SVWQC

March 6, 2013

Pamela Creedon, Executive Director
Central Valley Regional Water Quality Control Board
10200 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6114

The Sacramento Valley Water Quality Coalition (SVWQC) and Colusa Glenn Subwatershed respectfully request your determination that the chlorpyrifos and *Ceriodaphnia* toxicity Management Plans for Walker Creek be deemed complete. The primary basis for this request is that Walker Creek has been determined to meet the Water Quality Objectives (WQOs) for chlorpyrifos and toxicity. Additional factors supporting the request include the extensive outreach conducted in the subwatershed and focused in the represented drainage area, including the pursuit and award of Natural Resources Conservation Service (NRCS) cost-share funding to further augment and expand implementation of management practices to control discharges of chlorpyrifos and other agricultural pesticides (see attached map).

BACKGROUND FOR MANAGEMENT PLAN REQUIREMENT

The Walker Creek (WLKCH) monitoring location is a representative monitoring site in the Willow Creek drainage. In addition to the Willow Creek drainage, this site represents the Lower Stony Creek, Orland Area, Upper Colusa Drain, Logan Creek, Bounde Creek, Provident Drain, Packer Road, Upper Stony Gorge, and Upper Stony Creek drainages in the Colusa Glenn Subwatershed of the SVWQC. The management plan requirement for chlorpyrifos was triggered by two exceedances observed in August and September of 2007. One of these exceedances (September 2007) was also identified as the likely cause of toxicity to *Ceriodaphnia* observed in the same sample. The management plan requirement for Ceriodaphnia toxicity was triggered by exceedances observed in April and September 2007.

DATA AND EXCEEDANCES

Relevant monitoring data for the chlorpyrifos management plan are provided in Table 1. These results indicate the following:

- A total of 37 sample events have been conducted for chlorpyrifos in Walker Creek. There have been three (3) exceedances, with two of these observed in consecutive months in 2007, and the third in July of 2009.

- The September 2007 exceedance coincided with toxicity to *Ceriodaphnia*. The August 2007 and December 2009 samples were not toxic to *Ceriodaphnia*.

- Chlorpyrifos sampling conducted from 2008-2012 included the high-use periods (July-August) when the exceedances were initially observed. In the thirty (30) chlorpyrifos sample events that have been conducted since the Management Plan was triggered in September 2007, there has been only one (1) additional exceedance, with no related toxicity. A total of fifteen (15) sample events for chlorpyrifos have been conducted since the last exceedance in July 2009 with no exceedances and only one (1) detection of chlorpyrifos.

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www.norcalwater.org/sacvalleycoalition.html

- A total of 43 sample events have been conducted for *Ceriodaphnia* toxicity in Walker Creek. There have been three (3) exceedances, observed in April, September and December 2007.
- A total of 35 sample events for *Ceriodaphnia* toxicity have been conducted since the Management Plan was triggered in September 2007 with only one (1) additional toxicity exceedance (December 2007). Thirty-three (33) sample events have been conducted from 2008-2012 with no additional toxicity observed.

Monitoring will continue in 2013 for chlorpyrifos in Walker Creek during high-use periods as part of the compliance monitoring required for the chlorpyrifos/diazinon TMDL.

SUMMARY OF EVALUATIONS SUPPORTING REQUEST

The following evaluations and factors support this request:

Assessment of Compliance with Water Quality Objectives	No exceedances of the water quality objective for chlorpyrifos have occurred in the 15 samples collected since July 2009 (>3 years). No exceedances of the water quality objective for toxicity have occurred in the 33 samples collected since December 2007 (5 years).
Outreach	Extensive ongoing outreach has been conducted since 2008 in support of the Management Plan, including direct contact with 131 chlorpyrifos users, numerous targeted workshops on management practice implementation options, annual newsletters and reminders, surveys, and solicitation of growers to participate in grant-funded cost-share implementation projects.
Implemented practices	727 acres have been converted from flood irrigation to micro- and drip irrigation systems through NRCS Agricultural Water Enhancement Program (AWEP) and NRCS Bay-Delta Initiative (BDI) cost-share funding grants to implement best management practices since 2010.
Additional planned implementation	An additional 549 acres are planned to be converted from flood irrigation to micro- and drip irrigation systems through the AWEP and BDI grants.

