CHAPTER 3 APPROACH TO ENVIRONMENTAL ANALYSIS

3.1 INTRODUCTION

This chapter presents the assumptions use in this EIR about changed operations and management of the hydroelectric assets as a result of the transfer of those assets to new owners. These assumptions reflect ways that the assets could be operated or managed under different ownerships, with different motivations.

Developing the approach to the environmental analysis involves:

- Assessing project characteristics that could change in the future,
- Characterizing the entities that may own the hydroelectric assets in the future,
- Developing and implementing methods to project future operational and management behaviors of different types of owners,
- Identifying of future horizon years to be used in the analysis, and
- Establishing baseline conditions against which project effects will be compared.

This chapter expands upon each of those items.

Forecasting involves estimating and projection. Invariably there is the potential for a degree of error or inaccuracy in projections of the future. Notwithstanding this, the EIR must provide information about physical environmental effects that could be an outcome of the divestiture process. To ensure that potential errors that are naturally part of any projection does not downplay or minimize the potential for environmental impacts, this EIR has made assumptions that are reasonable *but conservative*. As an example, if increased timber harvesting after divestiture could cause physical environmental effects the EIR uses the assumption that the highest reasonable amount of timber harvesting would occur. This is an example of how the approach to the environmental analysis, and the assumptions presented in this chapter, have been designed to be inherently conservative.

Although the project itself—the transfer of ownership from Pacific Gas and Electric Company to new, non-utility owners—is rather straightforward, the projections, assumptions, and methodologies used in this EIR are at times complex. These projections, assumptions and methodologies are the basis for the analysis of physical environmental impacts presented in Chapter 4. This chapter outlines the approach to the environmental analysis in this EIR and the reasons for the assumptions employed.

3.2 IMPACTS AND MITIGATION MEASURES

3.2.1 TYPES OF IMPACTS

This EIR describes the potential adverse physical effects of the California Public Utilities Commission's (CPUC's) adoption and implementation of the proposed project. The environmental resources analyzed in this EIR are those typically associated with hydropower projects, including but not limited to vegetation, fish, wildlife, water resources, and land. The analysis first attempts to determine the extent to which each of the studied resources could be affected if the project is approved as proposed. The analysis is based upon assumptions regarding the types of environmental resources that could be affected if the project were approved, ant the nature of the effect. The analysis then applies a set of specific significance criteria to help categorize the severity of the potential environmental effects. These standards of significance are defined at the beginning of each impact analysis in Chapter 4, following a discussion of environmental setting.

Once the potential environmental changes are identified in this analysis, they are compared to the standards of significance. The impacts are then divided into the following categories:

Impact Categories

Significant	These impacts are significant because they exceed defined standards of significance as set forth in Chapter 4.
Less-Than-Significant	These impacts are less than significant because they do not exceed defined standards of significance.
No Adverse Impact	These impacts are not adverse because they are environmentally beneficial or neutral.
No Impact	These are not impacts because the project is not anticipated to create change.

For all *significant* impacts, the EIR is required to include a description of feasible measures that could be implemented to avoid the adverse impacts entirely, or to mitigate (reduce in magnitude) the impacts to a level that is below the defined standard of significance. Where available, mitigation measures are presented for all impacts determined to be *significant*. Where implementation of the mitigation measures would reduce the magnitude of the impact to below the defined standard of significance, the impact is determined to be *less than significant* after mitigation. Where implementation of the mitigation measures would not reduce the magnitude of the impact below the defined standard of significance, the impact is determined to be *significant and unavoidable*.

3.2.2 MITIGATION MEASURES

Where significant adverse impacts are identified, the EIR must "describe feasible measures which could minimize" those impacts to a less-than-significant level (see § 15126.4 of the State California Environmental Quality Act (CEQA) Guidelines). For each significant impact, mitigation measures

are identified. The EIR may include a list of alternative mitigation measures, any of which may be selected by the CPUC and which could reduce the impact to a less-than-significant level, or contribute to doing so. Where multiple measures are required to reduce an impact to a less-than-significant level, the discussion clearly identifies which combination or permutation of measures would be necessary to achieve the appropriate level of mitigation. Where measures are available that can reduce the magnitude of an impact, but not to a less-than-significant level, these are also identified.

The EIR strives not to include measures that are clearly infeasible. Under CEQA, "feasible means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" (see § 15364 of the CEQA Guidelines). Section 15126.4(a)(5) of the CEQA Guidelines states that "if the lead agency determines that a mitigation measure cannot be legally imposed, the measure need not be proposed or analyzed." However, the EIR is written on the assumption that the CPUC itself will make determinations about mitigation when the CPUC takes action on the application. At that time the CPUC will decide whether and how to impose each of the mitigation measures set forth in the EIR. The CPUC will either (1) require it as a condition of approval of the proposed divestiture; (2) find that it is within the jurisdiction of another public agency to impose upon the project, and that such agency can and should impose the mitigation measure; or (3) find that the mitigation measure is not feasible. If, even with imposition of mitigation measures, the project will generate unavoidable significant effects, the CPUC can only approve the project if it finds that the benefits of the project outweigh the occurrence of those unavoidable effects. As a result, it should be noted that this EIR contains mitigation measures that may most appropriately be implemented by other local, State or Federal governmental agencies. However, this EIR describes a wide range of mitigation measures to allow the CPUC maximum flexibility in imposing mitigation and to inform the public, regulators, and decision makers of the actions that may be available to avoid or mitigate the potential adverse effects of this project.

As to the mitigation measures that it imposes in connection with action on the project, the CPUC may select from a range of mechanisms to ensure that such measures will be fully implemented. These may include, but are not limited to:

- binding written agreements between the new owners and local, State or Federal agencies or other appropriate entities to take or refrain from taking certain action;
- easements, deed restrictions or covenants recorded against the lands to be transferred;
- requirements that the new owners undertake scientific studies in consultation with resource agencies and comport with the resulting recommendations; and
- requirements that new owners seek amendments to the licenses issued by the Federal Energy Regulatory Commission (FERC) for the hydroelectric facilities.

For any mitigation measures imposed by the CPUC, CEQA requires that the CPUC adopt a mitigation reporting or monitoring program specifying how it will ensure compliance with the mitigation measures. Such a monitoring program would be developed prior to action on the project.

3.3 RESTRUCTURING AND DIVESTITURE

In 1996, the enactment of Assembly Bill 1890 (AB 1890) (Stats. 1996, Ch. 854) established a restructured electricity market in California. The policy of introducing competition into California's electric generation sector is now law. An EIR on electricity market restructuring was unnecessary, since the implementation of laws enacted by the Legislature is exempt from CEQA.

Restructuring itself has led to, and is likely to continue to lead to, profound changes in how the State's electricity system operates. This EIR does not analyze effects associated with the changes brought about by restructuring, since such changes have already been mandated and are now occurring. The EIR thus assumes the existence of the restructured market, and analyzes potential impacts associated with projected operations of the hydroelectric generation assets (if the assets were sold) in the restructured market. However, since this EIR includes data on Pacific Gas and Electric Company's historical practices and levels of operation as well as information about the current environmental setting, observations could be made concerning the effects of both restructuring and divestiture on the existing, or in some cases historical, environmental setting.

3.4 EXISTING CONDITIONS / ENVIRONMENTAL SETTING

Existing conditions and setting are described in the first four sections of each of the 16 environmental resource discussions in Chapter 4. The existing conditions described are those existing at the time the Notice of Preparation (NOP) for the EIR was published, April 27, 2000. However, due to the unique characteristics of Pacific Gas and Electric Company’s hydroelectric assets, in particular the need to describe the hydrologic setting of rivers and reservoirs that make up Pacific Gas and Electric Company’s hydroelectric system, special care has been taken to accurately and appropriately define existing conditions.

3.4.1 SETTINGS FOR NON-WATER-RELATED ENVIRONMENTAL TOPICS

The environmental setting for topics other than water-related topics is the physical conditions existing as of the date the NOP was published (CEQA Guidelines § 15125). As with any EIR, the existing environmental setting for certain topics will include a reasonable amount of historical data in order to accurately and meaningfully portray existing conditions (e.g., annual local property tax revenues from the facilities, or typical number of recreation days associated with a reservoir). However, it should be noted that this EIR does not describe or consider environmental conditions that may have existed prior to construction of the hydroelectric generation assets.

3.4.2 SETTINGS FOR WATER-RELATED TOPICS

For water-related topics, such as hydrology, fisheries, water quality and water-based recreation, depicting the environmental conditions at a specific moment in time is not a reasonable method of describing the environmental setting. This is because the characteristics of water-related environmental conditions are entirely dependent upon the specific water flows and reservoir levels, which typically fluctuate throughout the year and from year to year. Therefore, in order to effectively and accurately describe the environmental setting in the context of naturally fluctuating water levels, this EIR presents a description of the conditions during an historically-relevant period. The environmental setting for water-related topics is described as 24 years of historical data (1975-1998) for both amount of water (i.e., rainfall) and in-stream flow or reservoir levels. It should be noted, however, that where hydroelectric and other facilities that affect in-stream flows or reservoir levels have been constructed on the waterways/reservoirs within the historical 24 years, only those years after construction of such facilities are considered in the description of the environmental setting. Data for years prior to construction of such facilities have been eliminated from the setting because the subsequent changes to the characteristics of the stream or reservoir make such data inappropriate for describing the environmental setting.

3.5 ENVIRONMENTAL BASELINE

The environmental baseline is that condition against which the future "with-project" condition is compared to determine the amount of impact. Normally, the environmental baseline is the same as existing conditions. However, because of the unique characteristics of this project, including the ongoing restructuring of the energy industry pursuant to AB 1890 and the special needs of the instream and reservoir analyses, special consideration is given to establishing the environmental baseline.

3.5.1 NON-WATER-RELATED ENVIRONMENTAL TOPICS

Like the existing conditions for non-water-related environmental topics, the environmental baseline for non-water-related environmental topics is the physical conditions existing as of April 27, 2000, the date the NOP was published (CEQA Guidelines § 15125).

3.5.2 WATER-RELATED ENVIRONMENTAL TOPICS

The environmental baseline for water-related environmental topics is not the same as for non-water-related environmental topics, due to highly variable conditions critical to the hydroelectric facility operations. As an example, differences in annual weather conditions result in large year-to-year fluctuation of precipitation and resulting operations of the hydroelectric facilities. Therefore, the "normal" or “typical” approach to defining the environmental baseline as existing year conditions cannot be used to determine water-related impacts.

The operation of the hydroelectric generation assets is dependent primarily upon hydrological conditions and market conditions. These two factors determine how facilities are operated on a daily basis. For a number of reasons, examination of both of these factors suggests that the conditions that existed precisely at the time of issuance of the NOP are not an accurate measurement or descriptor of the environmental conditions that should be used as the environmental baseline. First, hydrologic conditions have varied immensely during the past six years of operation in which California has been experiencing "wet" winters. As such, to use the current conditions that have been created by the recent climatic conditions in California, and which are not reflective of the historic weather patterns, would bias the conclusions of the EIR. Second, market conditions have varied over the past two years since the restructuring of the electricity marketplace, and have not adequately stabilized over the long term in a way that would reliably suggest that current hydroelectric operations are reflective of the restructured electricity market.

Because (1) restructuring has been in place only two years and the ultimate structure of the market will continue to develop with or without the proposed project, and (2) the baseline for water issues must take into account a range of water years[1] (e.g., wet through dry), it is most realistic and meaningful to use projections of Pacific Gas and Electric Company's foreseeable operations in today's economic and regulatory environment and across the range of water years as a baseline. A detailed description of the hydrologic modeling that is the basis for the water-related environmental baseline can be found in Appendix C.

Assumptions for Pacific Gas And Electric Company operations modeling include:

- Pacific Gas and Electric Company is regulated by the CPUC through cost-of-service rate-making. This is consistent with the CPUC's existing method of electricity price regulation; and
- The Competitive Transition Charges (CTCs) have ended. AB 1890 established that the CTCs would be eliminated no later than December 31, 2001. Since the period of time being considered for all environmental issues is beyond December 31, 2001, it is appropriate to assume that the CTCs would have ended at that time.[2]

3.6 ANALYSIS YEARS

The environmental analyses of the proposed project and cumulative impacts look several years into the future to describe the effects of the proposed auction and divestiture. The analysis years used in this EIR range from 2005, which is used for hydrologic-related modeling and analysis, to 2022,

1 A water year is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1998, is called the 1998 water year.

2 In light of the electricity shortages and high prices experienced in the summer of 2000, it is possible that there will be changes or delays in the rules concerning CTCs. Such changes could result from legislation, FERC proceedings or CPUC investigations. Since such potential changes are uncertain and because they would likely occur with or without the project, it is appropriate for the analysis in this EIR to continue to assume that the CTCs have ended as of December 21, 2001.

which is the outer range of years used for water supply analysis purposes. In preparing this EIR, the CPUC was mindful not to arbitrarily select a specific analysis year that would obscure the potential effects of the proposed action. Unlike many environmental studies, a single future analysis year is not used in this document. Rather, for each environmental issue area, the evaluation considers a time period into the reasonably foreseeable future at which time the potential effects of this project can be expected. As such, for some analyses (such as the effects of fragmented ownership), the effects are likely to occur soon after divestiture. Conversely, other issues (such as the reallocation of consumptive water) may take a number of years to occur; as a consequence, those analyses consider a period of time that is a decade or more into the future. In almost no case was a timeframe of more than 20 years considered. The specific timeframe for analysis is described in each environmental issue section in chapter 4 of the EIR.

It should be noted that for some environmental issues evaluated in Chapter 4, most notably issues related to hydrological operations, the Year 2005 was used for analytical purposes. The Year 2005 was selected for future hydrological modeling because it was considered far enough into the future so that the full effects of the proposed divestiture would be apparent in the operation of the electricity market, and it is not so far into the future that reasonable projections of such key factors as energy pricing, and the capacity and load of the western United States electricity grid, could be made. Analysis of years prior to 2005 in the hydrological modeling was considered to present the risk of missing some of the effects of divestiture, because those effects may not be felt in the years immediately following divestiture. Analysis of years beyond 2005 in the hydrological modeling was considered to present further risk due to the difficulty in accurately predicting the operations of the western United States electricity grid.

3.7 BINDING VERSUS NON-BINDING AGREEMENTS AND PRACTICES

3.7.1 APPROACH TO NON-BINDING AGREEMENTS AND PRACTICES

Pacific Gas and Electric Company currently has numerous non-binding, or informal, agreements with existing agencies and individuals. Informal agreements are defined as those agreements Pacific Gas and Electric Company has entered into with another party, or those operating practices that are not written or legally binding on new owners. These non-binding agreements include maintaining for recreational purposes higher reservoir levels or stream flows than required and access to existing roadways. In addition, many of Pacific Gas and Electric Company's ongoing environmental management and stewardship programs are not recorded in binding agreements. In its Application, Pacific Gas and Electric Company has stated that non-binding, informal agreements would not be passed on as a requirement for new owners of the hydroelectric assets.

In many cases, the non-binding agreements referred to above have environmental benefits (e.g., increased streamflows in bypass reaches, public access to recreational resources, etc.). As such, assumptions made about the implementation of these informal agreements by future owners are key to certain environmental issues and impacts. For the purposes of the analyses contained in

this EIR, several assumptions are made about the future implementation of informal, non-binding agreements.

- Non-binding agreements are assumed to be in place for the environmental baseline condition.
- Non-binding agreements are *not* assumed to be in place for future conditions after a price-based auction and divestiture of the hydroelectric assets to new owners.

These assumptions are reasonable and conservative in that new owners could abandon some or all of Pacific Gas and Electric Company's past non-binding agreements or practices in order to maximize profits. To the extent that abandonment of these practices and agreements would be environmentally damaging, this EIR documents the extent of such adverse environmental effects, and identifies measures (including continuation of past non-binding agreements and practices) that could avoid or mitigate these effects.

It should be noted that some changes in the implementation of non-binding agreements and practices have been documented since the initiation of the restructured energy market in 1998. These already-documented changes demonstrate that some facilities may be operated in the future in a manner closer to the physical, regulatory, and contractual limitations that exist, in order to maximize project-related profits.

3.7.2 DOCUMENTATION OF NON-BINDING AGREEMENTS AND PRACTICES

The CPUC has compiled, to the extent feasible, a comprehensive list of non-binding agreements and practices from a number of sources. Volume 18 of Pacific Gas and Electric Company's Proponent's Environmental Assessment (PEA) contains a partial list of Informal Practices and Agreements. With this as a starting point, the CPUC confirmed and expanded this list of non-binding agreements and practices through review of EIR scoping comments, as well as consultation with State and Federal agencies, such as the California Department of Fish and Game, U.S. Fish and Wildlife Services, U.S. Forest Service, California Department of Parks and Recreation, and the National Marine Fisheries Service, among others. Notwithstanding the efforts described above to document all non-binding agreements and practices undertaken by Pacific Gas and Electric Company, there may be additional agreements and practices beyond those identified by the CPUC, due to the informal and undocumented nature of such agreements and practices.

Appendix D contains the comprehensive list of informal, non-binding agreements, arrangements and practices compiled by the CPUC.

3.7.3 DOCUMENTATION OF BINDING AGREEMENTS.

Appendix D also contains a comprehensive list of formal, binding agreements that are assumed to transfer to and be implemented by, new owners. This list was compiled based on information supplied by Pacific Gas and Electric Company in its PEA, and information obtained by the CPUC during preparation of this EIR. Examples of these binding agreements include written

arrangements with resource agencies, such as the U.S. Fish and Wildlife Service and the U.S. Forest Service, for Pacific Gas and Electric Company to take certain actions to benefit or enhance the environment; approved timber harvest plans; and numerous leases and licenses for residences, recreational activities and grazing on Project Lands. This EIR assumes as to these binding agreements that the new owner would step into the shoes of Pacific Gas and Electric Company, taking on the obligations to carry out the agreements. For the most part, the EIR does not assume that a new owner would act differently than Pacific Gas and Electric Company upon termination of the agreements (where the agreements have specific termination dates or mechanisms) since it is not known what action Pacific Gas and Electric Company would have taken in such circumstance, and whether such action would differ from that of a new owner. Given the importance of water supply contracts, however, to both agriculture and public services, somewhat different assumptions are made with respect to Pacific Gas and Electric Company's contracts to supply water to public agencies. The water supply contracts are also listed in Appendix D, and the conservative EIR assumptions pertaining to them are explained in detail in Section 3.10.4.

3.8 BUNDLING OF HYDROELECTRIC ASSETS FOR DIVESTITURE

Pacific Gas and Electric Company has proposed that the hydroelectric assets be offered for auction in particular configurations or groupings. These groupings of assets are referred to in this EIR as "bundles" of assets. Pacific Gas and Electric Company's proposal is that the assets be available for auction in one of two basic configurations: five regional bundles (referred to by Pacific Gas and Electric Company as "watersheds"), which generally conform to the management organization that Pacific Gas and Electric Company currently uses, and 20 bundles that generally represent individual FERC licenses or physically related groups of licenses. This approach to bundling of the hydroelectric assets is presented in Chapter 2, Project Description.

The potential that there could be as many as 20 new owners of the hydroelectric assets is evaluated and described in the environmental analyses contained in Chapter 4. In addition, the potential that there could be five new owners (one for each regional bundle) is also described. Finally, there is potential that one new owner could purchase all of the hydroelectric assets if the same entity were successful in bidding on all five regional (or all 20 individual) bundles. For each environmental impact, a conclusion is drawn about the environmental implications of 20 or 5 new owners of the hydroelectric assets. The actual number of new owners resulting from the proposed auction could be somewhere between five and 20, but those ends of the spectrum of the number of owners captures the potential environmental changes. For each environmental impact, a conclusion is also drawn that considers the collective effect of the sales to new owners, to ensure that impacts are not understated by focusing on the effects at merely the bundle-by-bundle level. The impacts of one new owner purchasing all of the hydroelectric assets is addressed in Chapter 6 (Alternatives) of this EIR. To the extent that the number of owners could affect the fundamental assumptions about operational or other changes to the hydroelectric assets, the implications of 20, five, or one owner(s) are addressed in the discussion of assumptions regarding future changes, below.

3.9 FERC RESTRICTIONS AND OPERATIONAL CONSTRAINTS

FERC licenses contain a wide range of conditions that may restrict or constrain the operation of hydroelectric facilities. Many of these conditions are intended to benefit the environment and beneficial users of the affected rivers and streams. During the process of relicensing, which involves reevaluation and reconsideration of all elements of the license, new or modified conditions are determined for inclusion in the license by the FERC.

During this licensing process, many parties may suggest new or revised restrictions and operational constraints, including the FERC, the licensee, State and Federal regulatory agencies, other users of the river or stream, etc. While all suggested license conditions are considered by the FERC, certain suggested license conditions such as those falling under Section 4(e) of the Federal Power Act (FPA), and those under Section 401 of the Clear Water Act (CWA) are automatically required to be included in the newly issued license. The discussion below provides additional explanation of Section 4(e) of the FPA and the State's authority under Section 401 of the CWA.

3.9.1 FPA SECTION 4(E)

When the FERC issues a license or relicense for a hydroelectric project which uses public lands[3] and reservations[4] of the United States, such as U.S. Forest Service (USFS), and Bureau of Land Management (BLM) lands, Section 4(e) of the FPA requires that the license not be inconsistent with or interfere with the purpose for which such reservation was created or acquired, and that it be subject to and contain such conditions as the Secretary of the department under whose supervision such reservation falls shall deem necessary for the adequate protection and use of such reservation.

The 4(e) conditions recommended can cover the gamut of resource issues, including minimum stream flows, water temperature requirements, erosion control plans, recreation and aesthetic conditions, etc. These conditions are mandatory; that is, the FERC must either include them in the issued license or, if they would make the project infeasible, deny issuance of the license.

