

Draft CVPIA Fiscal Year 2013 Annual Work Plan

July 17, 2012

Program Title:

Spawning and Rearing Habitat Restoration – CVPIA Section 3406(b)(13)

Responsible Entities:

Staff Name	Agency	Role
<i>John Hannon</i>	<i>Reclamation</i>	<i>[Lead]</i>
<i>Julie Zimmerman</i>	<i>Service</i>	<i>[Co-Lead]</i>
<i>Tom Kisanuki</i>	<i>Reclamation</i>	<i>Sacramento River Activity Manager</i>
<i>Fred Jurick</i>	<i>CDFG</i>	<i>State Lead / Partner</i>
<i>Patricia Bratcher</i>	<i>CDFG</i>	<i>State Point of Contact (Sacramento River)</i>
<i>Mike Healey</i>	<i>CDFG</i>	<i>State Point of Contact (American River)</i>
<i>Patricia Brantley</i>	<i>CDFG</i>	<i>State Point of Contact (Stanislaus River)</i>

The lead and co-lead are responsible for overall coordination of budget and projects between the three program rivers (Sacramento, American, and Stanislaus). Activities include project identification, planning, permitting, construction oversight, monitoring, and reporting. Reclamation is the lead agency in project implementation and manages contracts associated with project work. The State lead and points of contact from CDFG provide professional input and guidance to program activities for each of the rivers.

Program Goals and Objectives for FY 2013

The major program performance goals as stated in CPAR and other documents are as follows:

- Increase the availability of spawning and rearing habitat for Sacramento River Basin Chinook salmon and steelhead trout by placing 10,000 tons of gravel. Support at least 25% of riverwide spawning salmonids in gravel placement reaches.
- Increase the availability of spawning and rearing habitat for American River Basin Chinook salmon and steelhead trout by placing 7,000 tons of gravel. Support at least 25% of riverwide spawning salmonids on gravel placement projects. Less than 10% egg retention in Chinook salmon.
- Increase the availability of spawning and rearing habitat for Stanislaus River Basin Chinook salmon and steelhead trout by placing 3,000 tons of gravel and meet the NMFS OCAP RPA Action prescribing 50,000 cubic yards (75,000 tons) of gravel placed by 2014. Support at least 10% of riverwide spawning salmonids on gravel placement projects.

Source Documents and Plans that Guide the Program

Upper Sacramento River Fisheries and Riparian Habitat Management Plan (State Advisory Council 1989); Fisheries and Instream Habitat Management and Restoration Plan for the Lower American River (Water Forum 2003); Lower American River Channel and Floodplain Restoration Planning Framework (Water Forum 2011); Stanislaus River Restoration Prioritization (Stanislaus Fish Group 2003); and 2009 NMFS Biological Opinion on CVP and SWP Water Operations .

Work performed in this program compliments the objectives in CVPIA Section 3406(b)(1). Staff involved in the two programs coordinate the development of the activities in the respective watersheds and share the data developed from this work.

Status of the Program

Gravel placement sites in each of the three rivers have been identified based on key habitat location (fish presence and habitat availability) and on ready river access. All gravel placed in the rivers conforms to criteria developed in coordination with the Fish and Wildlife Service, California Department of Fish and Game and the National Marine Fisheries Service. These criteria relate to size and relative proportion of the various sizes, and to particular times of the year when the gravel can be placed. Gravel placement methods and quantities correlate to the timing and location of use by spawning anadromous salmonids.

Sacramento River

In recent years (2002 to present), gravel has been placed each year on two sites in the Upper Sacramento River – (1) at the BOR Keswick Office injection site, on the right bank 300 yards downriver from Keswick Dam, and (2) at the Salt Creek injection site- 1.5 miles downriver from Keswick Dam. Both sites are within Redding city limits. The gravel is placed on the edge of the channel and high flows distribute the gravel within the river channel to be subsequently utilized for spawning and rearing. Since 1997, the CVPIA program has placed approximately 206,000 tons of gravel at these two sites (including the FY12 proposed placement of 15,000 tons). Examination of CDFG aerial redd survey data since the 1960's and instream gravel locations show that Chinook salmon are preferentially using injected gravel that was placed at the Keswick Dam and Salt Creek sites. Recent substrate/particle size, intergravel permeability and water quality survey data showed that spawning gravel quality was the highest upstream of the ACID dam area, where the greatest amount of gravel augmentation has taken place (North State Resources June 2012, Draft Technical Memorandum). The report also noted that gravels in areas downstream of ACID dam were typically coarser and displayed channel bed armoring.