SOURCE EVALUATIONS

Source evaluations of the potential causes of the chlorpyrifos exceedances and Ceriodaphnia toxicity observed in Walker Creek were completed and submitted in March 2010[1]. The source evaluation for chlorpyrifos assessed the chlorpyrifos applications by agriculture, which crops applied chlorpyrifos prior to exceedances, irrigation patterns and methods, and environmental conditions relevant to potential discharges of chlorpyrifos, and potential non-agricultural sources of chlorpyrifos. The conclusions of the chlorpyrifos source evaluation were as follows:

- Agriculture was determined to be a probable source of the observed chlorpyrifos exceedances in August and September 2007, based on the timing and methods of applications and the typical timing of irrigation. Almonds account for the majority of chlorpyrifos use in the drainage, with alfalfa and walnuts accounting for smaller percentages. Applications to outdoor nursery plants also had some minor potential to have contributed to both exceedances in 2007.

- No non-agricultural sources were identified as high-priority potential causes of the exceedances.

[1] *Source Evaluation Report: Ceriodaphnia Toxicity in Walker Creek.* Prepared by Larry Walker Associates for the Sacramento Valley Water Quality Coalition. March 2010.
Source Evaluation Report: Chlorpyrifos in Walker Creek. Prepared by Larry Walker Associates for the Sacramento Valley Water Quality Coalition. March 2010.

Based on evaluations of reported pesticide applications and predominant crops in the drainage, agriculture was determined to be the probable cause of the chlorpyrifos exceedances.

Based on a review of currently available pesticide use information for 2002 – 2010, the use of chlorpyrifos has not shown a consistent long-term trend in the Willow Creek drainage (Figure 1) or in the other drainages represented by Walker Creek (Figure 2). Use on walnut and almond orchards during summer irrigation season remains the primary use of chlorpyrifos in the drainage. The timing of use, and the majority of use on orchard crops (primarily on walnuts and almonds during irrigation season) limits the potential for chlorpyrifos discharges to surface waters. The primary pathways of transport are irrigation tailwater discharges and drift from applications, and managing these has been the focus of outreach to control chlorpyrifos exceedances.

OUTREACH AND EDUCATION

The Colusa Glenn Subwatershed has performed extensive outreach and education to its members and agricultural producers. In the Walker Creek watershed, the SVWQC built its Management Plan protocol utilizing the local knowledge and resources of the Glenn County Agricultural Commissioner, which surveyed growers along Walker Creek. Program support for the SVWQC Walker Creek Management Plan from the Agricultural Commissioner's office also included:

- Arranging meetings with growers and stakeholders
- Providing information and outreach about the Irrigated Lands Regulatory Program, and
- Providing up-to-date information on pesticide use, agricultural operations, and available information on water bodies and drainages

On a regular and frequent basis since 2008, the Colusa Glenn Subwatershed has augmented and reinforced its communications with landowners and Pesticide Control Agents (PCAs) about proper use of chlorpyrifos, with letters, newsletters, press releases to the three major newspapers serving the region, attendance at commodity specific grower meetings, local Farm Bureau events, and similar means of communicating with growers. Ongoing day-to-day outreach and individual contacts are difficult to capture, but the major relevant outreach and education efforts conducted are summarized below.