Courts have placed substantial limitations on FERC authority by virtue of Sections 4(e) and 18 of the FPA, which give other Federal agencies strong licensing powers. In the Escondido case, the U.S. Supreme Court held that conditions imposed under Section 4(e) are binding on the FERC.[5]

3 Section 3(1) and 3(2) of the FPA define "public lands" to mean such lands and interest in lands owned by the United States as are subject to private appropriation and disposal under public land laws. It shall not include "reservations," as hereinafter defined.

4 Section 3(1) and 3(2) of the FPA define "reservations" to mean national forest, tribal lands embraced within Indian reservations, military reservations, and other lands and interests in lands owned by the United States, and withdrawn, reserved, or withheld from private appropriation and disposal under the public land laws; also lands and interests in lands acquired and held for any public purposes; but shall not include national monuments or national parks.

5 Escondido Mutual Water Co. v. LaJolla Band of Mission Indians, 104 S. Ct 2105 (1984). See also Pacific Gas and Electric Co., 69 FERC ¶ 61,170 (1994) (once the FERC has made a threshold finding that conditions submitted by

The Seventh Circuit Court of Appeals held that Section 18 includes the authority of Federal fishery agencies to impose fishway prescriptions during the license term, as well as at the time of licensing, even if the fishway requirements would render a previously viable project uneconomic.[6]

For the purposes of this analysis, all existing FERC license conditions are assumed to be in place under new owners in the future following divestiture. In addition, all existing 4(e) conditions associated with all FERC licenses, including those in relicensing which have not yet been formally adopted, are assumed to continue to be upheld, since they are considered to be a formal written agreement. With that one exception, as to facilities currently in relicensing, this EIR assumes that the existing licenses continue in the future, and does not pre-suppose that Pacific Gas and Electric Company's relicensing application will be accepted, which conditions suggested by other parties will ultimately be adopted by the FERC, or when the relicensing process will be complete. Since relicensing generally results in conditions more favorable to the environment, this assumption (that existing licenses will apply to new owners) ensures a conservative analysis of impacts in this EIR.

3.9.2 CLEAN WATER ACT

The Clean Water Act (CWA)[7] establishes a comprehensive statutory scheme designed to "restore and maintain the chemical, physical, and biological integrity of the nation's waters". To achieve these goals, the CWA creates distinct roles for both the Federal government and the State government.

Under section 303 of the CWA, states are required to institute comprehensive water quality standards that establish water quality goals for all intrastate waters[8]. These standards must be approved by the EPA. In adopting standards, a State must comply with the following requirements:

> Such…water quality standards shall consist of the designated uses of the navigable waters involved and the water quality criteria for such uses. Such standards shall be such as to protect the public health or welfare, enhance the quality of water and serve the purposes of this Act. Such standards shall be established taking into consideration their use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes…[9]

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the Secretary "relate to the reservation on which the project works are to be located," the FERC generally has no authority to determine whether the conditions satisfy the requirements of Section 4(e).)

6 Wisconsin Public Service Corp., 32 F.3d 1165 (7th Cir. 1994). See also Lynchburg Hydro Associates, 39 FERC 61,079 (1987). (FERC has no authority to reject or modify properly prescribed fishways.)

7 33 U.S.C. 1251 *et seq*.

8 33 U.S.C. 1311(b).

9 33 U.S.C. 1313 (c)(2)(A).

Once a State adopts water quality standards, and those standards are approved by EPA, they become "the water quality standard for the applicable waters of that State" [10]. The State is then primarily responsible for enforcing water quality standards in its waters[11].

As part of its enforcement responsibility, a State must provide a water quality certification under CWA section 401 for any project requiring a Federal license or permit, where the project may result in any discharge into intrastate navigable waters[12]. Under the section 401 certification process, the State certifies "that any such discharge will comply with the applicable provisions of" the CWA, including the State's water quality standards adopted pursuant to section 303 of the CWA[13]. The certification is required to "set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure that any applicant…will comply with any applicable effluent limitations and other limitations…and with any other appropriate requirement of State law set forth in such certification[14]." Significantly, all limitations contained in the certification "shall become a condition of any Federal license or permit subject to the provisions of section 401"[15].

Thus, when FERC licenses or relicenses a hydroelectric facility, it must include in its license conditions any limitations imposed by the State in its certification under section 401. Significantly, the United States Supreme Court has determined that where an approved State water quality plan includes minimum instream flow requirements, those requirements also must be incorporated into the license[16].

California has adopted an approved water quality plan pursuant to CWA section 303. However, to date, only ten Pacific Gas and Electric Company facilities have received section 401 certification from the State. Certification for the remaining facilities was either waived by the State or was not required at the time of licensing. As Pacific Gas and Electric Company's facilities come up for relicensing by FERC, the State is expected to play a significant role in conditioning licenses through the section 401 certification process.

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10 33 U.S.C. 1313 (c)(2).

11 33 U.S.C. 1319 (a).

12 33 U.S.C. 1341.

13 33 U.S.C. 1341 (a).

14 33 U.S.C. 1341 (d).

15 *Id*.

16 *See PUD No. 1 of Jefferson Count, et al., v. Washington Department of Ecology, et al*. (1994) 511 U.S. 700. In refuting the petitioners' argument that the Clean Water Act is only concerned with water "quality," the Supreme Court noted that "water quantity is closely related to water quality" and that "a sufficient lowering of the water quantity in a body of water could destroy all of its designated uses, be it for drinking water, recreation, navigation, or…as a fishery." 511 U.S. at 719. The Court went on to point out that "the Act expressly recognizes that water 'pollution' may result from changes in the movement, flow, or circulation of any navigable waters…" *Id*. At 719-720.

3.10 ASSUMPTIONS REGARDING FUTURE CHANGES

The proposed project as analyzed in this EIR is the divestiture of Pacific Gas and Electric Company's hydroelectric generation assets through the conduct of a price-based auction. Under new ownership, the hydroelectric generation assets (including associated lands) could be operated or managed differently depending upon the nature and motivations of the new owner(s) of the assets. This section explains the assumptions that have been made in this EIR about how the new owner(s) may operate or manage the assets in the future. These assumptions form the analytical basis for the environmental impact evaluations that are contained in Chapter 4 of this EIR.

3.10.1 FUTURE HYDROLOGICAL OPERATION CHANGES

The new owner(s) could operate the hydroelectric generation facilities differently than past operations by Pacific Gas and Electric Company. Such changed operations could result in seasonal, monthly, daily, or hourly alterations in reservoir levels, in-stream flows, and/or ramping rates. As an example, seasonal operational changes are central to the analysis of fisheries effects in streams and reservoirs, while hourly changes are critical to the analysis of whitewater recreation effects.

The extent to which operations could be changed would depend upon two factors: (1) the motivations of the new owners, and (2) the physical and regulatory constraints on operations of each facility. Physical constraints include the size and physical capacity of reservoirs, canals, flumes, penstocks, turbines, etc. Regulatory constraints include FERC license conditions and other statutorily-based performance standards.

The specific motivations of any new owner(s) are central to understanding and predicting the likely ways that hydroelectric operations could change. Careful consideration of the hydroelectric generation assets and the testimony received by the CPUC to date suggests that power producers and water supply agencies are the two primary types of owners that may pursue acquisition of portions of Pacific Gas and Electric Company's hydroelectric system. Hydrological operational changes associated with the proposed project are analyzed for two basic ownership scenarios: (1) a power producer that purchases the facilities with the intent of profit and therefore will maximize power production by running the hydroelectric facilities to their physical and regulatory limits, and (2) a water supply agency that purchases the facilities to maximize water supply. These two scenarios are discussed below.

Testimony has been submitted to the CPUC that suggests that other entities could pursue acquisition of some of the hydroelectric assets for the purposes of environmental protection and/or benefit. These potential purchasers include governmental entities, non-governmental organizations, or combinations of these potential buyers. The analysis of the ownership scenarios, discussed below, does not presuppose the likelihood of environmental-based entities successfully purchasing one or more bundles of hydroelectric generation assets. This EIR assumes that the ability of such entities to purchase assets for environmental purposes would be limited under the proposed price-based

auction and, if it were to occur, would be unlikely to create environmental effects of greater magnitude than the adverse effects considered under the two ownership scenarios. As a result, the environmental effects of acquisition of some or all of Pacific Gas and Electric Company's hydroelectric assets by governmental or other entities for environmental purposes are considered and described as alternatives to the proposed project in Chapter 6, not as elements of the project. The analysis of alternatives in Chapter 6 also includes consideration of the potential for decommissioning of hydroelectric assets; such decommissioning would potentially create environmental impacts beyond those described for the ownership scenarios described below.

3.10.1.1 Basic Ownership Scenarios

Two scenarios are used to explore a reasonable range of potential operations under different ownership scenarios in Year 2005. The ownership scenarios do not represent all of the possible outcomes, but are meant to depict a range of environmental impacts consistent with plausible outcomes of divestiture.

PowerMax Scenario: New Owners that Maximize Power Market Profits

Types of Owners

In the PowerMax scenario, it is assumed that the hydroelectric assets are purchased through an auction by a new owner that seeks to maximize profits through the production and sale of electricity.

Size of Bundles

It is assumed that the new owner would purchase one or more regional bundle(s) or as few as one individual bundle.

Energy Market Considerations

For purposes of modeling and to be conservative in the analysis of impacts, it is assumed that new owners would have no other electric generation assets in northern California. The implication of this assumption is that under this scenario, all of the new owners' costs to purchase the hydroelectric assets must be recovered from revenues generated by selling power from the purchased hydroelectric generation assets. Further, in this scenario, because of the small capacity of the purchased hydroelectric assets (in the context of generation capacity in California and in the western power grid), the new owners would not be able to readily influence energy market prices.

However, an analysis of market power (the ability to influence market prices) solely through the operational decisions of a single owner) was prepared and is included in Appendix C to this EIR. This sensitivity analysis tested the amount of hydroelectric generation assets that a new owner would have to own (either alone or in combination with varying amounts of thermal generating capacity) for the new owner to have the capability to affect market prices. The potential

environmental effects of such market power exercise are explored in Section 4.14 (Air Quality) of this EIR. The market power analysis has indicated that strategies to exercise market power probably would not have a negative effect on stream flows. The market power analysis in Appendix C, and the analysis of its environmental impacts, provide information that can be used in the decision-making process on the project to ensure that new owners of hydroelectric facilities do not have the requisite portfolio of generation assets to readily and detrimentally influence energy market prices.

Operational Assumptions

Under the PowerMax Scenario, the analysis assumes that future owners would maximize the profits available from moving water through the portion of the hydroelectric system that they own. The new owners are assumed to operate their hydroelectric generation assets to meet energy demands during the highest-priced hours, days, and months. For this analysis, as mentioned above, it is assumed that the new owners would not have an incentive to operate the hydroelectric generation assets differently in order to affect the price of energy.

Non-Binding Agreements and Practices

Possibly the most important operational change that could occur under this scenario is that new owners could end existing voluntary, informal, or other non-binding agreements, arrangements, or practices that reduce potential profits. For example, non-binding arrangements to maintain higher in-stream flows or higher reservoir levels for recreation could be ignored in order to maximize power generation profits.

Bundling Considerations

For the most part, predicted operations for five new owners of the regional bundles would be the same as for 20 new owners of the individual bundles. An exception to this assumption involves specific locations where a lack of coordination among owners of generation assets within the same watershed could have adverse effects. As an example, on the Feather River, and in the Crane Valley and Kerckhoff systems, there could be multiple owners who fail to coordinate their operations. It is assumed that each operator would tend to make short-term decisions that maximize its own profits. Operators of hydroelectric facilities in the upper reaches of watersheds may generate at higher levels during the high-price hours with little regard to how their operations would affect downstream operators. As a result, water may be released from facilities in upper reaches at times when it cannot be used for hydroelectric generation at lower elevation facilities; this water would be "spilled," and its value for hydroelectric generation at the downstream units lost.

It should be noted, however, that several factors could mitigate in favor of coordinated practices. First, coordination agreements could be written in order to ensure that such uncoordinated events occur rarely, if ever. Also, the amount of water affected may not be sufficient to substantially

affect downstream hydroelectric operations. Finally, standard conditions contained in each FERC license require coordination with upstream and downstream license holders. Failure of an individual licensee to coordinate activities with upstream and downstream users could trigger FERC action. While FERC action in cases of this type is rare, experience suggests that multiple licensees and power generators on rivers coordinate operations to the mutual benefit of all operators. For the analysis, this EIR assumes that a coordination agreement would be signed for the Bucks Creek bundle, and is not necessary for other bundles.

WaterMax Scenario: New Owners that Maximize Water Supply Deliveries and Reliability

The primary management objective in this case would be to provide the largest, most reliable water deliveries to meet municipal and/or agricultural demands. The added supplies could be retained at reservoirs downstream of the hydroelectric facilities for delivery through conveyance projects, such as the Central Valley Project, State Water Project or EBMUD's Mokelumne River facilities. These supplies may be provided even if electricity generation creates greater direct economic value. Because water utilities are almost universally local or regional government entities, their primary objective would be to meet water supply demands with, a secondary objective of maximizing revenues from power production, especially in wet years.

Types of Owners

In this case, it is assumed that certain hydroelectric assets are purchased through an auction by new owners that change operations to provide the largest, most reliable water deliveries to meet municipal and/or agricultural demands. This case would vary by river basin, and would only affect those basins that have potential for water utility or purveyor buyers. There are two categories of potential buyers.

The first category of potential owners under the WaterMax Scenario would be new owners that currently take delivery of consumptive water from Pacific Gas and Electric Company and are interested in retaining, at least approximately, current water deliveries at the current level. Potter Valley, on the Eel-Russian Rivers complex, is the major example of this situation. Potter Valley currently is operated to meet Sonoma County Water Agency's water delivery requirements. Other examples include Butte Creek, Merced Falls, Tule River, and Kern Canyon. Because these bundles are currently operated to meet water delivery requirements, it is reasonable to assume that the operations would not change from the baseline under the WaterMax Scenario. The operations would only differ from the baseline in the PowerMax Scenario where voluntary, informal or unenforceable agreements may be changed. For this reason, potential ownership by these entities is not considered under the WaterMax Scenario.

The second category of potential owners under the WaterMax Scenario are those new owners that would prefer to manage the purchased hydroelectric assets to meet a set of water supply objectives that may not conform with power revenue maximization. These are the owners that are considered

under the WaterMax Scenario since it is reasonable to assume that these owners would change operational objectives. Because only certain river basins are likely to be purchased for this purpose, other river basins could be managed at the same time by other owners to maximize power market profits as described in the PowerMax Scenario. Table 3-1 lists the bundles along with the water utilities and purveyors that fall into the second category and are candidates most likely to buy the bundles for this purpose.

Size of Bundles

It is assumed that these new owners would purchase no more than one individual bundle.

Evaluation of Pacific Gas and Electric Company's hydroelectric assets suggests that only certain facilities would be likely to be purchased by owners for the purpose of maximizing water supply and reliability. The notable characteristics that would make a specific bundle of hydroelectric assets attractive to a water supply agency or entity would include water storage facilities (such as reservoirs) and/or substantial consumptive water rights or other assets including lands which serve as the upstream watershed for larger downstream water supply facilities. Table 3-1 lists those bundles of assets that could be purchased for this purpose, along with some specific water utilities and purveyors that have already expressed interest in purchasing bundles for water supply and/or reliability purposes. It should be noted that this list in no way limits the potential purchasers of the hydroelectric assets, and other potential entities interested in maximizing water supply and reliability could purchase bundles of hydroelectric assets.

Operational Assumptions

Under this scenario, it is assumed that in order to achieve improved water supply reliability, new owners of reservoirs or other storage facilities would store as much water as possible during a normal to wet year in order to carry over for dry years. Reservoir levels would be held to their highest level possible through the summer, and downstream flows would be minimized. In dry years, reservoirs would be drawn down as far as possible, with commensurate changes in flows.

Energy Market Considerations

Under the WaterMax Scenario, it is also assumed that the new owners would attempt to maximize power-sale revenues to the extent possible within the constraints presented by water supply priorities. This means that water supply would be used to generate hydroelectric power during the highest-priced hours. It is further assumed that during dry years, the new owners would draw down reservoirs to meet water supply demands, regardless of any losses in power revenues or impacts to recreation[17]. In fact, the new owners may go so far as to bypass the power turbine

[17] For example, the City and County of San Francisco currently follows this practice in operating the Hetch Hetchy Project (Ron Knecht et al., Final Report on the Feasibility of Electric System Municipalization in San Francisco (San Francisco, California: Economic and Technical Analysis Group, February 11, 1997).

inlets to access a larger portion of reservoir storage in those years. This would lead to a reduction in energy and generation capacity in drought conditions beyond that which occurs under existing conditions.

Table 3-1 Bundles Most Likely to Be Purchased and Reoperated For Water Supply Purposes

Bundle(s)	River System	Previously Identified Potential Purchaser
#1Hat Creek #2 Pit River	Pit River	Private water company, Westlands Water District or Central Valley Project (CVP) Contractors
#5 Hamilton Branch #6 Feather River #7 Buck's Creek	North Fork Feather River	State Water Contractors
#11 South Yuba/Bear River	Drum-Spaulding (Yuba, Bear, American Rivers)	Placer County Water Agency Nevada Irrigation District
#13 Mokelumne River	Mokelumne River	East Bay Municipal Utility District
#14 Stanislaus River	Stanislaus River	Tuolumne Utilities District
#16 Crane Valley	San Joaquin River	Friant Water Users Association, or U.S. Bureau of Reclamation
#18 Kings River	Kings River	Kings River Water Association

Note: Does not include systems that are currently managed for water supply purposes, including Potter Valley, Butte Creek, Merced Falls, Tule River, and Kern Canyon. These systems could be purchased by water utilities and purveyors for water system purposes.
Source: M Cubed, 2000

River System Assumptions

Within the physical, regulatory and institutional limitations and constraints imposed on the hydroelectric facilities, a water maximizing owner could use water management strategies to operate the hydroelectric assets on the river systems differently from Pacific Gas and Electric Company's operations. It is assumed that the following changes could occur in each affected watershed.

Pit River. Pacific Gas and Electric Company owns 11 reservoirs on the Pit and McCloud Rivers with a combined storage capacity of about 160,000 acre-feet[18]. The largest reservoirs and their total storage capacity in acre-feet are Lake Britton (41,907), Lake McCloud (35,234), Pit Forebay 7 (34,611), Iron Canyon (24,241) and Pit 6 Forebay (15,886). Pacific Gas and Electric Company reports licensed water rights for 19,943 acre-feet in Iron Canyon and 15,500 acre-feet in Pit Forebay 7. Any use of these facilities for water supply would require that water be passed through Lake Shasta, a Central Valley Project (CVP) reservoir on the upper Sacramento River. From there, water could be delivered downstream for irrigation use in the Sacramento Valley, or water could be released to the Delta and exported for use in the San Joaquin Valley, the Bay Area, or Southern California.

18 CALFED, 1999. "Hydroelectric Facility Reoperation Investigation." Integrated Storage Investigation. Draft, Sacramento, December 1999.

The most likely buyer of the Pacific Gas and Electric Company facilities is assumed to be a water broker who would sell water to the highest bidder. The Bureau of Reclamation could also be another potential intermediary. Water would probably be sold only in dry years. Urban users are the most likely buyers in these markets, and Westlands Water District is also a potential buyer.

Lake Shasta, which receives flows from the Sacramento, McCloud and Pit Rivers, normally refills entirely in normal and wet water years. Only under dry conditions is additional storage upstream of Shasta of any value. In years with dry conditions, the strategy that best improves water supply reliability and provides the most value for stored water is releasing water at Pit 7 below the turbine inlets. This allows access to an additional 15,000 acre-feet of stored water. The Pit River owner would be foregoing power revenues at that time, but the dry-year value of the water supplied would be greater.

North Fork Feather River. Pacific Gas and Electric Company owns eleven reservoirs on the North Fork Feather River, with a combined capacity of 1,340,486 acre-feet. Important reservoirs and their total storage capacity in acre-feet are Lake Almanor (1,142,964), Bucks Lake (105,605) and Butt Valley Reservoir (49,897). Pacific Gas and Electric Company has an obligation to release 145,000 acre-feet annually from its reservoirs upstream of the State's Thermalito Afterbay for delivery to Western Canal Water District.

Most uses of these facilities for water supply would require that water be passed through Lake Oroville, a State Water Project (SWP) reservoir on the lower Feather River. From there, water could be delivered downstream for irrigation use in the lower Sacramento Valley, or water could be released to the Delta and exported for use in the San Joaquin Valley, the Bay Area, or Southern California.

The most likely buyer of the Pacific Gas and Electric Company's facilities is assumed to be the State Water Project or State Water Contractors. The water would probably be allocated out among State Water Project contractors according to existing entitlements and allocation criteria as modified by the Monterey Agreement.

Storage at Lake Almanor and Butt Valley Reservoir could be used to supplement storage at Lake Oroville through better coordination of system releases. In general, this implies holding Almanor and Butt Valley at higher levels during normal and wet years, and not drawing them down as far during the late fall. This would increase the likelihood of winter-time spills. In dry years, these reservoirs would be drawn down further to meet water supply demands put on Oroville.

Yuba-Bear River Complex. Pacific Gas and Electric Company owns 22 storage reservoirs and seven small forebays on the Yuba, Bear, and North Fork American Rivers. Important reservoirs and their total storage capacity in acre-feet are Lake Spaulding (74,773) and Fordyce Lake (49,903). Total Pacific Gas and Electric Company storage capacity is about 151,000 acre-feet. Pacific Gas and Electric Company owns the water right to store up to 45,000 acre-feet of water in

Englebright Lake, a U.S. Army Corps of Engineers reservoir on the lower Yuba River. Any use of these facilities for water supply would require that water be passed through Englebright Lake or routed down the Bear River, or through the Bear River Canal to Folsom Lake on the American River.

The Pacific Gas and Electric Company facilities are closely inter-connected with facilities owned by the Nevada Irrigation District and the Yuba County Water Agency, and operations are coordinated for hydropower and water supply purposes. A number of agreements and contracts are used to deliver water supply for irrigation and domestic purposes. Pacific Gas and Electric Company supplies up to 104,000 acre-feet of water under a water supply contract with Placer County Water Agency, and separate purchase agreements provide additional supplies, bringing the total to about 125,000 acre-feet.

