Chapter 6
ALTERNATIVES

6.1 Introduction

This chapter describes the alternatives considered for the proposed Suction Dredge Permitting Program and evaluates their environmental impacts as compared to the Proposed Program. The purpose of the alternatives analysis in an EIR is to describe a range of reasonable alternatives to the project that can feasibly attain most of the identified Program objectives, but reduce or avoid one or more of the project's significant impacts. A more detailed description of the CEQA regulatory requirements for alternatives analysis is provided in the section immediately below.

The chapter then continues with a description of the alternative development process, alternatives that were considered, and alternatives that were considered but dismissed. The chapter closes with a discussion regarding the environmentally superior alternative.

6.1.1 Regulatory Requirements

CEQA requires that an EIR evaluate a reasonable range of alternatives to the proposed project, including the No Project Alternative. The No Project alternative allows decision makers to compare the impacts of approving the action against the impacts of not approving the action. While there is no clear rule for determining a reasonable range of alternatives to the proposed project, CEQA provides guidance that can be used to define the range of alternatives for consideration in the environmental document.

The range of alternatives under CEQA must meet most of the basic project objectives, should reduce or eliminate one or more of the significant impacts of the proposed project (although the alternative could have greater impacts overall), and must be potentially feasible. In determining whether alternatives are potentially feasible, Lead Agencies are guided by the general definition of feasibility found in CEQA Guidelines section 15364: "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." In accordance with CEQA Guidelines section 15126.6[f], the Lead Agency should consider site suitability, economic viability, availability of infrastructure, general plan consistency, other regulatory limitations, and jurisdictional boundaries in determining the range of alternatives to be evaluated in an EIR. An EIR must briefly describe the rationale for selection and rejection of alternatives and the information that the Lead Agency relied upon in making the selection. It should also identify any alternatives that were considered by the Lead Agency but were rejected as infeasible during the scoping process and briefly explain the reason for their exclusion (CEQA Guidelines section 15126[d][2]). These guidelines were used in developing the alternatives and their evaluation as described below.

6.2 Alternatives Development Process

The previous regulations governing suction dredge mining were adopted by CDFG in 1994 after the preparation and certification an environmental impact report (State Clearinghouse Number 93102046) under CEQA. This 1994 EIR included the evaluation of 6 alternatives to the 1994 regulations, though the proposed regulations were determined to be superior to the alternatives given CDFG's regulatory authority and legal considerations. In addition, in 1997, CDFG considered amendments to the 1994 regulations. A draft subsequent EIR was prepared that same year which also included a description of 5 alternatives; however, it was never finalized or certified, and the regulations were never amended. Both sets of alternatives were developed based on the comments received during the scoping and public review periods of the EIRs.

The current effort under CEQA builds upon work completed in the 1994 and 1997 EIRs, but incorporates new assumptions and current information. In particular, the most current special-status species information has been incorporated into the biological analysis to update the species maps and to provide a new basis for the seasonal or permanent availability of areas to suction dredging activities. The current Program also includes an analysis of potential mercury resuspension and discharge, a topic of concern which has been the subject of additional study since the 1994 EIR. And finally, the current effort incorporates additional environmental topics of concern that were either not fully addressed or not included in either of the prior EIRs; such topics include noise, aesthetics, cultural resources, and traffic effects.

Given the scope of the current analysis, CDFG sought to obtain public input through a range of outreach and involvement strategies. The formal public involvement process began on October 26, 2009, when the IS/NOP for the Program was published for review. Around this same time, an internet page on CDFG's website was established to alert individuals of current Program information and upcoming scoping meetings, and to solicit comments on the Program itself. A mailing list was also created to inform interested parties of the renewed environmental review of the Program and to provide direction on how and when to provide comments. This list built upon that of the previous effort and included past permit holders, dredging associations, and manufacturers, as well as public agencies, non-profit organizations, and members of the general public. Public scoping meetings for the IS/NOP were held on consecutive days in three different locations throughout the state in an effort to reach as much of the interested public as possible. Following these meetings, a Public Advisory Committee (PAC) consisting of interested individuals, agencies, and organizations, was formed to help develop updates to the Program regulations. The PAC convened on three occasions from February to March 2010 to share information and knowledge on a wide range of topics related to suction dredging. The results of these workshops, as well as a detailed summary of the scoping process, are presented in Appendix (C and G). Suggestions and comments received from each of these activities informed the development of alternatives for the Program.