Relevant Outreach & Education Conducted from 2008 – 2013:

- Growers (131) who reported applying chlorpyrifos in the Walker Creek drainage prior to the two exceedances observed in 2007 were directly contacted to inform them of the exceedances. Management practices to minimize the risk of exceedances were also discussed with the growers.
- 2008 – Initial workshop announcing exceedances and Management Plan development
- 2009 – Management Practice Survey conducted in partnership with Ag Commissioner and SVWQC
- 2010 to present: NRCS Agricultural Water Enhancement Program (AWEP), cost-share funding to implement best management practices

- 2012 to present: NRCS Bay-Delta Initiative (BDI) Walker Creek, cost-share funding to implement best management practices

- July/August (Annually) – 1) Letters to members and agricultural producers; 2) letters to Operators, Dealers and PCAs; 3) Press Release to various agricultural organizations and local media;

- November/December (Annually) – Annual Newsletter

- December (Annually) – Glenn & Colusa Counties Grower Meeting Presentations

There have also been presentations provided in various years to County Board of Supervisors, Farm Bureaus, RCDs, Pesticide Associations, local service organizations, and farmers markets.

Additional targeted outreach conducted specifically for the chlorpyrifos management plan in 2012 and 2013 includes:

- July 2012 – 1st Management Plan Implementation Notice announcing three (3) workshops in early 2013.

- December 2012 – Annual Newsletter to all members reminding the members of three (3) Management Plan Implementation workshops in early 2013.

- January 2013 –2nd Management Plan Implementation Notice for three (3) workshops in February 2013. Each workshop focused on one crop type (Almonds, Alfalfa, Walnuts).

- February 2013 – Three (3) workshops were held, with agendas including ILRP & Management Plan for Walker Creek Overview; Commodity-specific information by industry representatives; chlorpyrifos information by DOW AgroSciences; Integrated Pest Management; and information for NRCS & CGSP partnership to provide cost-share funding for implementation of best management practices by NRCS staff.

- February 2013 – Phone calls to members and agricultural producers reminding them that 100% participation is required by RWQCB to complete Management Plan.

MANAGEMENT PRACTICES

In addition to the management practices already implemented in the subwatershed, the Colusa Glenn Subwatershed has actively pursued and secured funding to support implementation of additional practices. These projects funded through these awards will continue to lower the risk of chlorpyrifos discharges and exceedances in the watershed.

- The Colusa Glenn subwatershed was awarded a grant from the NRCS Agricultural Water Enhancement Program (AWEP) to provide cost-share funding to implement best management practices in the area represented by Walker Creek monitoring (2010 to 2014).

- The Colusa Glenn subwatershed was awarded a grant through the NRCS Bay-Delta Initiative (BDI) for cost-share funding to implement additional best management practices. The implementation projects are beginning to be funded in 2013 (2012 to 2014).

The outreach and grant procurement in the subwatershed has already resulted in significant additional implementation of management practices. Through the AWEP grant funding, approximately 618 acres have already been converted from flood irrigation to microsystems in 2011 and 2012, with 270 additional acres committed for conversion. The BDI grant has supported conversion of 109 acres to date, with commitments to convert 279 more acres. The total acreage to be converted through these grants is estimated at approximately 1277 acres. These grants also support Integrated Pest Management and other practices to further reduce the risk of chlorpyrifos discharges and exceedances in the subwatershed.

SURVEYS

Surveys of growers are not specifically cited as a basis of support for this request for completion of the Walker Creek management plan for chlorpyrifos and toxicity. However, growers in the Walker Creek drainage have been extensively surveyed, once by the SVWQC (36 growers, 16,599 acres directly adjacent to Walker Creek), and also by the Agriculture Commissioner's Pilot Program to support the ILRP (365 sites, 27,138 acres in the Walker Creek drainage), The Pilot Program is a collaborative effort between the Central Valley Water Board and the Agricultural Commissioners Offices of Glenn and Butte Counties. The results of these surveys have been documented in reports previously submitted to the Water Board by the Pilot Program (*MOU Pilot Program: Final Report*, June 2011) and SVWQC (*Management Practices Implementation and Performance Goals: Ceriodaphnia Toxicity and Chlorpyrifos in Walker Creek*, August 2011). Both surveys found a very high degree of implementation of pesticide management practices designed to prevent and mitigate potential discharges of toxic pesticides, and chlorpyrifos in particular. Irrigation management practices included a mix of flood (~74%) and micro- or drip irrigation systems (24%). Converting flood irrigation systems to systems that are more efficient and less prone to discharges of tailwater and pesticides is currently the primary focus for implementation of additional management practices.