The most likely buyer of Pacific Gas and Electric Company's facilities is assumed to be the Placer County Water Agency (PCWA). Water would be allocated among PCWA member agencies. Existing contracts with Nevada Irrigation District may complicate any transfer of water out of the system.

It is assumed that the PCWA would manage the system to increase the probability of receiving its full 125,000 acre-foot contract allotment in all years. This would be accomplished by holding reservoirs at higher storage levels in normal and wet years, particularly higher up the cascade, and by drawing down the reservoirs further in dry years.

Mokelumne River. Pacific Gas and Electric Company owns 13 reservoirs on the North Fork of the Mokelumne River, with a total capacity of about 225,000 acre-feet. Important reservoirs and their total storage capacity in acre-feet are Salt Springs Reservoir (141,857) and Lower Bear River reservoir (52,025). Pardee and Comanche Reservoirs, owned and operated by East Bay Municipal Utility District (EBMUD) for municipal water supply, are downstream. Agreements with Amador Water Agency and the Lodi Decree, a Court adjudication, require certain releases, storage, and deliveries from Pacific Gas and Electric Company's system.

The most likely buyer of Pacific Gas and Electric Company's facilities is assumed to be EBMUD, or a consortium of water agencies dependent on the Mokelumne River. It is assumed that water would be used to increase deliveries to municipal customers in the EBMUD service area, or EBMUD would use the water in an exchange or conjunctive use with irrigators located downstream of Comanche Reservoir.

It is assumed that EBMUD would try to retain as much water storage as possible at the top of the Mokelumne cascade in Salt Springs and Lower Bear Reservoirs. It would do this by holding those reservoirs at the highest possible monthly target levels, as defined in the Lodi Decree.

Stanislaus River. Pacific Gas and Electric Company owns five reservoirs on the Middle Fork and South Fork of the Stanislaus River Basin, with a combined storage capacity of about 40,500 acre-feet. Important reservoirs and their total storage capacity in acre-feet are Relief Reservoir (15,554) Pinecrest Lake (18,312) and Lyons Reservoir (6,228). New Melones Reservoir, owned by the U.S. Army Corps of Engineers but operated by the Bureau of Reclamation, is downstream. Pacific Gas and Electric Company has an agreement with the County of Tuolumne to deliver water from the Phoenix Project on the South Fork Stanislaus River for distribution by the County for consumptive use.

One potential buyer for Pacific Gas and Electric Company's facilities is Stockton East Water District. Stockton East also provides Calaveras River water and groundwater to parts of the Stockton metropolitan area. Other potential buyers include Oakdale and South San Joaquin Irrigation Districts (also known as Tri-Dams), and the Tuolumne Utility District (TUD).

The TUD is assumed to be the most likely buyer for South Fork facilities. The TUD cannot currently obtain water from Relief Reservoir on the North Fork. Therefore, Tri-Dams is considered a more likely buyer for the North Fork facilities. The TUD obtains water from Pacific Gas and Electric Company by a diversion from Lyons Reservoir on the South Fork of the Stanislaus River. The TUD serves municipal and industrial users in Sonora, Twain Harte, Tuolumne, and other developed areas in western Tuolumne County. Current arrangements with Pacific Gas and Electric Company should provide adequate water supplies in the short run. TUD has contemplated increased use of Pacific Gas and Electric Company's South Fork facilities for water supply. The District has studied the potential for enlargement of Lyons Reservoir to meet increased demands in the future, and is currently discussing changes to operations at Pinecrest Lake (Strawberry Reservoir) which would improve supply reliability.

The TUD currently receives an incentive payment from Pacific Gas and Electric Company to conserve water and reduce water contract deliveries. The TUD would no longer receive those conservation incentives as new owners of the facility. As such, it is assumed that TUD more likely would attempt to take its full water contract delivery, thus reducing the flows in the Middle Fork of the Stanislaus River. As with the PCWA, it is assumed that TUD would also tend to hold Strawberry and Lyons Reservoirs higher in wet and normal years, and to draw them down in dry years.

Crane Valley. Pacific Gas and Electric Company owns seven reservoirs in the San Joaquin Basin, most on the North Fork Willow Creek, with a combined capacity of about 50,000 acre-feet. Bass Lake, with 45,410 acre-feet of capacity, accounts for 90 percent of the total. Millerton Lake (Friant Reservoir), a water storage facility operated by the U.S. Bureau of Reclamation, is downstream. The U.S. Bureau of Reclamation can call for release of stored water from Bass Lake under specified conditions.

The most likely buyer of Pacific Gas and Electric Company's facilities is assumed to be the U.S. Bureau of Reclamation or the Friant Water Users Association (FWUA). It is assumed that water would be used for irrigation purposes in the Friant service area, or the water might be used for environmental restoration. The FWUA and Metropolitan Water District (MWD) of Southern California recently signed an agreement to facilitate a swap of the FWUA's San Joaquin River supplies for MWD's Delta water supplies. It is assumed that the FWUA would gain delivery reliability, while MWD would improve its water quality.

The Miller-Lux Agreement requires Pacific Gas and Electric Company to release up to 60 percent of its storage to Millerton Lake by October. However, an additional 18,000 acre-feet could be released to Millerton if owned by the FWUA. The additional water could be used to meet the recent San Joaquin River agreement between FWUA and the Natural Resources Defense Council. In addition, this water could be introduced into the active Friant-Kern Canal water transfer market, including the proposed swap with MWD.

Kings River. The Kings River system is a special case. Courtright and Wishon Reservoirs have about 252,000 acre-feet of storage, but much of this storage is tied to the Helms Pumped Storage Facility. Given this situation, an owner that is focused on water-supply objectives, such as the Kings River Water Association, would be unlikely to purchase the Helms complex because it would be too expensive to use primarily for that reason[19]. If the Helms complex were to be valued at only $100 per kilowatt (versus estimates of upwards of $1,000 per kilowatt for the entire Pacific Gas and Electric Company hydroelectric system), that would translate into an effective cost of $750 per acre-foot. It is assumed that a Kings River water supplier would place a value of only about $600 per acre-foot on that storage. Given that Helms probably has a value substantially greater than $100 per kilowatt, it is unlikely that any water purveyor would purchase the Kings River system for the primary purpose of improving water supplies.

3.10.1.2 Hydrologic Modeling Process and Results

The hydroelectric system was modeled to identify potential future changes in water management practices that could result in environmental impacts. The goal of the modeling was to determine how changes in operating strategy would affect water flows and storage, should new owners operate differently from Pacific Gas and Electric Company. These differences would be in response to the electric market, and in light of the probable management objectives of different types of owners (e.g., water suppliers versus energy companies). The modeling was used to identify changes in water storage practices and water releases during different times of the day and during different months. These changes were examined for different types of water years and under different market conditions. The modeling process is described in detail in Appendix C.

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19 If Kings River Water Association, which has indicated interest in the Kings River bundle, did purchase the bundle, it is assumed that the purpose would be to protect its current water supply situation, in which case it would fall into the first class of water utilities described above.

Modeling Process

Potential changes in the operation of the hydroelectric system were analyzed using computer models developed by Water Resources Management, Inc. (WRMI) and LCG Consulting. WRMI's model simulates water release decisions, and LCG's model simulates electric power generation and pricing. The two models complemented each other in how they used data inputs and hydroelectric system parameters to generate outputs that could be used by the other model to further refine the analysis.

WRMI used its Operation and Simulation of Integrated Systems (OASIS) model, a generalized water resources system model, to simulate decisions regarding water releases for river systems. Water release and storage decisions are made in the model by balancing different objectives (e.g., water supply maximization, energy revenue optimization) within system constraints (e.g.,. mandatory minimum flows, size of water conveyances, reservoir capacity, etc.). In this analysis, OASIS modeled seven independent river systems on a monthly basis for the 24 years of water data used. OASIS relies on data about the physical features of the water storage and conveyance system and on rules about what minimum flow and other requirements must be met.

Pacific Gas and Electric Company's hydroelectric system has 68 powerhouses on 16 river systems. Half, or eight, of these river systems have storage facilities that allow owners to determine when water is released. The other half of these river systems have little water storage capability. As a result, hydroelectric facility operators on these eight river systems have limited ability to shift water availability to more advantageous times or seasons: water must be used when available. Therefore, these river systems were not modeled using OASIS.

The eight river systems that have sufficient reservoir capacity to allow water to be stored and released based on operator preferences are: the Pit, North Fork Feather, Yuba-Bear, Eel-Russian, Mokelumne, Stanislaus, San Joaquin, and Kings River systems. However, the Kings River system was not modeled because the operational goals for the Helms Pumped Storage Plant, which dominates the hydroelectric operating strategy for that river system, would not change substantially under any foreseeable management scenario, because water is largely recycled through the Helms facility.

LCG used its UPLAN Network Power Model (called UPLAN) to model the western United States transmission grid (as contained in the Western Systems Coordinating Council). UPLAN includes databases on electrical generation and electric load, and was used to simulate or recreate historic power dispatch for a given time period by modeling the behavior of different types of owners. For each powerhouse, UPLAN simulated hourly dispatch of power and predicted electricity prices. UPLAN simulated the energy and ancillary services[20] markets simultaneously, determined the

[20] Ancillary services are services needed to maintain system reliability and meet operating system criteria, including spinning, non-spinning, and replacement reserves and regulation, voltage control, and black start capability.

participants' expected bidding strategy for energy and ancillary services, calculated forward prices for energy and ancillary services, and dispatched resources to eliminate imbalances and to determine real time prices. Operations on all 16 river systems were simulated in UPLAN using Pacific Gas and Electric Company data on historic monthly water flows.

For the seven river systems modeled by OASIS, UPLAN determined how different management objectives, such as maximizing revenues or optimizing water supply reserves, would affect water management in these river systems.

OASIS and UPLAN were used sequentially to predict changes that might occur under different ownership and operating scenarios. UPLAN predicted future energy market conditions and supplied a set of price forecasts under various historic hydrologic conditions. OASIS used the output from UPLAN to model monthly water flows that would be expected under the following conditions: (1) baseline conditions in 2000, (2) the PowerMax Scenario in 2005, and (3) the WaterMax Scenario in 2005[21].

The monthly information generated by OASIS was used in UPLAN to simulate potential hourly water flows. These hourly flows were modeled in both a baseline year (2000) and a future year (2005) for the scenarios described above. The result was a simulation of hourly powerhouse generation for each model year, based on the scenarios described above.

Modeling Steps

To develop a reasonable baseline for hydrologic analysis, the first step in the modeling program was to use UPLAN to analyze how historic water flows would have been managed in light of today's price-oriented electricity market. In the model, 24 years of historic monthly flows (1975-1998) at the powerhouses were "rescheduled" on an hourly basis to meet the expected 2000 market. The result was an initial simulation of how power would have been dispatched in the year 2000's restructured energy markets for each of the historic years. To provide a better base against which to compare future scenarios, the UPLAN simulations assumed (1) Competitive Transition Charges (CTC) collections ended with valuation of the hydroelectric assets (as required by AB 1890), and (2) the hydroelectric assets were retained within Pacific Gas and Electric Company as a regulated utility providing cost-of-service power. This first step was undertaken to provide basic input for the 24 years of data, from which OASIS then optimized water release/storage scheduling on a monthly basis. Following this optimization in OASIS, UPLAN used the monthly schedules to maximize power revenues.

The hourly price output from UPLAN for each of the water years was used as input by the OASIS model. Input to OASIS also included hydrologic flows from Pacific Gas and Electric Company stream flow gauge data and reservoir storage data, the maximum and minimum capacities of the

[21] Other scenarios including the 2005 case without the project (the No Project Alternative), were modeled and are described and evaluated in Chapter 6 of this EIR, Alternatives to the Proposed Project.

hydroelectric facilities, reservoirs, and water conduits, and the operating rules for the system. Operating "rules" that placed limits on the model included FERC license or contract stipulated releases, required minimum reservoir elevations, required ramping rates, time-of-year water delivery requirements, and similar constraints on operational flexibility. The 2000 baseline scenario assumed continuation of FERC requirements, binding agreements, and the non-binding agreements affecting water flows. In the PowerMax and WaterMax Scenarios for the project, FERC requirements and binding agreements on water were assumed to continue, but non-binding agreements were assumed to be discontinued. Based on these inputs, OASIS allocated water flows among months for the two water-scheduling strategies described above: one to maximize power revenues and one to optimize the availability of consumptive water (especially for its use in dry years). For the period June through December of each year OASIS simulated monthly optimization of energy revenues only for the baseline 2000 scenario and the 2005 PowerMax Scenario. From January through May of each year, the simulation again maximized for energy revenues, but required the reservoirs be refilled during the wet season. In the WaterMax scenario, the additional objective of enhancing water supplies was added. In this scenario, end-of-year water storage targets were increased during normal and wet years. In dry years, reservoirs were drained, to the extent feasible, to meet water supply requirements. Power revenues were still optimized in this scenario, consistent with the water-maximizing objective.

At the beginning of each month, the OASIS model rescheduled water releases for the balance of that calendar year, based on the results of prior months. This monthly revisiting of the optimal allocation of the remainder of the year mimics what an operator would do when managing a system.

Two electricity price distributions, one for dry years and one for normal years, were developed for OASIS to analyze all water scheduling strategies. The price distributions, or "curves", were based on the 24-year historic record, as modeled by UPLAN for year 2000 and 2005 scenarios. The model was directed to optimize water releases for the price curve appropriate to water conditions in that year and month. For example, depending on the price curves, water might be held back from generation use in June and July to maximize power production in the higher-valued month of August. Even under these simulated conditions, the model required all other conditions to be met, namely the operating rules were honored and the reservoirs were drained and refilled seasonally.

In the WaterMax Scenario, the primary rule that governed the maximum availability of consumptive water was to always hold back enough water to meet the one-year demands of a dry year (that could occur in the next water year). This tended to keep higher carry-over storage volumes in reservoirs as a hedge against a dry year.

OASIS simulated water flows, reservoir levels, and water diversions on a monthly basis. The powerhouse flows became new input to UPLAN, which then optimized the available water to

maximize revenue with the new flow data for each scenario[22]. Hourly power generation was determined for every hydroelectric powerhouse for each hour in each month.

The modeled water flows for all scenarios were then compared to the modeled flows for the 2000 baseline to discern changes. These changes would be attributable to changes in operating strategy - either energy revenue optimization or water supply optimization. The key variations between the 2000 baseline and the 2005 project scenarios were (1) the elimination of non-binding agreements and (2) the saving of water for a critically dry year in the WaterMax Scenario.

The results of the modeling were used by environmental resource specialists to analyze the potential impacts of future operations on flow-sensitive resources, such as aquatic biology, recreation, and hydrology (see Chapter 4).

Summary of Operational and Economic Analysis Results

The operational and economic analysis was conducted on a 24-year history of hydrological conditions in the Pacific Gas and Electric Company hydropower system. As discussed previously, the analysis focused on first defining the baseline condition in 2000, and then developing ownership scenarios on potential ranges of operations in 2005.

Hydropower Generation and Powerhouse Flows

Figure 3-1 shows how annual generation calculated by UPLAN varied among the baseline and two ownership scenarios, depicted by hydrologic year. Two observations can be made from these results:

- Annual generation in the PowerMax Scenario is higher than the baseline in all but three years. Those three years (1978, 1989, and 1991) all followed multi-year drought periods. This results from not maintaining reservoirs levels in the late summer, and from reducing minimum flows to the FERC-mandated levels.
- Annual generation in the WaterMax Scenario is generally higher than the baseline in drier years, and lower in wetter years. This occurs because a water supplier would draw down reservoirs further in dry years, but maintain higher storage for supply insurance in wet years.

Figures 3-2 and 3-3 compare the average monthly flows through the powerhouses measured by UPLAN among the quasi historic usage*, the baseline and ownership scenarios[23]. In comparison to quasi historic flows, all three scenarios under restructuring assumptions show lower flows and associated generation in January, February, June, and September, as operators retain water to be released during higher-priced periods. In other words, substantial operational changes are likely to

22 For hydroelectric power generation, this EIR assumes that maximizing revenues is the equivalent of maximizing profits.

*The "historic" generation shown is actually adjusted for new generation plants, and on a weekly and daily basis is dispatched to match load and generation conditions in 2000.

23 As discussed previously, historic and baseline conditions are not the same.

occur as a result of restructuring alone. Generation is universally higher in the high-priced months of July, August, November, and December. Results vary in the spring months of March, April, and May, and in October due to the differences in management objectives. Due to higher carryover storage under the WaterMax Scenario, more water must be released in the spring in that scenario. In October, more water is retained for carryover in the WaterMax Scenario.

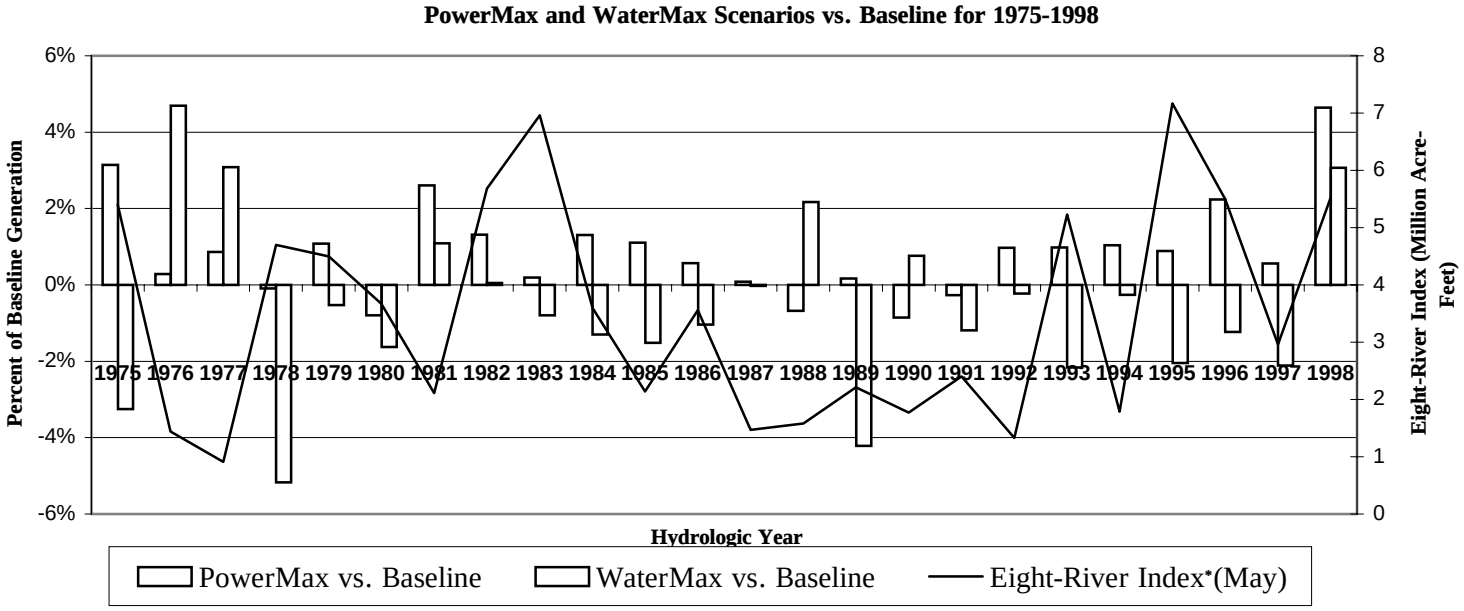
Figure 3-4 compares the monthly generation pattern of the PowerMax and WaterMax Scenarios against the baseline scenario. The PowerMax Scenario shows less powerhouse flows and generation through May as more water is retained for the later summer power peaks. Flows and generation are higher for each of the last seven months, reflecting the higher power market values and the relaxing of the non-binding constraints. The WaterMax Scenario shows higher generation for February through August. First, carryover water is released to accommodate springtime flows in all but the driest years. Then, higher power prices drive higher generation from June to August, with generation higher earlier in the summer than in the PowerMax Scenario. From September through December, water is stored as insurance to enhance dry-year reliability, and powerhouse flows are commensurately decreased.

Reservoir Levels

Figures 3-5 through 3-11 compare the collective river basin storage for the seven river systems that were modeled with OASIS on a monthly basis. These provide a useful summary statistic for comparing the various scenarios. For each modeled river system, the figures across the water years show the average end-of-month storage levels, taking into account the range of the 24 water years. Following that depiction, for each modeled river system, the figures indicate the frequency that the storage levels are achieved. Storage is shown as of the end of May, August, and December, as representative comparative months. As the figures show, the drier years correspond to the highest frequencies (because the levels attained in the driest year will always be achieved), and wetter years correspond to the lowest frequencies (because such higher storage levels will more rarely be achieved).

Across the seven river basins, storage in the PowerMax Scenario is generally lower than the baseline or WaterMax Scenario under most water conditions. In the WaterMax Scenario, storage is generally lower than the baseline in the drier years, but varies among river basins in the wetter years.

Figure 3-1 Annual Hydropower Generation



* Eight-River Index represents the weighted annual flows of major rivers in the Sacramento and San Joaquin Watersheds, as computed by the California Department of Water Resources.