Plans are currently underway to identify potential new injection sites downstream of the ACID dam and evaluate site-specific injection methods.

American River

The gravel in the American River and Stanislaus River has been placed to create habitat features

anticipated to be immediately usable by salmonids. Gravel has been placed at six sites in the American River in 1999 and 2008 - 2011 - two locations at Sailor Bar, two locations at upper Sunrise, downstream of Lower Sunrise Bridge, and at Sacramento Bar. The substrate at the sites was manipulated prior to gravel placement in order to improve water quality conditions within the gravel (the area where eggs develop) after the gravel was in place. The conditions in the regions where gravel was placed has been monitored and compared with pre-project conditions and to conditions in adjacent areas. A five year series of projects began implementation in 2008. Reclamation contracted with the Water Forum (City of Sacramento) for assistance in the permitting, placement, and monitoring of projects. Placements through 2012 totaled 65,000 tons (the FY12 placement amount of 15,000 tons is a pre-project estimate). Work has occurred at four of the nine sites (six main channel and three side channel sites) identified in the initial planning document. The program is finalizing a planning framework using a Structured Decision Making process to help guide American River project selection, design, and monitoring. A data repository is being developed to house documents and data relevant to the projects.

Stanislaus River

Several sites have been selected for gravel placement in the Stanislaus River in the reach within two miles downriver of Goodwin Dam and at Knights Ferry. Gravel has been placed by conventional front end loader, by sluice delivery, and by helicopter since 1997. Approximately 30,000 tons of gravel has been placed to date. The program is currently working on implementation of a channel enhancement project at Two Mile Bar where gravel on a floodplain bench will be sorted and placed in the river leaving the resulting floodplain elevation lower to provide side channel habitat and increased floodplain inundation during spring high flows. This helps to meet the NMFS RPA actions prescribing increased spawning gravel injections and enhanced floodplain rearing habitat, specifically for steelhead.

Overall

Salmonids have been observed spawning on the placed gravel at the gravel placement sites on each river. Aerial photography and onsite ground surveys have documented the location of salmon and steelhead redds and determined that juvenile salmonid rearing occurs at and in the vicinity of the projects. Intragravel conditions have been monitored for selected gravel placement projects and shown that gravel placement has provided high quality conditions for salmonid egg incubation.

The (b)(13) program is increasingly emphasizing restoration of side channels, channel margins, meander belts, and complexity to address the current potentially limited amount of juvenile rearing habitat, particularly in dryer years. Restoration of these habitats is being incorporated into the program as overall CVPIA Fisheries Program priorities are refined.

Adaptive Management

Sacramento River

Monitoring of Chinook salmon spawning distributions in the Sacramento River has shown that spawning, particularly for the endangered winter-run Chinook, is concentrated near Keswick Dam where water temperatures are coolest for successful incubation during the summer. This reach of the river has a gravel deficit due to the location of the dam and absence of significant tributary sediment sources in this upstream reach. Because of the monitoring information showing fish distribution, water temperature, and gravel deficit information, past and current projects in the Sacramento River have focused on sites near Keswick Dam to best meet the needs of the species for spawning habitat.

The importance of augmenting spawning gravel in areas other than Keswick Dam and Salt Creek injection sites is acknowledged to improve spawning habitat for winter-run and fall-run Chinook salmon. To this effect, the evaluation process to implement projects between Salt Creek and the confluence of Clear Creek has begun.