CONCLUSIONS

Based on the monitoring results with no exceedances of chlorpyrifos in over three (3) years and no toxicity in five (5) years, Walker Creek is meeting the Central Valley Basin Plan water quality objectives for chlorpyrifos and toxicity. We attribute this success primarily to the extensive outreach and education efforts conducted within the drainages represented by the Walker Creek monitoring. Additionally, a majority of over $2 million in grants funded through the Agricultural Water Enhancement Program (AWEP) and the Environmental Quality Incentives Program (EQIP) will support irrigation water management (e.g., microsprinkler), Integrated Pest Management, and other practices to further reduce the risk of chlorpyrifos discharges and exceedances, and toxicity in regional surface waters.

As specified in the SVWQC's Criteria for Completion of a Management Plan, we respectfully request that you make a determination of the completeness of this management plan.

Sincerely,

David J. Guy
President
Northern California Water Association

Cc: Joe Karkoski
Susan Fregien
Mark Cady
Larry Domenighini
Kandi Manhart
Lester Messina
Bruce Houdesheldt
Claus Suverkropp

TABLES

Table 1. Monitoring Results for Chlorpyrifos and *Ceriodaphnia*

EventID	Sample Date	*Ceriodaphnia*, percent survival	Chlorpyrifos, µg/L
17		100	ND (<0.001)
19	17-Apr-07	16.7	ND (<0.001)
19.1	24-Apr-07	105.3	
20	15-May-07	100	ND (<0.001)
21	19-Jun-07	100	ND (<0.001)
22	17-Jul-07	100	ND (<0.001)
23	21-Aug-07	100	0.050
24	18-Sep-07	40	0.017
24.1	25-Sep-07	100	
25	19-Dec-07	30	ND (<0.001)
26	28-Jan-08	100	0.004
27	21-Feb-08	95	ND (<0.001)
28	23-Apr-08	100	ND (<0.001)
29	21-May-08	95	ND (<0.001)
30	19-Jun-08	95	ND (<0.001)
31	16-Jul-08	100	ND (<0.001)
32	20-Aug-08	100	ND (<0.001)
33	17-Sep-08	100	ND (<0.001)
36	19-Feb-09	100	ND (<0.001)
37	17-Mar-09	100	ND (<0.001)
38	22-Apr-09	95	ND (<0.001)
39	20-May-09	100	ND (<0.001)
40	18-Jun-09	95	0.014
41	22-Jul-09	181.8	0.022
42	19-Aug-09	100	ND (<0.001)
43	23-Sep-09	100	ND (<0.001)
46	17-Dec-09	105.3	
59	19-Jan-11	105.3	ND (<0.003)
60	16-Feb-11	100	ND (<0.001)
61	16-Mar-11	100	ND (<0.001)
62	21-Apr-11	100	ND (<0.001)
63	18-May-11	90	ND (<0.001)
64	22-Jun-11	100	ND (<0.001)
65	20-Jul-11	100	0.005
66	17-Aug-11	100	ND (<0.001)
71	24-Jan-12	105	ND (<0.001)
72	22-Feb-12	100	ND (<0.001)
73	15-Mar-12	105	ND (<0.001)
74	18-Apr-12	106	
75	16-May-12	100	
76	20-Jun-12	100	
77	18-Jul-12	100	0.0014
78	22-Aug-12	100	ND (<0.001)

Exceedances of ILRP trigger limits are highlighted in yellow
"—" indicates analyte was not not sampled

Figure 1. Annual chlorpyrifos use by agriculture in the Willow Creek drainage.

