Chapter 4
Affected Environment and Environmental Consequences

4.0 Introduction

This introduction lists the resources that could be affected by the implementation of any Restoration Project action alternative (Five-Dam Removal, No Dam Removal, Six Dam Removal, and Three Dam Removal) and discusses environmental baseline, affected environment, environmental consequences, and an environmental protection strategy. Following this introduction are resource-specific sections that describe the affected environment and environmental consequences associated with each resource.

Resources

The following resources could be affected by the implementation of any Restoration Project action alternatives. The affected environment and environmental consequences for each of the resources listed below are discussed in the sections that follow this introduction.

- fish
- botanical, wetland, and wildlife resources
- hydrology
- water quality
- groundwater
- land use
- geology and soils
- aesthetics and visual resources
- transportation
- noise
- air quality

- public health and safety
- public services and utilities
- recreation
- cultural resources
- power generation and economics
- socioeconomics
- environmental justice
- Indian trust assets

Environmental Baseline

Section 15125 of the State CEQA Guidelines (Title 14, California Code of Regulations, Section 21000 *et seq*.) states that "the environmental setting will *normally* constitute the baseline physical conditions by which a lead agency determines whether an impact is significant" (emphasis added). The environmental setting is further defined in this section as the physical environmental conditions in the vicinity of the project as they exist at the time the notice of preparation is published.

NEPA requires that the EIS present, for the alternatives, the environmental consequences and their significance (40 CFR 1506.16). *Significantly* is defined to require the federal agency to consider the "context and intensity" of the action (40 CFR 1508.27); however NEPA has no direct guidance regarding the baseline for determining the significance of an impact when preparing an EIS. According to CEQ's Memorandum "Forty Most Asked Questions Concerning CEQ's NEPA Regulations," question 3 states that the analysis No Action Alternative "provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives." Therefore, some NEPA practitioners interpret this language to allow the No Action Alternative to be use as a baseline for determining the significance of the impacts within an EIS.

For the majority of environmental impacts in this EIS/EIR (those unrelated to flow), the lead agencies have chosen to use the current environmental setting as the baseline for determining the significance of environmental impacts. Except for those resources affected by flows, the current environmental setting (described in this document as the *affected environment*) is equivalent to the No Action Alternative.

For flow-related resources, the current conditions include the Interim Flow Agreement between Reclamation and PG&E. This agreement is, as its title suggests, a temporary flow condition that does not accurately reflect the conditions along Battle Creek; it is not included in the No Action Alternative. Use of the term *normally* in CEQA's definition of *environmental setting* is intended to convey that the environmental setting is not required to be the

baseline for analysis of the significance of resource impacts when circumstances dictate the use of another baseline. Therefore, for the purpose of analyzing flow-related resource impacts, the Interim Flow Agreement is not included in the environmental baseline.

Affected Environment

In the sections that follow this introduction, affected environment is described for each resource. *Affected environment* includes the environmental setting and the regulatory setting, as appropriate. Within the regulatory setting, applicable laws, regulations, permits, and policies associated with the resource are identified.

Environmental Consequences

Environmental consequences are presented after the affected environment discussion for each resource. Impacts, as well as respective mitigation, compensation, or restoration, are discussed. In conducting the impact analyses, the action alternatives (Five Dam Removal [Proposed Action], No Dam Removal, Six Dam Removal, and Three Dam Removal) are compared with the No Action Alternative.

The significance of an impact relies on significance thresholds generally referenced in section 15065 and Appendix G of the State CEQA Guidelines and on professional judgment and knowledge of the context within which the impact would occur. As applicable, significant, less-than-significant, and beneficial impacts and cumulative impacts are identified for each resource being evaluated. Mitigation measures are recommended for all significant adverse impacts. Compensation or restoration measures are recommended for all other impacts.