American River

Projects in the American River initially placed gravel on channel margins where use by fish was possible only during higher flow years. Lack of use during low water years influenced the decision to design projects spanning the river channel so that material was available to fish under nearly all flow conditions likely to occur during spawning periods. Monitoring of adult fish concentrations and egg retention identified that Chinook salmon and steelhead both congregate in the upper river where substrate conditions are most degraded. Chinook salmon escapement monitoring provided by DFG identified high levels of egg retention (fish dying before spawning) in the American River. This could potentially be due to a lack of suitable spawning habitat in areas where fish are concentrated resulting in a high level of competition for spawning sites that stresses fish in the often warm water conditions. This resulted in a focus on projects in the stretch of the river near the dam in order to address the egg retention issue and improve degraded conditions by providing additional spawning habitat where the fish are most abundant.

The American River gravel team participated in a week long Structured Decision Making (SDM) workshop in October 2011. The workshop team identified fundamental objectives of the b13 program and developed a conceptual model that outlined key management actions available to the team, habitat variables and ecological processes that may be influenced by those management actions, and ultimate effects on juvenile outmigrating anadromous fish. This conceptual model was parameterized using expert opinion to develop a decision support tool that can be used to identify the management action(s) that would be expected to maximize the number of outmigrating juvenile salmon and steelhead per dollar spent. This model can also be used to determine which relationships between management actions and predicted outcomes have the most uncertainty, and where reducing uncertainty may cause a manager to make a different decision or implement an alternative action. These are the areas where information is

most valuable and monitoring should be concentrated; thus, the model can be used to help develop a strategic monitoring plan that changes as information is acquired. Monitoring data should be incorporated into the model as it becomes available, so that knowledge gained through implementation and monitoring is used to influence future decisions in an adaptive management framework. We are further developing this model and incorporating existing b13 monitoring data with the help of a coach from USGS and using the SDM approach. Once complete, the resulting decision support tool will allow us to explicitly incorporate adaptive management into all future decisions of site selection, project design, and monitoring.

Stanislaus River

Projects in the Stanislaus River sometimes used gravel mixtures that lacked material smaller than $\frac{1}{2}$ ". Chinook salmon readily spawned in the gravel mixtures without a smaller size fraction, but egg to fry survival was unknown. Experiments conducted through AFRP in the Stanislaus in 2006, using experimental gravel mixtures provided by the program, examined egg to fry survival in various gravel mixtures and showed that gravel lacking smaller material supported only minimal egg to fry survival. As a result of this work gravel mixtures now contain material down to $\frac{1}{4}$ " or smaller to attempt to provide conditions most conducive to high egg to fry survival.

Overall

Gravel projects have traditionally focused primarily on spawning habitat due to the gravel deficit that is present below most dams. The recognition that rearing habitat conditions in the lower rivers and delta are particularly degraded and emigration survival is low has resulted in an increased attempt to design both spawning and rearing habitat features into projects. It is anticipated that with increased rearing habitat in close proximity to spawning areas higher numbers of juvenile Chinook salmon will remain to rear and grow larger in these areas. Larger juveniles obtain higher survival rates during emigration to the ocean. Juvenile steelhead rearing habitat is expected to be enhanced by providing more habitat complexity in these areas where steelhead are present year round and water is coolest during summer. Features such as incorporation of side channel habitat, inundated floodplain habitat, inclusion of woody material, rock piles, boulders, and island creation have been included in recently constructed projects and are providing increased rearing habitat to increase carrying capacity for juvenile salmonids in the project rivers.

Table 1. FY2013 Proposed Activities and Costs

CVPIA Section 3406 (b)(13) , Spawning Gravel

	3406 (b)(13) Requested Funding for Fiscal Year 2013				
	Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources
Total Funding	\$903,000	\$0	\$0	\$30,000	\$933,000
Reclamation	\$808,192	\$0			\$808,192
Service	\$94,808	\$0			\$94,808
CA DFG			\$0	\$30,000	\$30,000
CA DWR			\$0	\$0	\$0

