

10.0 ECONOMIC ANALYSIS

10.1 Introduction

The Regional Water Boards are legally required to consider economics in Total Maximum Daily Load (TMDL)³⁰ development and water quality control planning (basin planning)³¹. There are three triggers for Regional Water Board consideration of economics or costs in basin planning. They are:

- The Board must consider economics in establishing water quality objectives that ensure the reasonable protection of beneficial uses.
- The Boards must comply with the California Environmental Quality Act (CEQA)³² when they amend their basin plans. CEQA requires that the Boards analyze the reasonably foreseeable methods of compliance with proposed performance standards and treatment requirements. This analysis must include economic factors.

Chapter 9 is the analysis of potential environmental impacts, as required under CEQA, associated with adopting an amendment to the Water Quality Control Plan for the North Coast Region (Basin Plan) to include the draft regional Temperature Implementation Policy and Action Plans for the Eel River, Mattole River and Navarro River Temperature TMDLs. In Chapter 9, staff identifies the reasonably foreseeable compliance measures necessary to achieve compliance with the Temperature Implementation Policy and associated actions. These compliance measures are management practices most likely to be implemented to achieve compliance with water quality standards for temperature.

10.2 Scope of the Economic Analysis

What follows is an estimate of the costs associated with compliance measures. The costs are given as a range, dependent on the specific characteristics of the land or operation to which a given management practice is applied. A list of potential funding sources is also given.

The Regional Water Board is not obligated to consider the balance of costs and benefits associated with implementation of a TMDL or Basin Plan amendment. It is only obligated to consider economic factors and may adopt a TMDL or Basin Plan amendment even if the costs are significant.

10.2.1 Methodology

The costs identified in this chapter primarily come from four sources of information: the Natural Resources Conservation Service (NRCS) Field Office Technical Guide (FOTG), California Department of Fish and Wildlife (CDFW) Salmonid Stream Habitat Restoration Manual (2006) (Manual), CDFW Coho Salmon Recovery

³⁰ See 33 U.S.C. § 1313(d); 40 C.F.R. § 130.7.

³¹ See Wat. Code, § 13240-13247

³² Pub. Resources Code § 21000 *et seq.*

Strategy, California Department of Transportation (Caltrans) 2013 contract proposal award information. The cost information provided in the NRCS FOTG is a national dataset to assist local NRCS Districts in setting cost shares for implementing conservation practices. Cost estimates are provided at the county level and the data used for this analysis are specific to Northern California (including Del Norte, Humboldt, Trinity, Siskiyou, Mendocino and Sonoma Counties), as described in their Fiscal Year 2013 Payment Schedule.

The costs included in the CDFG Manual are described as upslope erosion inventory and sediment control guidance. The numbers are based on estimates from Pacific Watershed Associates, a consulting firm specializing in erosion control work. Actual costs can vary considerably depending on operator skill and experience, equipment types, local site conditions, and regional location.

10.2.2 Existing Requirements

Landowners and project proponents are bound by various existing regulatory requirements that involve water quality and natural resource protection. The economic impact of existing obligations should not be attributed to the costs of compliance with the proposed Basin Plan amendment. Limiting the scope of the economic analysis is difficult given the similarity of measures necessary to achieve a wide range of water quality and wildlife protection goals. To remain as focused as possible, this economic analysis only contemplates the costs of measures identified as reasonably foreseeable (see Chapter 9) in the implementation of the Temperature Implementation Policy and Action Plans. However, if taken as a whole, they are likely an overestimate of the actual costs of compliance. This is because of the multiple and overlapping regulatory programs under which the same measures are reasonably foreseeable.

For example, some temperature control costs are related to actions necessary to avoid a violation of the sediment prohibitions in the Basin Plan and to avoid a taking under the Endangered Species Act or to fully mitigate impacts of authorized takes. Other costs may be incurred as a result of compliance with the Clean Water Act (CWA), other related statutes and regulations, or local land use ordinances. Conversely, compliance with the proposed Temperature Implementation Policy and Action Plan(s) will help dischargers comply with the other regulatory requirements.

10.2.3 Geographic Scope

The implementation actions within the proposed Basin Plan amendment are not uniformly required across the North Coast Region or even across properties with similar land uses. Instead, many of the implementation actions will be required of landowners/project proponents on an as-needed, site-specific basis or are simply activities that are encouraged by the Regional Water Board.

Economic considerations differ with site-specific issues and applicable actions necessary for compliance within the three main categories (shade, sedimentation, and flow) that affect stream temperature. For example the cost for retaining shade

on timber lands will be different across the region depending on the amount of yield and product (a.k.a. species) to harvest. Likewise restoration action cost will not be uniform since diverse bioregions and microclimates within those regions will play a role in the species composition in riparian areas. In addition, more intensive land use activities will face greater costs than less intensive land use activities. Activities on steep, erosive slopes in proximity to waterbodies will require greater care and higher costs than activities on lands that do not deliver to a water body or on lands that are not highly erosive. Additionally, developing alternative water supplies, conservation practices, and switching from surface water diversions to groundwater pumping are highly site-specific economic considerations that can be generally assessed but should not be implied as the absolute upper and lower limit of costs in all instances.