Concurrent with the activities described above, CDFG and other entities have conducted studies and prepared technical documents to develop a more detailed understanding of the Program activities and potential effects on the environment. The Literature Review (Appendix D) compiled and reviewed information related to suction dredge mining to

assess the existing body of information and need for additional areas of study. CDFG also conducted a survey of suction dredge permit holders to update information gathered previously in 1994 (see Appendix F). This survey expanded upon the 1994 survey to develop a more current characterization of suction dredging operations and estimation of economic activity associated with the activity. These and other investigations, together with the public involvement process described above, collectively offered helpful insights for CDFG's consideration and use in the development of Programmatic alternatives.

A range of alternatives is presented below that address some of the potential impacts of the Proposed Program. Alternatives were developed with consideration of the Program's goals and objectives (i.e., purpose and need), the significant environmental impacts of the Program, and potential feasibility. These Programmatic alternatives seek to achieve similar goals as the Proposed Program, though they may achieve these goals to a greater or lesser extent.

6.2.1 Program Objectives

The Program was developed to achieve the following objectives:

- Comply with the December 2006 Court Order;
- Promulgate amendments to CDFG's previous regulations as necessary to effectively implement Fish and Game Code sections 5653 and 5653.9 and other applicable legal authorities to ensure that suction dredge mining will not be deleterious to fish;
- Develop a Program that is implementable within the existing fee structure established by statute for the California Department of Fish and Game's suction dredge permitting program, as well as the existing fee structure established by the CDFG pursuant to Fish and Game Code section 1600 et seq.;
- Fulfill the CDFG's mission of managing California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public; and
- Ensure that the development of the regulations consider economic costs, practical considerations for implementation, and technological capabilities existing at the time of implementation.
- Fulfill the CDFG's obligation to conserve, protect, and manage fish, wildlife, native plants, and habitats necessary for biologically sustainable populations of those species and as a trustee agency for fish and wildlife resources pursuant to Fish and Game Code section 1802.

6.2.2 Significant Environmental Impacts of the Proposed Program

The analysis of Program effects did not identify any significant impacts which could be reduced to a level of less-than-significant through implementation of mitigation; rather, measures to reduce or avoid impacts were incorporated directly into the draft updated regulations where feasible given the scope of CDFG's jurisdictional authority with respect to suction dredging. CDFG's authority is limited to avoiding or reducing impacts that are deleterious to fish pursuant to the provisions of Fish and Game Code section 5653. As a

result, adverse impacts were found to be either *less-than-significant* (i.e., the proposed regulations would ensure that impacts are not significant) or *significant and unavoidable* (i.e., the proposed regulations would not reduce impacts to a level of insignificance and no other feasible mitigation within the authority of CDFG could be determined).

6.2.3 Significant and Unavoidable Environmental Impacts of the Proposed Program

The following impacts have been identified as significant and unavoidable:

- *Impact WQ-4:* Effects of Mercury Resuspension and Discharge from Suction Dredging
- *Impact WQ-5: E*ffects of Resuspension and Discharge of Other Trace Metals from Suction Dredging
- *Impact BIO-WILD-2:* Effects on Special-Status Passerines Associated with Riparian Habitat
- *Impact CUL-1:* Substantial Adverse Changes, When Considered Statewide, in the Significance of Historical Resources
- *Impact CUL-2:* Substantial Adverse Changes, When Considered Statewide, in the Significance of Unique Archaeological Resources
- *Impact NZ-1:* Exposure of the Public To Noise Levels in Excess of City of County Standards
- *Impact CUM-2*: Effects on Wildlife Species and their Habitats
- *Impact CUM-6*: Turbidity/TSS Discharges from Suction Dredging
- *Impact CUM-7:* Cumulative Impacts of Mercury Resuspension and Discharge from Suction Dredging

6.3 Alternatives Considered

The following alternatives have been evaluated for their potential feasibility and their ability to achieve most of the Program objectives while avoiding, reducing, or minimizing significant impacts identified for the Proposed Program. These alternatives (with the exception of the No Program Alternative) were determined to be feasible or potentially feasible, and would generally meet the Program objectives.

The degree to which these alternatives substantially lower the significant impacts identified for the Proposed Program is discussed below. All subject areas are analyzed for each alternative, though at a more general level than for the Proposed Program as provided by CEQA.

- No Program Alternative
- 1994 Regulations Alternative
- Water Quality Alternative

- Reduced Intensity Alternative

Table 6-1 provides a summary comparison of the impacts of each of the alternatives analyzed compared to the Proposed Program, including beneficial and adverse effects. Each of the alternatives, and associated impacts, are described below.

