

**DIRECT COST ANALYSIS
FOR THE PROPOSED
CANNABIS CULTIVATION POLICY**

**State Water Resources Control Board
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CHAPTER 1 – INTRODUCTION

This report presents an analysis of the potential costs to cannabis cultivators to comply with the proposed *Cannabis Cultivation Policy – Principles and Guidelines for Cannabis Cultivation* (Policy). As directed by Water Code section 13149, the Policy establishes principles and guidelines (requirements) for cannabis cultivation activities to ensure that the diversion of water and discharge of waste associated with cannabis cultivation does not have a negative impact on water quality, aquatic habitat, wetlands, and springs. The Policy area covers the entire state of California, as indicated on Figure 1. The Requirements established by this Policy will be implemented through five regulatory programs:

- State Water Resources Control Board's (State Water Board) Cannabis General Waste Discharge Requirements for Discharges of Waste Associated with Cannabis Cultivation Activities (Cannabis General Order) or any Waste Discharge Requirements addressing cannabis cultivation activities adopted by a Regional Water Quality Control Board;
- State Water Board's General Water Quality Certification for Cannabis Cultivation Activities;
- State Water Board's Cannabis Small Irrigation Use Registration;
- State Water Board's Water Rights Permitting and Licensing Program; and
- California Department of Food and Agriculture's CalCannabis Cultivation Licensing Program¹.

This report evaluates the direct costs of reasonably foreseeable methods of compliance with the Policy as implemented through the five regulatory programs. Costs of compliance include regulatory program application and annual fees, preparing monitoring plans, and implementation of water quality protection measures as expressly required by the Policy. Potential costs to cannabis cultivators to comply with the Policy will vary from cultivator to cultivator depending on many factors, including cannabis cultivation site size, location, and the extent of existing environmental issues. Additionally, this report identifies possible sources of funding to assist the cultivator with implementation costs. This report does not evaluate the economic impact of potential indirect effects that may arise from the Policy, such as the economic impact of developing alternative water supplies.

The Policy applies to a new regulatory program (for cannabis cultivation). As such, the cost of complying with the Policy does not directly compare to other existing regulatory programs. Accordingly, this report provides estimated ranges of anticipated costs that cannabis cultivators may incur to comply with the Policy. The estimated ranges of costs are based primarily on existing regulatory programs, State Water Board professional judgment, and reasonable implementation expectations. The costs are also based on the use of outside contractors to provide labor and materials in connection with compliance activities. Throughout this report, it is acknowledged that many of the potential costs are subject to variation based on site-specific circumstances.

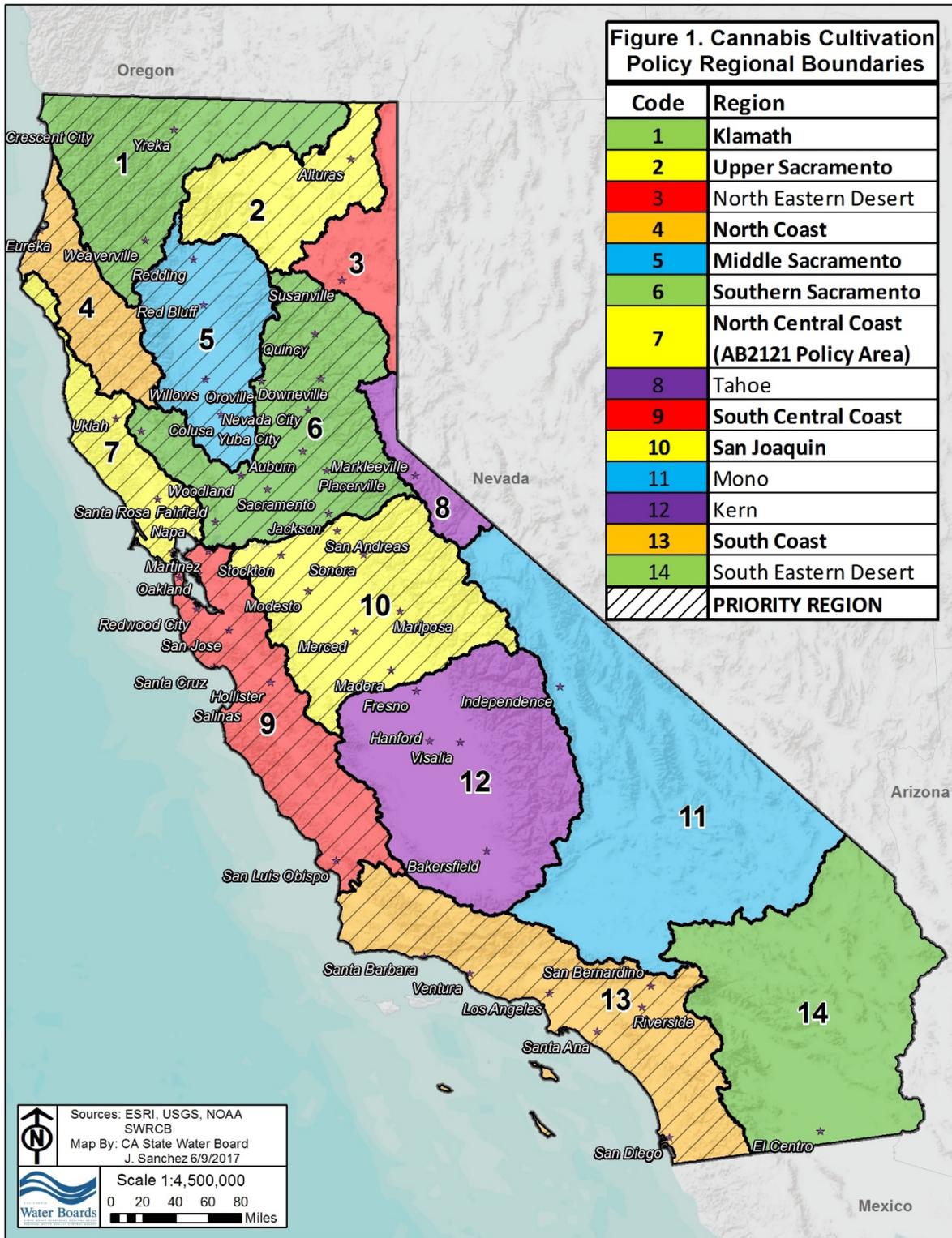
1.1 ORGANIZATION OF THE REPORT

This analysis is organized as follows: Chapter 2 provides a brief overview of the Policy. Chapter 3 presents the estimated ranges of anticipated costs to cannabis cultivators under each of the regulatory programs identified in the Policy. Chapter 4 identifies

¹ Business and Professions Code section 26060(b)(1).

potential sources of funding to assist cannabis cultivators in complying with the Policy. Chapter 5 includes references used in the development of this analysis.