NEPA requires a federal agency to prepare an EIS for major federal actions that significantly affect the quality of the human environment. *Significantly* as used in NEPA, requires the federal agency to consider both the context and intensity of the action and its effects. Although the CEQ NEPA regulations [40 CFR 1508.27] direct federal lead agencies to consider certain factors when determining context and intensity, there are no specific significance criteria spelled out as there are in CEQA. Determination of significance is left to the discretion of the federal lead agency. Because the CEQA guidance on thresholds of significance is more explicit than the NEPA guidance and the CEQA guidance is consistent with NEPA's concepts of *context* and *intensity*, this analysis of the Restoration Project will rely on the thresholds identified above.

For any Restoration Project action alternative, resources could be directly and indirectly affected during construction and future operation and maintenance activities. Construction- and operation-related impacts could result in temporary, short-term, or long-term disturbance of the resources.

Information included in the following sections—"Impact Terminology," "Impact Assessment Areas," "Impact Assumptions," and "Impact Mechanisms"—was used in environmental consequences impact analyses.

Impact Terminology

Types of environmental impacts are described below.

- A significant impact would cause a substantial adverse change in the environment. Mitigation is required for all significant impacts.
- A less-than-significant impact would cause an adverse, but not a substantial adverse, change in the environment. Compensation/restoration is planned for all less-than-significant impacts.
- A beneficial impact would cause a change in the environment for the better.

Impact Assessment Areas

The following areas associated with the Restoration Project action alternatives were included in environmental consequences impact analyses:

- dam removal sites and their work zones (including temporary cofferdams);
- fish ladder installation sites and their work zones;
- stream reaches with flow changes;
- proposed improved or new access roads;
- proposed improved, new, or to be removed hydroelectric project appurtenant facilities and their work zones;
- proposed improved or new trails; and
- proposed staging areas, stockpile areas, disposal areas, borrow material sites, parking areas, and construction administration sites (e.g., trailers, etc.).

Impact Assumptions

The following assumptions were made regarding Restoration Project action alternatives and were considered in environmental consequences impact analyses.

- For sites not accessible by existing or temporary access roads, construction equipment would be brought into the dam sites by helicopter; however, helicopters could be used at any site. Light equipment and tools would be hand-carried down existing access trails rather than along new means of access.

- Existing access roads would not be widened, including during re-grading and graveling activities (e.g., at the Wildcat Diversion Dam maintenance road).
- New temporary access roads may be constructed to remove pipelines at Wildcat Diversion Dam and the Soap Creek Feeder.
- If material from a dam removal were placed in the creek, it would be done in a manner that would not hinder flows. It is assumed that the natural streamflow would distribute the material throughout the downstream river system.
- All material-stockpiling areas and staging areas would be located either within the work zones in nonsensitive areas or at designated disturbed sites outside the work zones. All materials would be disposed of at the nearest approved commercial disposal site unless otherwise indicated.
- Removing portions of common and widespread habitat types, such as annual grassland, would not lead to substantial local decreases in those habitat types.
- Removing portions of uncommon and biologically unique habitats, such as riparian woodland, could lead to a localized decrease in those habitat types and could result in the direct loss of special-status species or their habitats.

Impact Mechanisms

The following activities, associated with Restoration Project action alternatives, were considered in environmental consequences impact analyses:

- excavation and vegetation removal;
- dewatering of waters of the United States;
- changing flows;
- alteration of instream flows as they relate to effects on aquatic organisms (other than fish) and riparian vegetation;
- temporary stockpiling and sidecasting of soil, construction materials, and/or other construction wastes;
- redistributing of diversion dam materials;
- construction of temporary and permanent access roads;
- soil compaction, dust, and water runoff from the construction site;
- equipment access through stream channels;
- construction-related noise from equipment and helicopters;
- construction of improvements to existing trails for construction access;
- site preparation for temporary water bypass structure;
- development of waste disposal areas to contain material from tunnel excavation and access road construction;

- decommissioning of open water diversion tunnels and conveyance canals; and
- impacts from growth inducement.