TABLE 6-1. ALTERNATIVES COMPARISON TABLE

CEQA Resource Topic	No Program Alternative	1994 Regulations Alternative[1]	Water Quality Alternative	Reduced Intensity Alternative
Hydrology and Geomorphology	○	●	○	○
Water Quality and Toxicology	○	●	○	○
Biological Resources	○	●	○	○
Hazards and Hazardous Materials	○	●	⊙	○
Cultural Resources	○	●	⊙	○
Aesthetics	○	●	○	○
Noise	○	●	○	○
Recreation	○	●	○	○
Transportation and Traffic	○	⊙	⊙	○
Mineral Resources	⊙	⊙	⊙	⊙
Cumulative Impacts	○	●	○	○

1. Note that this alternative would have similar or greater adverse effects than the Proposed Program overall; however, effects would be reduced in certain locations.

Symbol

(●) overall, alternative would have additional adverse effects compared to the Proposed Program (i.e. effects are more adverse)

(○) overall, alternative would have decreased adverse effects compared to the Proposed Program (i.e. effects are more beneficial)

(⊙) overall, effects would be similar as those described for the Proposed Program Proposed Program

6.3.1 No Program Alternative

Characteristics of this Alternative

Under the No Program Alternative, the current prohibitions on instream suction dredging operation would remain in effect and no further permit issuance by the California Department of Fish and Game would occur. Essentially, this would entail continuance of the existing environmental conditions of the Program area.

Impact Analysis

By continuing the moratorium on the use of suction dredges in California, all of the adverse environmental impacts related to the Proposed Program would be eliminated. By having no effect at all on these resources, the No Program Alternative would avoid all the significant and unavoidable effects of the Program and would further reduce or eliminate the effects

reported as being less-than-significant. This includes the avoidance of noise and air emissions, recreational conflicts between users, and geomorphic and biologic effects, among others.

In relation to mineral resources, the No Program Alternative would not result in any discernable change from the Proposed Program. Though this alternative would no longer permit the use of a particular device to conduct gold mining, it does not entirely prohibit gold or other mineral extraction. This is similar to the Proposed Program in that methods other than suction dredging would still be allowed in the streams subject to seasonal or permanent closures under the proposed regulations.

6.3.2 1994 Regulations Alternative

Characteristics of this Alternative

Under this alternative, CDFG would resume administering the Program under the 1994 Regulations, which were in place prior to the moratorium. This includes the limits on nozzle size and operational requirements as outlined in those regulations, and suction dredge use classifications for waterways unchanged from the 1994 specifications. While the following analysis reveals that this alternative would have greater or similar impacts compared to the Proposed Program overall, impacts would be reduced in locations that would be closed to suction dredging under this alternative, but open under the Proposed Program. This alternative was also selected for analysis in this SEIR because of the value of the information that would be provided by such analysis. Because of the unique circumstances leading up to the preparation of this SEIR, it was determined that CEQA's informational purpose would be served by providing the interested public and Department decision-makers with this information comparing the Proposed Program to the regulations previously in place before the litigation and 2006 Court Order and the ensuing court and Legislative moratoria on suction dredging.

Impact Analysis

One common aspect of this alternative which contributes equally to all environmental resource topics is that the 1994 regulations did not establish a maximum limit on the number of permits CDFG could issue each year. Though based on historic records, CDFG issues an average of 3,650 permits annually; the actual distribution number can vary significantly. At the height of its popularity in 1980, over 12,000 suction dredging permits were issued. Depending on a number of factors, including the current selling price of gold, it is reasonable to assume that demands for permits under this alternative could reach, or even surpass, these peak levels. If this were the case, adverse effects identified for the Program could be exacerbated.

In addition, and perhaps more importantly, the listing of open or closed streams would differ under this alternative than under the Proposed Program. While all of the impacts of the Proposed Program would be eliminated in certain geographic areas (areas proposed to be open under the Proposed Program, but closed under the 1994 regulations), this would be offset to varying degrees by increased impacts in other locations (areas that are proposed to be closed under the Proposed Program but would be open under the 1994 regulations). In terms of reducing impacts of the Proposed Program, this alternative would eliminate all

impacts in areas closed under the 1994 regulations but proposed to be open under the Proposed Program.

Hydrology and Geomorphology

Implementation of this alternative is likely to have a greater adverse effect on hydrology and geomorphology resources in the Program Area due to the potentially unlimited number of permits that could be issued each year and the less restrictive regulations.

Compared to the Proposed Program, the 1994 regulations allow for greater potential site disturbance associated with a larger permissible nozzle size and less restrictive operational requirements. Under the 1994 regulations, dredgers are able to use nozzles with diameter between 6 and 8 inches, as opposed to 4 inches under the Proposed Program. As detailed in Chapter 3, dredges equipped with 6-8 inch nozzles have a substantially greater excavating capacity compared to those using a 4 inch nozzle. Moreover, the 1994 regulations do not include certain operational restrictions which are expected to minimize effects on this resource. Under the 1994 regulations there would be no limitations on the hours of operation, and clear definitions of prohibited water diversions and bank disturbance are not provided. For instance, section (k) of the currently proposed regulations specify that permittees must level tailing piles and return the location to pre-mining grades to the greatest extent possible. Similarly, prohibitions on the alterations of flow now include actions which would concentrate flow in a way that reduces the total wetted area of the stream. Consequently, this alternative would potentially result in a greater extent of geomorphic disturbance to in-channel features, increasing the potential for destabilization or alteration of waterways beyond that described for the Proposed Program.