Figure 1. Policy Area



CHAPTER 2 – DESCRIPTION OF PROPOSED POLICY

The purpose of the Policy is to ensure that the diversion of water and discharge of waste associated with cannabis cultivation does not have a negative impact on water quality, aquatic habitat, riparian habitat, wetlands, and springs. The Policy applies to the following cannabis cultivation activities throughout California:

- Commercial Recreational
- Commercial Medical
- Personal Use Medical

The Policy does not apply to recreational cannabis cultivation for personal use, which is limited to six plants under the Adult Use of Marijuana Act (Proposition 64, approved by voters in November 2016)².

Cannabis cultivation legislation enacted California Water Code (Water Code) section 13149, which directs the State Water Board, in consultation with the California Department of Fish and Wildlife (CDFW), to adopt interim and long-term principles and guidelines for the diversion and use of water for cannabis cultivation in areas where cannabis cultivation may have the potential to substantially affect instream flows. The legislation requires the State Water Board to establish these principles and guidelines as part of a state policy for water quality control³. Per Water Code section 13149, the principles and guidelines:

- shall include measures to protect springs, wetlands, and aquatic habitats from negative impacts of cannabis cultivation; and
- may include requirements that apply to groundwater diversions where the State Water Board determines those requirements are reasonably necessary.

Additionally, Business and Professions Code section 26060.1(b) requires that these principles and guidelines be included as conditions in cannabis cultivation licenses issued by the California Department of Food and Agriculture (CDFA).

Water Code section 13149 authorizes the State Water Board to develop both interim and long-term principles and guidelines (hereinafter “Requirements”) and update them as necessary. The Requirements for cannabis cultivation are located in Policy Attachment A. Policy background information and justifications for the Requirements are located in the Cannabis Cultivation Policy Staff Report. It is anticipated that the State Water Board will update this Policy over time to modify or add requirements to address cannabis cultivation impacts, as needed.

The State Water Board holds the dual mandates of allocating surface water rights and protecting water quality. The State Water Board is the state agency with primary authority over water quality under California’s Porter-Cologne Water Quality Control Act and the federal Clean Water Act. Under these authorities, the State Water Board may adopt water quality objectives, including flow objectives, and programs of implementation to achieve these objectives. California law directs the State Water Board and Regional Water Boards

² Recreational cannabis cultivation for personal use as defined in Health and Safety Code section 11362.1(a)(3) and section 11362.2.

³ Water Code section 13149(b)(2). *The board shall adopt principles and guidelines under this section as part of state policy for water quality control adopted pursuant to Article 3 (commencing with Section 13140) of Chapter 3 of Division 7.* Water Code section 13142 outlines specific requirements for a state policy for water quality control, which this Policy implements.

(collectively Water Boards) to adopt water quality control plans and policies that identify existing and potential beneficial uses of waters of the state and establish water quality objectives to protect these uses.

CHAPTER 3 – ESTIMATED COSTS

This chapter provides a discussion of estimated potential costs to cannabis cultivators to comply with the Policy. Each section within this chapter represents one of the five regulatory programs through which the Policy will be implemented. The estimated costs are based on previous cost evaluations of existing regulatory programs, similar state government activities, and established or proposed fees associated with the cannabis cultivation regulatory programs. The costs also are based on the use of outside contractors to provide labor and materials in connection with compliance activities. Cannabis cultivation permitting is a new government program, and some of the fees associated with implementation of the Policy have not yet been established, so the actual cost of permit and licensing fees will not be known until fees and regulations are adopted in the last quarter of 2017 or the first quarter of 2018. Major costs not included in this analysis are permitting costs at the county and local level, and permits required outside of the Cannabis Policy.

General Assumptions

The cost of compliance in the sections below were developed using assumptions about labor costs and the cost of various cannabis cultivation related activities. Three primary references were used to determine the costs presented in this report:

- Recovery Strategy for California Coho Salmon (CDFW 2004)
- Direct Cost Analysis for the Proposed North Coast Instream Flow Policy (Stetson Engineers Inc. 2007)
- FY17 – Practice Payment Scenarios for Conservation Activity Plans and Conservation Practices (USDA 2016)

Analysis based on these references shows that consultant labor costs for activities similar to cannabis cultivation have remained relatively constant over the last 15 years, and allow some level of confidence in the estimated costs. The higher cost was generally selected if there were differences in the costs assessed from the references. Therefore, the cost assumptions are conservative.

For example, Table 3.1 compares the cost assumptions between the references and what is used in this analysis. Table 3.1 shows that the more recent document estimated lower hourly costs for engineers and scientists; however, this analysis uses the highest rate found in the references, with actual costs likely to be lower.

**Table 3.1 – Comparison of Hourly Labor Costs
between References and this Cost Analysis**

Category	CDFA 2004	Stetson Engineers Inc. 2007	USDA 2016	Cannabis Cost Analysis
General Labor	\$18-25/hr	n/a	\$24/hr	\$25/hr
Engineer Labor	n/a	\$120/hr	\$89/hr	\$120/hr
Environmental Scientist Labor	n/a	\$100/hr	\$74/hr	\$100/hr

The costs developed, especially for costs related to the development and implementation of plans under the Cannabis General Order, rely primarily on the payment scenarios (costs) for conservation activity plans developed by the United States Department of Agriculture

(USDA) under its Environmental Quality Incentives Program. The payment scenarios go into depth on the exact assumptions of time, labor, and equipment needed to plan and implement conservation practices that improve soil, water, plant, animal, air, and related natural resources on agricultural land and non-industrial private forestland. Additionally, the costs listed under each activity have been localized by the USDA regional offices to account for cost differences within various states and regions. The names of the components and scenarios used by the USDA have been retained in this analysis to facilitate cross reference of the activity.