Figure 3-2 Average Monthly Hydropower Flows

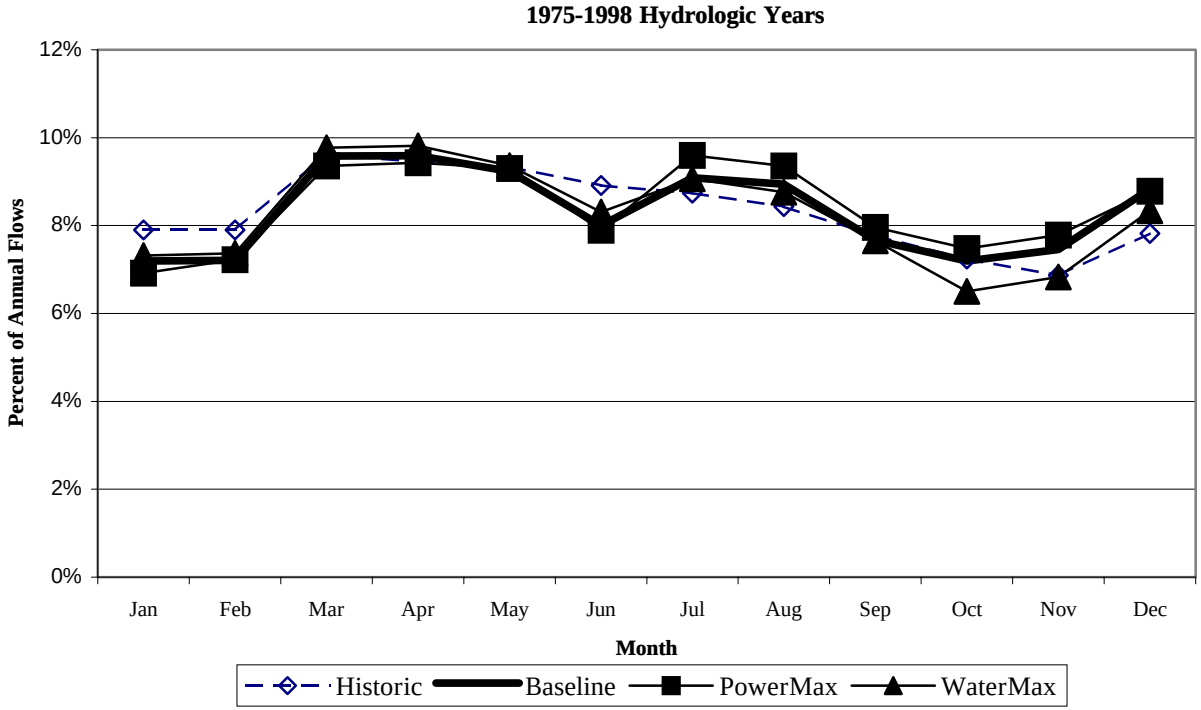


Figure 3-3 Monthly Powerhouse Flows vs. Historic Pattern

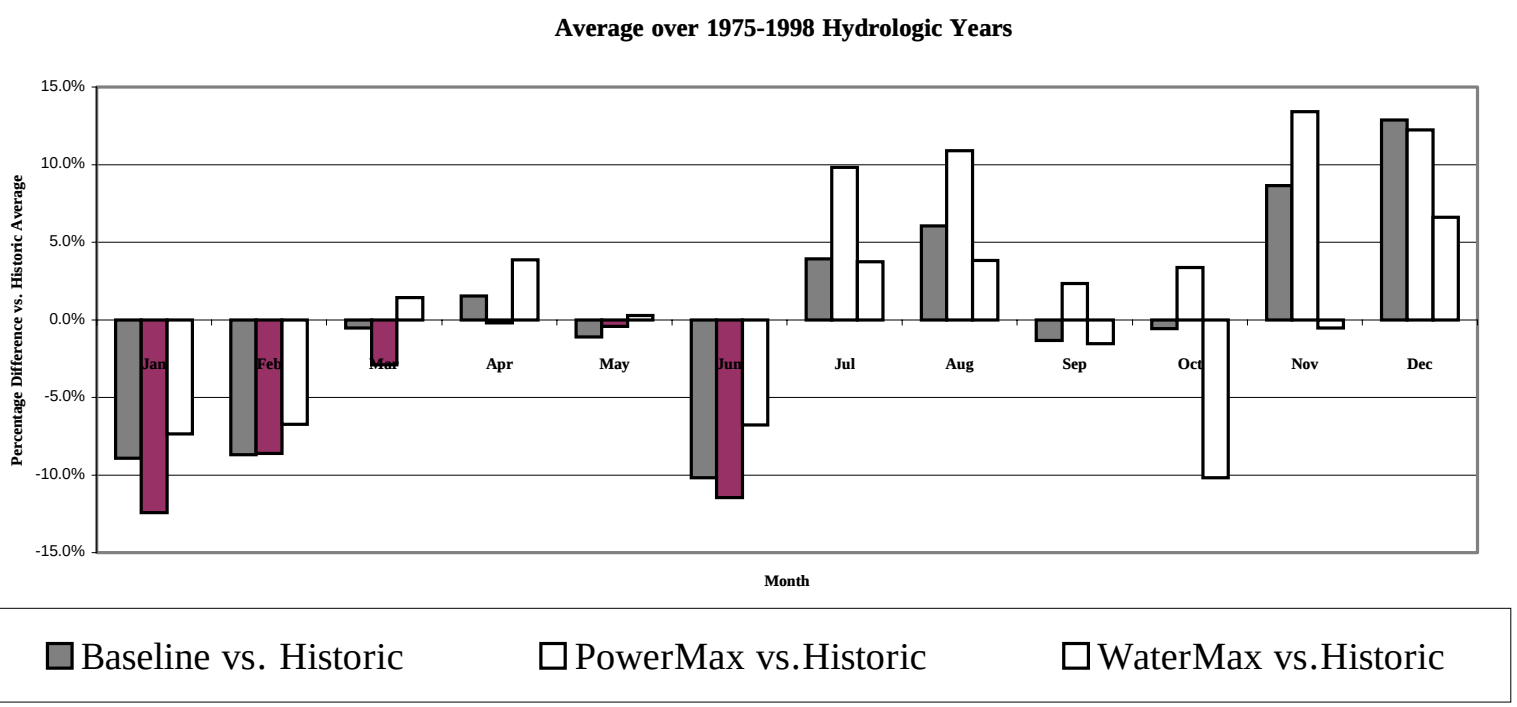
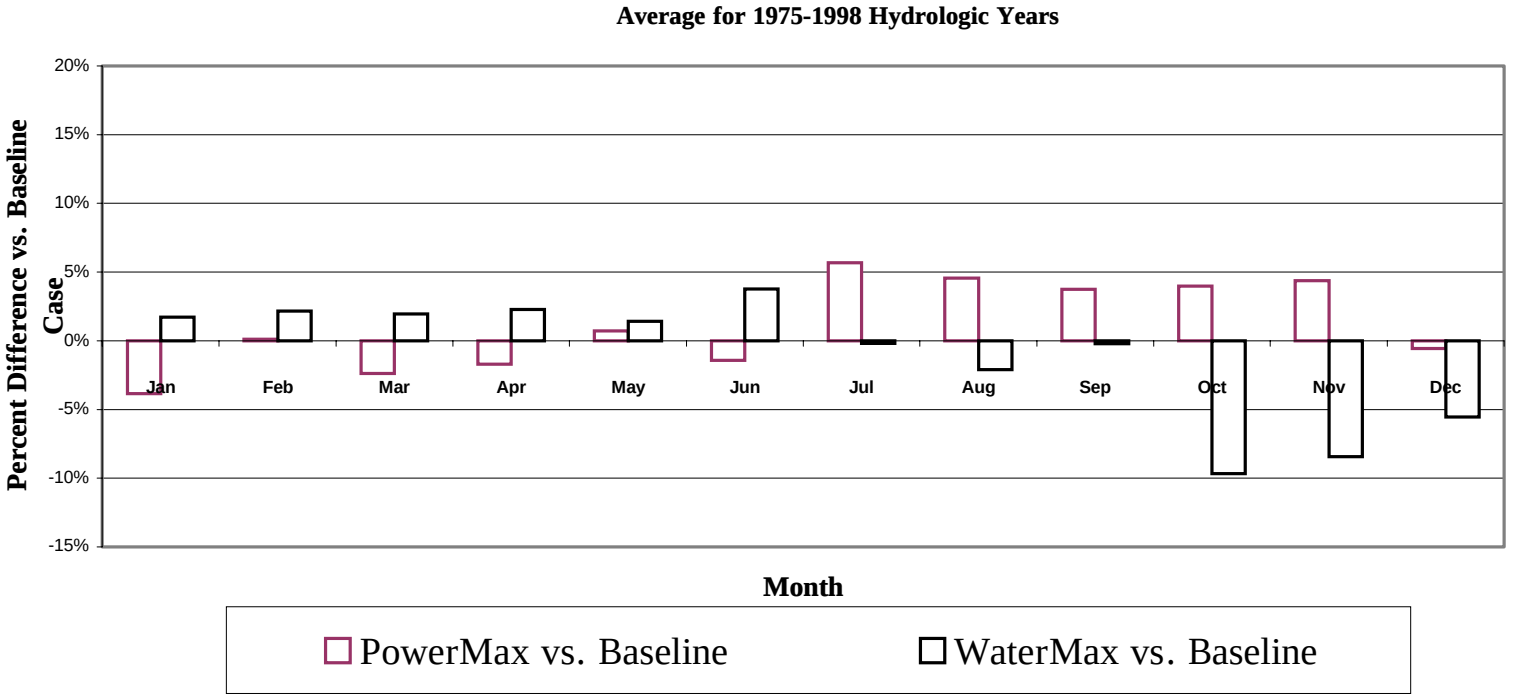