Water Quality and Toxicology

Operational requirements in the 1994 regulations are not as extensive as the Proposed Program in addressing accidental or preventable contamination of waterways. For instance, common activities such as the use and storage of fuels and other hazardous materials would remain unregulated, and measures to avoid excessive turbidity from dredging silt or clay would not be implemented. Consequently, this alternative would increase adverse effects involving the risk of contaminated discharges.

In addition, the increase in the volume of sediment movement achievable using larger nozzle sizes would further contribute to the significant adverse impacts affecting water quality and toxicology. As detailed in Chapter 4.2, the relative proportion of total mercury (THg) and trace metal loading from suction dredging activity is directly dependent on the dredge size, duration of operations during the year, and sediment characteristics and concentrations. Overall, available data show that fewer numbers of dredgers using more powerful equipment (nozzle sizes 6-8) are required to discharge similar amounts of mercury in contaminated areas. Several aspects of the 1994 regulations would create potential for greater mercury and trace metal discharges than under the Proposed Program, including the permitted use of larger nozzle sizes, the unlimited number of permits which can be issued each year, and unrestricted number of hours of operation per day. As a result, this alternative would increase adverse effects associated with mercury and trace metal loading, methylmercury formation, and bioaccumulation in areas downstream of dredging activity.

Biological Resources

Resuming dredging activities based on *Suction Dredge Use Classifications* from 1994 would result in additional adverse effects on biological resources compared to the Proposed Program. This is due in large part to the fact that the 1994 regulations do not take into consideration the up-to-date listings and information regarding the life history, distribution, and abundance of special-status species and habitats. By permitting dredging practices in areas currently supporting special-status resources, adverse impacts on these biological resources would be substantially greater under this alternative.

Furthermore, the operation of dredge equipment under the 1994 Regulations would increase the potential for a greater area of site disturbance. As described previously, the permitted use of larger nozzle sizes increases the volume of sediment displacement. Usage of more powerful equipment would increase disturbances to instream habitats and species, such as contributing to further habitat alteration and increased risk of entrainment and/or harm. General operational requirements intended to prevent damage or harm to biological resources under the 1994 regulations are also not as comprehensive as those included in the Proposed Program. This disparity in the protection of biological resources would increase adverse effects on fish and other species.

Hazards and Hazardous Materials

Certain practices, including the creation of tailings piles, accidental release of hazardous materials, use of toxic materials, and equipment staging pose safety risks to dredgers and other individuals in the vicinity. Such practices are regulated under the Proposed Program, but are not under the 1994 regulations. As such, the implementation of this alternative would increase the potential for adverse effects from hazards associated with dredging, compared to the Proposed Program.

Cultural Resources

The potentially increased number of Program participants under this alternative would intensify the risk of accidental discovery or disturbance of buried cultural resources. This would contribute to increased adverse effects on these resources as compared to the Proposed Program.

Aesthetics, Noise, and Recreation

Beyond the potential exacerbation of adverse effects related to increased users, the 1994 regulations do not include certain requirements that help prevent or avoid impacts under the Proposed Program. Unlike the Proposed Program, this alternative would not impose restrictions on daily operation of equipment. In addition, the allowance of larger nozzle sizes (6-8 inches in diameter) lends to the use of larger engines to provide adequate suction power. These factors would increase noise level exposure and duration of noise compared to the Proposed Program, though likely not to a significant level, due to the relatively small difference in noise levels associated with varying size dredges (see Table 4.7-5 in Chapter 4.7 *Noise*).

The 1994 regulations are also less specific in defining operational requirements compared to the Proposed Program. The Proposed Program advises permit holders on the proper treatment of wastes, provides additional protection of upland vegetation, and gives

additional clarifications on permissible and prohibited in-stream disturbances. Under the 1994 alternative, none of these measures would be included. As such, the implementation of this alternative could result in additional disturbance and therefore intensified adverse aesthetic impacts at or near dredging sites compared with the Proposed Program.

These intensified adverse effects related to noise emissions and aesthetic conditions would correspond to a similar potential for greater recreational conflicts. Since user experience is based primarily on the conditions of a site, increases in noise level and site disturbance would negatively affect recreational experience for certain user groups. Therefore, the perpetuation of the 1994 regulations also would have increased adverse effects on recreational resources.