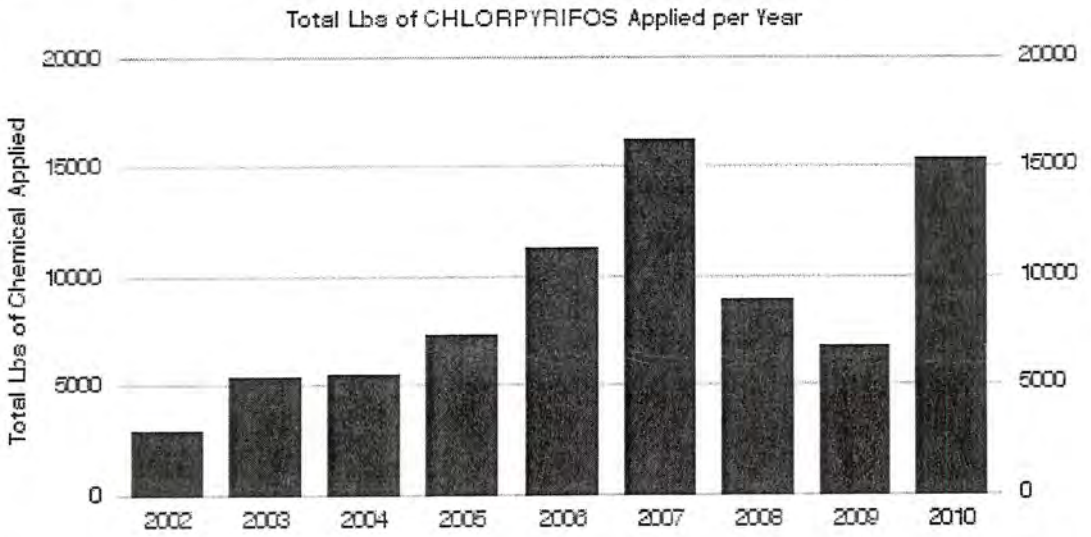
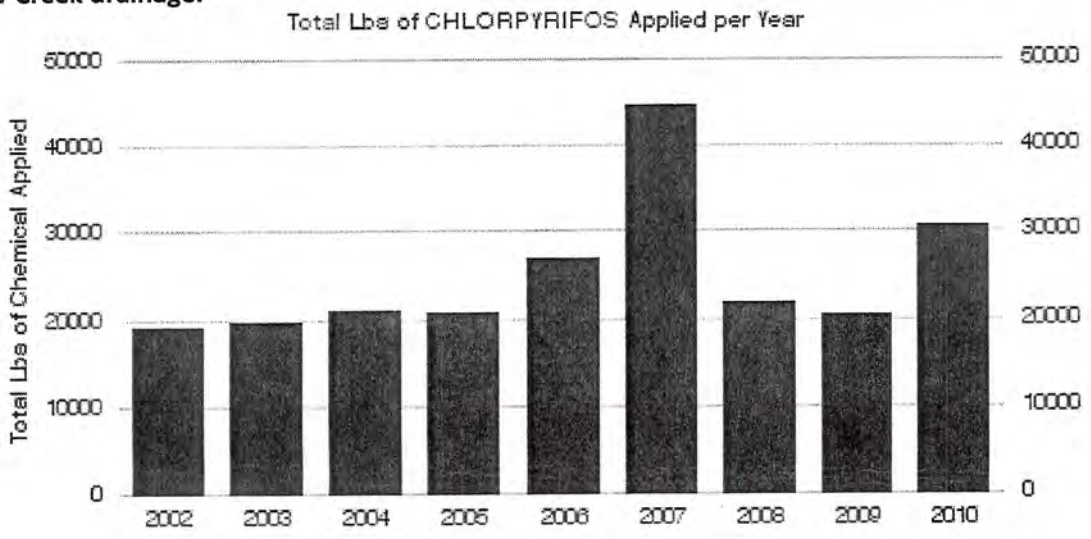


Figure 2. Annual chlorpyrifos use by agriculture in the drainages represented by Walker Creek in the Willow Creek drainage.