Dam Removal

The cost of removing dams varies fairly regularly with the height and width of the dam, but project-specific factors, such as structure type, sediments, water rights, easements, and the need for monitoring can greatly impact the total cost of treatment. Friends of the Earth performed case studies of more than 30 dam removal projects in the United States and found that some small dams can be removed for under \$10,000. The removal of a larger dam (e.g., 15-20 feet in height) can cost as much as \$1 million. In neither case do these cost estimates include the important considerations of the cost of permits, easements, design, or monitoring. The median cost of dam removal in this study was about \$100,000. However, this finding cannot be interpreted to suggest that this will always be true in California or elsewhere in the future. Previous dam removals were not the result of a random selection; it is likely that relatively inexpensive removal projects have been undertaken first and that average removal costs will rise over time. (Sunding, D./A. P. Zwane, 2004)

Irrigated Agriculture

Irrigated agriculture occurs throughout the North Coast Region and is predominantly concentrated in: 1) the Tule Lake region in Siskiyou and Modoc Counties; 2) the Scott Valley, Shasta Valley, and upper Klamath River Valley in Siskiyou County; 3) Round Valley, Potter Valley, Eden Valley, Anderson Valley and the upper Russian River Valley in Mendocino County; and 4) Alexander Valley, Dry Creek Valley, Russian River Valley Below Dry Creek and the Laguna de Santa Rosa in Sonoma County. Principal irrigated crops are barley, irrigated pasture, alfalfa hay and other hay, oats, potatoes, wheat and grapes. For most of the management practices, a range of costs is given, depending on numerous site-specific factors to be determined by landowners/dischargers. Typical categories of compliance for irrigated agriculture include maintaining and preserving site potential shade, controlling erosion and sediment, addressing tailwater and surface water impoundments, preserving existing cold water resources, aquatic ecosystem restoration and actions to restore or maintain stream flows to support all beneficial uses.

Grazing

Grazing activities occur throughout the North Coast Region both on private and public lands. As with the estimated costs to the irrigated agricultural community to comply with the proposed Basin Plan Amendment, the estimates to the grazing community are derived from NRCS Fiscal Year 2013 Payment Schedule. Typical categories of compliance for grazing include maintaining and preserving site potential shade, controlling erosion and sediment, preserving existing cold water resources, aquatic ecosystem restoration and actions to restore or maintain stream flows to support all beneficial uses.

Roads

The road networks in the North Coast Region contribute to elevated temperatures in tributary watersheds through the discharge of excess sediment. In some cases, an inventory of roads will determine that decommissioning or upgrading of roads is required.

Regardless of the method of regulation or the responsible party, the requirements for controlling sources of sediment from roads are similar and implementation will potentially focus on the following process:

1. Inventory: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from the source(s).
2. Prioritize: Prioritize efforts to control discharge of excess sediment based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility.
3. Implement: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge. Road decommissioning may be required as part of a responsible parties' load allocation if maintaining the road is cost prohibitive, road is not needed or is a source of uncontrollable excess sediment discharge.
4. Monitor and Adapt: Use monitoring results to direct adaptive management in order to refine excess sediment control practices and implementation schedules until discharges are reduced to a level that meets any applicable TMDL load allocations and water quality standards.

Typical categories of compliance for roads include maintaining and preserving site potential shade, controlling erosion and sediment, preserving existing cold water resources, and aquatic ecosystem restoration.

Timber

Timber harvest activities can substantially impact water temperature. The Temperature Implementation Policy and Action Plans focuses on controlling sediment and protecting riparian functions from timber harvest activities to meet

the watershed-wide TMDL allocations and temperature objectives as described throughout this staff report. Timber harvest on nonfederal lands is currently regulated by the Regional Board through a combination of general WDRs and conditional waivers of WDRs. The costs associated with WDRs are not outlined here as they are a current requirement. Roads that are part of a timber harvest plan or Non-Industrial Timber Management Plan (NTMP) area required by the WDRs and waivers for timber harvest on nonfederal lands to implement an erosion control plan. Additional costs to timber operators associated with the proposed Basin Plan amendment could come from the additional retention of trees above the existing requirements in certain areas. Therefore, the additional retention of trees could potentially be a foregone revenue. However, due to the broad range of potential factors including site potential, topography, existing requirements, and amount of timber available the specific costs are too complex to estimate. Typical categories of compliance for timber operations include maintaining and preserving site potential shade, controlling erosion and sediment, preserving existing cold water resources, and aquatic ecosystem restoration.

10.3 Estimated Costs of Compliance

The following examples are not meant to be exhaustive of the suitable suite of compliance measures, but rather provide a representative sample with the widest range to accommodate as many compliance scenarios as possible. Site potential is defined as the shade provided by topography and full potential vegetation conditions at a site, with an allowance for natural disturbance such as floods, wind throw, disease, landslides, and fire. Table 10-1 presents the estimated costs of compliance measures to preserve, maintain and restore shade. Addressing elevated water temperature associated with excess sediment discharges includes controlling the cumulative impacts of sediment waste discharges on such watersheds that affect stream temperature. Table 10-2 presents the estimated costs of compliance measures to control sedimentation. Addressing elevated water temperature associated with alteration of natural thermal regimes includes a balance of water demand for all beneficial uses. Table 10-3 presents the estimated costs of compliance measures that address tailwater, surface water impoundments, input from cold water resources, and surface water flows.