Figure 3-4 Monthly Powerhouse Flows vs. Baseline Case



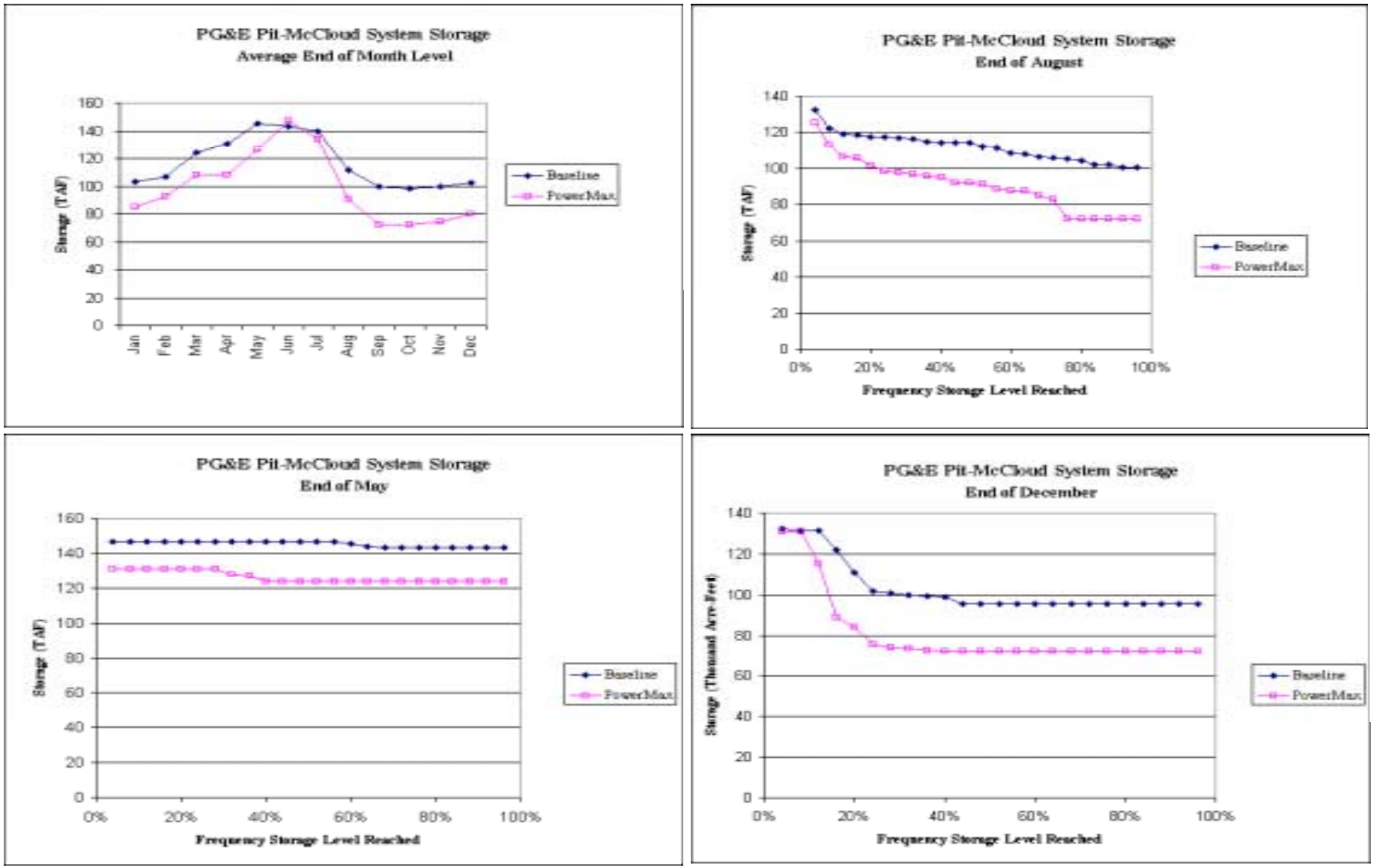


Figure 3-5 Total PG&E Pit-McCloud System Storage

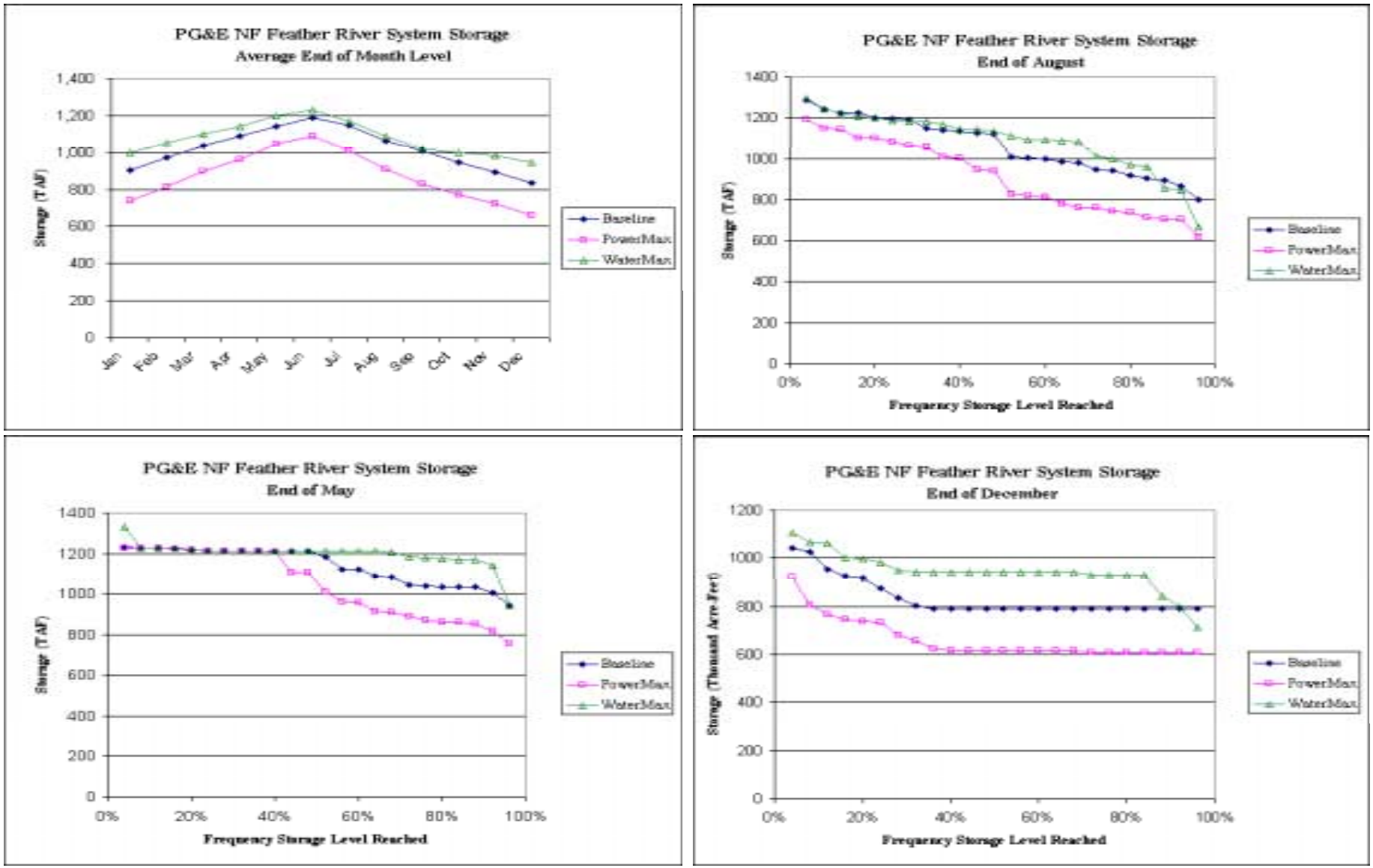


Figure 3-6 Total PG&E NF Feather River System Storage

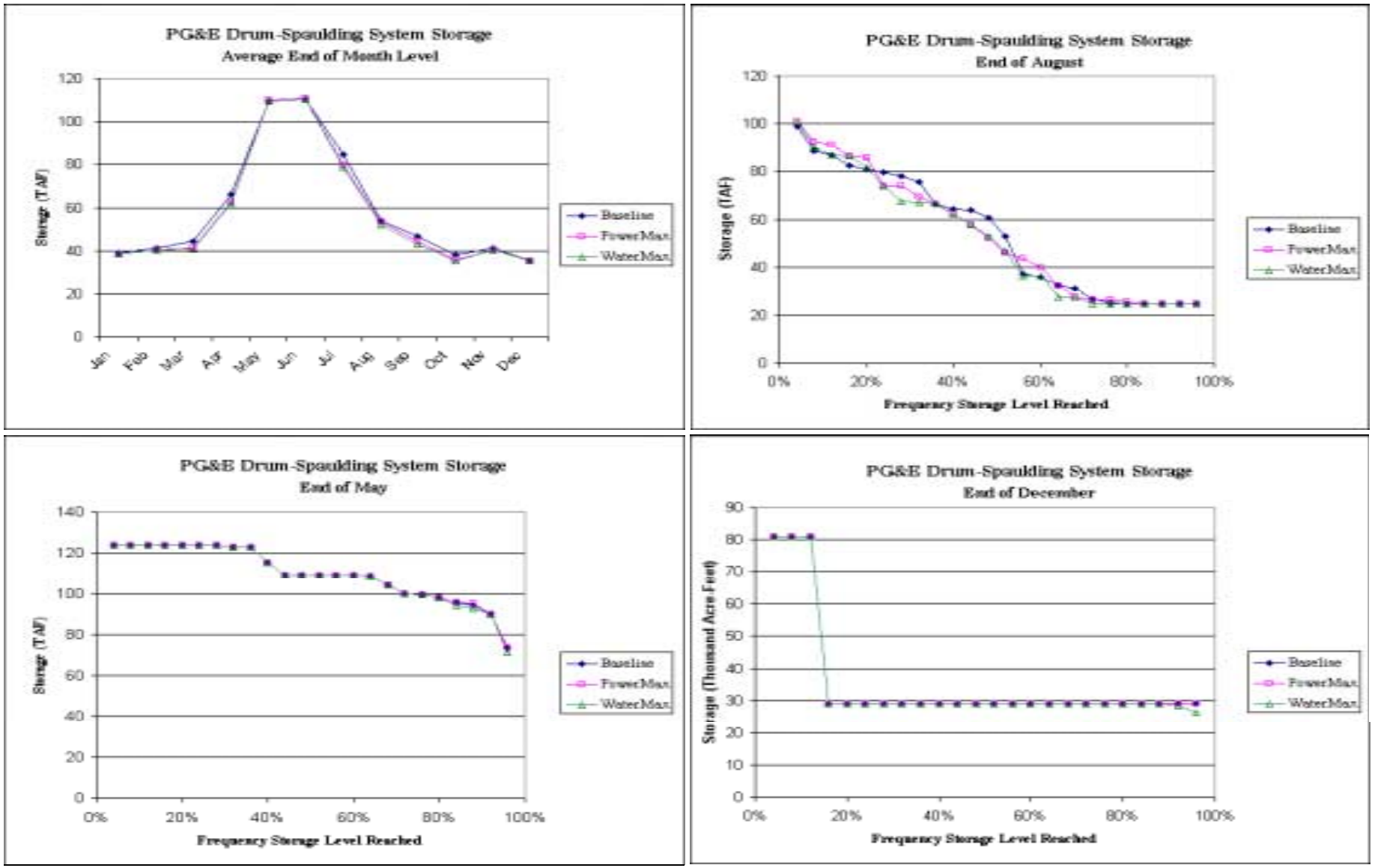


Figure 3-7 Total PG&E Drum-Spaulding System Storage

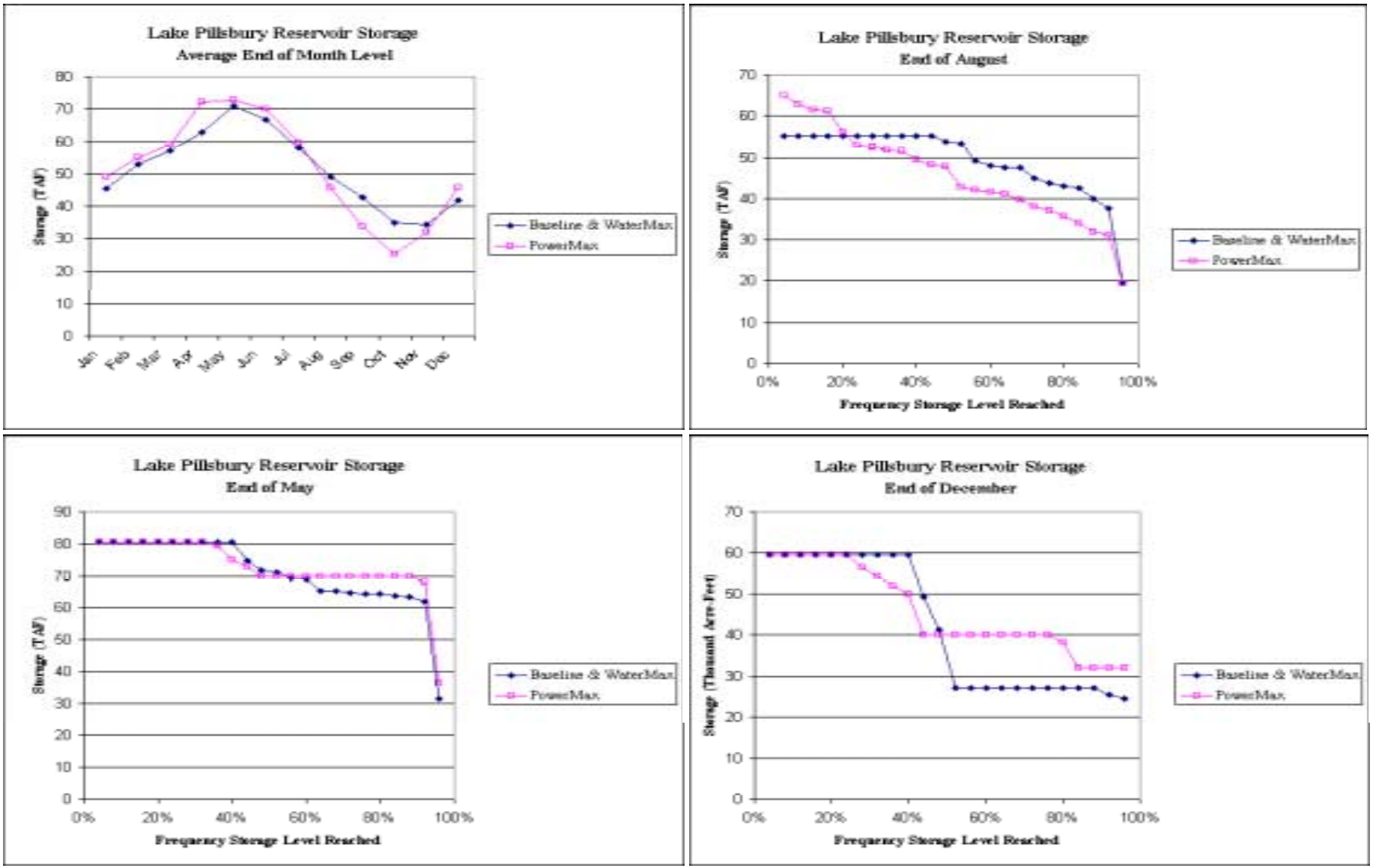


Figure 3-8 Total Lake Pillsbury Reservoir Storage

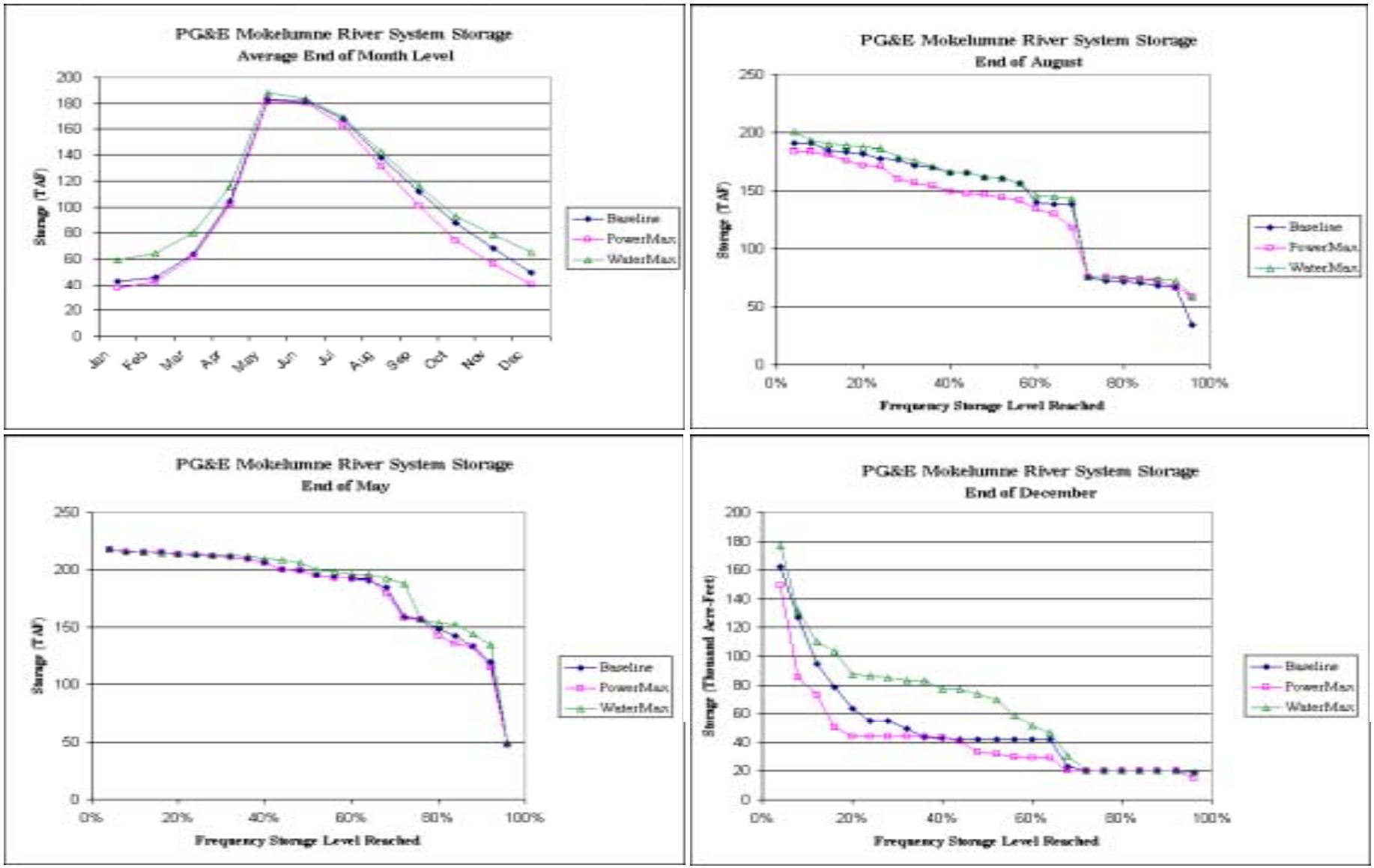


Figure 3-9 Total PG&E Mokelumne River System Storage

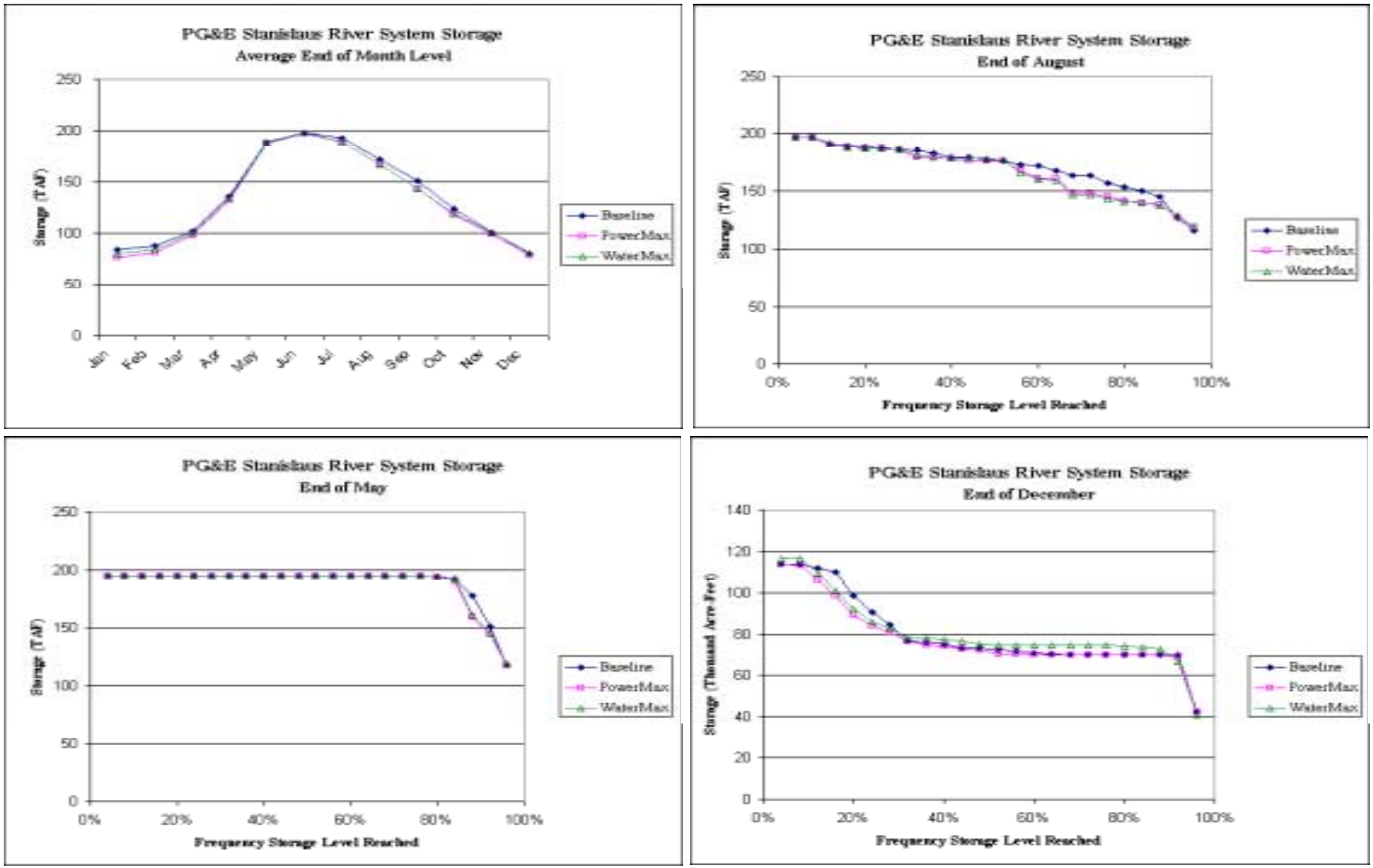


Figure 3-10 Total PG&E Stanislaus River System Storage

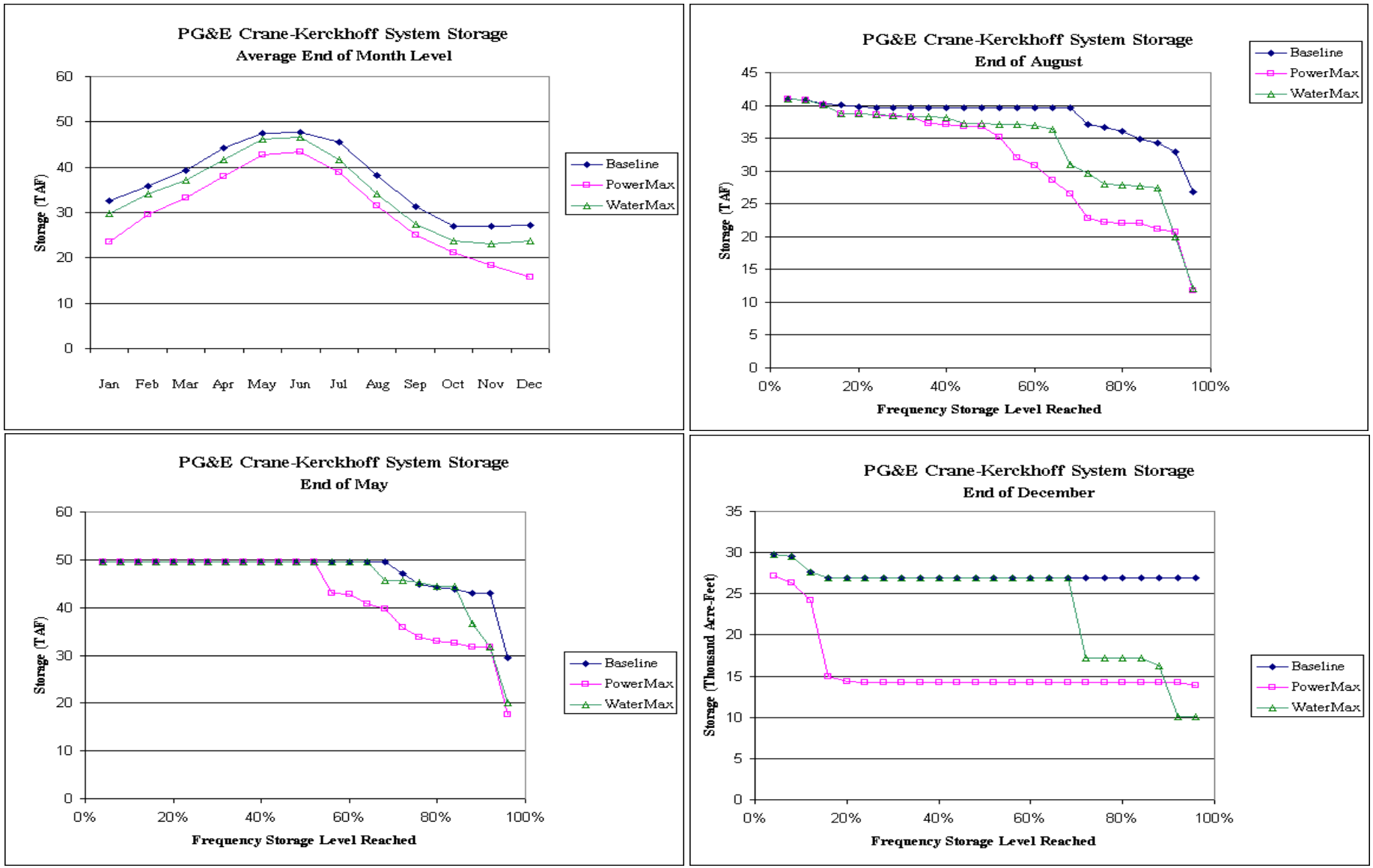


Figure 3-11 Total PG&E Crane-Kerckhoff System Storage

Pit-McCloud River System. Figure 3-5 show that in almost 90 percent of the year types in the Pit Cloud system non-binding constraints appear to add about 25,000 af of storage late in the year to the baseline scenario as compared to the PowerMax Scenario. Figure 3-6 shows that May storage is invariant under any scenario with hydrologic conditions. Figure 3-7 shows that storage is drawn down more quickly in the PowerMax Scenario under drier conditions. As explained in Appendix C, the Pit River cannot be managed to further increase water supply, so there is no WaterMax Scenario.

North Fork Feather River. Figure 3-6 shows that storage declines at a steady rate as conditions get drier under the baseline scenario. Storage is always lower in the PowerMax Scenario, declining at a parallel rate, until the reservoirs are drawn more deeply under drought conditions. Storage is generally higher in the WaterMax Scenario in all but the driest year, when the reservoirs are drawn deeply to provide water supplies.

Drum-Spaulding System. Figure 3-7 shows that storage levels are relatively similar across all three scenarios. The storage levels are equally sensitive to changes in water conditions. Pacific Gas and Electric Company's system is closely integrated with that of the Nevada Irrigation District, thus limiting flexibility.

Potter Valley Reservoir. Figure 3-8 shows that the WaterMax scenario would be identical to the baseline, because the Potter Valley project is currently operated to meet the water supply requirements of Russian River water suppliers. Figure 3-8 shows that the PowerMax scenario storage levels are lower in wet years and higher in dry years.

Mokelumne River. Figure 3-9 shows that storage is generally higher under the WaterMax Scenario and lower under the PowerMax Scenario. Figure 3-9 reflects the discontinuities in the Lodi Decree driven by trigger points in hydrologic conditions. Unlike the other river basins, there is little variation in reservoir levels in the driest 30 percent of the years. In the wetter 70 percent of the years, storage is held highest in the WaterMax Scenario since a water supplier would hold more water in wetter years to ensure supplies for drier years. Non-binding constraints in the baseline force holding storage higher than in the PowerMax Scenario.

Stanislaus River. Figure 3-10 shows that storage levels are largely invariant among the scenarios as with the Drum-Spaulding system. This reflects an integration with other projects, in this case, with Tri-Dam. Differences in management objectives apparently do not affect reservoir operations substantially, and the non-binding agreements are likely to be observed in any case.

Crane-Kerckhoff System. Figure 3-11 shows the storage levels for the Crane-Kerckhoff system on the San Joaquin River. For the wettest 40 percent of the years, storage levels are the same in each scenario through August. The PowerMax Scenario leads to the deepest draws in the reservoirs in the driest 60 percent of the years. The WaterMax Scenario has similar reductions, somewhat mitigated by maintaining higher carryover storage in December in all but the driest year.

3.10.2 FUTURE LAND DEVELOPMENT ASSUMPTIONS

3.10.2.1 Introduction

Approximately 95,000 acres of lands (as distinct from water), including 88,000 acres of land that are outside of FERC license boundaries, are included in the hydroelectric assets that are proposed for divestiture[24]. These lands are currently used for a variety of purposes, such as drainage areas for streams and rivers, timber harvesting, cattle grazing, and recreation. It is assumed that new owners of these lands would have incentives to attempt to maximize profits from all elements of the hydroelectric assets that they will have acquired, including lands. Therefore, one of the potential outcomes of the proposed divestiture is change to the use of lands.

The proposed change in ownership of hydroelectric assets and lands could result in various changes in the disposition and use of the land involved in the proposed divestiture. New owners may choose to manage certain lands differently than Pacific Gas and Electric Company has in the past, resulting in potential land use changes. Several letters received in response to the Notice of Preparation identified Pacific Gas and Electric Company's environmentally sensitive stewardship of Watershed Lands over the years. Many of those letters noted that a price-only auction could lead to new owners with high debts and the need to maximize profits through development of Watershed Lands[25].

One of the potential future changes in use of lands could involve the development of new uses, such as residential homes, tourist-based recreation facilities, resorts, etc. In order to fully disclose the effects of the proposed divestiture, the EIR preparers evaluated the regulatory constraints that would affect development on the subject lands, as well as the physical characteristics of the lands which may affect development capacity and potential.

The use of the lands outside of the FERC license boundaries is regulated by local general plan and zoning regulations. The analysis described below fully considers the existing entitlements and restrictions put in place by local land use designations and zoning controls. However, the EIR recognizes that general plan and zoning designations are subject to discretionary actions by local decision makers, and can and often are amended to facilitate growth and development, infrastructure construction, and other land use changes determined to be in the overall public interest. Therefore, the analysis contained herein estimates the potential for development of Pacific Gas and Electric Company lands beyond the limitations of local land use regulations; this evaluation of development potential, described below, considers local land use regulations as well as some of the key physical characteristics of the sites that affect the potential for, as well as the intensity and type of, development that could occur in the future under different ownership.

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24 This figure does not include the approximately 40,500 surface acres of water within FERC licensed areas.

25 As is described in Chapter 2, the term "Watershed Lands" as used in this EIR refers to those land areas to be auctioned that are owned by Pacific Gas and Electric Company that are located outside of the FERC license boundaries.

3.10.2.2 General Methodology and Assumptions

The Watershed Lands present the greatest potential for land use change. Unlike FERC licensed lands, Watershed Lands, for the most part, are not necessary for the operation of the hydroelectric facilities, and are often adjacent to or separate from the hydroelectric facilities. As a result, these lands can be managed and sold independently from lands located inside FERC license boundaries. It is considered reasonably foreseeable that new owners could explore new uses for the Watershed Lands, with the assumed intent of maximizing the economic value of these lands. In some cases, the successful bidder could initiate changes in the general plan and zoning regulations for these lands. As a result of potential land development maximization policies of new owners, portions of the Watershed Lands could be sold to others who are better able to realize the economic potential of the land.

The potential for significant change in the use and management of lands within the FERC-license boundaries is very limited due to the fact that land uses within a FERC license are fairly tightly circumscribed to only be what is necessary for the operation of the hydroelectric facilities and for the protection of the hydroelectric facilities from activities that would interfere with its successful operation. In most cases, the FERC license boundary is a very short distance from the edge of the hydroelectric facility or conveyance infrastructure. However, for the purposes of this EIR, the development potential of FERC licensed lands was analyzed.

Possible changes in the disposition and use of Project Lands (FERC licensed and Watershed Lands) include intensification of existing uses of the land, and introduction of new land uses. Because most Watershed Lands are located in wilderness or rural areas, possible uses of the land include timber harvesting, mining, grazing, second homes, resort residential, and recreation. In more urban areas, various types of residential, commercial, recreation, and even industrial land development are possible. New or altered use of the land may involve the construction of various types of site improvements ranging from minor improvements for site access and drainage to full-scale development of new buildings and infrastructure to support a new use.

In order to establish the basis for a conservative analysis of potential land use changes on the lands contained in the hydroelectric assets, the EIR preparers conducted an analysis of potential future land development that could occur under new profit-maximizing ownerships. The analysis was initiated by full consideration of the land development potential reflected in existing land use and zoning designations from local general plans and ordinances. The level of development currently allowed was documented.

In addition, the analysis assumes that where site conditions are appropriate, development of uses and intensities other than those called for in existing plans and ordinances may take place, as is described above. The specific approach to establishing bundle-by-bundle estimates is presented below. However, several key points must be kept in mind.

Development of uses that are different, or of greater intensity, than called for in local general plans and zoning ordinances requires discretionary actions by local governments. In addition, it is typical that development activities that are in locations with sensitive natural resources require approval of one or more State or Federal resource protection agencies. Finally, the discretionary actions of State and/or local government require compliance with CEQA. Such compliance informs and provides the opportunity for decision makers to consider and mitigate environmental impacts of development, where feasible. CEQA compliance can be met through preparation of an environmental impact report or a negative declaration, though in some cases projects are exempt from CEQA. Further, the CEQA review process does not ensure mitigation of significant impacts where mitigation measures do not exist or where the decision makers determine that the benefits of the project outweigh the environmental impacts of the project. The analysis of potential future land development in this EIR identifies (though at a fairly broad level and in a conservative manner given the absence of specific development proposals) the impacts associated with such development and does not rely on future local discretionary decision making processes or CEQA review to dismiss impacts.