Colusa Glenn

Subwatershed Program

P.O. Box 1205, Willows, California 95988 - Phone (530) 934-8036 - Email cgsubwatershed@sbcglobal.net

November 6, 2013

Mr. Bruce Houdesheldt
c/o Sacramento Valley Water Quality Coalition
Northern California Water Association
455 Capitol Mall, Suite 335
Sacramento, CA 95814

RE: *Management Practices Implementation and Performance Goals: Ceriodaphnia Toxicity and Chlorpyrifos in Walker Creek – Supplemental Information*

Dear Bruce,

Per your request for additional information regarding the *Management Practices Implementation and Performance Goals: Ceriodaphnia Toxicity and Chlorpyrifos in Walker Creek* (MP), I respectfully submit this documentation in an effort to request this management plan be deemed complete by Central Valley Regional Water Quality Control Board (Regional Board) Staff. Please note, I have attached the following documents pertaining to the Represented Drainages:

WALKER CREEK @ Road 33 Monitoring Site - Willow Creek; Lower Stony Creek; Orland Area; Upper Colusa Drain; Logan Creek; Bounde Creek; Provident Drain Packer Road; Upper Stony Gorge; Upper Stony Creek

1. Management Practices Implementation Schedule, per Page 7 of MP. A written communication.
2. Map "FY10-12 AWEP-17 and EQIP-Bay Delta Initiative Conservation Practices by 12-Digit Hydrologic Unit" developed by USDA NRCS SSRA-RAD.

Please let me know if you have any questions or need additional information. I can be contacted at (530) 934-8036 or cgsubwatershed@sbcglobal.net.

Best regards,

Kandi Manhart
Subwatershed Coordinator
Outreach & Education

Enclosure

cc Larry Domenighini

DRAFT

Management Practices Implementation and Performance Goals: Ceriodaphnia Toxicity and Chlorpyrifos in Walker Creek – Supplemental Information

1. Management Practices Implementation Schedule, per Page 7 of MP.

    - The Colusa Glenn Subwatershed Program was successful in obtaining funding through the USDA Natural Resources Conservation Service's Agricultural Water Enhancement Program (AWEP) and EQIP-Bay Delta Initiative (BDI) to help implement on-the-ground conservation practices protective of water quality within the Walker Creek Representative Drainage. Each cost-share funding program is detailed below and a map is attached including conservation practices obligated in FY 2010-2012.

AWEP focused on surface and ground water projects to enhance water quality and quantity within the Colusa Basin Watershed in Colusa and Glenn Counties. The partners recognized the importance of water resources and sought irrigated landowners to implement Best Management Practices (BMPs) that would increase irrigation system efficiency, decrease runoff, sediment erosion and flooding, and improve surface and ground water quality.

EQIP-BDI was designed specifically for the Walker Creek Watershed Represented Area to provide financial and technical assistance to agricultural producers to install conservation practices (BMPs) on irrigated land in the Walker Creek, Colusa Basin and Sacramento River watersheds. Through this initiative, USDA NRCS and Colusa Glenn Subwatershed Program worked together to assist producers to implement water quality and water conservation practices (BMPs) to meet the management plan goals and objectives.

Although it is not possible for USDA NRCS to use the watershed boundaries (Representative Drainages) used by Regional Board due to being federally recognized HUCs, we have written a description to detail the implementation of BMPs in relation to the Representative Area. Please note that when outreach was conducted for this Management Plan the focused growers included all Almond, Alfalfa and Walnut growers in the entire Glenn County area. In addition to this implementation, multiple outreach and education efforts have been conducted and submitted to you to include in the annual reporting for Regional Board. To remind you, three formal workshops were held in February 2013 for all of the named growers. We reached more than 100% through grower participation and/or follow-up mailings with the workshop materials for those who could not physically attend. To expand, we also encouraged operators, Pest Control Advisors, partners, etc. to participate. With assistance of the Glenn County Department of Agriculture we utilized their grower/operator list and compared it to the Colusa Glenn Subwatershed Program's member list, as well as partners to reach as many interested participants as possible.