This analysis assumes that the majority of cannabis cultivators have low to moderate experience with environmental regulations and the cultivation sites being permitted or licensed under the Policy can come into environmental compliance with the Policy. Many cannabis cultivation sites have never been permitted through any regulatory program due to the formerly illegal status of cannabis at the state level and/or the lack of environmental regulation for medical cannabis cultivation. However, there are reasons to assume cannabis cultivators interested in basic environmental compliance have pursued it on existing cannabis cultivation sites. The first is general, agricultural practices that reduce environmental impact, widely known as “best management practices” or BMPs, are readily available to the public and are reasonably accessible for a cannabis cultivator, regardless of legal status or regulatory oversight. The second is that pilot programs for environmental regulation have been available in Northern California since 2015, where high concentrations of cannabis cultivation occurs. Medical cannabis cultivators within that area are already required to apply under Regional Water Quality Control Boards Cannabis Cultivation Waste Discharge Regulatory Programs⁴ that have similar requirements to those proposed in the Policy.

The Policy creates a statewide regulatory program in the place of regionally-based programs to promote consistent and timely regulation of the cannabis cultivation industry in advance of the January 1, 2018 deadline for agencies, including the CDFA, to establish commercial cannabis licensing programs. Potential costs to cannabis cultivators to comply with the Policy will vary from cultivator to cultivator depending on many factors, including cannabis cultivation site size, location, and the extent of existing environmental issues that need to be brought into compliance. This analysis does not address all potential environmental issues related to cannabis cultivation that need to be brought into compliance with the Policy or the variety of means by which a cannabis cultivator could achieve compliance.

Finally, while this analysis does not cover socioeconomic analysis of the costs of compliance, the *Recovery Strategy for California Coho Salmon by the California Department of Fish and Wildlife* does include socioeconomic analysis of habitat recovery within a large portion of the state that coincides with existing cannabis cultivation. The significance of CDFW’s analysis is that it finds that habitat recovery activities also become a source of beneficial income at the local level for the range of jobs required to implement the recovery activities.

3.1 COSTS FOR CALCANNABIS CULTIVATION LICENSING PROGRAM

⁴ North Coast Regional Water Quality Control Board (Region 1) Order No. R1-2015-0023: Waiver of Waste Discharge Requirements and General Water Quality Certification for Discharges of Waste Resulting from Cannabis Cultivation and Associated Activities or Operations with Similar Environmental Effects in the North Coast Region and Central Valley Regional Water Quality Control Board (Region 5) Order No. R5-2015-0113: Waste Discharge Requirements General Order for Discharges of Waste Associated with Medicinal Cannabis Cultivation Activities.

CDFA is developing and managing the CalCannabis Cultivation Licensing Program (CalCannabis). Business and Professions Code 26060.1(b)(1) requires that the Requirements of the Policy be included as conditions in cannabis cultivation licenses issued by CDFA. The CalCannabis application and licensing fees are not established by the State Water Board and do not fund the State Water Board's programs. However, the projected costs are provided here for reference.

Application Costs

The application costs of CDFA's CalCannabis Licensing Program depends on the canopy size or number of plants being cultivated and the method of cultivation. The April 28, 2017, CDFA proposed *Regulations for Medical Cannabis Cultivation Program* (proposed Medical Cannabis Regulations) included application costs ranging from \$60 to \$4,260 depending on the license type.⁵ (CDFA 2017) CDFA has retracted the proposed Medical Cannabis Regulations and is currently drafting emergency regulations to address cannabis cultivation for both medical and adult recreational use and the application costs may change.

Cost of Compliance

The proposed Medical Cannabis Regulations included licensing fees that ranged from \$560 to \$38,350 based on the same criteria as the application costs. The proposed licensing fees were for the initial issuance and for the renewal of CalCannabis licenses. The proposed licensing fees may change in with CDFA's development of cannabis cultivation emergency regulations, which are under development.

The cost of compliance for the Policy Requirements are separate and distinct from CDFA's CalCannabis Licensing Program licensing fees. The costs associated with Policy Requirements can be found in the individual sections for the applicable State Water Board regulatory program within this analysis.

3.2 COSTS FOR CANNABIS GENERAL ORDER

The costs associated with complying with the Policy Requirements as implemented through the Cannabis General Order depend on the tier and risk designation a cannabis cultivator falls under. The Cannabis General Order provides a statewide tiered approach for permitting discharges and threatened discharges of waste from cannabis cultivation and associated activities, establishes a personal use exemption standard, and provides conditional exemption criteria for activities with a low threat to water quality. Tiers are defined by the amount of disturbed area. The disturbed area indicates the threat to water quality because level of threat is proportional to the area of disturbed soil, the amount of irrigation water used, the potential for storm water runoff, and the potential impacts to groundwater (e.g., the use of fertilizers or soil amendments, the possible number of employees on site, etc.).

A general overview of the criteria for the tier structure consist of three exemptions and two tiers, as follows:

- a. Personal use-exempt cannabis cultivators are very small, non-commercial cultivators that are exempt from the Cannabis General Order.

⁵ The specific application and licensing proposed fees by license type can be found in the proposed Regulations for Medical Cannabis Cultivation Program at: <http://cannabis.cdfa.ca.gov/>

- b. Indoor commercial cultivation activities are conditionally exempt under the Cannabis General Order.
- c. Outdoor commercial cultivation activities that disturb less than 2,000 square feet may be conditionally exempt under the Cannabis General Order.
- d. Tier 1 outdoor commercial cultivation activities disturb an area equal to or greater than 2,000 square feet and less than 1 acre (43,560 square feet).
- e. Tier 2 outdoor commercial cultivation activities disturb an area equal to or greater than 1 acre.

The Policy and General Order provide specific detail on the Requirements a cultivation site needs to meet to qualify for an exemption or tier listed above. Tier 1 and Tier 2 enrollees under the Cannabis General Order must characterize the risk designation based on the slope of disturbed areas and the proximity to a water body. Table 3.2 summarizes the risk designations.

Table 3.2 – Summary of Risk Designation

Low Risk	Moderate Risk	High Risk
<ul style="list-style-type: none"> • No portion of the disturbed area is located on a slope greater than 30 percent, and • All of the disturbed area complies with the riparian setback Requirements. 	<ul style="list-style-type: none"> • Any portion of the disturbed area is located on a slope greater than 30 percent and less than 50 percent, and • All of the disturbed area complies with the riparian setback Requirements. 	<ul style="list-style-type: none"> • Any portion of the disturbed area is located within the riparian setback Requirements.