Table 10-1 Estimated Costs of Reasonably Foreseeable Compliance Measures to Preserve, Maintain and Restore Shade			
Reasonably Foreseeable Compliance Measure	Practice Name	Range of Practice Costs	NRCS Practice Code or Source
Use exclusion	Forage exclusion	\$0.64-1.32/ft	#472
Riparian Restoration	Riparian forest buffer/herbaceous cover	\$165.04-22,916.06/acre	#390, #391
Protect and manage existing wetland and/or riparian areas for their natural filtering functions	Riparian herbaceous cover/forest buffer, wetland restoration	\$165.04-22,916.06/acre	#390, #391, #657
Animal trails and walkways	Animal trails and walkways	Not available	#575
Stream crossing	Ford, culvert, bridge	\$363-1,488 per/Lft	#578
Riparian Restoration	--	\$44.03/ft ² -\$2,706/Lft	A.Riley, 2008
Riparian Restoration	--		A.Riley, 2008
Retain in-channel trees following timber operations Increased riparian canopy retention in Class II and III watercourses	Not applicable	Dependent on site specific determinations	Staff judgment

**Table 10-2
Estimated Costs of Reasonably Foreseeable Compliance Measures
Associated with Erosion and Sediment Control**

Reasonably Foreseeable Compliance Measure	Practice Name	Range of Practice Costs	NRCS Practice Code or Source
Reduce erosion -Maintain crop residue or vegetative cover	Cover Crop	\$113.75-206.64/acre	#340
Erosion control	Dry Seed	\$0.40/ft ²	Caltrans 2013
Erosion control	Compost Cover	\$0.20-0.80/ft ²	Caltrans 2013
Erosion control	Compost Blanket	\$250/cubic yard	Caltrans 2013
Erosion control	Rolled Erosion Control Blanket	\$2.00/ft ²	Caltrans 2013
Erosion control	Straw	\$0.05/ft ²	Caltrans 2013
Erosion control	Hydroseed	\$0.05/ft ²	Caltrans 2013
Reduce erosion and sequester sediment - Stream buffer areas/Field borders	Field Borders: Riparian tree & shrub establishment; Non-native or native seedbed preparation	\$211-1,617/acre	#386
Reduce erosion and sequester sediment - Riparian restoration	Tree & Shrub Establishment	\$1.20-3.20/unit	#612
Reduce soil erosion - Improve soil properties	Deep tillage/1 Scenario	\$20.10/acre	#324
	Res. & Tillage Mgt, Mulch Till	\$28.10/acre	#345
Reduce slope length, steepness, or unsheltered distance	Precision land forming	\$175/acre	#462
	Contour Farming	\$10.10/acre	#330
	Contour Buffer Strips	\$282.30-917.40/acres	#332
Reduce soil erosion - Practices to reduce detachment	Conservation Cover	\$237.40-2,279.90/acre	#327
	Conservation Crop Rotation	\$6.10-30.90 /acre	#328
	Residue and Till Management	\$36-71.12/acre	#329
	Cover crop	\$113.75-206.64/acre	#340
	Critical area planting	\$398.21-14,046.80/acre	#342
	Seasonal residue management	\$3.76/acre	#344
	Diversion	\$3.17-5.69/ft	#362
Practices to reduce detachment (cont.)	Windbreak/shelterbelt establishment	\$0.45-0.90/ft	#380
	Windbreak/shelterbelt renovation	\$0.56-4.77/ft	#650
	Mulching	\$297.73-756.15/acre	#484
	Hydromulch	\$0.05/yard ²	Caltrans 2013
	Irrigation water management	\$28.09-	#449

**Table 10-2
Estimated Costs of Reasonably Foreseeable Compliance Measures
Associated with Erosion and Sediment Control**

		202.12/acre	
	Cross wind ridges/stripcropping/trap strips	Not available	#589
	Surface roughening		
	Waste utilization	\$175.21-949.51/acre	#612
	Wildlife upland habitat management	Not available	#633
		\$17.50-392.05/acre	#645
Practices to reduce transport within the field	Contour farming	\$304.10/acre	#330
	Field windbreak	Not available	#392
	Grassed waterway	\$1502.42/acre	#412
	Contour stripcropping	\$1.60-3.83/acre	#585
	Herbaceous wind barriers	Not available	#442A
	Field stripcropping	Not available	#586
	Terrace	\$2.09-3.40/Lft	#600
Practices to trap sediment below the field or critical area	Contour buffer strips	\$282.29-917.41/acre	#332
	Sediment basins	Not available	#350
	Field border	\$210.57-1617.25/acre	#386
	Filter strip	\$210.57-448.10/acre	#393
	Water and sediment control basin	\$4.86/cubic yard	#638
Mulch exposed areas	Mulching	\$297.73-756.15/acre	#484
Grazing Management Plan		To be determined	
Pasture and hay planting	Seedbed preparation, seeding, non-native	\$191.43-501.24/acre	#512
Rangeland planting	Drill or broadcast, native or non-native	Not available	#550
Animal trails and walkways	Animal trails and walkways	Not available	#575
Stream crossing	Ford, culvert, bridge	\$90-1,488 per/Lft	#578/ Caltrans 2013
Forage harvest management	Forage harvest management	\$12.74-61.61/acre	#511
Vegetation control with grazing	Prescribed grazing	\$3.89-5.80/acre	#528
Wetland wildlife habitat management	Low, medium or high intensity	\$17.50-248.94/acre	#644