Transportation and Traffic

The primary aspect of this alternative affecting transportation and traffic is the potential number of permits issued by CDFG for this activity. However, an increase in Program participation is unlikely to cause noticeable additional adverse effects related to traffic hazards or parking capacity. These matters are common issues for all recreationists using motorized vehicles for transportation, and the extent to which any particular user group is responsible for adverse effects is difficult to discern, and suction dredgers in all cases would represent a relatively small number within the overall population of recreationalists. Rather, shortages and hazards are generally attributable to personal behaviors, as well as an area's recreational popularity and available facilities. As such, the 1994 Regulation Alternative would result in similar effects on this resource as the Proposed Program.

Mineral Resources

This alternative would have similar effects on mineral resources as described for the Proposed Program.

Cumulative Impacts

Increases in use, larger nozzle/engine sizes, and overall disturbances associated with operations would make a larger incremental contribution to some cumulative effects compared to the Proposed Program. In particular, impacts associated with mercury discharges, greenhouse gas emissions, and effects on fish species would be slightly increased under this alternative; however effects on terrestrial species and the remainder of cumulative effects would likely remain similar as described for the Proposed Program.

6.3.3 Water Quality Alternative

Characteristics of this Alternative

The Water Quality Alternative focuses on reducing the water quality impacts of the Program. In addition to applying the updated regulations of the Proposed Program, this alternative would include additional considerations for water bodies listed as impaired pursuant to Clean Water Act Section 303(d) for sediment or mercury. Specifically, listed areas would be closed to suction dredging in order to avoid further degradation of the water body from dredging activities.

As detailed in the *Water Quality and Toxicology* chapter of this SEIR, the current Section 303(d) list for California includes 178 water bodies listed for mercury impairment and 728 identified for sediment impairment. These impaired waters include portions of the Trinity River, the Eel River, the Feather River, San Joaquin, Stanislaus River, and the American River. While several of these listed waters are already classified as seasonally or permanently closed to suction dredging as part of the proposed regulations, it is likely that this alternative would result in new areas which are closed to suction dredging.

The listing of areas closed to dredging would be updated as necessary to remain consistent with the State Water Resources Control Board's determinations, which generally occurs every 2 years. Bi-annual updating of suction dredge regulations would require CDFG to prioritize budgeting to account for this additional effort.

Impact Analysis

Hydrology and Geomorphology

This alternative would impose additional restrictions which would reduce the number of locations open to suction dredging activities. As such, fewer areas would be subject to the geomorphic effects of suction dredging. And while this alternative could concentrate impacts in certain locations where suction dredging is permitted, such localized effects are anticipated to be offset by the greater proportion of the Program area where impacts are eliminated entirely. Furthermore, the bi-annual updates to the regulations could change the mosaic of open/closed areas such that some locations within the Program area are able to experience extended periods of rest and geomorphic recovery, as sites are added or removed from the 303(d) list.

Water Quality and Toxicology

This alternative would have the most evident reduction in effects on this resource, as it includes consideration of the Program's effects on water quality and restricts activities in all areas listed for mercury and sediment impairment. As detailed in Chapter 4.2, mercury discharge associated with suction dredging activities contributes to adverse fate and transport processes both locally and in downstream receiving waters. Such effects are especially pronounced when dredging occurs in areas containing highly-elevated sediment mercury concentrations. By preventing dredging in mercury impaired systems, this alternative would largely avoid the significant adverse water quality effects associated with mercury discharge in comparison to the Proposed Program.

Sediment resuspension into the water column caused by suction dredging increases turbidity and total suspended solid (TSS) concentrations in downstream areas. Such increases in turbidity and TSS have the potential to adversely affect aquatic organisms, water supplies, recreation, or other beneficial uses. Since waterbodies listed as impaired for these constituents have been determined to have no further assimilative capacity for sediment/turbidity, this alternative would avoid the further degradation of these impaired waterbodies.

As such, this alternative would have an overall reduced effect on water quality and toxicology as compared to the Proposed Program.

Biological Resources

Biological resources in the Program area would benefit from the prevention of dredging practices in areas with known sensitivity to further water quality degradation. Closures of such waterbodies would decrease the severity of secondary habitat effects associated with turbidity and water quality contamination in impaired areas. However, the greatest reduction in effects associated with this alternative stem from the reduced geographic area subject to dredging operations. Under this alternative, reduced disturbances to wildlife and plant species, including habitat alteration and risk of direct harm, would result from the less expansive area of operation. Furthermore, the general operational requirements intended to prevent damage or harm to biological resources are common to both this alternative and the Proposed Program. As such, effects associated with a more condensed activity area would not likely result in noticeable increases in localized adverse effects on fish or other species.