Enrollees under the Cannabis General Order are required to submit technical reports to the appropriate Regional Water Quality Control Board (Regional Water Board). Table 3.3 summarizes report submittal Requirements, by tier and risk level, and Cannabis General Order Attachment D contains guidance regarding contents of required reports.

Table 3.3 – Summary of Technical Reports Required by Tier and Risk Level

Tier	Risk Level	Technical Reports
Conditionally Exempt	Not Applicable	Site Closure Report
Tier 1	All	Site Management Plan
		Site Closure Report
	Moderate	Site Erosion and Sediment Control Plan
	High	Disturbed Area Stabilization Plan
Tier 2	All	Site Management Plan
		Nitrogen Management Plan
		Site Closure Report
	Moderate	Site Erosion and Sediment Control Plan
	High	Disturbed Area Stabilization Plan

Application Costs

The application costs of the Cannabis General Order are based on the Tier and Risk category. Table 3.4 outlines the application fees for each category.

Table 3.4 – Proposed Application and Annual Fees for the Cannabis General Order

Category	Application Fee	Subsequent Annual Fee
Conditionally Exempt	\$600	N/A
Tier 1 – Low Risk	\$600	\$600
Tier 2 – Low Risk	\$1,000	\$1,000
Tier 1 – Moderate Risk	\$1,800	\$1,800
Tier 2 – Moderate Risk	\$3,000	\$3,000
Tier 1 – High Risk	\$4,800	\$4,800
Tier 2 – High Risk	\$8,000	\$8,000

Conditionally Exempt cannabis cultivators are not charged annually. The application fee provides the initial coverage of five years. Subsequent renewals of coverage will be charged the application fee. For Tier 1 and Tier 2 cannabis cultivators, the application fee serves as the annual fee for the first year; Tier 1 and Tier 2 cannabis cultivators will be billed on an annual basis. It is incumbent for the cannabis cultivator to notify the appropriate Regional Water Board and provide proof when the associated cultivation site is decommissioned or has moved into a different tier or risk category.

Cost of Compliance

The cost of compliance under the Cannabis General Order is dependent on both the tier and risk category that a cannabis cultivator qualifies under and the extent of existing

environmental issues at the cannabis cultivation site that need to be brought into compliance with the Policy Requirements. Cost assumptions are listed under each Cannabis General Order section below.

3.2.1 Cost of Technical Reports

Enrollees under the Cannabis General Order are required to submit technical reports to the appropriate Regional Water Board, as summarized in Table 3.3. The cost of each report is based on a combination of field and in-office work performed by qualified professionals, as described in the Policy Requirements. The hours of work required for each report relies on the information contained in the references listed in the general assumptions and State Water Board staff professional judgment. Actual costs will also vary depending on the speed and efficiency of the professionals involved in developing any plan.

Site Management Plan

The Site Management Plan is required of all risk levels in both tiers of the Cannabis General Order. The Site Management Plan should be considered the foundation of the technical reports as it includes elements of all the Policy and Cannabis General Order Requirements and a site map of the cultivation activities. For a relatively simple site (Tier 1, low risk), an individual that is not a qualified professional can prepare the Site Management Plan so long as the individual is familiar with aspects of the cultivation site and can describe the report elements described in the General Order’s Technical Report Guidance. It is feasible to assume that the costs of the other technical reports are reduced if a robust Site Management Plan is created, as much of the information can be reused in the more detailed reports required with higher risk levels. Costs are reflected as a range to include the variability of site complexity.

Table 3.2-1. Summary of Estimated Costs for the Site Management Plan

Task	Environmental Scientist Labor (\$100/hr)	Engineering Labor (\$120/hr)	Total
Field Inspection/Survey	0 - 10 hrs	3 - 16 hrs	\$360 - \$2,920
In-Office Report Production	0 - 10 hrs	10 - 30 hrs	\$1,200 - \$4,600
Subtotal	\$0 - \$2,000	\$1,560 - \$5,520	\$1,560 - \$7,520

Field inspections and surveys are expected to include documenting site characteristics, assessing the site conditions, identifying water quality issues and native species of concern, and surveying measurements of site features as needed. In-office report production is expected to include research of the site area on environmental, water quality, and habitat range databases, identification of mitigation measures needed to comply with the Policy Requirements, and production of the site plan.

Site Erosion and Sediment Control Plan

The Site Erosion and Sediment Control Plan adds to the Site Management Plan with more detailed information. The hours of labor for costs in Table 3.2-2 assumes that this report builds off of existing plans or is co-authored with the Site Management Plan, with the cost of supervision of qualified professional built in, and would not need additional in-field work. The major addition within this plan are the mapping and description of historic disturbances, recent or planned disturbances, and areas of the special concern. It is also assumed that

the majority of the labor would be in the engineering or geology fields and that biological issues would be addressed in the Site Management Plan.

Table 3.2-2. Summary of Estimated Costs for the Site Erosion and Sediment Control Plan

Task	Environmental Scientist Labor (\$100/hr)	Engineering Labor (\$120/hr)	Total
Field Inspection/Survey	0	0	\$0
In-Office Report Production	0	10 - 20 hrs	\$1,200 - \$2,400
Subtotal	\$0	\$1,200 - \$2,400	\$1,200 - \$2,400

Disturbed Area Stabilization Plan

Disturbed Area Stabilization Plan must be prepared under supervision of a qualified professional. Assuming that the Site Management Plan is prepared under the supervision of a qualified professional, some of the Disturbed Area Stabilization Plan is assumed to be developed within the Site Management Plan. The major addition within this plan are the detailed mapping of the site (topography, vegetation, elevation, etc.) and nearby water bodies and associated riparian setback, description of disturbed area, identification and description of native vegetation in the area. Biological surveys of riparian areas that are disturbed may be required to be included as a part of the revegetation of the Disturbed Area Stabilization Plan.