Table 10-2 Estimated Costs of Reasonably Foreseeable Compliance Measures Associated with Erosion and Sediment Control			
Installation of grade stabilization structures	Grade stabilization structure	Not available	#410
Streambank and shoreline protection	Low-high complexity	\$17.58-80.26/ft	#580
Stream channel stabilization	Stream channel stabilization	Not available	#584
Road Surface stabilization	Asphalt paving	\$238,000/mile	Siskiyou County Public Works
	Asphalt paving	\$115.00-300.00/ton	Caltrans 2013
	Chip sealing	\$57,000/mile	Siskiyou County Public Works
	Rocking	\$4,250-10,000/1000 ft	Weaver, et. al. (2006)
	Class II Aggregate Base	\$75.00/cubic yard	Caltrans 2013
	Import Rock Material	\$100.00/cubic yard	Caltrans 2013
	Dust abatement	\$90hr	Harris Blade Rental,
Road Fill slope/cutbank compliance measures	Removal/stabilization of unstable fill.	\$2-5/cubic yard	Weaver, et. al. (2006)
	Soil stabilization (mulch/vegetate) of fill and cut slopes.	\$19-22/1,000 ft.	Weaver, et. al. (2006)
Control sediment	Disconnect road drainage from watercourses (drain to hillslopes).	\$170/1,000 ft	Weaver, et. al. (2006)
	Install rolling dip	\$85-170/ each	Weaver, et. al. (2006)
	Install ditch relief culvert	\$645-825/ each	Weaver, et. al. (2006)
	Install stream crossing	\$3,270/each	Weaver, et. al. (2006)
	Fiber roll	\$5.00-20.00/Lft	Caltrans 2013
	Silt fence	\$8.00-20.00/Lft	Caltrans 2013
	Gavel check dam	\$8.00-20.00/Lft	Caltrans 2013
Stabilize/treat crossing approach	Rock road surface	\$4,250-10,000/1,000 ft	Weaver, et. al. (2006)
	Install additional road drainage: waterbars, rolling dips, cross drains	\$85-3,270/each	Weaver, et. al. (2006)
Stabilize/treat crossings and associated fills	Remove undersized/failing culverts	\$3-10/cubic yard	Weaver, et. al. (2006)
	Remove unstable fill	\$2-5/cubic yard	Weaver, et. al. (2006)
	Rock armor, rip rap fill slopes	\$150-725.00/Cubic yard	Caltrans 2013
	Rock slope protection fabric	\$5.00-100.00/yard ²	Caltrans

Table 10-2 Estimated Costs of Reasonably Foreseeable Compliance Measures Associated with Erosion and Sediment Control			
	Drain road away from unprotected fills	\$10,000-75,000/mile	Weaver, et. al. (2006)
Develop a Road System Plan	Erosion Control Plan, non-timber land use	\$3528-7,740/100 acres	R. Fitzgerald Memo dated August 6, 2005
	Erosion Control Plan, timber land use	\$2,370-7,740/100 acre	
	Water Pollution Control Plan	\$650-10,000/per	Caltrans 2013
Road decommissioning	Recontour road to provide for a stable, hydrologically "invisible" site (e.g. remove perched fill, outslope old road prism, remove crossings)	\$2,000-\$50,000/mile depending on steepness and location of road	Weaver, et. al. (2004)
	Minimize road system (density) to correspond with maintenance resources	\$2,000-50,000/mile to recontour unnecessary roads	Weaver, et. al. (2004)
	Decommission roads adjacent to watercourse and relocate to midslope or ridgetop if possible	\$3,000-23,000 per mile	CDFW Coho Recovery Plan

**Table 10-3
Estimated Compliance Measures Costs to
Address Tailwater/Surface Water Impoundments/
Cold Water Resources/In-Stream Flows**

Reasonably Foreseeable Compliance Measure	NRCS Practice Name	NRCS Practice Cost	NRCS Practice Code
Irrigation scheduling	Irrigation water management	\$28.09-202.12/acre	#449
Efficient application of irrigation water	Microirrigation	\$503.85-1835.93/acre	#441
Efficient transport of irrigation water	Installation of piping to replace open ditches	\$2.47-5.13/ft	#516
Use of runoff or tailwater	Irrigation system/tailwater recovery	Not available	#447
Management of drainage water	Runoff management system	Not available	#570
Vegetated filter strips	Filter strip	\$210.57-448.10/acre	#393
Surface field ditch	Field ditch	Not available	#607
Water table control, controlled drainage	Subsurface drain	\$3.86-6.44/ft	#606
Installation of pipeline for off-channel water	Pipeline, rough terrain, steel or plastic	\$2.47-5.13/ft	#516
Constructing off-stream pond	Pond up to 50 AcFt	\$12,969.38-32,068.24/no.	#378
Installing trough or tank for off-channel water	Watering facility	\$1,958.69-5,020.64/no.	#614
Constructing well	Water well	\$15,413.45-41,537.97/no.	#642
Improving springs	Spring development	\$2,629.19-4,335.61/no.	#574
Barrier removal (dam)	NA	\$10,00 -500,000/per	CDFW Coho Recovery Plan
Barrier removal (non-structural sites)	NA	\$2,400-34,000/per	CDFW Coho Recovery Plan
Barrier removal (stream crossings)	NA	\$15,000-500,000/per	CDFW Coho Recovery Plan
Riparian revegetation	NA	\$5,000-135,000/acre	CDFW Coho Recovery Plan
Streambank restoration	NA	\$125.00/ft ²	CDFW Coho Recovery Plan
Fencing	NA	\$3.00-12.00/Lft	CDFW Coho Recovery Plan

10.4 Sources of Funding

Potential sources of funding include monies from private and public sources. Public financing includes, but is not limited to: grant funds, as described below; single-purpose appropriations from federal, state, and/or local legislative bodies; and, bond indebtedness and loans from government institutions.

10.4.1 Summary of Pertinent State Funding Programs

There are several potential sources of public financing through grant and funding programs administered, at least in part, by the Regional Water Board and the State Water Board. These programs vary over time depending upon federal and state budgets and ballot propositions approved by voters. State funding programs pertinent to the proposed Basin Plan amendment are summarized and described below. Additional information can be found on the State Water Resources Control Board webpage

(http://www.waterboards.ca.gov/water_issues/programs/grants_loans/).

Agricultural Drainage Loan Program

The Agricultural Drainage Loan Program was created by the Water Conservation and Water Quality Bond Act of 1986 to address treatment, storage, conveyance, or disposal of agricultural drainage water that threatens waters of the State. There is a funding cap of \$20 million for implementation projects and \$100,000 for feasibility studies. Loan repayments are for a period of up to 20 years.