WORKSHOP PARTICIPATION	PARTICIPANT #'S	TOTAL GROWERS
Workshop #1 – Focus Topic ALMONDS	54	329
Workshop #2 – Focus Topic ALFALFA	34	
Workshop #3 – Focus Topic WALNUTS	73	
Mailings of Workshop	210	

Surveys and Presentation Documents to Growers		
TOTAL PARTICIPANTS	371	113%

Per the Map titled, "FY10-12 AWEP-17 and EQIP-Bay Delta Initiative Conservation Practices by 12-Digit Hydrologic Unit" the key designates the Number of Conservation Practices Applied or Planned under AWEP or BDI. The shaded areas determine these numbers per their HUC recognized watersheds which make up the majority of Glenn County's valley floor. Summary of implementation is below, specific to Glenn County.

PROGRAM	PRACTICE #	PRACTICE NAME	COUNT	UNIT	AMOUNT	OBLIGATION
AWEP 2008	340	Cover Crop	9	AC	940	$91,300
	441	Irrigation System, Micoirrigation	22	AC	1,239	$816,895
	442	Irrigation System, Sprinkler	7	AC	264	$282,514
	449	Irrigation Water Management	17	AC	1,216	$19,697
	595	Pest Management	3	AC	227	$10,491
TOTAL						$1,220,897

PROGRAM	PRACTICE #	PRACTICE NAME	COUNT	UNIT	AMOUNT	OBLIGATION
BDI 2008	386	Cover Crop	1	AC	2	$314
	441	Irrigation System, Micoirrigation	3	AC	237	$193,095
	442	Irrigation System, Sprinkler	2	AC	88	$98,425
	449	Irrigation Water Management	8	AC	966	$20,604
	590	Nutrient Management	2	AC	210	$8,418
	595	Pest Management	3	AC	246	$24,754
	734	Fish & Wildlife Structure	7	NO	37	$3,530
TOTAL						$349,140