1.1 Program Management												
AWP Activity Number	Activity Name	Activity Description	Agency		Program Performance Goal	FY2013 Projected Performance	3406 (b)(13) Requested Funding for Fiscal Year 2013					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
1.1.1	Program Lead	Works with the FWS co-lead and activity managers for each of the three river systems in which spawning and rearing habitat restoration projects are authorized. Plans projects, conducts monitoring, oversees construction. H30 0214 6650 000 00 0 0	BOR	0.20			\$31,325					\$31,325
1.1.2	Program Co-lead	Coordinates with Reclamation staff and is the primary point of contact with the Fish and Wildlife Service. Plans projects, conducts monitoring, oversees construction. FRFR4833-0833GP0	FWS	0.25			\$56,306					\$56,306
							Sub-Total for Program Management, FY2013					
							Subtotal Funding	\$87,631	\$0	\$0	\$0	\$87,631
							Reclamation	\$31,325	\$0			\$31,325
							Service	\$56,306	\$0			\$56,306
							CA DFG			\$0	\$0	\$0
							CA DWR			\$0	\$0	\$0

1.2		Program Support										
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2013 Projected Performance	3406 (b)(13) Requested Funding for Fiscal Year 2013					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
1.2.1	Activity Manager - Sacramento River	Upper Sacramento River Activity Manager H30 0214 6650 000 00 0 0	BOR	0.15			\$30,136					\$30,136
1.2.2	FWS Regional Program Administration	FWS Region 8 management and administration (Program Administration - PA) FRFR4833-0833GP0	FWS	0.00			\$2,671					\$2,671
1.2.3	FWS Financial Support	Provide FWS budget and finance support (P20 - Payments to Others) FRFR4833-0833GP0	FWS	0.00			\$2,048					\$2,048
1.2.4	CDFG Technical Advisor	Provide technical review on program documents and technical support for Sacramento River project planning and implementation	CDFG	0.06							\$10,000	\$10,000
1.2.5	CDFG Technical Advisor	Provide technical review on program documents and technical support for American River project planning and implementation	CDFG	0.06							\$10,000	\$10,000
1.2.6	CDFG Technical Advisor	Provide technical review on program documents and technical support for Stanislaus River project planning and implementation	CDFG	0.06							\$10,000	\$10,000
							Sub-Total for Program Support, FY2013					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
							<i>Subtotal Funding</i>	\$34,855	\$0	\$0	\$30,000	\$64,855
							<i>Reclamation Service</i>	\$30,136	\$0			\$30,136
							<i>CA DFG</i>	\$4,719	\$0			\$4,719
							<i>CA DWR</i>			\$0	\$30,000	\$30,000
									\$0	\$0		\$0

1.3		Technical Support										
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2013 Projected Performance	3406 (b)(13) Requested Funding for Fiscal Year 2013					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
1.3.1	Monitoring support	Survey and Monitoring for gravel projects in the American and Stanislaus FRFR4833-0833GP0	FWS	0.15			\$33,783					\$33,783
1.3.2	Geology support	Oversee gravel processing on the American River H30 0214 6650 000 00 0 0	BOR	0.18			\$40,040					\$40,040
1.3.3	Engineering support	Engineering support for Stanislaus and American River gravel projects H30 0214 6650 000 00 0 0	BOR	0.10			\$22,000					\$22,000
							Sub-Total for Technical Support, FY2013					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
							<i>Subtotal Funding</i>	\$95,823	\$0	\$0	\$0	\$95,823
							<i>Reclamation Service</i>	\$62,040	\$0			\$62,040
							<i>CA DFG</i>	\$33,783	\$0			\$33,783
							<i>CA DWR</i>			\$0	\$0	\$0
									\$0	\$0	\$0	\$0

2.3		Outreach and Public Involvement										
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2013 Projected Performance	3406 (b)(13) Requested Funding for Fiscal Year 2013					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
2.3.1	Outreach	Public affairs involvement in scoping and notifying the public of work H30 0214 6650 000 00 0 0	BOR	0.03	0	0	\$5,000					\$5,000
							Sub-Total for Outreach and Public Involvement, FY2013					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
							<i>Subtotal Funding</i>	\$5,000	\$0	\$0	\$0	\$5,000
							<i>Reclamation Service</i>	\$5,000	\$0			\$5,000
							<i>CA DFG</i>	\$0	\$0			\$0
							<i>CA DWR</i>			\$0	\$0	\$0
									\$0	\$0	\$0	\$0