Table 3.2-3. Summary of Estimated Costs for the Disturbed Area Stabilization Plan

Task	Environmental Scientist Labor (\$100/hr)	Engineering Labor (\$120/hr)	Total
Field Inspection/Survey	4-8 hrs	0	\$400 - \$800
In-Office Report Production	5-10 hrs	10 - 20 hrs	\$1,700 - \$3,400
Subtotal	\$900 - \$1,800	\$1,200 - \$2,400	\$2,100 - \$4,200

Nitrogen Management Plan

The Nitrogen Management Plan is required for Tier 2 dischargers that cultivate one acre or more of cannabis. The Nitrogen Management Plan requires specific information regarding how nitrogen is stored, used, and applied to crops in a way that is protective of water quality. An individual that is not a qualified professional can supervise the preparation of the Nitrogen Management Plan if the individual is familiar with aspects of the cultivation site and can describe the report elements described in the General Order's Technical Report Guidance. However, documentation of limited nitrogen availability requires an analytical or agricultural laboratory to perform plant tissue analysis. The discharger may also hire an agronomist or other similarly qualified person to assist in the report preparation.

Table 3.2-4. Summary of Estimated Costs for the Nitrogen Management Plan

Task	Environmental Scientist Labor (\$100/hr)	Engineering Labor (\$120/hr)	Total
Field Inspection/Survey	4-8 hrs	0	\$400 - \$800
In-Office Report Production	4-16 hrs	0	\$400 - \$1,600
Subtotal	\$800 - \$2,400	\$0	\$800 - \$2,400

Site Closure Report

The Site Closure Report is required when the cultivation activities at the site cease. This requirement is applicable to all enrolled dischargers (conditionally exempt, Tier 1, and Tier 2). Submittal of the Site Closure Report is accompanied by a Notice of Termination Form provided as Attachment C of the General Order. The costs of preparing Site Closure Plan are likely to be linearly correlated with tier and risk classification of a cultivation site. A Site Closure Plan is likely a modest expense for conditionally exempt dischargers. For example, an indoor cultivator discharging to sewer collection system can simply complete a Notice of Termination form and submit a Site Closure Report indicating that none of the measures (mainly for outdoor cultivation) are applicable. Larger cultivation sites located in sloped areas with a portion of its cultivation area within a riparian setback will need to describe all measures implemented to prevent sediment discharges to water bodies and to stabilize or restore the disturbed areas to minimize erosion, along with preparation of final monitoring and reporting program

Table 3.2-5. Summary of Estimated Costs for the Site Closure Plan

Task	Environmental Scientist Labor (\$100/hr)	Engineering Labor (\$120/hr)	Total
Field Inspection/Survey	0-4 hrs	4-8 hrs	\$480 - \$1,360
In-Office Report Production	0-10 hrs	5-20 hrs	\$600 - \$3,400
Subtotal	\$0 - \$1,400	\$1,080 - \$3,360	\$1,080 - \$4,760

3.2.2 Land Development and Maintenance, Erosion Controls, and Drainage Features

Costs are assumed to derive from the professional development of plans to control discharges (control plans) (see Section 3.2.1) and from the actual cost of control activities needed to bring the cultivation site into compliance with the Requirements. Table 3.2-6 summarizes the unit cost of activities to comply with the Requirements related to Land Development and Maintenance, Erosion Controls, and Drainage Features. All costs are listed by unit as each cultivation site will have varying degrees of need. Table 3.2-6 is not meant to be the exhaustive list of activities that could occur under this section, but rather a representation of potential reasonable actions.

**Table 3.2-6. Summary of Land Development and Maintenance,
Erosion Controls, and Drainage Feature Unit Costs**

Component	Scenario	Description	Unit	Cost
Access Road	New Road, Earth, <10% Hillside Slope	Length of Roadway Treated	Foot	\$6.13
	Road Rehab, Earth, <10% Hillside Slope	Length of Roadway Treated	Foot	\$1.42
	New Road, Earth, >10% Hillside Slope	Length of Roadway Treated	Foot	\$12.22
	Road Rehab, Earth, >10% Hillside Slope	Length of Roadway Treated	Foot	\$3.08
	Road Rehab, Surfaced, 10% - 40% Slope	Length of Roadway Treated	Foot	\$19.28
	Erosion Control, Unsurfaced	Length of Roadway Treated	Foot	\$1.61
	Erosion Control, Surfaced	Length of Roadway Treated	Foot	\$5.42
	Rolling Dip Addition	Length of Roadway Treated	Foot	\$7.82
	Water bar Addition	Length of Roadway Treated	Foot	\$10.92
Heavy Use Area Protection	Rock/Gravel	Area of Rock and or Gravel	Square Foot	\$1.46
Precision Land Forming	Minor Shaping	Area of Land Treated	Acre	\$472.09
	Site Stabilization	Volume of Material Moved	Cubic Yard	\$7.54
	Habitat Excavation	Volume Excavated	Cubic Yard	\$14.26
Mulching	Natural Materials	Area Covered	Acre	\$289.66
	Hydromulch	Area Covered	Square Foot	\$0.06
	Geotextile	Area Covered	Square Foot	\$0.29
Stormwater Runoff Control	Silt Fence	Length Treated	Foot	\$0.91
	Straw Bales	Number of Items	Each	\$5.00
	Straw Wattles	Length Treated	Foot	\$0.99
Structure for Water Control (No aquatic organism passage)	Corrugated Metal Pipe Culvert <30 inches	Diameter of Pipe by Length Required	Diameter Inch Foot	\$10.23
	Corrugated Metal Pipe Culvert >=30 inches	Diameter of Pipe by Length Required	Diameter Inch Foot	\$7.67
Surface Drain, Field Ditch	Drainage Ditch, <= 3 Feet Deep	Length Treated	Foot	\$3.39

USDA 2016, *FY17 Practice Payment Scenarios for Conservation Activity Plans and Conservation Practices*. Available at: https://efotg.sc.egov.usda.gov/references/public/CA/FY17_ScenarioDescriptions-wBookMarks.pdf

3.2.3 Cleanup, Restoration, and Mitigation

Costs are assumed to derive from the professional development of the control plans (see Section 3.2.1) and from the actual cost of control activities needed to bring the cultivation site into compliance with the Requirements. Table 3.2-7 summarizes the unit cost of activities to comply with the requirements related to Cleanup, Restoration, and Mitigation. All costs are listed by unit as each cultivation site will have varying degrees of need. Table 3.2-7 is not meant to be the exhaustive list of activities that could occur under this section, but rather a representation of potential reasonable actions. Actions that are already covered in other sections are not repeated. For example, many activities under Table 3.2-6 would also apply to potential activities in this section.