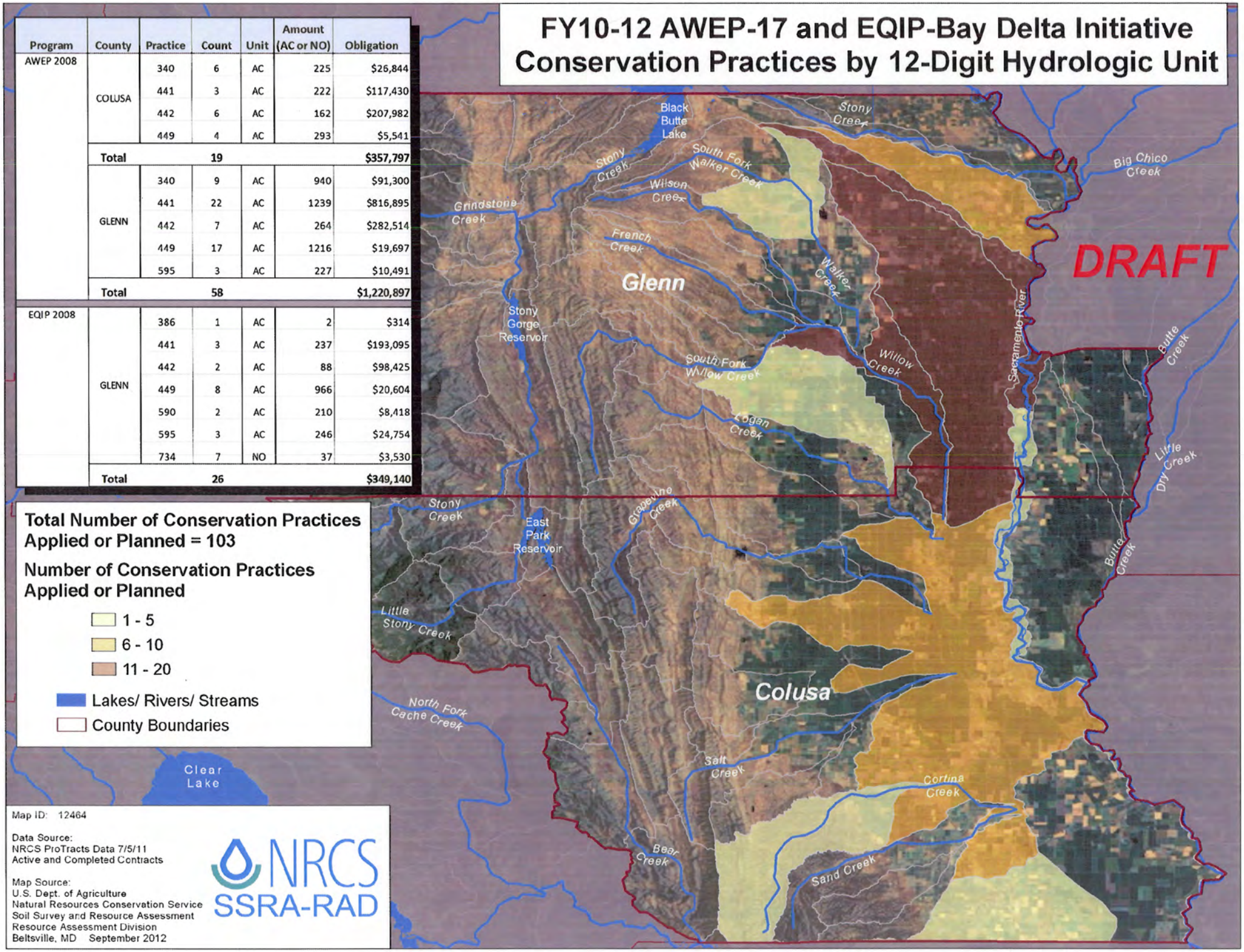
FY10-12 AWEP-17 and EQIP-Bay Delta Initiative Conservation Practices by 12-Digit Hydrologic Unit

Program	County	Practice	Count	Unit	Amount (AC or NO)	Obligation
AWEP 2008	COLUSA	340	6	AC	225	$26,844
		441	3	AC	222	$117,430
		442	6	AC	162	$207,982
		449	4	AC	293	$5,541
	Total		**19**			**$357,797**
	GLENN	340	9	AC	940	$91,300
		441	22	AC	1239	$816,895
		442	7	AC	264	$282,514
		449	17	AC	1216	$19,697
		595	3	AC	227	$10,491
	Total		**58**			**$1,220,897**
EQIP 2008	GLENN	386	1	AC	2	$314
		441	3	AC	237	$193,095
		442	2	AC	88	$98,425
		449	8	AC	966	$20,604
		590	2	AC	210	$8,418
		595	3	AC	246	$24,754
		734	7	NO	37	$3,530
	Total		**26**			**$349,140**

Total Number of Conservation Practices Applied or Planned = 103

Number of Conservation Practices Applied or Planned

- 1 - 5
- 6 - 10
- 11 - 20
- Lakes/ Rivers/ Streams
- County Boundaries



Map ID: 12464

Data Source:
NRCS ProTracts Data 7/5/11
Active and Completed Contracts

Map Source:
U.S. Dept. of Agriculture
Natural Resources Conservation Service
Soil Survey and Resource Assessment
Resource Assessment Division
Beltsville, MD September 2012

NRCS SSRA-RAD