As a result, the provisions of this alternative would provide greater protection of biological resources and would help alleviate adverse effects on fish and other biological resources in the overall Program area.

Hazards and Hazardous Materials and Cultural Resources

Adverse effects associated with these resource topics are related to the potential risk of accidents or inadvertent disturbances. Given that this alternative would support a similar number of Program participants as the Proposed Program, the overall risks associated with dredging operations would remain similar. Likewise, though this alternative would likely concentrate Program participants to areas available for dredging (thus increasing risk of disturbances); this effect is counterbalanced by the more restricted Program area (thus eliminating effects in certain areas). Consequently, the risks of accidental releases of hazardous materials and inadvertent discovery or disturbance of buried cultural resources under this alternative are likely to remain similar to that of the Proposed Program.

Aesthetics, Noise, and Recreation

The additional area closures under this alternative may lead to concentrations of Program users in certain locations. At these particular locations, greater numbers of suction dredging operations would increase noise level exposure and could result in additional aesthetic disturbances and recreational conflicts at or near dredging sites. However, because the relative amount of suction dredgers is small compared to other users, it is unlikely that this alternative would exacerbate effects beyond those described for the Proposed Program. Furthermore, this alternative would also provide additional areas where other recreational users can go to avoid Program activities. By restricting dredging to fewer locations and creating additional areas where adverse effects are eliminated, this alternative would have an overall reduced impact on these resources within the Program area.

Transportation and Traffic

In relation to transportation and traffic, effects are primarily associated with the number of participants. Since this alternative would differ only in the permitted dredging locations and not the allowed number of participants, traffic effects would remain similar in the overall Program area. As suction dredgers represent only a proportion of the overall population of recreationalists, concentrations of Program participants at certain locations due to area

closures are unlikely to cause noticeable additional adverse effects related to traffic hazards or parking capacity. Therefore, the Water Quality Alternative would result in similar effects on this resource as the Proposed Program.

Mineral Resources

Effects related to mineral resources under this alternative would not differ from those described for the Proposed Program.

Cumulative Impacts

Further restrictions on the Program area size, and elimination of disturbances associated with operations at certain locations would decrease the Program's incremental contribution to cumulative effects compared to the Proposed Program. In particular, impacts associated with mercury discharges and effects on wildlife species would be reduced under this alternative.

6.3.4 Reduced Intensity Alternative

Characteristics of this Alternative

The Reduced Density Alternative is similar to the Proposed Program but would incorporate a combination of additional restrictions on the total number of permits issued and general methods of operation to reduce the intensity of environmental effects in the Program area.

Under this alternative, a maximum of 1,500 permits would be issued annually by CDFG instead of a maximum of 4,000 under the Proposed Program. This would translate to a 59% decrease in dredging operations permitted annually compared to the recent historic average. As described in Chapter 3, the total number of permits issued by CDFG over the last 15 years has fluctuated; though on average approximately 3,650 permits have been issued each year.

Additional operational requirements would include density limitations, additional equipment restrictions, and restrictions on the duration of daily dredging and total number of days each individual could dredge. Dredging densities would be regulated by establishing a minimum spacing requirement of 500 feet between dredges. The maximum permissible diameter for nozzle sizes on dredging equipment would be set at 4 inches, with no exceptions. Equipment usage would also be limited to the hours of 10 a.m. to 4 p.m., and a total of 14 days per year for each permit holder.

Impact Analysis

Hydrology and Geomorphology

Implementation of this alternative would reduce adverse effects on hydrology and geomorphology resources in the Program area due to the substantially decreased number of permits that would be issued each year and the greater restrictions placed on dredge operations.

Enforcing yearly and greater daily dredging limitations would decrease potential site disturbances and result in an overall reduction in excavating capacity compared the

Proposed Program. Moreover, the reduction in Program participants would minimize effects on in-channel features. Consequently, this alternative would result in a lower volume of sediment movement and lessened disturbances to geomorphic features that could cause destabilization or alteration of waterways compared to the Proposed Program.

Water Quality and Toxicology

Fewer participants and shorter dredging periods would lower risks associated with dredging activities, such as those associated with the use and storage of fuels or other hazardous materials and discharges of contaminants. Chapter 4.2 describes that the relative proportion of total mercury (THg) and trace metal loading from suction dredging activity is directly dependent on the dredge size, duration of operations during the year, and sediment characteristics and concentrations. By cutting total participant maximums by half and imposing yearly dredging limitations, this alternative would reduce the potential overall volume of sediment movement in the Program area compared to the Proposed Program. As a result, this alternative would reduce adverse effects associated with mercury and trace metal loading, methylmercury formation, and bioaccumulation in areas downstream of dredging activity.