Table 3.2-7. Summary of Cleanup, Restoration, and Mitigation Unit Costs

Component	Scenario	Description	Unit	Cost
Herbaceous Weed Control	Hand Tools	Area of Land Treated	Acre	\$343.06
	Competing Vegetation Control	Area of Land Treated	Acre	\$1,142.47
Clearing and Snagging	Vegetation Removal	Length of Clearing	Foot	\$16.78
	Rock Removal	Length of Clearing	Foot	\$29.13
	Instream Structure Removal	Volume of Material Removed	Cubic Yard	\$22.56
Critical Area Planting	Hydroseed	Area Treated	Acre	\$2,157.02
Riparian Herbaceous Cover	Riparian Broadcast Seeding	Area Treated	Acre	\$1,367.39
	Plug Planting	Area Treated	Acre	\$26,705.04
Riparian Forest Buffer	Seeding	Area Treated	Acre	\$211.00
	Cuttings, Small to Medium	Area Treated	Acre	\$1,808.81
	Cuttings, Medium to Large	Area Treated	Acre	\$4,688.87
	Bare Root, Hand Planted	Area Treated	Acre	\$1,547.02

USDA 2016, *FY17 Practice Payment Scenarios for Conservation Activity Plans and Conservation Practices*. Available at: https://efotg.sc.egov.usda.gov/references/public/CA/FY17_ScenarioDescriptions-wBookMarks.pdf

3.2.4 Stream Crossing Installation and Maintenance

Costs are assumed to derive from the professional development of the control plans (see Section 3.2.1) and from the actual cost of control activities needed to bring the cultivation site into compliance with the Requirements. Table 3.2-8 summarizes the unit cost of activities to comply with the requirements related to Stream Crossing Installation and Maintenance. All costs are listed by unit as each cultivation site will have varying degrees of

need. Table 3.2-8 is not meant to be the exhaustive list of activities that could occur under this section, but rather a representation of potential reasonable actions. Actions that are already covered in other sections are not repeated. For example, many activities under Table 3.2-6 could also apply to potential activities in this section.

Table 3.2-8. Summary of Stream Crossing Installation and Maintenance Unit Costs

Component	Scenario	Description	Unit	Cost
Aquatic Organism Passage	Corrugated Metal Pipe (CMP) Culvert, <=8 Feet	Pipe Length	Foot	\$838.30
	CMP Culvert, <=8 Feet, Foundation Modification	Pipe Length	Foot	\$968.76
	CMP Culvert, >8 Feet	Pipe Length	Foot	\$1,044.55
	Bottomless Culvert <=8 feet Span	Culvert Length	Foot	\$1,040.52
	Bottomless Culvert >8 feet Span	Culvert Length	Foot	\$1,102.29
	Concrete Box Culvert	Culvert Length	Foot	\$1,868.70
	Step Pool Weir	Area of Material	Cubic Yard	\$110.53

USDA 2016, *FY17 Practice Payment Scenarios for Conservation Activity Plans and Conservation Practices*. Available at: https://efotg.sc.gov.usda.gov/references/public/CA/FY17_ScenarioDescriptions-wBookMarks.pdf

3.2.5 Water Storage and Use

Costs are assumed to derive from the professional development of the control plans (see Section 3.2.1) and from the actual cost of control activities needed to bring the cultivation site into compliance with the Requirements. Costs under this category are also found under the Cannabis Small Irrigation and Use Registration and Water Rights sections below as they involve surface water diversion activities.

Table 3.2-9 summarizes the unit cost of activities to comply with the requirements related to Water Storage and Use. All costs are listed by unit as each cultivation site will have varying degrees of need. Table 3.2-9 is not meant to be the exhaustive list of activities that could occur under this section, but rather a representation of potential reasonable actions. Actions that are already covered in other sections are not repeated. For example, water use measurement is a specific requirement for most surface water diversions and the cost associated with measurement activities is located with the Cannabis Small Irrigation and Use Registration section.

Table 3.2-9. Summary of Water Storage and Use Unit Costs

Component	Scenario	Description	Unit	Cost
Irrigation Reservoir	Embankment Reservoir	Volume of Earth Excavated	Cubic Yard	\$4.53
	Steel Tank	Volume of Storage Tank	Gallon	\$1.44
	Plastic Tank	Volume of Storage Tank	Gallon	\$1.79
	Fiberglass Tank	Volume of Storage Tank	Gallon	\$1.11
Pumping Plant	Electric Powered Pump <=3 Horsepower	Power of Device	Horsepower	\$1,445.74
	Electric Powered Pump <=3 Horsepower w/ Pressure Tank	Power of Device	Horsepower	\$1,909.41
	Electric Powered Pump >3 to 10 Horsepower	Power of Device	Horsepower	\$480.98
	Electric Powered Pump >10 to 40 Horsepower	Power of Device	Horsepower	\$441.12
	Solar <1 Horsepower	Mechanical Device	Each	\$7,514.74
	Solar 1-3 Horsepower	Mechanical Device	Each	\$14,226.01
	Solar >3 Horsepower	Mechanical Device	Each	\$23,105.40
	Internal Combustion-Powered Pump <= 7.5 Horsepower	Power of Device	Horsepower	\$693.80
	Internal Combustion-Powered Pump 7.5 to 75 Horsepower	Power of Device	Horsepower	\$691.21
Open Channel	Excavation, Normal Conditions	Volume of Material Removed	Cubic Yard	\$2.87
Structure for Water Control	Fish Screen, Irrigation Type	Rate of Water Screened	Cubic Foot per Second	\$1,600.85
Water Harvest Catchment	Elevated Catchment	Surface Area	Square Yard	\$167.26
	Surface Catchment	Surface Area	Square Yard	\$17.10
Water Well	Drilled <200 Feet Deep	Entire Well	Each	\$13,008.14
	Drilled 200-400 Feet Deep	Entire Well	Each	\$19,678.86
	Drilled 401-800 Feet Deep	Entire Well	Each	\$33,020.29

USDA 2016, *FY17 Practice Payment Scenarios for Conservation Activity Plans and Conservation Practices*. Available at: https://efotg.sc.egov.usda.gov/references/public/CA/FY17_ScenarioDescriptions-wBookMarks.pdf

3.2.6 Fertilizers, Pesticides, and Petroleum Products

Costs are assumed to derive from the professional development of the control plans (see Section 3.2.1) and from the actual cost of control activities needed to bring the cultivation site into compliance with the Requirements. Fertilizer, Pesticides, and Petroleum Products requirements are assumed to fall under the ongoing operations and maintenance cost of the cultivation site and are not included in this analysis. Further, many of the requirements fall under county-specific ordinances or under the Department of Pesticide Regulation for methods of compliance and are outside the scope of this analysis.

