the objective of this project is to acquire water rights dedicated to providing spring-run Chinook salmon in-stream flows during critical migration periods. These transportation flows will provide passage for salmon unable to ascend Mill creek in dry and critically dry years.

Target Species: Steelhead

Population Status Decreasing
Specific to Watershed:

Target Life Stages:

Spawning Egg Incubation Summer Rearing Winter Rearing
 Juvenile Emigration Adult Immigration

Description of Project Objectives:

Steelhead counts in Mill Creek are sporadic and escapement is largely unknown. Counts in the 1950's suggest escapement of up to 2,300 steelhead. Upper Mill Creek currently provides sufficient habitat for Steelhead holding, spawning and early life stage development. The main factor in the watershed limiting stable or increasing adult returns is reliable passage flows into and out of the creek. During the spring and early fall, low flows in Mill Creek may cause in-stream barriers, particularly in dry and critically dry years. Augmenting instream flows at certain times will result in improved passage which will benefit migrating Steelhead kelts and smolts during the late spring months (May 1 through June 15.) Improved passage from October 15 through November 30 will benefit migrating adult Steelhead.

VI. Project Cost

Capital Cost: \$930,000 total for both water rights

Annual Operation and Maintenance Cost: \$5,000/year for both water rights

Annual Operation and Maintenance Description: CDFG is responsible for establishing the times and amounts of water under the Acquired Water Rights that are desirable to remain in lower Mill Creek for Chinook Flows. In order to determine the need and timing for "calling on" Acquired Water Rights for Chinook Flows, CDFG monitors pre- and post-diversion water temperature and flows in late spring and early fall. Stream surveys are made in the post-diversion reach of lower Mill Creek to identify and monitor potential critical passage riffles. LMMWC, as Water Master for Mill Creek, determines ditch operations based on obligations to water users while foregoing irrigation during a Chinook Flow event. LMMWC is responsible for water accounting and reporting to CDWR for reimbursement in ground water exchanges. Calling on Acquired Water Rights for Chinook Flows is not an annual event. It is a tool in dry and critically dry years to provide assured migration flows for the duration of the migration season.

Project Lifespan: The benefits derived from this Project will remain in effect as long as the Memorandum of Agreement for the Implementation of the Long-Term Cooperative Management Plan for Mill Creek remains in existence. Withdrawal of any Party or future admendments to the Agreement will not effect the right and obligation to administer Acquired Water Rights for Chinook Flows.

VI. Project Cost

Project Partners (Funding):	Delta Four-Pumps Committee reimburses the CDWR for the pumping costs associated with the Ground Water Exchange Program. Labor costs associated with pulse flows, and riffle, flow, and water temperature monitoring are provided by the existing operating expenses of LMMWC and CDFG.
Project Partners (Maintenance):	TNC, CDFG, CDWR, MCC and LMMWC

VII. Schedule

Proposed Start:	Immediate
Expected Time to Completion:	Immediate
Expected Time to Realize Environmental Benefits:	Immediate
Expected Time to Realize Biological Benefits:	Immediate

VIII. Feasibility

Technical Feasibility:	In 2006 and again in 2008, adjudicated water rights were successfully acquired by TNC to providing in-stream benefit, specifically for Chinook flows. TNC has expressed interest in selling their adjudicated water rights on Mill Creek.
Technical Challenges:	Prior to finalizing a transfer of the water rights, TNC, in consultation with the other Mill Creek Management Group members, will develop an accurate way of accounting for water usage, and will determine the proper legal mechanism for deeding the rights to another entity.
Related Projects:	Mill Creek Water Exchange Program, the Long-Term Cooperative Management Plan for Mill Creek
Ownership or Permitting Challenges:	TNC will determine the proper legal mechanism for deeding the water rights to another entity.
Conflicts with Cultural, Zoning, or Other Issues:	None identified at this time.

IX. Project Support

Supporting Entities:	TNC
Cooperating Entities:	TNC, CDFG, CDWR, MCC, LMMWC
Degree of Local Support:	High at this time.

IX. Project Support

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.

California Department of Fish and Game (CDFG). 1990. Central Valley Salmon and Steelhead Restoration and Enhancement Plan. Inland Fisheries Division.

California Department of Fish and Game (CDFG). 1993. Restoring Central Valley Streams: A Plan for Action. Inland Fisheries Division.

California Department of Fish and Game (CDFG). 1996. Steelhead Restoration and Management Plan for California. Inland Fisheries Division.

California Department of Fish and Game (CDFG). 1998. A Status Review of the Spring-run Chinook Salmon (*Oncorhynchus tshawytscha*) in the Sacramento River Drainage. Candidate Species Status Report 98-01.

California Resources Agency. 1989. Upper Sacramento River Fisheries and Riparian Habitat Management Plan. January 1989.

Mill Creek Management Committee. 2007. Agreement for the Implementation of a Long-Term Cooperative Management Plan for Mill Creek. Memorandum of Agreement between Los Molinos Mutual Water Company,

Mill Creek Conservancy, California Department of Fish and Game, and California Department of Water Resources. October 2007.

Mill Creek Watershed Conservancy. 1997. Mill Creek Watershed Management Strategy Report. Prepared by CH2MHill. January 1997.

United States Fish and Wildlife Service. 2001. Final Restoration Plan for the Anadromous Fish Restoration Program.

United States Forest Service. 2000. Watershed Analysis for Mill, Deer, and Antelope Creeks. Lassen National Forest.

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.