Agricultural Drainage Management Loan Program

The Agricultural Drainage Management Loan Program, created by Proposition 204 and distributed through the Agricultural Drainage Management Subaccount, provides loan and grant funding for Drainage Water Management Units. Drainage Water Management Units are land and facilities for the treatment, storage, conveyance, reduction or disposal of agricultural drainage water that, if discharged untreated, would pollute or threaten to pollute the waters of the State. This program is available to any city, county, district, joint power authority, or other political subdivision of the State involved with water management.

Agricultural Water Quality Grants Program

The Agricultural Water Quality Grant Program provides funding for projects that reduce or eliminate non-point source pollution discharge to surface waters from agricultural lands. Funding from Propositions 50 has approximately \$15 million in grant funding is available under this funding cycle. Eligible projects include:

- Agricultural Water Use Efficiency Implementation Projects that result in water savings, increased in-stream flow, increased water quality, and increased energy efficiency
- Agricultural Water Use Efficiency Technical Assistance, Planning, Feasibility Studies, Research and Development, Training, Education, Public Outreach, and Pilot projects

Federal Clean Water Act Section 319 Nonpoint Source Implementation Program

This program is an annual federally funded nonpoint source pollution control program that is focused on controlling activities that impair beneficial uses and on limiting pollutant effects caused by those activities. States must establish priority rankings for waters on lists of impaired waters and develop action plans, known as Total Maximum Daily Loads (TMDLs), to improve water quality. Project proposals that address TMDL implementation and those that address problems in impaired waters are favored in the selection process. There is also a focus on implementing management activities that lead to reduction and/or prevention of pollutants that threaten or impair surface and ground waters.

Clean Water State Revolving Fund

The Federal Water Pollution Control Act (Clean Water Act or CWA), as amended in 1987, provides for establishment of a Clean Water State Revolving Fund (CWSRF) program. The program is funded by federal grants, State funds, and Revenue Bonds. The purpose of the CWSRF program is to implement the CWA and various State laws by providing financial assistance for the construction of facilities or implementation of measures necessary to address water quality problems and to prevent pollution of the waters of the State.

The CWSRF Loan Program provides low-interest loan funding for construction of publicly-owned wastewater treatment facilities, local sewers, sewer interceptors, water recycling facilities, as well as, expanded use projects such as implementation of nonpoint source (NPS) projects or programs, development and implementation of estuary Comprehensive Conservation and Management Plans, and storm water treatment.

Integrated Regional Water Management Grants

Integrated Regional Water Management (IRWM) is a collaborative effort to manage all aspects of water resources in a region. IRWM crosses jurisdictional, watershed, and political boundaries; involves multiple agencies, stakeholders, individuals, and groups; and attempts to address the issues and differing perspectives of all the entities involved through mutually beneficial solutions.

The Department of Water Resources has a number of IRWM grant program funding opportunities. Current IRWM grant programs include: planning, implementation, and stormwater flood management. DWR's IRWM Grant Programs are managed within DWR's Division of IRWM by the Financial Assistance Branch with assistance from the Regional Planning Branch and regional offices.

10.4.2 Summary of Pertinent Federal Funding Programs

Several federal agencies, including but not limited to the U.S. Environmental Protection Agency, NOAA Fisheries, U.S. Fish and Wildlife Service, and USDA Natural Resources Conservation Service, also provide grants and other funding opportunities. Table 10-4 presented below provides a summary of the pertinent federal funding programs.

The U.S. Environmental Protection Agency provides access through its webpage to a catalog of federal funding opportunities:

http://water.epa.gov/grants_funding/shedfund/databases.cfm

The U.S. Department of Agriculture – Natural Resource Conservation Service has a wide variety of agricultural/timber financial support programs. The Environmental Quality Incentives Program (EQIP) is a voluntary program that provides financial and technical assistance to agricultural producers through contracts up to a maximum term of ten years in length. These contracts provide financial assistance to help plan and implement conservation practices that address natural resource concerns and for opportunities to improve soil, water, plant, animal, air and related resources on agricultural land and non-industrial private forestland. In addition, a purpose of EQIP is to help producers meet Federal, State, Tribal and local environmental regulations. The financial assistance programs include:

- Agricultural Management Assistance
- Agricultural Water Enhancement Program
- Air Quality Initiative
- Cooperative Conservation Partnership Initiative
- Conservation Innovation Grants
- Conservation Stewardship Program
- Environmental Quality Incentives Program
- Emergency Watershed Protection Program
- Wildlife Habitat Incentive Program

Website <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig/>

For additional agriculture specific grants:

<http://www.grants.gov/search-grants.html?fundingCategories%3DAG%7CAgriculture>

**Table 10-4
Summary of Pertinent Federal Funding Programs**

Funding Program	Program Description
Aquatic Ecosystem Restoration (CAP Section 206)	Work under this authority may carry out aquatic ecosystem restoration projects that will improve the quality of the environment, are in the public interest, and are cost-effective. There is no requirement that an existing Corps project be involved
Bring Back the Natives Grant Program	The Bring Back the Natives initiative (BBN) funds on-the-ground efforts to restore native aquatic species to their historic range. Projects should involve partnerships between communities, agencies, private landowners, and organizations that seek to rehabilitate streamside and watershed habitats. Projects should focus on habitat needs of species such as fish, invertebrates, and amphibians that originally inhabited the waterways across the country. Funding for the BBN program is administered through NFWF from federal agencies cooperating to support this program. Cooperating agencies and organizations include the US Fish and Wildlife Service (USFWS), Bureau of Land Management (BLM), USDA Forest Service (USFS), and Trout Unlimited (TU).
Coastal Program	The U.S. Fish and Wildlife Service (USFWS) Coastal Program works to conserve healthy coastal habitats on public or private land for the benefit of fish, wildlife, and people in 22 specific coastal areas. The program forms cooperative partnerships designed to (1) protect coastal habitats by providing technical assistance for conservation easements and acquisitions; (2) restore coastal wetlands, uplands, and riparian areas; and (3) remove barriers to fish passage in coastal watersheds and estuaries. Program biologists provide restoration expertise and financial assistance to federal and state agencies, local and tribal governments, businesses, private landowners, and conservation organizations such as local land trusts and watershed councils.
Community-based Habitat Restoration Partnership Grants	The NOAA Community-based Restoration Program (NOAA CRP) provides funds for small-scale, locally driven habitat restoration projects that foster natural resource stewardship within communities. The program seeks to bring together diverse partners to implement habitat restoration projects to benefit living marine resources. Projects might include restoring salt marshes, mangroves, and other coastal habitats; improving fish passage and habitat quality for anadromous species; removing dams; restoring and creating oyster reefs, removing exotic vegetation and replanting with native species; and similar projects to restore habitat or improve habitat quality for populations of marine and anadromous fish.
Conservation Reserve Program	The Conservation Reserve Program (CRP) is a voluntary program for agricultural landowners. Through CRP, you can receive annual rental payments and cost-share assistance to establish long-term, resource conserving covers on eligible farmland.
Conservation Security Program	The Conservation Security Program (CSP) is a voluntary conservation program that supports ongoing stewardship of private lands by providing payment for maintaining and enhancing natural resources. CSP identifies and rewards those farmers and ranchers who are meeting the highest standards of conservation and environmental management on their operations.
Cooperative Watershed Management Program	Department of the Interior Bureau of Reclamation. The purpose of the Cooperative Watershed Management Program is to enhance water conservation, including alternative uses; improve water quality; improve ecological resiliency of a river or stream; and to reduce conflicts over water at the watershed level by supporting the formation of watershed groups to develop local solutions to address water management issues.
Emergency Watershed	The USDA Natural Resources Conservation Service's Emergency Watershed Protection (EWP) program helps protect lives and property threatened by

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Summary of Pertinent Federal Funding Programs**

Funding Program	Program Description
Protection	<p>natural disasters such as floods, hurricanes, tornadoes, droughts, and wildfires. EWP provides funding for such work as clearing debris from clogged waterways, restoring vegetation, and stabilizing river banks. The measures that are taken must be environmentally and economically sound and generally benefit more than one property owner. EWP also provides funds to purchase floodplain easements as an emergency measure. Floodplain easements restore, protect, maintain, and enhance the functions of the floodplain; conserve natural values including fish and wildlife habitat, water quality, flood water retention, ground water recharge, and open space; reduce long-term federal disaster assistance; and safeguard lives and property from floods, drought, and the products of erosion. EWP can provide up to 90 percent cost share in limited resource areas as determined by the US Census.</p>
Environmental Quality Incentives Program	<p>The USDA Natural Resources Conservation Service's Environmental Quality Incentives Program (EQIP) was established to provide a voluntary conservation program for farmers and ranchers to address significant natural resource needs and objectives. EQIP offers contracts with a minimum term that ends one year after the implementation of the last scheduled practices and a maximum term of ten years. These contracts provide financial assistance to program participants to implement conservation practices. Persons or legal entities, who are owners of land under agricultural production or who are engaged in livestock or agricultural production on eligible land may participate in EQIP. EQIP activities are carried out according to an environmental quality incentives program plan of operations developed in conjunction with the producer that identifies the appropriate conservation practice or practices to address the resource concerns. The practices are subject to NRCS technical standards adapted for local conditions. NRCS approves the plan of operations and obligates contract funds for the conservation practices listed in the plan of operations.</p>
Farm and Ranch Lands Protection Program (FRPP)	<p>The USDA Natural Resources Conservation Service's Farmland Protection Program (FPP) is a voluntary program that helps farmers and ranchers keep their land in agriculture and prevents conversion of agricultural land to non-agricultural uses. The program provides matching funds to organizations with existing farmland protection programs that enable them to purchase conservation easements. These entities purchase easements from landowners in exchange for a lump sum payment, not to exceed the appraised fair market value of the land's development rights. The easements are for perpetuity unless prohibited by state law. Eligible land is land on a farm or ranch that has prime, unique, statewide, or locally important soil or contains historical or archaeological resources; supports the policy of a State or local farm and ranch land protection policy; is subject to a pending offer by an eligible entity; and includes cropland, rangeland, grassland, pasture land, forest land and other incidental land that is part of an agricultural operation.</p>
Five-Star Restoration Program	<p>The EPA supports the Five-Star Restoration Program by providing funds to the National Fish and Wildlife Foundation and its partners, the National Association of Counties, NOAA's Community-based Restoration Program and the Wildlife Habitat Council. These groups then make subgrants to support community-based wetland and riparian restoration projects. Competitive projects will have a strong on-the-ground habitat restoration component that provides long-term ecological, educational, and/or socioeconomic benefits to the people and their community. Preference will</p>