The development documented in these assumptions, if it were to occur, would occur over a period of many years. No specific timeframe has been established for the development assumptions presented below.

3.10.2.3 Specific Methodology for Future Land Use Development Analysis

In estimating land use development for Project Lands, the following steps were taken: (1) identification of Land Areas, (2) GIS analysis of Land Area opportunities and constraints, and (3) estimated development calculations. The steps are described below.

Identification of Land Areas

Pacific Gas and Electric Company is proposing to sell its system as a series of bundles. For the purpose of evaluating the development potential of land, the Project Lands were reclassified into "Land Areas" consistent with local jurisdictional boundaries, and to reflect similar geographic conditions.

Physical Characteristics Used in Evaluating Land Development Potential

To determine the development potential of project lands, a geographical information system (GIS) and various digital map layers were used to evaluate development characteristics of Land Areas. Using the parameters described below, the GIS model was used to divide the Land Areas into three development potential categories: *High Development*, *Low Development*, and *No Development*.

To categorize the developability of the Land Areas, the following categories were considered: topography/slope, distance to urban center, proximity to services, proximity to recreation attractors, and access. A point range of one to three was assigned for each parameter, as is

described below in Table 3-2. Land under water or steeper than 30 percent was classified as *No Development*.

Table 3-2: GIS Model Analysis Categories

Parameters	3 Points	2 Points	1 Point	No Development
Topo/Slope	0-3 percent	3-15 percent	15-30 percent	>30 percent
Transportation	Within one mile of highway	Paved road	Unpaved road	N/A
Distance to urban center	0-50 miles	50-75	>75	N/A
Proximity to Services	Within one mile	Within two miles	Over two miles	N/A
Recreation Attractor	Zero to two miles	Two to ten miles	>Ten miles	N/A
Waterbody				Present

Model Parameters

The land characteristic categories used to evaluate the development potential of land in the GIS model are briefly described below.

Topography/Slope

This category determines the difficulty with which land can be developed due to slope, with the assumption that development potential increases as slope decreases. Lands with zero to three percent slope were given three points; lands with three to 15 percent slope were given two points; lands with 15 to 30 percent slope were given one point. Lands over 30 percent slope were classified as *No Development*.

Transportation

The results of the transportation category reflect the existing access to the land. Lands within one mile of a State or Federal highway were given three points; lands that were accessible with a paved road were given two points; lands where access is via an unpaved road were given one point. There were no Land Areas that are completely inaccessible.

Distance to Urban Center

Land Areas were categorized based on their distance to urban centers that are undergoing growth pressures. The following urban centers were used in the analysis: Redding, Chico, Marysville/Yuba City, Rocklin/Roseville, Folsom, Stockton, Modesto, Merced, Fresno, Visalia and Bakersfield. Lands within zero to 50 miles to an urban center were given three points; lands within 50 to 75 miles to an urban center were given two points; lands greater than 75 miles from an urban center were given one point.

Proximity to Services

Land Areas were rated in terms of the distance to existing available retail services based on the assumption that reasonable proximity to retail shopping and services is required for development activity. United States Geologic Survey quadrangle information was used to identify cities or towns where retail services are available. Using this information, proximity was determined by distance: within one mile, within two miles, and over two miles. Lands within one mile of retail services were given three points; lands within two miles of retail services were given two points; lands greater than two miles from retail services were given one point.

Recreation Attractors

It is assumed that recreation attractors provide an incentive for second home or resort type development that is common in the Sierra Nevada. Points were assigned based on proximity to identified recreation attractors. Lands that are within two miles of a recreation attractor were given three points; lands that are two to ten miles from a recreation attractor were given two points; lands greater than ten miles from a recreation attractor were given one point. The following is the list of recreation attractors used:

Regional Bundle	Recreation Attractors
Shasta	Pit River (Above Britton - Near Big Bend), Hat Creek, Lake Britton, Lake McCloud, Iron Canyon Reservoir Battle Creek, Macumber Reservoir,
DeSabla	Feather River, Deer Creek, Bucks Lake, Lake Oroville, Lake Almanor, Mt. Meadows Reservoir
Drum	Lake Spaulding, Fuller Lake, Bear River, Lake Valley Reservoir, Lands around Halsey Forebay, Rock Creek Reservoir, Lake Pillsbury
Motherlode	Bear River Reservoir
Kings Crane Helm	Bass Lake, Manzanita Lake, Wishon Reservoir, Courtright Reservoir, Kerckhoff Lake, North Fork Kings River (from Black Rock Res. to Pine Flat Res.), (Upper) San Joaquin River (below North Fork Willow Creek), Kings River (below North Fork Kings River)

Results

The scores resulting from this GIS model evaluation range from three to 15 for each Land Area. The analysis was further refined based on additional information gathered through field reconnaissance and based on information gained through interviews with local planning officials. Land Areas receiving scores from four to nine were classified as *Low* for development potential and lands receiving scores from ten to 15 were classified as *High* for development potential. Land Areas that were on slopes of more than 30 percent or were underwater were classified as *No Development*.

Summary calculations were made for each Land Area. In Land Areas where more than 50 percent of the land rated high, the entire Land Area was classified as *High*. Land Areas where more than 50 percent of the land rated low or no development were classified as *Low*.

Methodology Used to Estimated Development in Land Areas

Using the GIS analysis results, appropriate densities were established for each Land Area. Equivalent Dwelling Units (EDUs) were used as a generic measurement unit to describe the amount of development that could occur within each Land Area. EDUs do not represent a specific type of development, but instead indicate the intensity of development that could occur within a Land Area.

The development yield calculations were based on the following guidelines:

- For Land Areas that the GIS analysis categorized as *Low* (including land determined to have no development potential), EDUs were calculated using development densities indicated in the underlying general plan land use designation.
- For Land Areas that the GIS analysis categorized as *High*, EDUs were assigned densities in excess of the current general plan land use designation.
- When calculating development yield, a single land use density factor was applied across the entire Land Area.
- Land use density factors were assigned using professional judgment and considering a variety of factors, including existing adjacent uses, area development trends, and local policies about growth.

The results of the development yield calculations are described below.

Several issues should be noted about the analysis of development potential on Project Lands included among Pacific Gas and Electric Company's hydroelectric assets. First, the analysis described above considers only some of the factors that future owners would consider prior to making investments necessary to develop these lands. As such, the conclusions about development potential are likely to be conservative as further research and due diligence would likely suggest limitations to development that were not explored as part of this analysis. Second, the analysis undertaken as part of this EIR did not consider the economic or development market conditions that exist throughout the many regions of the Sierra where the Project Lands exist. While there are Land Areas that are located in areas that are undergoing substantial development pressures, the Project Lands are generally remote and quite distant from areas that are currently undergoing development activities. Nevertheless, in order to be conservative, this EIR assumes that the Project Lands possess some degree of development potential that may someday be realized. For both of the above-described reasons, the land development estimates included and evaluated in this EIR should be considered conservative.

In order to test the methodology used to estimate development potential in Land Areas, the EIR preparers reassessed the development estimates with alternate applications of the methodology. Instead of ultimately classifying each Land Area as either *High* or *Low*, more intensive

development was estimated for the specific lands that rated *high*, with local general plan land use densities estimated for the particular lands rated *low*. This alternate methodology resulted in an estimate of total development potential within five percent of that described below. The EIR preparers determined that a five percent variation was well within the normal margin of error of any method to estimate development potential on such a large scale, and as such, determined that the method described above resulted in a reasonable and conservative estimate of development potential on Project Lands.

3.10.2.4 Development Estimated for the Purposes of Analysis

The analysis resulted in an estimate of the potential for development of 10,226 equivalent dwelling units on Project Lands. Table 3-3 provides a summary of the results of the land development analysis. The following discussion presents estimated development for the Land Areas in each Regional Bundle. The discussion of each bundle includes a table that presents relevant information from the analysis and an explanation of the reasons for the development densities assigned to each Land Area.

Shasta Regional Bundle: Estimated Development in Land Areas

The Land Areas in the Shasta Regional Bundle are depicted in Figure 3-12. The development assumed for the purposes of analysis for the Land Areas in the Shasta Regional Bundle are presented in Table 3-4.

Bundle 1: Hat Creek

Hat Creek. Based on the GIS analysis, 90 percent of this Land Area is rated high and ten percent is rated low. A density of five acres per unit is assumed for the 2,969-acre Land Area for the following reasons:

- The land has few constraints to development.
- The land is easily accessible via State highways.
- Hat Creek is an established recreation destination due to high quality fishing conditions.
- This land has potential for second home and resort-type development.

The resulting development estimate is 594 equivalent dwelling units.

Bundle 2: Pit River

Pit. Based on the GIS analysis, 88 percent of this land Area is rated *high*, seven percent is rated *low* and five percent is rated *no development*. A density of five acres per unit is assumed for the 3,568-acre Land Area for the following reasons.

- Land is accessible via State highways and county roads.
- Land south of Fall River Mills would be developed in large lot subdivisions.
- Land adjacent to Fall River Mills would be developed at 1 unit per acre.
- Land in the Fall River Valley and near Saddle Mountain would remain in ranching or open space uses.

Table 3-3 Estimated Development on Project Lands

Regional Bundle	Bundle	Equivalent Dwelling Units	
Shasta	#1 : Hat Creek	594	3,036
	#2 : Pit River	1826	
	#3 : Kilarc-Cow Creek	20	
	#4 : Battle Creek	596	
DeSabla	#5: Hamilton Branch	35	2,099
	#6: Feather River	1,376	
	#7: Bucks Creek	244	
	#8: Butte Creek	444	
Drum	#9 : North Yuba River	3	4,071
	#10 : Potter Valley	201	
	#11 : South Yuba River	3,863	
	#12 : Chli Bar	4	
Motherlode	#13: Mokelumne River	271	319
	#14: Stanislaus River	47	
	#15: Merced River	1	
Kings Crane-Helms	#16: Crane Valley	380	701
	#17: Kerckhoff	93	
	#18: Kings River	153	
	#19: Tule River	45	
	#20: Kern Canyon	30	
TOTAL		10,226	10,226

Table 3-4 Estimated Development for the Shasta Regional Bundle

Land Area	Total Acreage	GIS Analysis Rating	Surrounding Land Uses	Applicable General Plan/Zoning Designations	Development Based on General Plan (EDUs)	Development Assumed in EIR Analysis (EDUs)
Bundle 1: Hat Creek						
Hat Creek	2,969	High 90 percent - high ten percent - low	Grazing, Recreation, Town uses	Timberland (TP, TL, and U)	19	594
Bundle 2: Pit River						
Pit 1	3,568	High 88 percent - high seven percent - low five percent - no dev.	Open space, Grazing, Habitat Protection, Town uses, Rural Residential	Residential (IR) Agriculture Cropland (EA, U) Open Space (OS)	85	714
McArthur Swamp	6,135	Low 32 percent - high 68 percent - low	Open space, recreation State park, grazing	Unclassified	17	17
Pit 3	3,681	High 99 percent - high one percent - low	Open space, Recreation, Habitat Protection, Timber	Timberland (U)	23	736
Lake Britton	2,636	High 64 percent - high 30 percent - low six percent - no dev.	Recreation, Timber, Rural Residential	Timberland (U)	16	264
McCloud, Black, Pit	15,162	Low 24 percent - high 67 percent - low nine percent - no dev.	Timberland, Open Space, Rural Residential	Timberland (U, TP, TL)	95	95
Bundle 3: Kilarc-Cow						
Kilarc-Cow Creek	2,603	Low 49 percent - high 51 percent - low	Grazing, Rural Residential, Recreation (resort and dispersed)	Timberland (TP, U)	20	20
Bundle 4: Battle Creek						
Shingletown	5,528	High 57 percent - high 42 percent - low one percent - no dev.	Town uses, Dispersed and focused recreation, timber, rural residential	Timberland (TPU) Habitat Resource, Rural Residential	92	558
Inskip Powerhouse	1,354	Low 14 percent - high 86 percent - low	Grazing, Rural residential, Habitat Protection	Grazing (UAB), Timber (TPZ), Rural Small Lot (R1)	38	38
Total Estimated Development	43,636					3,036

McCloud, Black, Pit Land Area
15,162 Acres
95 EDUs

Lake Britton Land Area
2,636 Acres
264 EDUs

McArthur Swamp Land Area
6,135 Acres
17 EDUs

Pit 1 Land Area
3,568 Acres
714 EDUs

Pit 3 Land Area
3,681 Acres
736 EDUs

Hat Creek Land Area
2,969 Acres
593 EDUs

Kilarc-Cow Creek Land Area
2,603 Acres
20 EDUs

Shingletown Land Area
5,528 Acres
558 EDUs

Inskip Land Area
1,354 Acres
38 EDUs

JAMES B. BLACK PH
PIT PH #3
PIT PH #4
PIT PH #5
PIT PH #6
PIT PH #7
PIT PH #1
MCARTHUR SUB
HAT CREEK PH #2
HAT CREEK PH #1
RISING RIVER SUB
BURNEY SUB
ROUND MTN SUB
CEDAR CREEK SUB
KILARC PH
WHITMORE SUB
COW CREEK PH
VOLTA PH #1
VOLTA PH #2
COLEMAN PH
INSKIP PH
SOUTH PH
LAKE SHASTA
REDDING
299
44
89
5
36

DISCLAIMER
1. "This map is not a survey of legal boundaries or a depiction of actual FERC boundaries. It should not be relied upon for such purpose. It is intended solely to be a visual depiction of such boundaries. The data used to prepare this map were compiled from multiple sources and varying levels of accuracy. Arbitrary adjustments have been made to FERC boundaries and the property line boundaries in order to provide a spatial dataset that is consistent with existing spatial data. While the map is believed to be an accurate depiction of the underlying data, Pacific Gas and Electric Company assumes no liability for any person's reliance upon this map for any reason."

2. "The FERC project boundaries and boundaries for Company fee land used in this report may not be accurate legal boundaries. The actual locations of any feature identified in this report would need to be surveyed in order to definitively determine whether the feature lies within or outside of Company fee land."

Source: Pacific Gas and Electric Company GIS Data Files; Ferc Boundary, Hydrology, Parcels, Public Lands; and Foothill Associates GIS Program August 2000. GIS Data Projection: UTM Zone 10, NAD 83, Units Meters.

- FERC License Area
- Project Lands in Land Area
- General Location of Land Area
- State Highway
- Streams
- County Line
- Water Body
- Public Lands
- Powerhouses & Substations (Pacific Gas & Electric Company unless other owner identified)

Map Location Reference

N

6 0 6
Miles

Hydrodivestiture EIR

Figure 3 - 12
Land Areas
Shasta Regional Bundle

Aspen Environmental Group

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The resulting development estimate is 714 equivalent dwelling units.

McArthur Swamp. Based on the GIS analysis, 32 percent of this Land Area is rated *high* and 68 percent is rated *low*. Nearly all of the 6,135-acre Land Area is zoned Unclassified (U). This zoning designation is a holding district until a precise principal zone district has been adopted for the property. Allowed development is determined at one dwelling per parcel consistent with the General Plan designation of Agriculture Cropland. The resulting development estimate is 17 equivalent dwelling units. The land is currently under review by CPUC and FERC for transfer to the California Waterfowl Association, with conservation easements attached (see Land Use Setting, Section 4.1). Thus, this land could instead remain in its current land use of open space/recreation, wildlife enhancement, and limited grazing.

Pit 3. Based on the GIS analysis, 99 percent of this Land Area is rated high and one percent is rated low. A density of five acres per unit is assumed for the 3,681-acre Land Area for the following reasons.

- Hat Creek/Pit River is an established recreation destination due to high quality fishing conditions.
- Land is easily access via Highway 299.
- This land has potential for second home and resort-type development.
- Contiguous nature of the site allows more intensive projections.

The resulting development estimate is 736 equivalent dwelling units.

Lake Britton. Based on the GIS analysis, 64 percent of this Land Area is rated *high*, 30 percent is rated *low,* and six percent is rated *no development*. Much of the land rated as high is located on the south and east side of Lake Britton. A density of ten acres per unit is assumed for the 2,636-acre Land Area for the following reasons:

- Lake Britton is an established scenic and recreation destination.
- Steep terrain west and southwest of Lake Britton is undevelopable. Floodplain east of Lake Britton is undevelopable.
- Flatter parcels around Lake Britton (SBE#'s 135-45-85A-14,15,17) have potential for smaller lot parcels.
- Land around Lake Britton is generally constrained by topography, access, and water levels, though dispersed large lot development may occur.

The resulting development estimate is 264 equivalent dwelling units.

McCloud, Black, Pit. Based on the GIS analysis, 24 percent of this Land Area is rated *high,* 67 percent is rated *low*, and nine percent is rated *no development*. Nearly all of the 15,162-acre Land Are is zoned Unclassified (U), Timberland (TL), or Timber Production Zone (TPZ). Assuming General Plan development, and using a density of 160 acres per unit, the resulting development estimate is 95 equivalent dwelling units.

Bundle 3: Kilarc-Cow Creek

Kilarc-Cow Creek. Based on the GIS analysis, 49 percent of this Land Area is rated *high* and 51 percent is rated *low*. The total equivalent dwelling units yield is determined by assuming General Plan intensity. Approximately 1,000 acres of land is zoned Timber Production Zone (TPZ), approximately 460 acres is zoned Exclusive Agriculture (EA), and approximately 1,100 acres is zoned Unclassified (U). The U land is designated as Timberland, Habitat Resource, or Agricultural grazing by the General Plan. Using the maximum development intensity of 160-acre lots for TPZ, 80-acre lots for EA, and one dwelling per U parcel (8), the resulting development estimate is 20 equivalent dwelling units.

Bundle 4: Battle Creek

Shingletown. Based on the GIS analysis, 57 percent of this Land Area is rated *high*, 42 percent is rated *low*, and one percent is rated *no development*. The Shingletown Land Area has a high development potential along the Highway 44 corridor and near Lake Macumber and a low development potential surrounding the Volta facilities according to the GIS analysis. A density of ten acres per unit is assumed for the 5,528-acre Land Area for the following reasons.

- Land is easily accessible via Highway 44.
- Land is within commuting distance to Redding.
- Land would transition from timber management into residential use near Shingletown.
- Steeper and more remote land would remain in timber management.
- Land surrounding Lake Macumber would be developed with second home development.
- Land along North Fork Battle Creek would remain large lot, rural residential, or grazing type development due to its remote location.

The resulting development estimate is 558 equivalent dwelling units.

Inskip Powerhouse. Based on the GIS analysis, 14 percent of this Land Area is rated *high* and 86 percent is rated *low*. The total equivalent dwelling units yield is determined by assuming General Plan intensity. Approximately 650 acres of land is zoned Timber Production Zone (TPZ), approximately 20 acres is zoned Natural Resource (NR), approximately four acres is zoned Rural Small Lot (R-1), and approximately 680 acres is zoned Upland Agriculture (UAB). Using the maximum development intensity of 160-acre lots for TPZ, one dwelling for each parcel of UAB (10), and six dwelling units per acres for R-1, the resulting development estimate is 38 equivalent dwelling units.

DeSabla Regional Bundle: Estimated Development in Land Areas

The Land Areas in the DeSabla Regional Bundle are depicted in Figure 3-13. The development assumed for the purposes of analysis for the Land Areas in the DeSabla Regional Bundle are presented in Table 3-5, below following Figure 3-13.

North Lake Almanor Land Area
866 Acres
87 EDUs

Hamilton Branch Land Area
239 Acres
16 EDUs

Mtn. Meadows Land Area
1,912 Acres
19 EDUs

West Lake Almanor/Pratville
Land Area
276 Acres
276 EDUs

Southeast Lake Almanor Land Area
1,230 Acres
615 EDUs

Humbug Valley Land Area
2,402 Acres
240 EDUs

Butt Valley Reservoir Land Area
920 Acres
92 EDUs

Caribou to Belden Land Area
370 Acres
16 EDUs

DeSabla Centerville Land Area
2,471 Acres
66 EDUs

Rock Creek-Cresta Land Area
1,175 Acres
19 EDUs

Bucks Lake Land Area
1,222 Acres
244 EDUs

Poe Land Area
3,823 Acres
31 EDUs

Coal Canyon Land Area
1,133 Acres
378 EDUs

CHESTER SUB
HAMILTON BRANCH PH
LAKE ALMANOR
HAMILTON BRANCH SUB
BUTT VALLEY PH
BIG MEADOWS SUB
GREENVILLE SUB
CARIBOU PH #2
CARIBOU PH #1
OAK FLAT PH
BELDEN PH
ROCK CREEK PH
BUCKS CREEK PH
GRIZZLY PH (Santa Clara)
CRESTA PH
TOADTOWN PH
DeSABLA PH
ORO FINO SUB
CENTERVILLE PH
PARADISE
PARADISE SUB
POE PH
LIME SADDLE PH
COAL CANYON PH
TABLE MTN SUB
OROVILLE
OROVILLE SUB
KELLY RIDGE (OWID)

36 99 32 70 89 45 49

DISCLAIMER

1. "This map is not a survey of legal boundaries or a depiction of actual FERC boundaries. It should not be relied upon for such purpose. It is intended solely to be a visual depiction of such boundaries. The data used to prepare this map were compiled from multiple sources and varying levels of accuracy. Arbitrary adjustments have been made to FERC boundaries and the property line boundaries in order to provide a spatial dataset that is consistent with existing spatial data. While the map is believed to be an accurate depiction of the underlying data, Pacific Gas and Electric Company assumes no liability for any person's reliance upon this map for any reason."

2. "The FERC project boundaries and boundaries for Company fee land used in this report may not be accurate legal boundaries. The actual locations of any feature identified in this report would need to be surveyed in order to definitively determine whether the feature lies within or outside of Company fee land."