Similarly, turbidity effects associated with the Program would also be further reduced through the additional provision that ensures a minimum distance between active dredging operations. As such, this alternative would lessen the overall adverse effects on water quality and toxicology as compared to the Proposed Program.

Biological Resources

As described previously, the provision of greater operational restrictions would reduce the overall volume of sediment displacement. As such, the severity of both the direct and indirect effects on biological resources associated with Program activities would be reduced. This includes fewer secondary habitat effects associated with turbidity and toxicity/water quality contamination, as well as lessened disturbances to in-channel habitat features. Furthermore, fewer dredgers operating in the Program area would also reduce the intensity of habitat alteration and reduce the risk of entrainment and/or harm.

Thus, dredging activities based on these more stringent requirements would result in lessened adverse effects on sensitive species and habitats compared to the Proposed Program.

Hazards and Hazardous Materials/Cultural Resources

Fewer Program participants and more restrictive dredging requirements would decrease the risk of accidental discovery or disturbance of buried cultural resources, as well as the potential for accidental releases of hazardous materials. Likewise, the risk of safety hazards associated with equipment staging and operations would also be reduced in relation to the increased spacing requirement and shortened dredging season. As such, the additional restrictions imposed under this alternative would have a reduced adverse effect on these resources as compared to the Proposed Program.

Aesthetics/Noise/Recreation/ Transportation and Traffic

Decreases in the allowable number of Program participants and a reduced dredging season would lessen competition between recreational uses and for available parking. Furthermore, density restrictions and operational restrictions would decrease the extent to which Program activities affect these resources. Even though suction dredgers represent only a small proportion of the overall population of recreationalists, these additional restrictions on Program activities would reduce adverse effects on these resources compared to the Proposed Program.

Mineral Resources

This alternative would have similar effects on mineral resources as described for the Proposed Program.

Cumulative Impacts

The additional operational restrictions imposed on Program activities and further limitations on permit issuance would decrease the incremental contribution to cumulative effects compared to the Proposed Program. In particular, cumulative impacts associated with mercury discharges and effects on wildlife species would be reduced under this alternative.

6.4 Alternatives Considered and Dismissed

The following alternatives were considered but ultimately were not carried forward for detailed analysis because they did not meet most of the Program objectives, were determined to be infeasible, or did not avoid or substantially reduce one or more significant impacts of the Proposed Program.

In addition, some of the following alternatives, though feasible, included components beyond the regulatory authority of CDFG. As detailed in Chapter 2, CDFG's regulatory authority governing suction dredge mining is based specifically on Fish and Game Code section 5653 et seq. In general, these provisions of the Fish and Game Code provide that CDFG's permitting authority is limited to in-stream use of vacuum or suction dredge equipment within any river, stream, or lake in California. As such, CDFG's regulatory authority under this Program does not extend to other methods of placer mining or other activities that may be associated with suction dredging which occur in upland areas. Similarly, CDFG's authority related to issuance of suction dredging permits is related to effects that are considered deleterious to fish. CDFG does not have the authority through its power to promulgate regulations to limit use of suction dredging based on impacts to other resource areas (upland biological species, noise, aesthetics, etc.).

- **Increased Intensity Alternative.** This alternative would consist of permit requirements that are more lenient than those in the 1994 regulations. Under this scenario, there would be reduced or no nozzle size restrictions, and reduced or no areas closed to suction dredging. Although this alternative would be within the CDFG's authority to permit, it would not reduce any of the significant impacts of the Program. Therefore, this suggestion was dismissed from further consideration as it does not meet the CEQA requirements for an alternative.

- **Federal or State-listed Species Alternative.** Consideration of only federally- or state-listed species was suggested as a means of determining which California water bodies would be designated as open or closed to suction dredging activities. However, this suggestion excludes consideration of all unlisted section 15380 species and would not provide protection for these currently unlisted species. As such, application of this criterion would result in additional areas open to dredging compared to the Proposed Program. Given the increase in area, species, and habitats subject to suction dredge mining, this suggested alternative was not considered as it would not reduce any of the impacts of the Proposed Program.

- **Site-Specific Evaluations for Every Permit.** Under this alternative, a site-specific analysis would be required for each individual permit issued by CDFG. While such analysis could potentially lessen Program effects by considering site-specific conditions and necessary operational restrictions, the time and effort associated with these investigations would be impracticable and substantial. Specifically, CDFG believes it would be unable to implement such site-specific analyses within the current fee structure for permits, and it is not authorized to increase such fees. For these reasons, performing a site-specific analysis for every permit was determined to be an infeasible alternative and unnecessary as a matter of law under Fish and Game Code sections 5653 and CEQA. On that basis, along with the related language directing CDFG to issue permits, CDFG does not believe the Legislature intended CDFG to make individualized, permit-by-permit deleterious effects determinations.