3.2.7 Refuse, Domestic, and Cultivation Related Waste

Costs are assumed to derive from the professional development of the control plans (see Section 3.2.1) and from the actual cost of control activities needed to bring the cultivation site into compliance with the Requirements. Refuse, Domestic, and Cultivation Related Waste requirements are assumed to fall under the ongoing operations and maintenance cost of the cultivation site and are not included in this analysis. Further, many of the requirements fall under county-specific ordinances for methods of compliance and are outside the scope of this analysis.

3.2.8 Winterization

Costs are assumed to derive from the professional development of the control plans (see Section 3.2.1) and from the actual cost of control activities needed to bring the cultivation site into compliance with the Requirements. Winterization practices are largely extensions of the Policy Requirements from the other sections with a focus on stormwater management. The costs of individual activities overlap with those found in Table 3.2-6 and Table 3.2-7. Monitoring of cultivation sites over winter and the cleaning of required equipment and facilities to comply with the Winterization section is assumed to fall under the ongoing operations and maintenance cost of the cultivation site and are not included in this analysis.

3.2.9 Tribal Cultural Resources and Prehistoric Archeological Materials

Costs are assumed to derive from the evaluation of tribal cultural resources and prehistoric archeological materials by a qualified professional. This evaluation is not explicitly listed under the development of the technical reports, however it is a requirement that an assessment of tribal cultural resources and prehistoric archeological materials is completed prior to any land disturbance activities. The assessment is assumed to be a combination of in-office work by a qualified professional searching the appropriate tribal cultural resource databases or contacting tribal representative, when appropriate, and possible field visits to establish the conditions of the area that would be disturbed. Costs in Table 3.2-10 are shown as a range to reflect the variability of site complexity. Costs associated with inadvertent discovery of prehistoric materials or indicators, or human remains, are not reflect in this analysis.

Table 3.2-10. Summary of Estimated Costs for Tribal Cultural Resources and Prehistoric Archeological Resources

Task	Environmental Scientist/Professional Archeologist Labor (\$100/hr)	Engineering Labor (\$120/hr)	Total
Field Inspection/Survey	2 – 8 hrs	0	\$200 - \$800
In-Office Report Production	4-16 hrs	0	\$400 - \$1,600
Subtotal	\$600 - \$2,400	\$0	\$600 - \$2,400

3.3 COSTS FOR GENERAL WATER QUALITY CERTIFICATION FOR CANNABIS CULTIVATION ACTIVITIES

The costs associated with the General Water Quality Certification for cannabis cultivation activities (Certification) was not compiled for this analysis. The costs associated with obtaining and complying with a Clean Water Act (CWA) section 404 (33 U.S.C. § 1344) permit from the United States Army Corps of Engineers (Army Corps) and a CWA section 401 (33 U.S.C. § 1341) water quality certification, coverage under the Cannabis General Order water quality certification, or site-specific WDRs issued by the Regional Water Board for discharges of dredge or fill materials to waters of the United States or to the non-federal waters of the state are not unique to the Policy.

3.4 COSTS FOR CANNABIS SMALL IRRIGATION USE REGISTRATION

Since January 1, 1989, the Water Rights Registration Program has been available for expedited acquisition of appropriative water rights for certain small projects. In accordance with the Water Code section 1228, water right registrations are available for small irrigation, small domestic, and livestock stockpond users. Small Irrigation Use Registrations (SIUR) are applicable to irrigated crops for sale or trade, including commercial cannabis cultivation once general conditions are adopted. Small Domestic Registrations (SDR) may be used for small, incidental watering and personal gardens and are not subject to this Policy (SDRs may not be used for obtaining CDFA commercial cannabis cultivation licenses). Livestock stockpond registrations are not available for cannabis cultivation.

Although cultivators often have multiple options to establish a water right for their water supply, the State Water Board anticipates that many cultivators will choose the Cannabis SIUR because it is a faster and easier way to obtain a water right in comparison to the application process for a new appropriative water right, which can take many years. In accordance with this Policy, cultivators who rely on surface water to irrigate their cannabis operation are required to divert to storage during the wet season (portions of fall/winter/spring) and forebear from diverting during the dry season (summer/portions of fall). Because riparian water rights do not allow for water storage, riparian water right holders who intend to cultivate cannabis will also be required to obtain an appropriative (storage) water right (most likely through the Cannabis SIUR) in order to comply with the Policy.

The Requirements established in the Policy serve as general conditions for the Cannabis SIUR water right registrations for commercial cannabis cultivation statewide. Cultivators will be subject to all terms and conditions set forth in the Policy as well as any additional

conditions assigned by CDFW.

Application Costs

The application costs of the Cannabis SIUR will be a flat fee of \$750. The annual fee will be the same as the application fee. The application and annual fees for the Cannabis SIUR are subject to change overtime.

Cost of Compliance

The cost of compliance with the Cannabis SIUR largely overlaps with the requirements of the Water Storage and Use component of the Cannabis General Order (Section 3.2.5 above). However, the main additional cost that would be reasonably required is the cost of measuring and monitoring water diverted for cannabis cultivation. The Policy requires cannabis cultivators to install and maintain a measuring device(s) for surface water or subterranean stream diversions. The measuring device shall be, at a minimum, equivalent to the requirements for direct diversions greater than 10 acre-feet per year in California Code of Regulations, Title 23, Division 3, Chapter 2.7.

Table 3.4-1 outlines the accuracy and monitoring requirements to meet the Policy measuring device requirements. Table 3.4-2 details the expected costs of measurement devices. As with all other sections in this analysis, these are not meant to be the exhaustive list of devices that can be used for measurement, but rather a representation of potential reasonable measurement methods. More information about the State Water Board's measurement regulations can be found at http://www.waterboards.ca.gov/waterrights/water_issues/programs/diversion_use/water_use.shtml.