Cumulative Impact Analysis

Legal Requirements

State CEQA Guidelines and NEPA regulations require that the cumulative impacts of a proposed project be addressed in an EIR/EIS when the cumulative impacts are expected to be significant (40 CFR 1508.25[a][2], CEQA Guidelines Section 15130[a]). Cumulative impacts are impacts on the environment that result from the incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7, CEQA Guidelines Section 15355[b]). Such impacts can result from individually minor but collectively significant actions taking place over time.

Section 15130 of the State CEQA Guidelines states that the discussion of cumulative impacts need not provide as much detail as the discussion of effects attributable to the project alone. The level of detail should be guided by what is practical and reasonable.

Methodology

According to the State CEQA Guidelines (Section 15130), an adequate discussion of cumulative impacts should contain the following elements:

- an analysis of related future projects or planned development that would affect resources in the project area similar to those affected by the proposed project,
- a summary of the expected environmental effects to be produced by those projects with specific reference to additional information and the sources of the information, and
- a reasonable analysis of the cumulative impacts of the relevant projects and an examination of reasonable options for mitigating or avoiding the significant cumulative effects of a proposed project.

To identify the related projects, the State CEQA Guidelines (15130[b]) recommend either:

- the list approach, which entails listing past, present, and reasonably anticipated future projects producing related or cumulative impacts, including those projects outside the control of the agency; or

- the projection approach, which uses a summary of projections contained in an adopted general plan or related planning document designed to evaluate regional or areawide conditions.

The CEQA guidance for assessing cumulative impacts was used in this EIR/EIS. The cumulative impact assessment requirements under CEQA provide specific guidance and are consistent with and more stringent than those under NEPA. Therefore, this assessment focuses on meeting the requirements of CEQA as discussed in the State CEQA Guidelines.

Environmental Protection Strategy

Mitigation Strategies

Mitigation measures are methods and techniques that can be implemented to reduce the amount of adverse environmental impacts during and after construction. The following measures, identified in 40 CFR 1508.20 and in CEQA Guidelines Section 15370, were used in developing mitigation strategies for the Restoration Project action alternatives. These measures, listed in the order in which they would be applied, lay out a strategy to protect the environment.

1. Avoid the impact by not taking a certain action or parts of the action.

2. Minimize impacts by limiting the degree or magnitude of the action and its implementation.

3. Rectify the impact by repairing, rehabilitating, or restoring the affected environment.

4. Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action.

5. Compensate for the impact by replacing or providing substitute resources or environments.

General Environmental Protection Measures

As part of the environmental protection strategy, the following general environmental protection measures, based on the mitigation strategies described above, will be used before and during construction of any Restoration Project action alternative, where applicable. These measures are consistent with broader measures adopted in the CALFED record of decision (ROD) (CALFED 2000c). In addition to these general environmental protection measures, each resource section may discuss specific environmental protection measures, as well as

mitigation for significant adverse impacts and compensation or restoration for all other impacts.

Develop and Implement a Worker Environmental Education Program

Construction contractor and subcontractor personnel will be required to participate in and comply with a government-provided environmental education program. This program will include, but is not limited to (1) awareness regarding federal, state and local environmental laws and regulations and permits, as well as the penalties for noncompliance with environmental requirements and conditions; (2) threatened and endangered species and special-status species, as well as their habitats; (3) cultural resource sites; and (4) environmental protection measures, mitigation, compensation, and restoration. A member of the contractor's management staff shall participate in the training sessions to discuss the contractor's environmental protection plans. Upon completion of each training session, each employee will be required to sign a statement indicating that he/she has received the training.

Obtain and Implement the Conditions of the Environmental Permits

All permit conditions included in the state and federal permits obtained for the project will be followed. Reclamation will obtain the required state and federal permits and comply with the conditions of those permits. Where appropriate, the permit conditions will be incorporated into the project engineering plans and specifications.