  That said, the option to conduct site-specific analysis is incorporated into the Proposed Program. Under the Program, on-site inspections are required for certain suction dredging operations deviating from the standard provisions of the permit regulations. Such deviations require notification under Fish and Game Code section 1602 and can include, but are not limited to, activities involving dredging in lakes or reservoirs, dredging with nozzle sizes greater than 4 inches, and employing motorized winching equipment. Additionally, the Program acknowledges the authority of CDFG to monitor individual suction dredging operations for problems and to take enforcement action as may be necessary, as well as to modify the regulations in the future if persistent, significant problems arise.

- **Large-Scale Site-Specific Evaluations.** This alternative is similar, though more broadly-based, than the previous proposal. Here, dredging would be allowed only in areas that have received site-specific CEQA analysis. Such analyses could range in size from entire watersheds to individual river segments, depending on likely dredging potential. As proposed, these investigations would identify the specific requirements for dredging in those areas, including dredging capacity, timing, and operational requirements. However, this alternative was not considered feasible for the same reasons as the prior alternative.

  As noted above, the Proposed Program does incorporate site-specific analysis where appropriate for suction dredging operations requiring notification under Fish and Game Code Section 1602.

- **Only allow suction dredging in areas with no potential to have deleterious impacts to a single fish or individual fish populations.** This alternative was

dismissed from further analysis as it does not meet the basic Program objectives of fulfilling the legislative intent of the regulation, which does not appear to consider "deleterious" to be an impact to a single fish or individual fish population. If implemented, this alternative would likely preclude all suction dredging in the state.

- **Only open areas where sufficient monitoring and enforcement capacity exists.** This alternative was not pursued because future budgets and staffing for monitoring and enforcement by Department law enforcement personnel are not known and will be variable from year to year, and are therefore outside the scope of the Proposed Program. Nonetheless, the systems currently in place provide an adequate level of service in responding to and enforcing regulations. In addition, CDFG believes that the vast majority of suction dredge miners operate in compliance with the regulations defined by CDFG.
- **Close sites that are "hot-spots" for mercury or other contaminants.** This alternative was not considered further because only limited data is available on the locations of any existing "hot-spots," and there is no definite consensus on the criteria for identifying an area as such. Furthermore, the cost and effort associated with an evaluation of the entire state to identify such locations is considered infeasible under CDFG's current fee structure.
- **Mitigate all significant adverse impacts.** This alternative would identify mitigation for all environmental resource topics (i.e. cultural resources, human health/fish consumption, etc.) to avoid, minimize, or offset impacts to the greatest extent possible. This alternative was dismissed from further analysis because mitigation for impacts without a nexus to the statutory directive to avoid actions "deleterious to fish" is not within CDFG's regulatory authority.
- **Tracking and adaptively managing stream use by suction dredgers.** This alternative could leverage existing Programs, such as CDFG Scientific Collecting Permit field reporting requirements, or use new approaches (dedicated Permit/GIS staff person) to track and monitor suction dredge effects on stream conditions. Data collected would guide and regulate activities. However, the time and expense involved in data collection, regulation updating and enforcement was determined to be infeasible to implement within CDFG's current fee structure.

6.5 Environmentally Superior Alternative

The No Program Alternative is considered the environmentally superior alternative, because it would eliminate all of the adverse effects of the Proposed Program by continuing the moratorium on suction dredging. However, CEQA requires that when the No Program Alternative is selected as the environmentally superior alternative, another environmentally superior alternative must be chosen from one of the action alternatives. Accordingly, the Reduced Intensity Alternative is considered the environmentally superior action alternative. By limiting the locations open to dredging and placing further restrictions on equipment and the number of permits issued, it would reduce the impacts associated with such operations for each resource category compared to the Proposed Program and other alternatives to the greatest extent.

The other Programmatic alternatives were not selected as the environmentally superior alternative for the following reasons:

- ***1994 Regulations Alternative.*** This alternative would eliminate all impacts in areas closed under the 1994 regulations but proposed to be open under the Proposed Program. However, this factor was overwhelmed by the substantially greater impacts that would be anticipated to result from the less restrictive operational requirements, as well as the greater disparity in the protection of biological resources. Since the 1994 regulations do not take into consideration the up-to-date special-status species and habitat information, this alternative have much greater potential for adverse impacts on special-status species.
- ***Water Quality Alternative.*** The avoidance of Program effects in areas listed as impaired for sediment or mercury were not as advantageous in reducing overall Program impacts, as compared to Reduced Intensity Alternative. Several resource areas, including hazards and hazardous materials, cultural resources, and transportation and traffic would have no discernable reduction in impacts compared to the Proposed Program or the Reduced Intensity Alternative.