2.4		Environmental Compliance										
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2013 Projected Performance	3406 (b)(13) Requested Funding for Fiscal Year 2013					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
2.4.1	NEPA and Permitting Support	Provide support for NEPA/CEQA and ESA compliance, and permitting for Keswick, Nimbus Basin, and Two-Mile Bar projects or other project sites, if selected. H30 0214 6650 000 00 0 0	0	0.10	0	0					\$0	
							Sub-Total for Environmental Compliance, FY2013					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
							<i>Subtotal Funding</i>	\$0	\$0	\$0	\$0	\$0
							<i>Reclamation Service</i>	\$0	\$0			\$0
							<i>CA DFG</i>			\$0	\$0	\$0
							<i>CA DWR</i>			\$0	\$0	\$0

2.5		Design										
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2013 Projected Performance	3406 (b)(13) Requested Funding for Fiscal Year 2013					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
2.5.1	American River Design	American River project Design at Nimbus Basin - subcontracted through Water Forum. Gravel program funding gravel costs and AFRP funding channel rehabilitation costs. H30 0214 6650 000 00 0 0	BOR	0.00	less than 10% egg retention in	0	\$45,000				\$45,000	
							Sub-Total for Design, FY2013					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
							<i>Subtotal Funding</i>	\$45,000	\$0	\$0	\$0	\$45,000
							<i>Reclamation Service</i>	\$45,000	\$0			\$45,000
							<i>CA DFG</i>	\$0	\$0			\$0
							<i>CA DWR</i>			\$0	\$0	\$0

2.7		Construction/Implementation										
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2013 Projected Performance	3406 (b)(13) Requested Funding for Fiscal Year 2013					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
2.7.1	Sacramento River project	Gravel placement at existing (Keswick) or new project site, permitting for new sites is underway H30 0214 6650 000 00 0 0	BOR	0.00	Annually 10,000 tons	10,000 tons	\$210,000					\$210,000
2.7.2	American River project	Gravel, side channel, and floodplain project at Nimbus Basin or other permitted site - seven main channel and three side channel sites between Nimbus Dam and River Bend park were permitted in 2008 and a portion of the work has been completed each year since. Three sites remain to be worked on under the original plan. This program is funding the gravel portion of the project, while AFRP is funding the channel and floodplain rehabilitation portion. H30 0214 6650 000 00 0 0	BOR	0.00	Annually 7,000 tons gravel in the Am. River	7,000 tons	\$173,000					\$173,000
2.7.3	Stanislaus River project	Gravel, side channel, and floodplain at Two Mile Bar or Goodwin gravel addition. The Two Mile Bar project includes floodplain and side channel habitat enhancement but successful implementation is uncertain. Design is nearly complete. The Goodwin gravel placement sites will be augmented if Two Mile Bar construction cannot be initiated. H30 0214 6650 000 00 0 0	BOR	0.00	Annually 3,000 tons gravel in the Stan. River	3,000 tons	\$156,860					\$156,860
							Sub-Total for Construction/Implementation, FY2013					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
							<i>Subtotal Funding</i>	\$539,860	\$0	\$0	\$0	\$539,860
							<i>Reclamation Service</i>	\$539,860	\$0			\$539,860
							<i>CA DFG</i>	\$0	\$0			\$0
							<i>CA DWR</i>			\$0	\$0	\$0

2.8		Post-Project Monitoring										
AWP Activity Number	Activity	Activity Name & Description	Agency		Program Performance Goal	FY2013 Projected Performance	3406 (b)(13) Requested Funding for Fiscal Year 2013					
			Name	Fractional FTE			Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
2.8.1	American River Monitoring	American River monitoring - pre and post project, costs shared with AFRP. This work evaluates a series of seven restoration sites on the American River with biological monitoring conducted by Cramer Fish Sciences and Physical monitoring conducted by Sac State. Each group develops an annual report on monitoring results. H30 0214 6650 000 00 0 0	BOR	0.00	0	0	\$75,000					\$75,000
2.8.2	Stanislaus River Monitoring	Stanislaus River monitoring - this consists of redd mapping at gravel placement sites and monitoring gravel movement through snorkel surveys in coordination with DFG H30 0214 6650 000 00 0 0	BOR	0.03	0	0	\$4,699					\$4,699
2.8.3	American Spawning Photos	American River aerial photos documenting Chinook spawning riverwide - Three flights conducted in November and December covering the reach between Nimbus Dam and Business 80 bridge, approximately 70 photos per flight at 1:2400 scale. Contract through American Aerial Surveys H30 0214 6650 000 00 0 0	BOR	0.02	0	0	\$15,132					\$15,132
							Sub-Total for Post-Project Monitoring, FY2013					
							Restoration Fund	Water and Related Resources	State Cash	State In-Kind	Total All Sources	
							<i>Subtotal Funding</i>	\$94,831	\$0	\$0	\$0	\$94,831
							<i>Reclamation</i>	\$94,831	\$0			\$94,831
							<i>Service</i>	\$0	\$0			\$0
							<i>CA DFG</i>			\$0	\$0	\$0
							<i>CA DWR</i>			\$0	\$0	\$0