**Table 10-4
Summary of Pertinent Federal Funding Programs**

Funding Program	Program Description
	<p>be given to projects that are part of a larger watershed or community stewardship effort and include a description of long-term management activities. Projects must involve contributions from multiple and diverse partners, including citizen volunteer organizations, corporations, private landowners, local conservation organizations, youth groups, charitable foundations, and other federal, state, and tribal agencies and local governments. Each project would ideally involve at least five partners who are expected to contribute funding, land, technical assistance, workforce support, or other in-kind services that are equivalent to the federal contribution.</p>
<p>Fish and Wildlife Management Assistance</p>	<p>Department of the Interior Fish and Wildlife Service Funds may be used to conduct fish and wildlife management activities that align with the conservation, restoration, and management goals and priorities of the Fish and Wildlife Conservation Offices. This includes goals and priorities identified by the National Fish Passage Program (NFPP) and individual partnerships under the National Fish Habitat Partnership (NFHP). Restoration work can consist of habitat construction activities such as culvert replacements, dam removals, fishway construction, installation of fish habitat structures and vegetation plantings. Examples of funded activities include habitat restoration (stream improvements or deconstruction of barriers to increase quality of aquatic habitats), monitoring and assessment, removal of barriers to passage, fish propagation, and aquatic plant establishment. This also includes efforts to minimize the establishment, spread, and impact of aquatic invasive species, including those efforts conducted under the auspices of the State/Interstate Aquatic Nuisance Species (ANS) Management Plan Grant Program. Technical assistance –in the form of advice on biological, chemical, and/or physical aspects of a project –is also available to awardees. Awardees are expected to include a public outreach component in their project. Applicants applying for State/Interstate ANS Management Plan funds must be a State or Interstate organization with an ANS Task Force approved plan.</p>
<p>Healthy Forests Reserve Program</p>	<p>The Healthy Forests Reserve Program (HFRP) is a voluntary program established for the purpose of restoring and enhancing forest ecosystems to: 1) promote the recovery of threatened and endangered species, 2) improve biodiversity; and, 3) enhance carbon sequestration. Program implementation has been delegated by the Secretary of Agriculture to the Natural Resources Conservation Service.</p>
<p>Forest Legacy Program</p>	<p>Through its Forest Legacy Program (FLP), the USDA Forest Service supports state efforts to protect environmentally sensitive forest lands from the conversion to non-forest uses through the use of conservation easements and fee-simple purchase. Designed to encourage the protection of privately owned forest lands, FLP is an entirely voluntary program. The program enables landowners to retain ownership of their land and continue to earn income from it while keeping drinking water safe and clean, conserving valuable open space as well as protecting critical wildlife habitats and outdoor recreation opportunities. The program promotes professional forest management and requires forest management plans. The program emphasizes strategic conservation - working in partnership with States, local communities and non-governmental organizations to make a difference on the land and for communities by conserving areas of</p>

**Table 10-4
Summary of Pertinent Federal Funding Programs**

Funding Program	Program Description
	unbroken forest, watershed or river corridor forests or by complimenting existing land conservation efforts. FLP conservation easements restrict development, protect a range of public values and many require public access for recreation.
NOAA Open Rivers Initiative	The NOAA Open Rivers Initiative (ORI) provides funding and technical expertise for community-driven, small dam and river barrier removals, primarily in coastal states. Projects are expected to provide an economic boost for communities, enhance public safety, and improve populations of NOAA trust resources such as striped bass, Atlantic and shortnose sturgeon, Atlantic and Pacific salmon, American eel, American shad, blueback herring, and alewife. Proposals selected will be implemented through a cooperative agreement
National Integrated Water Quality Program (NIWQP)	The National Integrated Water Quality Program (NIWQP) provides funding for research, education, and extension projects aimed at improving water quality in agricultural and rural watersheds. The NIWQP has identified eight "themes" that are being promoted in research, education and extension. The eight themes are (1) Animal manure and waste management (2) Drinking water and human health (3) Environmental restoration (4) Nutrient and pesticide management (5) Pollution assessment and prevention (6) Watershed management (7) Water conservation and agricultural water management (8) Water policy and economics. Awards are made in four program areas - National Facilitation Projects, Regional Coordination Projects, Extension Education Projects, and Integrated Research, Education and Extension Projects. Please note that funding is only available to universities.
National Wildlife Refuge Friends Group Grant Program	The National Fish and Wildlife Foundation provides grants for projects that help organizations to be effective co-stewards of our Nation's important natural resources within the National Wildlife Refuge System. This program provides competitive seed grants to help increase the number and effectiveness of organizations interested in assisting the refuge system nationwide. The program will fund: (1) Start-up Grants to assist starting refuge support groups with formative and/or initial operational support (membership drives, training, postage, etc.); (2) Capacity Building Grants to strengthen existing refuge support groups' capacity to be more effective (outreach efforts, strategic planning, membership development); and (3) Project Specific Grants to support a specific project (conservation education programs for local schools, outreach programs for private landowners, habitat restoration projects, etc.)
Native Plant Conservation Initiative	The National Fish and Wildlife Foundation's Native Plant Conservation Initiative (NPCI) supports on-the-ground conservation projects that protect, enhance, and/or restore native plant communities on public and private land. Projects typically fall into one of three categories and may contain elements of each: protection and restoration, information and education, and inventory and assessment. Applicants are encouraged, when appropriate, to include a pollinator component in their project. This program is funded by the Bureau of Land Management, Forest Service, Fish and Wildlife Service, and National Park Service.
North American Wetlands Conservation Act Grants Program	The U.S. Fish and Wildlife Service's Division of Bird Habitat Conservation administers this matching grants program to carry out wetlands and associated uplands conservation projects in the United States, Canada, and Mexico. Grant requests must be matched by a partnership with nonfederal