Table 3.4-1. Summary of Accuracy and Monitoring Requirements

Type of Diversion	Required Device Accuracy	Required Monitoring Frequency	Installation and Certification
Direct Diversion > 10 AF and <100 AF annually	15%	Daily	Individual experienced with measurement and monitoring (No professional certification or specific training is required)

State Water Board 2016, *Emergency Regulation for Measuring and Reporting Water Diversions*. Available at http://www.waterboards.ca.gov/waterrights/water_issues/programs/measurement_regulation/docs/measure_cost_tables.pdf

Table 3.4-2. Summary of Water Measurement Device Costs

Category	Device/Service	Cost Range	
		Low	High
Direct Diversion	In-Line Flow Meter	\$1,200	\$1,800
	In-Line Flow Meter / Open Channel	\$2,000	\$6,000
	Pressure Transducer	\$300	\$1,000
State Water Board 2016, <i>Emergency Regulation for Measuring and Reporting Water Diversions</i> . Available at http://www.waterboards.ca.gov/waterrights/water_issues/programs/measurement_regulation/docs/measure_cost_tables.pdf			

3.5 COSTS FOR WATER RIGHTS PERMITTING AND REGISTRATION FOR CANNABIS CULTIVATION

The appropriative water rights process is the standard method for obtaining water rights that do not qualify for either the water right registration program or for a riparian water right. It is assumed that the majority of cannabis cultivators will obtain water rights through the Cannabis SIUR Program, but there may be cases, such as where a cultivator wants to create a new onstream dam, that a full appropriative water right will be required. This analysis only covers the basic application and ongoing costs of an appropriative water right. Detailed analysis of appropriative water rights are beyond the scope of this analysis. Documents such as Stetson Engineers Inc. 2007 should be consulted for details on appropriative water right requirements.

Application Costs

The application costs of an appropriative water right is \$1,850 plus an additional \$15 for each acre-foot of water being sought for applications greater than 10 acre-feet. This cost is current as of the publication of this analysis and is subject to change by the State Water Board each fiscal year.

Cost of Compliance

While detailed analysis is not provided for appropriative water rights in this analysis, it can be assumed that a portion of the cost of compliance overlaps with the requirements of the Water Storage and Use component of the Cannabis General Order (Section 3.2.5 above). Additional cost that would be reasonably required is the cost of measuring and monitoring the water diverted (Section 3.4 above). The annual fee for an appropriative water right, permitted or fully licensed, is \$150 plus \$0.069 per acre-foot greater than 10 acre-feet.⁶ The annual fee for a pending water right application is \$750 plus \$0.069 per acre-foot greater than 10 acre feet.

⁶ State Water Board Resolution No. 2017-0052 established the water right fees for fiscal year 2017- 18.

CHAPTER 4 – POTENTIAL FUNDING SOURCES

The previous chapter discusses representative costs that the cannabis cultivator would incur in order to comply with the Policy. The costs are divided into two categories: application and implementation costs. It is assumed that the cannabis cultivator would provide his/her own funding for the costs associated with the application process. The cannabis cultivator would also provide funding for implementation costs of compliance; however, potential sources of funding are available to assist the cultivator with implementation costs. This chapter discusses possible sources of funding for the applicant.

4.1 FEDERAL GRANT PROGRAMS

There are hundreds of federal programs that provide funds for habitat restoration and other mitigation requirements of the Policy. However, cannabis cultivation is illegal at the federal level and there is no indication that cannabis's legal status will change within the first years of implementation of the Policy. Therefore, while federal programs are listed below, it is unlikely that funding from those sources would be approved for a project associated with cannabis cultivation.

Table 4.1 lists many of the federal agencies that administer grant programs for habitat restoration. Each agency's website should list the currently available funding programs along with specific information on eligibility. Federal grant opportunities can also be researched at www.grants.gov.

Table 4-1. Federal Agencies that Administer Grant Programs for Habitat Restoration (Stetson Engineering Inc. 2007)

Agency	Website
AmeriCorps	www.americorps.org
Bureau of Indian Affairs	www.doi.gov/bureau-indian-
Bureau of Land Management	www.blm.gov
Coastal America	www.coastalamerica.gov
Economic Development Administration	www.eda.gov
National Fish and Wildlife Foundation	www.nfwf.org
National Marine Fisheries Service	www.nmfs.noaa.gov
National Oceanographic and Atmospheric	www.noaa.gov
National Park Service	www.ncrc.nps.gov
Natural Resources Conservation Service	www.nrcs.usda.gov
US Army Corps of Engineers	www.usace.army.mil
US Environmental Protection Agency	www.epa.gov
US Farm Service Agency	www.fsa.usda.gov
US Fish and Wildlife Service	www.fws.gov
USDA Forest Service	www.fs.fed.us

4.2 STATE AND LOCAL GRANT AGENCIES

Table 4.2 lists many of the state and local agencies that administer grant programs for habitat restoration and similar mitigation plans in California. Each agency's website should list the currently available funding programs along with specific information on eligibility. State grant opportunities can also be researched at <http://getgrants.ca.gov>. Funding may also be available through local county or city programs.

Table 4-2. State and Local Agencies that Administer Grant Programs for Habitat Restoration (Stetson Engineers Inc. 2007)

Agency	Website
California Bay-Delta Authority	http://calwater.ca.gov
California Coastal Coalition	www.calcoast.org
California Department of Conservation	www.consrv.ca.gov
California Department of Fish and Game	www.dfg.ca.gov
California Department of Parks and Recreation	www.parks.ca.gov
California Department of Water Resources	www.dwr.water.ca.gov
California Resources Agency	http://resources.ca.gov
California State Coastal Conservancy	www.scc.ca.gov
California State Water Resources Control Board	www.waterboards.ca.gov
California Wildlife Conservation Board	www.wcb.ca.gov

4.3 NONPROFIT GROUPS AND PRIVATE FOUNDATIONS

Table 4.3 lists a few of the nonprofit organizations and private foundations that may have current funding programs for habitat restoration in California. There are hundreds of potential grant sources available that can be researched through a subscription grant database such as the Foundation Directory at www.foundationcenter.org.

Table 4-3. Examples of Nonprofit Organizations and Private Foundations that May Fund Programs for Habitat Restoration in California (Stetson Engineers Inc. 2007)

Organization	Website
David and Lucile Packard Foundation	www.packard.org
FishAmerica Foundation	www.fishamerica.org
Fishery Foundation of California	www.fisheryfoundation.org
Singing for Change	www.singingforchange.com

CHAPTER 5 – REFERENCES

- California Department of Fish and Wildlife (CDFW). 2004. *Recovery Strategy for California Coho Salmon*. Available at: <http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=99401>
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