Table 2 – Intentionally left blank

Table 3. Monitoring

Table 3 – Proposed Monitoring Activity 1 of 2	
Project Description:	American River Spawning and Rearing Habitat Projects - Effectiveness Monitoring
FY 2013 Project Complete?	No, this is a continuing series of restoration projects with ongoing monitoring.
CVPIA annual work plan subtask number:	1.12.2
Scope of the monitoring effort:	Evaluates an ongoing series of seven yearly projects in the American River from Nimbus Dam to River Bend Park permitted for 2008 through 2012
Product/deliverable:	Yearly biological monitoring report from Cramer Fish Sciences and physical monitoring report from Sacramento State
Cost:	\$89,000 this is half the cost – costs shared with others
Questions posed:	Are steelhead and Chinook spawning on gravel projects? Are gravel conditions conducive to high egg to fry survival? Can gravel project designs enhance invertebrate production? Do the projects provide increased juvenile salmonid rearing habitat? Can the onsite rock source be used cost effectively? How much gravel should be added yearly? Can woody material be safely incorporated into projects?
Objectives:	Determine effectiveness of projects by answering the questions listed above. Use results to inform future projects.
Results – expected or actual:	Spawning use is high. Intragravel conditions should be good for survival. Invertebrates quickly recolonize. Rearing habitat can be successfully incorporated into gravel projects. Onsite rock sources can be used cost effectively.
Data collection methods:	Ground and aerial redd surveys, intragravel permeability and water quality measurements, pebble counts, tracer rocks, snorkel surveys, invertebrate sampling, topographic mapping, hydraulic modeling
Data management:	Reports in regional library. GIS shapefiles, Excel files, and Access database will be available and maintained by USBR and USFWS
Assessment:	Spawning and rearing habitat use, habitat quality, and distribution will be evaluated to determine whether key limiting factors are being addressed and to help in design of future habitat improvement projects.
Use of information in future decision making:	Future project designs will be based on monitoring results. Species data is included in ESA consultations on CVP operations.

Table 3 – Proposed Monitoring Activity 2 of 2

Project Description:	Stanislaus River Redd Surveys at Gravel Projects
FY 2013 Project Complete?	Continuing
CVPIA annual work plan subtask number:	1.12.3
Scope of the monitoring effort:	Maps redds at gravel projects to compare with river-wide surveys conducted by DFG during Chinook carcass surveys. This work is done cooperatively with DFG.
Product/deliverable:	Map and shapefile of yearly redd locations and assessment of gravel movement
Cost:	\$5,000
Questions posed:	Are salmonids spawning on gravel placement projects? How does habitat use at project sites compare to riverwide spawning habitat use? Is placed gravel being transported downstream and, if so, where is it winding up?
Objectives:	Determine effectiveness of projects by answering the questions above.
Results – expected or actual:	Habitat use is concentrated in upstream areas. Spawning distribution is influenced by escapement level.
Data collection methods:	Ground surveys collect GPS points with habitat parameters at redds. Carcass surveys count redds by river reach. Gravel movement monitored through snorkel surveys and tracers.
Data management:	ESRI shapefiles maintained by USBR in GIS library
Assessment:	This is a low intensity monitoring activity used to track habitat use through time.
Use of information in future decision making:	Future project designs will be based on monitoring results. Species data is included in ESA consultations on CVP operations.