Source: Pacific Gas and Electric Company GIS Data Files; Ferc Boundary, Hydrology, Parcels, Public Lands; and Foothill Associates GIS Program August 2000. GIS Data Projection: UTM Zone 10, NAD 83, Units Meters.

- FERC License Area
- Project Lands in Land Area
- General Location of Land Area
- State Highway
- Streams
- County Line
- Water Body
- Public Lands
- Powerhouses & Substations (Pacific Gas & Electric Company unless other owner identified)

Map Location Reference

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Hydrodivestiture EIR

Figure 3 - 13
Land Areas
DeSabla Regional Bundle

Aspen Environmental Group

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Table 3-5 Estimated Development for the DeSabla Regional Bundle

Land Area	Total Acreage	GIS Analysis Rating	Surrounding Land Uses	Applicable General Plan/Zoning Designations	Development Based on General Plan (EDUs)	Development Assumed in EIR Analysis (EDUs)
Bundle 5: Hamilton Branch						
Mountain Meadows	1,912	Low 24 percent - high 22 percent - low 54 percent - no dev.	Habitat Protection, Timber, Recreation, Town uses	Upland Conservation (UC2), Hydro-Electric (H-R)	19	19
Hamilton Branch	239	High 99 percent - high one percent - low	Rural Residential, Recreation, Timber	Recreation (Rec-3), Important Timber (TPZ), Residential (3-R)	16	16
Bundle 6: North Fork Feather River						
North Lake Almanor	866	High 72 percent - high 26 percent - low 12 percent - no dev.	Timber, recreation, Town Uses. Forest Service	Recreation (Rec-OS, Rec-3), Important Timber (TPZ), Secondary Suburban (S-3), Limited Opportunity (R-20)	30	87
West Lake Almanor/Prattville	276	High 99 percent - high one percent - low	Recreation, Resort Residential, Forest Service	Recreation (Rec-1), Secondary Suburban (S-3)	28-92	276
Southeast Lake Almanor	1,230	High 98 percent - high two percent - low	Timber, recreation, Resort Residential	Recreation (Rec-1), Important Timber (TPZ), Suburban (S-1), Limited Opportunity (R-20)	60	615
Butt Valley Reservoir	920	High 57 percent - high 40 percent - low three percent - no dev.	Recreation, Timber	Important Timber (TPZ), Secondary Suburban (S-3), Important Agriculture (GA), Limited Opportunity (R-20)	70	92
Caribou to Belden	370	High 56 percent - high 34 percent - low ten percent - no dev.	Timber, Forest Service	Important Timber (TPZ), Secondary Suburban (S-3), Mining (M), Limited Opportunity (R-20)	16	16
Humbug Valley	2,402	High 82 percent - high 18 percent - low	Recreation, Grazing, Timber, Rural Residential (Limited)	Important Timber (TPZ, Important Agriculture (GA, AP)	15	240

Table 3-5 Estimated Development for the DeSabla Regional Bundle

Land Area	Total Acreage	GIS Analysis Rating	Surrounding Land Uses	Applicable General Plan/Zoning Designations	Development Based on General Plan (EDUs)	Development Assumed in EIR Analysis (EDUs)
Rock Creek-Cresta	1,175	Low 33 percent - high 18 percent - low 49 percent - no dev.	Timber, Forest Service, Recreation	Important Timber (TPZ, GF), Secondary Suburban (S-3), Mining (M), Limited Opportunity(R-20)	19	19
Poe	3,823	Low 36 percent - high 43 percent - low 21 percent - no dev.	Timber, Rural Residential	Timber Management (TPZ, FR-20), Agricultural residential (U)	31	31
Bundle 7: Bucks Creek						
Bucks Lake	1,222	High 64 percent - high 15 percent - low 21 percent - no dev.	Recreation, Resort Residential, Town uses, Timber, Grazing	Important Timber (GF), Secondary Suburban (S-3), Limited Opportunity(R-20), Recreation (R-3)	61	244
Bundle 8: Butte Creek						
DeSabla-Centerville (Butte County)	2,471	Low 23 percent - high 54 percent - low 23 percent - no dev.	Rural Residential, Recreation, Timber	Grazing and Open Lands (FR-1—40,TM-40), Agricultural Residential (U), Timber Management (TM-40))	66	66
Coal Canyon (Butte County)	1,133	High 75 percent - high 25 percent - low	City uses, Recreation	Public-Recreation (P-Q, U)	N/A	378
Total Estimated Development	18,039				2,099	

Bundle 5: Hamilton Branch

Mountain Meadows Reservoir. Based on the GIS analysis, 24 percent of this Land Area is rated *high,* 22 percent is rated *low,* and 54 percent is rated *no development*. Some high development land occurs on lakefront property on the north side of the lake. Development opportunity in this location however is highly constrained due to the marshy nature of the site. The total equivalent dwelling units yield is determined by assuming General Plan intensity. Approximately 1,000 acres of land is zoned Upland Conservation/Resource Management (U-C-2), and the other approximately 800 acres is zoned Hydroelectric (H-R). Using the maximum development intensity of 80-acre lots for U-C-2 and 160 acres lots for H-R, the total estimated development would be 19 equivalent dwelling units. Assumptions factored into the calculation include:

- Residential land is constrained by Mountain Meadows Reservoir, and adjacent wetlands.
- Residential has limited opportunity due to shape and size of parcels.

- Increased recreational development, such as boat launch facility, may be realized due to increased development pressures from the proposed mountain resort.

The resulting development estimate is 19 equivalent dwelling units.

Hamilton Branch Powerhouse. Based on the GIS analysis, 99 percent of this Land Area is rated *high* and one percent is rated low. Site limitations such as linear property shape and steep canyons, however, preclude this area from any significant development. The total equivalent dwelling units yield is determined by assuming General Plan intensity. Approximately 200 acres of land is zoned Timber Production Zone (TPZ), approximately 15 acres is zoned Recreation (Rec-1), and approximately 40 acres is zoned Rural Residential (3-R). Using the maximum development intensity of 160-acre lots for TPZ, three-acre lots for Rec-1, and three-acre lots for 3-R, the total development estimate is 16 equivalent dwelling units.

Bundle 6: Upper North Fork Feather River

North Lake Almanor. Based on the GIS analysis, 72 percent of this Land Area is rated *high,* 26 percent is rated *low,* and 12 percent is rated *no development*. The land with a high development potential is located on the east side of the lake. A density of ten acres per unit is assumed for the 866-acre Land Area for the following reasons:

- The site is constrained by topography and roadway.
- Lake water level and marsh areas constrain potential sites.
- Topography constrains north parcel somewhat.
- Views and access make site developable.
- The resulting development estimate is 87 equivalent dwelling units.

West Lake Almanor/Prattville. Based on the GIS analysis, 99 percent of this Land Area is rated *high* and one percent is rated *low*. A density of one unit per acre is assumed for the 276-acre Land Area for the following reasons:

- Site is adjacent to existing high-density resort and second home developments.
- Site is easily accessible via Highway 89.
- Surrounding land is primarily in U.S. Forest Service ownership.

The resulting development estimate is 276 equivalent dwelling units.

Southeast Lake Almanor. Based on the GIS analysis, 98 percent of this Land Area is rated *high* and two percent is rated *low*. A density of two acres per unit is assumed for the 1,230-acre Land Area for the following reasons:

- Area is highly scenic with existing second home and resort development adjacent.
- Contiguous nature of site may allow master planning.
- Site is easily accessible via Highway 147.
- Site is within 15 miles of proposed ski resort.

The resulting development estimate is 615 equivalent dwelling units.

Butt Valley Reservoir. Based on the GIS analysis, 57 percent of this Land Area is rated *high*, 40 percent is rated *low*, and three percent is rated *no development*. This Land Area has a high development potential on the north and eastern shore of Butt Valley Reservoir. A density of ten acres per unit is assumed for the 920-acre Land Area for the following reasons:

- Land development would most likely be limited to the north and eastern shore of the lake.
- Access is limited to the east shore of the lake.
- Overall, the site is more remote than Lake Almanor.

The resulting development estimate is 92 equivalent dwelling units.

Caribou to Belden. Based on the GIS analysis, 56 percent of this Land Area is rated *high*, 34 percent is rated *low*, and ten percent is rated *no development*. Steep slopes and the North Fork Feather River constrain much of the land. However, there may be some pockets where development may occur. The total equivalent dwelling units yield is determined by assuming General Plan intensity. Approximately 175 acres of land is zoned Timber Production Zone (TPZ), approximately 75 acres is zoned Rural Limited (R-20), approximately 75 acres is Secondary Suburban (S-3), and approximately 45 acres is zoned Mining (M). Using the maximum development intensity of 160-acre lots for TPZ, 20-acre lots for R 20, and ten-acre lots for S-3 and M, the total estimated development would be 16 equivalent dwelling units.

Humbug Valley. Based on the GIS analysis, 82 percent of this Land Area is rated *high* and 18 percent is rated *low*. A density of ten acres per unit is assumed for the 2,402-acre Land Area for the following reasons:

- Yellow Creek is an established recreation destination due to high quality fishing conditions.
- Land development would likely be exclusive large lot second homes.
- Contiguous nature of the site may allow a planned unit development with a considerable amount of land.

The resulting development estimate is 240 equivalent dwelling units.

Rock Creek-Cresta. Based on the GIS analysis, 33 percent of this Land Area is rated *high*, and 18 percent is rated *low*, and 49 percent is rated *no development*. Steep slopes and the North Fork Feather River constrain much of the land. However, there may be some pockets where development may occur. The total equivalent dwelling units yield is determined by assuming General Plan intensity. Approximately 800 acres of land is zoned Timber Production Zone (TPZ), approximately 300 acres is zoned General Forest (GF), approximately two acres is zoned Rural Limited (R-20), and approximately 100 acres is zoned Mining (M). Using the maximum development intensity of 160-acre lots for TPZ, 80-acre lots for GF, 20-acre lots for R-20, and ten-acre lots for M, the total development estimated is 19 equivalent dwelling units.

Poe. Based on the GIS analysis, 36 percent of this Land Area is rated *high*, 43 percent is rated *low* and 21 percent is rated *no development*. The total equivalent dwelling units yield is determined by assuming General Plan intensity. Approximately 3,400 acres of land is zoned Timber Production

Zone (TPZ), approximately 250 acres is zoned Foothill Recreation (FR-40), and approximately 180 acres is zoned Unclassified (U). Using the maximum development intensity of 160-acre lots for TPZ, 40-acre lots for FR-40, and 1 dwelling for each U zoned parcel (4), the total development estimate is 31 equivalent dwelling units.

Bundle 7: Bucks Creek

Bucks Lake. Based on the GIS analysis, 64 percent of this Land Area is rated *high,* 15 percent is rated *low,* and 21 percent is rated *no development*. A density of five acres per unit is assumed for the 1,222-acre Land Area for the following reasons:

- Lake is an established recreation destination.
- Much of the surrounding land is in U.S. Forest Service ownership limiting the supply of land.
- Site is relatively close to Oroville and Chico via the improved Butte County Road.

The resulting estimated development is 244 equivalent dwelling units.

Bundle 8: Butte Creek

DeSabla-Centerville. Based on the GIS analysis, 23 percent of this Land Area is rated *high,* 54 percent is rated low, and 23 percent is rated *no development*. The total equivalent dwelling units yield is determined by assuming General Plan intensity. Approximately 110 acres of land is zoned Timber Production Zone (TPZ), approximately 1,000 acres is zoned Timber Management (TM-40), approximately 250 acres is zoned Timber Management (TM-20), approximately 400 acres is zoned Foothill Recreation (FR-40), approximately 50 acres is zoned Foothill Recreation (FR-20), and 50 acres is zoned Unclassified (U). Using the maximum development intensity of 160-acre lots for TPZ, 40-acre lots for FR-40 and TM-40, 20-acre lots for TM-20 and FR-20, and one dwelling for each U zoned parcel (3), the total estimated development is 66 equivalent dwelling units.

Coal Canyon. Based on the GIS analysis, 75 percent of this Land Area is rated *high* and 25 percent is rated *low*. A density of five acres per unit is assumed for the 1,133-acre Land Area for the following reasons.

- Land is adjacent to recreation opportunities of Lake Oroville.
- Land is adjacent to the City of Oroville.
- Urban-type development may be possible in some locations.

The resulting estimated development is 378 equivalent dwelling units.

Drum Regional Bundle: Estimated Development in Land Areas

The Land Areas in the Drum Regional Bundle are depicted in Figures 3-14 and 3-15. The development assumed for the purposes of analysis for the Land Areas in the Drum Regional Bundle are presented in Table 3-6, below following Figures 3-14 and 3-15.

Bundle 9: North Yuba River

Narrows-Lake Englebright. Based on the GIS analysis, 74 percent of this Land Area is rated *low* and 26 percent has *no development* potential. A development intensity of one unit per 20 acres based on General Plan land use and zoning designations was determined for this Land Area for the following reasons:

- This land area consists of fairly steep topography which constrains access.
- Surrounding properties are predominantly National Forest lands. In addition, some surrounding properties are designated Timber Preserve Zone. These are privately owned lands used for timber production.

The resulting estimated development is three equivalent dwelling units.

Bundle 10: Potter Valley

Potter Valley-Van Arsdale Reservoir/Potter Valley Powerhouse. Based on the GIS analysis, 76 percent of this Land Area is rated *low* and 24 percent is rated *no development*. A development intensity of one unit per 160 acres based on General Plan land use and zoning designations was determined for this Land Area for the following reasons:

- The majority of project parcels are in forested areas and are immediately adjacent to lands of the Mendocino National Forest.
- Development of project parcels in this Land Area is low due to constrained public access.

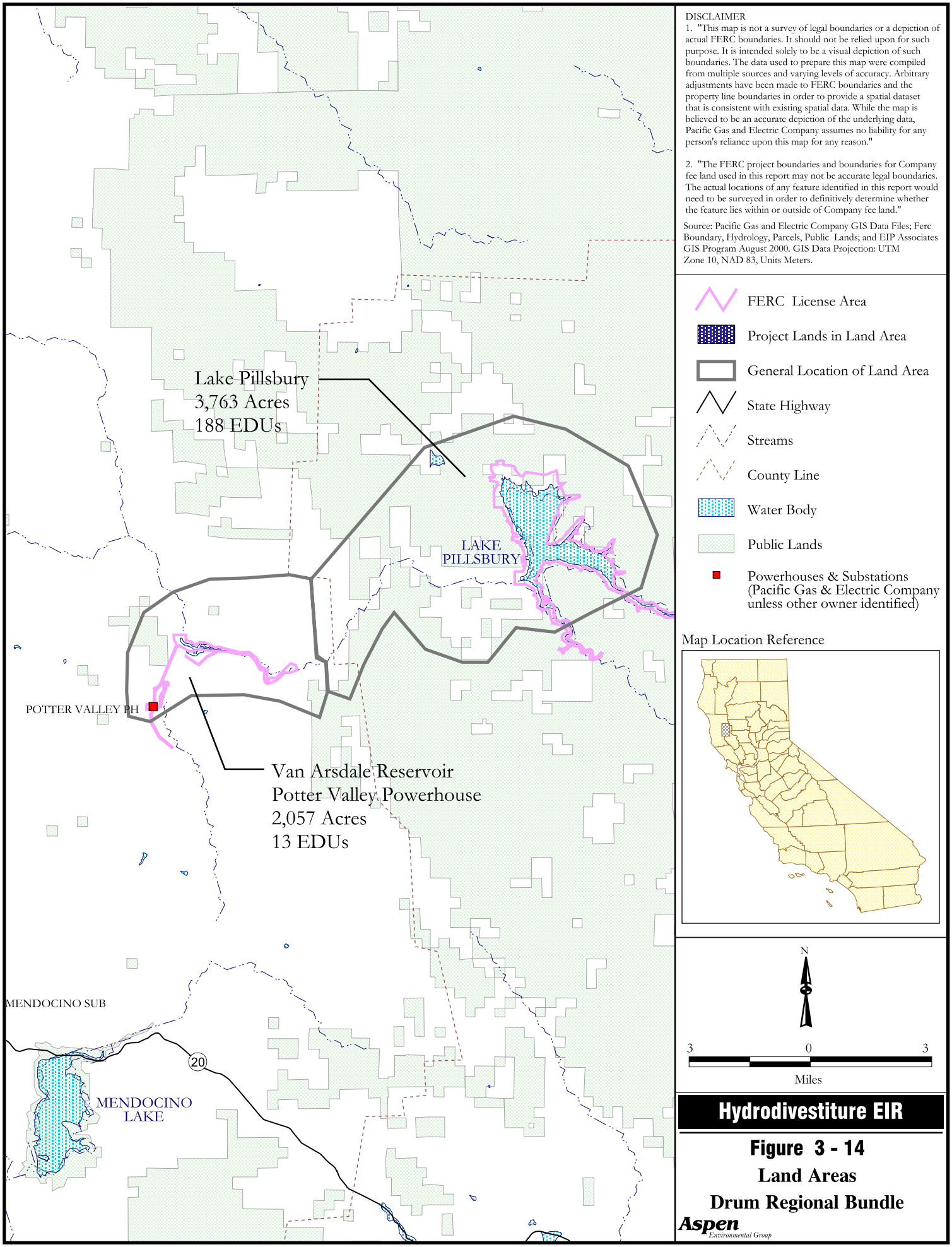
The resulting estimated development is 13 equivalent dwelling units.

Lake Pillsbury. Based on the GIS analysis, 78 percent of this Land Area is rated *low* and 22 percent is rated *no development*. A development intensity of one unit per 20 acres based on General Plan land use and zoning designations was determined for this Land Area because development is expected to be low due to constrained public access. The resulting estimated development is 188 equivalent dwelling units.

Bundle 11: South Yuba River

Kidd Lake/Cascade Lakes. Based on the GIS analysis, 93 percent of this land Area is rated *high* and seven percent is rated *no development*. A development intensity of one unit per five acres was determined for this Land Area for the following reasons:

- Although the majority of project parcels are the waters of Kidd Lake, and Cascade Lakes, there is one parcel that lies just between Kidd and Cascade Lakes.
- This parcel can be accessed from two different locations just north of it.
- There is an existing I-80 interchange immediately north of this Land Area.
- Although elevations in this Land Area are up to 6,600 feet, cluster development could occur similar to the development near Ice Lakes which is located just to the east.
- Proximity to Yuba River, ski resorts, lake access and views, trails, and forested areas indicate the high likelihood of lands being developed with residential cluster development of single family homes.


Lake Pillsbury
3,763 Acres
188 EDUs
LAKE PILLSBURY
POTTER VALLEY PH
Van Arsdale Reservoir
Potter Valley Powerhouse
2,057 Acres
13 EDUs
MENDOCINO SUB
20
MENDOCINO LAKE
DISCLAIMER
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Source: Pacific Gas and Electric Company GIS Data Files; Ferc Boundary, Hydrology, Parcels, Public Lands; and EIP Associates GIS Program August 2000. GIS Data Projection: UTM Zone 10, NAD 83, Units Meters.
FERC License Area
Project Lands in Land Area
General Location of Land Area
State Highway
Streams
County Line
Water Body
Public Lands
Powerhouses & Substations (Pacific Gas & Electric Company unless other owner identified)
Map Location Reference
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Figure 3 - 14
Land Areas
Drum Regional Bundle
Aspen Environmental Group

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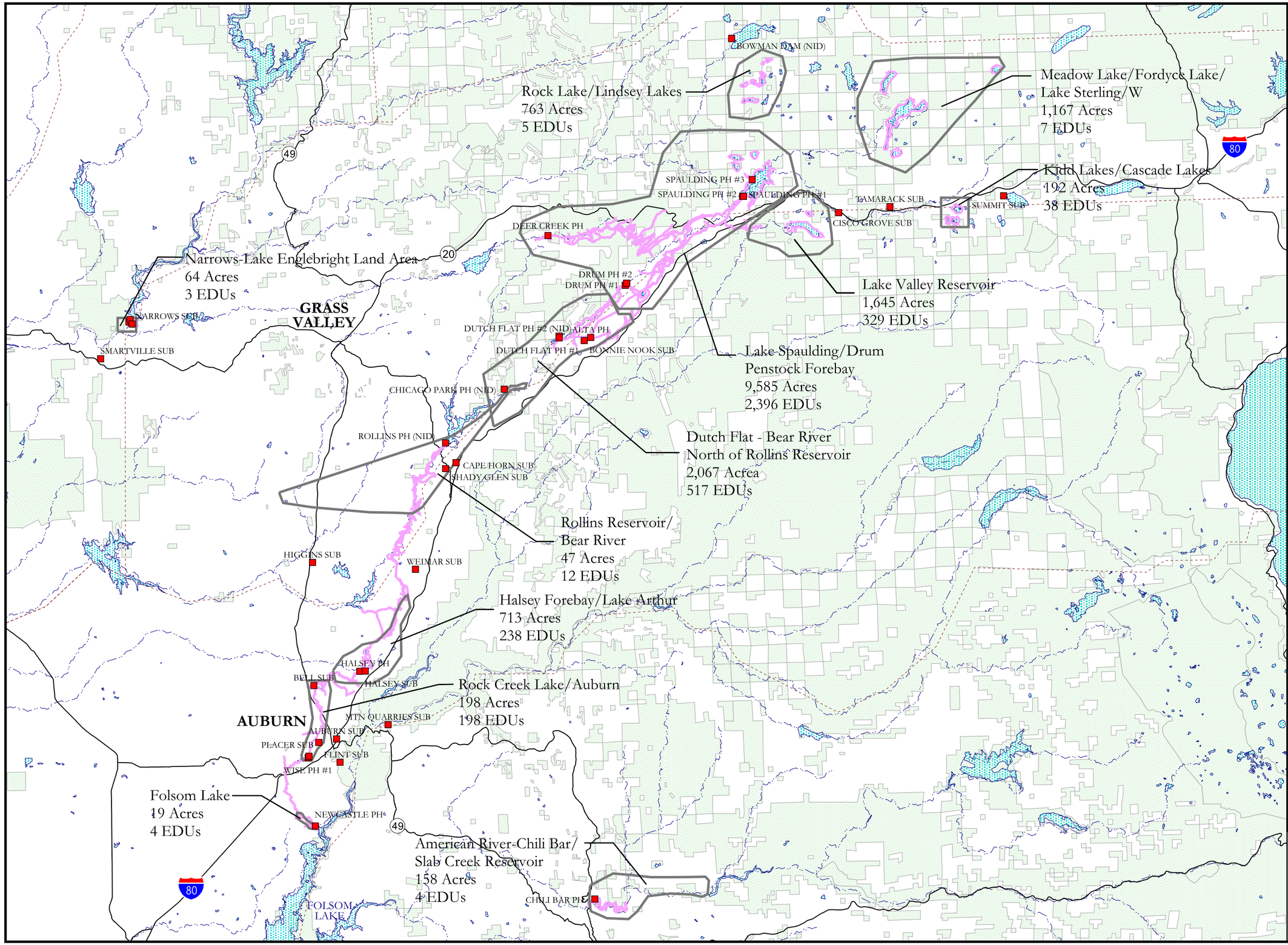