Develop an Environmental Compliance Monitoring Program

Reclamation will develop an environmental compliance monitoring program to ensure that the mitigation measures identified in this EIS/EIR are implemented in an appropriate and timely manner. As part of this construction monitoring program, Reclamation will retain qualified biologists, environmental resource specialists, and archeologists to monitor construction activities near environmentally sensitive areas, including areas that support threatened, endangered, and special-status species; migratory bird nesting; woody riparian vegetation; wetlands and perennial drainage crossings; and cultural sites.

Construction monitors will be hired and trained prior to construction and will be responsible for daily preconstruction surveys, staking resources, on-site monitoring, clearing equipment and vehicle staging areas, documentation of violations and compliance, coordination with construction inspectors, and postconstruction documentation. Resource monitors will be responsible for

patrolling work zones and working with construction inspectors to ensure that barrier fencing, stakes, and required setback buffers are maintained.

The roles and responsibilities of the resource monitors and other individuals on the project, compliance documentation, and other elements of the environmental compliance monitoring program will be clearly outlined in the Implementation Plan (described below).

Designate Work Zones

Reclamation will ensure that construction equipment and associated activities will be confined to the designated work zone in areas that support sensitive resources. Construction equipment will be confined to a designated work zone (including access roads) at each project site. Prior to construction, the work zone will be clearly staked and flagged. During the environmental training program, construction personnel will be informed about the importance of avoiding ground-disturbing activities outside the designated work area. During construction, the construction monitors and resource monitors will ensure that construction equipment and associated activities avoid any disturbance of sensitive resources outside the designated work zones. Construction personnel will avoid all marked environmentally sensitive locations and cultural resources locations within and outside of the contractor use area limits. Environmental monitors will conduct surveys as appropriate for threatened and endangered species and special-status species. The following measures will also be employed:

- Use and storage of construction equipment, including helicopters, will be confined to within the designated contractor use area limits.
- Existing roads and access points will be used to the extent possible to minimize disturbance to wildlife and their habitats.
- Excavating, filling, and other earth-moving within the contractor use areas will be done gradually to allow wildlife to escape in advance of machinery and moving soils.
- Riparian vegetation or wetlands temporarily affected by loss or reduction of water supplies as a result of construction activities will be provided with replacement water supplies.
- Staging areas, borrow material sites, parking locations, stockpile areas, and storage areas will be located outside of environmentally sensitive locations and will be clearly marked and monitored.

Anadromous Fish Spawning Exclusion

Exclusionary materials will be placed on the stream bottom to prevent spawning by chinook salmon and steelhead prior to initiation of construction activities. The exclusionary materials will be installed in areas where heavy equipment may

be operated within the stream channel or in the vicinity of potential blasting. Exclusionary materials, such as fencing, will be placed over gravels that potentially support spawning by chinook salmon and steelhead. The need for exclusionary materials at construction locations will be determined by a qualified fish biologist prior to any construction activity.

Implement Environmental Timeframes

All activities will be completed in a timely manner to minimize their duration and resulting impacts. In addition, all activities will occur during the times of the year that are least detrimental to the environment. Instream work will be conducted during periods of low streamflow, as explained in Section 4.1, "Fish." In addition, construction activities that could adversely affect nesting birds and their habitat will be limited to the nonbreeding period, and construction activities that could adversely affect bat colonies and their habitat will be limited to the non-hibernation, non-maternity colony period (August–October). Each are explained in Section 4.2, "Botanical, Wetland, and Wildlife Resources."

Develop an Implementation Plan

As part of the environmental protection strategy, a postconstruction mitigation, compensation, restoration, and reporting plan, referred to in this document as an Implementation Plan, will be developed through coordination with the state and federal agencies responsible for the Restoration Project. This plan will provide detailed information on how each mitigation measure will be implemented and monitored during the preconstruction, construction, and postconstruction periods. The implementation plan will contain the following documents:

- storm water pollution prevention plan (SWPPP) (including specific erosion control and site reclamation measures),
- spill contingency plan,
- riparian restoration plan,
- wetland restoration plan,
- oak planting plan,
- noxious weed eradication plan, and
- environmental compliance monitoring program.