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Funding Program	Program Description
	funds at a minimum 1:1 ratio. Conservation activities supported by the Act in the United States and Canada include habitat protection, restoration, and enhancement. Mexican partnerships may also develop training, educational, and management programs and conduct sustainable-use studies. Project proposals must meet certain biological criteria established under the Act. Visit the program web site for more information. (Click on the hyperlinked program name to see the listing for "Primary Internet".)
Partners for Fish and Wildlife Program	The Partners for Fish and Wildlife Program provides technical and financial assistance to private landowners to restore fish and wildlife habitats on their lands. Since 1987, the program has partnered with more than 37,700 landowners to restore 765,400 acres of wetlands; over 1.9 million acres of grasslands and other upland habitats; and 6,560 miles of in-stream and streamside habitat. In addition, the program has reopened stream habitat for fish and other aquatic species by removing barriers to passage.
Pesticide Environmental Stewardship Grants	EPA's Pesticide Environmental Stewardship Program (PESP) offers grants to support the reduction of risks from pesticides in agricultural and non-agricultural settings, and to implement pollution prevention measures. All organizations with a commitment to pesticide risk reduction are eligible to join PESP as members, either as Partners or as Supporters. For more information about membership requirements and available grants, click on the program name and refer to the link listed under "Primary Internet."
Project Modifications for Improvement of the Environment (CAP Section 1135)	Work under this authority provides for modifications in the structures and operations of water resources projects constructed by the Corps of Engineers to improve the quality of the environment. Additionally, the Corps may undertake restoration projects at locations where an existing Corps project has contributed to the degradation. The primary goal of these projects is ecosystem restoration with an emphasis on projects benefiting fish and wildlife. The project must be consistent with the authorized purposes of the project being modified, environmentally acceptable, and complete within itself
Pulling Together Initiative	The National Fish and Wildlife Foundation's Pulling Together Initiative (PTI) provides a means for federal agencies to partner with state and local agencies, private landowners, and other interested parties to develop long-term weed management projects within the scope of an integrated pest management strategy. The goals of PTI are: (1) to prevent, manage, or eradicate invasive and noxious plants through a coordinated program of public/private partnerships; and (2) to increase public awareness of the adverse impacts of invasive and noxious plants. PTI provides support on a competitive basis for the formation of local weed management area (WMA) partnerships, allowing them to demonstrate successful collaborative efforts and develop permanent funding sources for the maintenance of WMAs from the involved parties. Successful projects will serve to increase public awareness and interest in future partnership projects.
Watershed Protection and Flood Prevention Program	Also known as the 'Watershed Program' or the 'PL 566 Program,' this program provides technical and financial assistance to address water resource and related economic problems on a watershed basis. Projects related to watershed protection, flood mitigation, water supply, water quality, erosion and sediment control, wetland creation and restoration, fish and wildlife habitat enhancement, agricultural water conservation, and public recreation are eligible for assistance. Technical and financial assistance is also available for planning new watershed surveys.

**Table 10-4
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Funding Program	Program Description
Sustainable Agriculture Research and Education	The Sustainable Agriculture Research and Education (SARE) program of the U.S. Department of Agriculture works to advance farming systems that are more profitable, environmentally sound and good for communities through an innovative grants program. More specifically, SARE funds scientific investigation and education to reduce the use of chemical pesticides, fertilizers, and toxic materials in agricultural production; to improve management of on-farm resources to enhance productivity, profitability, and competitiveness; to promote crop, livestock, and enterprise diversification and to facilitate the research of agricultural production systems in areas that possess various soil, climatic, and physical characteristics; to study farms that have are managed using farm practices that optimize on-farm resources and conservation practices; and to promote partnerships among farmers, nonprofit organizations, agribusiness, and public and private research and extension institutions. Click on program name and check the link in the Primary Internet box for more information about grant opportunities and program results.
Watershed Rehabilitation Program	This program provides Federal cost-share funding for the rehabilitation of aging dams that were installed primarily through the Watershed Protection and Flood Prevention Program over the past 55 years. The purpose for rehabilitation is to extend the service life of dams and bring them into compliance with applicable safety and performance standards or to decommission the dams so they no longer pose a threat to life and property.
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Watershed Restoration and Enhancement Agreement Authority	Department of Agriculture Forest Service. Projects that protect, enhance, or restore resources within a watershed and provide tangible benefits to achieving Forest Service goals and objectives are allowable under Wyden. Project types are not limited to actual projects on the ground; for example, stream gabion installation, check dam construction, fish habitat restoration, or culvert cleaning. Watershed analysis studies, habitat surveys and wildlife species monitoring, depending on the benefit to resources within the watershed, are also permissible under Wyden. Any project carried out under Wyden authority must comply with all applicable Federal, State and local laws and regulations, policies and permit requirements; for example, National Environmental Policy Act, Clean Water Act, and Endangered Species Act. Projects must be within a watershed for the stated program objectives. Use of grants is restricted to State and Private Forestry funding.
Wetlands Reserve Program	Through this voluntary program, the USDA Natural Resources Conservation Service (NRCS) provides landowners with financial incentives to restore and protect wetlands in exchange for retiring marginal agricultural land. To participate in the program landowners may sell a conservation easement or enter into a cost-share restoration agreement (landowners voluntarily limit future use of the land, but retain private ownership). Landowners and the NRCS jointly develop a plan for

**Table 10-4
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Funding Program	Program Description
	the restoration and maintenance of the wetland.
Wildlife Habitat Incentives Program	The Wildlife Habitat Incentives Program (WHIP) is a voluntary program for people who want to develop and improve wildlife habitat on private lands. It provides both technical assistance and cost sharing to help establish and improve fish and wildlife habitat. Participants work with USDA's Natural Resources Conservation Service to prepare a wildlife habitat development plan in consultation with a local conservation district. The plan describes the landowner's goals for improving wildlife habitat, includes a list of practices and a schedule for installing them, and details the steps necessary to maintain the habitat for the life of the agreement.