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- FERC License Area
- Project Lands in Land Area
- General Location of Land Area
- State Highway
- Streams
- County Line
- Water Body
- Public Lands
- Powerhouses & Substations (Pacific Gas & Electric Company unless other owner identified)

Map Location Reference

N

5 0 5

Miles

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Figure 3 - 15
Land Areas
Drum Regional Bundle

Aspen Environmental Group

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Table 3-6 Estimated Development for the Drum Regional Bundle

Land Area	Total Acreage	GIS Analysis Rating	Surrounding Land Uses	Applicable General Plan/Zoning Designations	Development Based on General Plan (EDUs)	Development Assumed in EIR Analysis (EDUs)
Bundle 9: North Yuba River						
Narrows-Lake Englebright	64	Low 74 percent - low 26 percent - no dev	Forest Land, Rangeland	TPZ; Public; R-40; AG-40; Foothill Agriculture	3	3
Bundle 10: Potter Valley						
Potter Valley-Van Arsdale Reservoir/Potter Valley Powerhouse	2,057	Low 76 percent - low 24 percent - no dev	Forest Land, Rangeland, Agricultural Land, Urban/Built-Up Land	RL; PL (160); FL (160); TP; AG	13	13
Lake Pillsbury	3,765	Low 78 percent - low 22 percent - no dev	Forest Land, Rangeland, Timber Lands, Recreation, Rural Residential,	RR-B3 (20)	188	188
Bundle 11: South Yuba River						
Kidd Lake/Cascade Lakes	192	High 93 percent - high 7 percent - no dev	Forest Land, Recreation, Timberlands, Water	TPZ; F-R-Ds (80); R1	2	38
Meadow Lake/Fordyce Lake/Lake Sterling/White Rock Lake	1,167	Low 93 percent - low 7 percent - no dev	Forest Land	F(160); TPZ (160); FR (160); WA; OS	7	7
Rock Lake/Lindsey Lakes	763	Low 89 percent - low 11 percent - no dev	Forest Land	F (160); TPZ (160)	5	5
Lake Valley Reservoir	1,645	High 95 percent - high 5 percent - no dev	Forest Land, Rural Residential, Outdoor Recreation	F (160); FR (160); FOR; TPZ	10	329
Lake Spaulding/Drum Penstock Forebay	9,585	High 71 percent - high 29 percent - no dev	Forest Land, Recreation, Residential, Commercial, Urban/Built-Up Land	F (160); TPZ (160); TPZ (160)-SC; WA; FR (160); FR-B-X (40); RF-20; FOR (160); F-B-X-5; F-B-100 (2.3)	1,917	2,396
Dutch Flat - Bear River North of Rollins Reservoir	2,067	High 78 percent - high 22 percent - no dev	Forest Land, Recreation, Residential, Commercial, Urban/Built-Up Land, Mining	F-40; TPZ-40; FR-40; F (160); TPZ (160); FR-B-X-20; C1-Dh; FOR (160);	413	517

Table 3-6 Estimated Development for the Drum Regional Bundle

Land Area	Total Acreage	GIS Analysis Rating	Surrounding Land Uses	Applicable General Plan/Zoning Designations	Development Based on General Plan (EDUs)	Development Assumed in EIR Analysis (EDUs)
				FR (160); FR-B-X (5); FR-B-X (40); OS; OS-M		
Rollins Reservoir/Bear River	47	High 84& - high 16 percent - no dev	Residential, Commercial, Forest Land, Agricultural Land, Recreation	R5; AG-5-PD; WA; OS; FR-B-X (40); F-B-100 (2.3); F-B-43	9	12
Halsey Forebay/Lake Arthur	713	High 100 percent - high	Residential, Commercial, Forest Land, Agricultural Land, Industrial, Recreation	RA-B-100; OS; R1-A; RA-B-X (4.6); F (4.6)	143	357
Rock Creek Lake/Auburn	198	High 100 percent - high	Residential, Commercial, Forest Land, Agricultural Land, Industrial, Recreation	ULDR; R-1-10; CPD-Dc; RM-DL-8; RS-AG; INP-Dc; C2-Dc; OS	66	198
Folsom Lake	19	Low 55 percent - low 45 percent - no dev	Residential, Commercial, Forest Land, Agricultural Land	F-B-X (5); F-B-X(20); RA-B-100	4	4
Bundle 12: Chili Bar						
American River-Chili Bar/Slab Creek Reservoirs	158	Low 26 percent - high 47 percent - low 27 percent - no dev	Forest Land, Recreation	RR; PL; U; NR; J; RA-20; NR-MR; RA-40	4	4
TOTAL ESTIMATED DEVELOPMENT	22,440					4,071

The resulting estimated development is 38 equivalent dwelling units.

Meadow Lake/Fordyce Lake/Lake Sterling/White Rock Lake. Based on the GIS analysis, 93 percent of this Land Area is rated *low* and seven percent is rated *no development*. A development intensity of one unit per five acres based on General Plan land use and zoning designations was determined for this Land Area because development potential is low. The resulting estimated development is seven equivalent dwelling units.

Rock Lake/Lindsey Lakes. Based on the GIS analysis, 89 percent of this Land Area is rated *low* and 11 percent is rated *no development*. A development intensity of one unit per 160 acres based on General Plan land use and zoning designations was determined for this Land Area because elevations of up to 7,000 feet constrain development on the majority of project parcels that do not contain water bodies. The resulting estimated development is five equivalent dwelling units.

Lake Valley Reservoir. Based on the GIS analysis, 95 percent of this Land Area is rated *high* and five percent is rated *no development*. A development intensity of one unit per 40 acres was determined for this Land Area for the following reasons:

- This Land Area contains and is surrounded by many water bodies.
- Many flat areas exist within this Land Area due to previous mining activity, making the topography in these areas generally moderate.
- This Land Area has good access to existing I-80 off-ramps and is in close proximity to Cisco, Cisco Grove, and Emigrant Gap.
- Proximity to ski resorts make this an attractive area for residential development such as second homes or condominiums: however, this could be limited due to elevations of up to 6,000 feet and associated climatic changes during the winter months.

The resulting estimated development is 329 equivalent dwelling units.

Lake Spaulding/Drum Penstock Forebay. Based on the GIS analysis, 71 percent of this Land Area is rated *high* and 29 percent is rated *no development*. A development intensity of one unit per four acres was determined for this Land Area for the following reasons:

- This Land Area has access to many water bodies, and scenic amenities such as water views and the forested areas of the Tahoe National Forest.
- This Land Area is composed of primarily of lands with moderate topography adjacent to water bodies.

The resulting estimated development is 2,396 equivalent dwelling units.

Dutch Flat - Bear River North of Rollins Reservoir. Based on the GIS analysis, 78 percent of this Land Area is rated *high* and 22 percent is rated *no development*. A development intensity of one unit per four acres was determined for this Land Area for the following reasons:

- Proximity to Dutch Flat and Chicago Park.
- Proximity to I-80, although there are no existing interchanges and this Land Area is not immediately adjacent to the freeway.
- Proximity to Lake Alta and forested areas, which afford this Land Area with scenic amenities such as water and forest views.

The resulting estimated development is 517 equivalent dwelling units.

Rollins Reservoir/Bear River. Based on the GIS analysis, 84 percent of this Land Area is rated *high* and 16 percent is rated *no development*. A development intensity of one unit per four acres was determined for this Land Area for the following reasons:

- Proximity to I-80, Highway 174, and the communities of Colfax and Chicago Park.
- Proximity of parcels to Bear River, river-oriented development could occur.

The resulting estimated development is 12 equivalent dwelling units.

Halsey Forebay/Lake Arthur. Based on the GIS analysis, 100 percent of this Land Area is rated *high*. A development intensity of one unit per three acres was determined for this Land Area. It is considered attractive to development for the following reasons:

- This Land Area is adjacent to I-80 (with existing freeway on- and off-ramps) and Auburn Airport.
- The existence of many water bodies such as the Halsey Forebay and Afterbay, Lake Arthur, and Lake Theodore.
- Land topography is moderate.

The resulting estimated development is 357 equivalent dwelling units.

Rock Creek Lake/Auburn. Based on the GIS analysis, 100 percent of this Land Area is rated *high*. A development intensity of one unit per acre was determined for this Land Area. It is attractive to development for the following reasons:

- Proximity to Auburn.
- Availability of public services.
- The rate of growth and development of surrounding land uses.
- Access to I-80 and Highway 88.
- Surrounding existing low-density residential exists, such as mobile home parks and freeway-oriented commercial retail.
- Water bodies such as Rock Creek Lake and Wise Forebay with good access from all directions.
- Proximity and access to Auburn Airport.
- Lands around water bodies have flat topography and water views.

The resulting estimated development is 198 equivalent dwelling units.

Folsom Lake. Based on the GIS analysis, 55 percent of this Land Area is rated *low* and 45 percent is rated *no development*. A development intensity of one unit per five acres based on General Plan land use and zoning designations was determined for this Land Area for the following reasons:

- This land area is not easily accessible.
- Due to relatively low acreage of Project Lands and existing surrounding land uses, development at a higher density than general plan land use and zoning is unlikely.
- Only one project parcel is in close proximity to the North Fork of the American River, with moderate topography and good river views.

The resulting estimated development is four equivalent dwelling units.

Bundle 12: Chili Bar

American River-Chili Bar/Slab Creek Reservoirs. Based on the GIS analysis, 26 percent of this Land Area is rated *high*, 47 percent is rated *low*, and 27 percent *no development*. A development

intensity of one unit per 40 acres based on General Plan land use and zoning designations was determined for this Land Area due to low-density surrounding land uses (i.e., Eldorado National Forest) and low project land acreage. The resulting estimated development is four equivalent dwelling units.

Motherlode Regional Bundle: Estimated Development in Land Areas

The Land Areas in the Motherlode Regional Bundle are depicted in Figure 3-16. The development assumed for the purposes of analysis for the Land Areas in the Motherlode Regional Bundle are presented in Table 3-7, after which follows Figure 3-16.

Bundle 13: Mokelumne River

Tiger Creek Reservoir and Facilities. Based on the GIS analysis, 14 percent of this Land Area is rated *high*, 68 percent is rated low, and 18 percent has *no development* potential. A development intensity of one unit per 160 acres based on General Plan land use and zoning designations was determined for this Land Area for the following reasons:

- Mountainous terrain and very steep elevations and climate changes greatly constrain access.
- Project parcels are surrounded by forest lands.
- Access to project lands is mostly unavailable.

The resulting estimated development is 11 equivalent dwelling units.

Electra Tunnel/West Point Power House. Based on the GIS analysis, 11 percent of this Land Area is rated *high*, and 35 percent is rated *low*, and 54 percent is rated *no development*. A development intensity of one unit per 160 acres based on General Plan land use and zoning designations was determined for this Land Area for the following reasons:

- Mountainous terrain and very steep elevations and climate changes greatly constrain access.
- Project parcels are surrounded by National Forest lands.
- Access to project lands is mostly unavailable.

The resulting estimated development is five equivalent dwelling units.

Lake Tabeaud/Electra Power House. Based on the GIS analysis, 26 percent of this Land Area is rated *high*, 62 percent is rated *low*, and 12 percent has *no development* potential. A development intensity of one unit per five acres based on General Plan land use and zoning designations was determined for this Land Area for the following reasons:

- Steep terrain constrains access.
- Project parcels are surrounded by National Forest lands.

The resulting estimated development is 150 equivalent dwelling units.

Table 3-7 Estimated Development for the Motherlode Regional Bundle

Land Area	Total Acreage	GIS Rating	Surrounding Land Uses	Applicable General Plan and Zoning Designations	Development Based on General Plan (EDUs)	Development Assumed in EIR Analysis (EDUs)
Bundle 13: Mokelumne						
Tiger Creek Reservoir and Facilities	1,752	Low 14 percent-High 68 percent-Low 18 percent-No Dev	Forest Land	TP, U, TPZ, R1-A	11	11
Electra Tunnel/West Point Power House	752	Low 11 percent-High 35 percent-Low 54 percent-No Dev	Forest Land, Rangeland	TP, R1-A	5	5
Lake Tabeaud/Electra Power House	752	Low 26 percent-High 62 percent-Low 18 percent-No Dev	Forest Land, Hydro, Rangeland	R, BLM, OF	150	150
Bear River Reservoir/Lower Bear River Reservoir/Salt Springs	1,506	Low 16 percent-High 80 percent-Low 4 percent-No Dev	Forest Land, Hydro, Rangeland	R1-A, OR	38	38
Upper and Lower Blue Lakes/Meadow Lake/Twin Lake	1,338	Low 97 percent-Low 3 percent-No Dev	Forest Land, Hydro, Rangeland	OS, AG, WA	67	67

Table 3-7 Estimated Development for the Motherlode Regional Bundle

Land Area	Total Acreage	GIS Rating	Surrounding Land Uses	Applicable General Plan and Zoning Designations	Development Based on General Plan (EDUs)	Development Assumed in EIR Analysis (EDUs)
Bundle 14: Stanislaus River						
Stanislaus River	1,362	Low 95 percent-Low 5 percent-No Dev	Forest Land, Hydro, Rangeland	C-K, K, TPZ, P, A-10	37	37
Lyons Reservoir/Phoenix Reservoir	347	Low 19 percent-High 75 percent-Low 69 percent-No Dev	Forest Land, Hydro, Rangeland, Agricultural Land, Some Urban	O, K, P	10	10
Bundle 15: Merced River						
Merced Falls	8	Low 41 percent-High 57 percent-Low 2 percent-No Dev	Forest Land, Hydro, Rangeland, Agricultural Land	AEZ*, A2	1	1
Total Estimated Development	7,187				319	

Bear River Reservoir/Lower Bear River Reservoir/Salt Springs. Based on the GIS analysis, 16 percent of this Land Area is rated *high*, 80 percent is rated *low*, and 4 percent is rated *no development*. A development intensity of one unit per 40 acres based on General Plan land use and zoning designations was determined for this Land Area for the following reasons:

- Rural residential is allowed.
- Topography constrains most access.

The resulting estimated development is 38 equivalent dwelling units.

Upper and Lower Blue Lakes/Meadow Lake/Twin Lake. Based on the GIS analysis, 97 percent of this Land Area is rated *low* and three percent is rated *no developmen*t. A development intensity of one unit per 20 acres based on General Plan land use and zoning designations was determined for this Land Area for the following reasons:

- Forest lands are in holdings and within Wilderness Area.
- Approximately 18 acres zoned for Single Family Residential is inaccessible due to topography.
- Lack of accessibility to lands during winter months due to snow cover and average altitudes of 7,000 to 8,000 feet. Blue Lakes Road at the Junction of Highway 88 is closed from November to May. According to Alpine County, if residential development were to occur, it would most likely involve vacation homes sparsely located along or close to Hwy 88.

The resulting estimated development is 67 equivalent dwelling units.

Bundle 14: Stanislaus River

Stanislaus River. Based on the GIS analysis, 95 percent of this Land Area is rated *low*, and the remaining five percent is rated *no development*. A development intensity of one unit per 37 acres based on General Plan land use and zoning designations was determined for this Land Area for the following reasons:

- Predominantly forest lands with Timber Production Zones.
- Steep topography constrains access; majority of the lands are not accessible.
- Sierra Pacific Power Company has timber holdings within this area.
- One Pacific Gas and Electric Company–owned parcel called Kennedy Meadows has development potential for commercial recreation. Existing uses at Kennedy Meadows include a hotel, bar, restaurant, grocery store, and commercial uses important to campers. There is a 1992 Development Agreement that allows for greater use of the parcel. The existing hotel and commercial uses are anticipated to be the uses that would grow.

The resulting estimated development is 37 equivalent dwelling units.

Lyons Reservoir/Phoenix Reservoir. Based on the GIS analysis, 19 percent of this Land Area is rated *high*, 75 percent is rated *low*, and 6 percent is rated *no development*. A development intensity of one unit per 37 acres based on General Plan land use and zoning designations was determined for this Land Area for the following reasons:

- Most parcels are isolated with limited access and surrounded by U.S. Forest Service lands. All parcels (with the exception of two) are zoned "P" (Public), and would require a general plan amendment and zone change to allow future development.
- Structural development on the affected parcels would be difficult due to strict requirements and severe restrictions of the County's Fire Prevention Bureau. Campgrounds with limited structures could be a possibility.
- Most Project Lands in this area are constrained by steep topography and seasonal climatic changes.
- Lyons Reservoir has good access and fishing available.

The resulting estimated development is ten equivalent dwelling units.

Bear R. Reservoir
Lower Bear R. Reservoir
Salt Spring
1,506 Acres
38 EDUs

Upper & Lower Blue Lakes/
Meadow Lk/Twin
1,338 Acres
67 EDUs

Tiger Creek Reservoir
and Facilities
1,752 Acres
11 EDUs

Electra Tunnel
West Point Powerhouse
752 Acres
5 EDUs

Lake Tabeaud
Electra Powerhouse
752 Acres
450 EDUs

Stanislaus River
1,362 Acres
37 EDUs

Lyons/Phoenix
Reservoir
347 Acres
10 EDUs

Merced Falls
8 Acres
1 EDU

SALT SPRINGS SUB
SALT SPRINGS PH #1 & #2
CABBAGE PATCH SUB
TIGER CREEK PH
PINE GROVE SUB
WEST POINT PH
ELECTRA PH
MOKELUMNE HILL
ARNOLD
DONNELLS PH (Tri-Dam)
BEARDSLEY PH (Tri-Dam)
SAND BAR PH (Tri-Dam)
SPRING GAP PH
STANISLAUS PH
MIWUK SUB
PHOENIX PH
EXCHEQUER PH (MID)
MERCED FALLS PH

88
4
108
49
132

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- FERC License Area
- Project Lands in Land Area
- General Location of Land Area
- State Highway
- Streams
- County Line
- Water Body
- Public Lands
- Powerhouses & Substations (Pacific Gas & Electric Company unless other owner identified)

Map Location Reference

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Figure 3 - 16
Land Areas
Motherlode Regional Bundle

Aspen Environmental Group

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Bundle 15: Merced River

Merced Falls. Based on the GIS analysis, 41 percent of this Land Area is rated *high*, and 57 percent is rated *low*, and two percent is rated *no development*. A development intensity of one unit per 80 acres based on General Plan land use and zoning designations was determined for this land area for the following reasons:

- Project Lands have very low acreage in this area.
- Project Lands are designated as Land Conservation Areas and are zoned as Agricultural Exclusive Zone (AEZ). These lands are under Williamson Act Contracts, and their development potential is very low. Allowed uses under AEZ are low-density rural residential (ranchettes), mining, and rock and mineral processing in compliance with the Surface Mining Act.
- Public recreational (e.g., swimming, fishing) access to Merced Falls Reservoir is available.

The resulting estimated development is one equivalent dwelling unit.

Kings Crane-Helms Regional Bundle: Estimated Development in Land Areas

The Land Areas in the Kings Crane-Helms Regional Bundle are depicted in Figures 3-17 and 3-18. The development assumed for the purposes of analysis for the Land Areas in the Kings Crane-Helms Regional Bundle is presented in Table 3-8 below, after which follows Figures 3-17 and 3-18.

Bundle 16: Crane Valley

Bass Lake. Based on the GIS analysis, 90 percent of this Land Area is rated *high*, five percent is rated *low*, and five percent is rated *no development*. A density of two-acre lots is assumed for the following reasons:

- The lake is an attractive recreation resource.
- Similar development exists on the east side of the lake.

The resulting estimated development yield is 104 equivalent dwelling units.

Manzanita Lake. Based on the GIS analysis, 95 percent of this Land Area is rated *high*, three percent is rated *low*, and two percent is rated *no development*. A density of two-acre lots is assumed for the following reasons:

- The land is reasonably accessible via County roads.
- Manzanita Lake is an established recreation destination.

Table 3-8 Estimated Development Yield for the Kings Crane-Helms Regional Bundle

Land Area	Total Acres	GIS Analysis Rating	Surrounding Land Uses	Applicable General Plan/Zoning Designations	Development Based on General Plan (EDUs)	Development Assumed in EIR Analysis (EDUs)
Bundle 16: Crane Valley						
Bass Lake	208	High 90 percent - high 5 percent - low 5 percent - no dev.	Public sector: developed public recreation facilities. Sierra NF dispersed recreation. Private sector: developed commercial recreation facilities. Retail commercial. Single-family residential units and planned developments	GP: Open Space (OS): .05 dwelling units (DU)/acre. Zoning: Multiple Residential (RRM)	80	104
Manzanita Lake	492	High 95 percent - high 3 percent -low 2 percent no dev.	Open Space and very low density residential	GP: Rural Residential: .5 DU/acre Zoning: Rural Residential (RR)	126	246
San Joaquin PH #2	243	High 93 percent - high 6 percent - low 1 percent - no dev.	Rural agricultural w/ large lots predominant (40-acre, Madera County) Sierra National Forest	GP: Agricultural Residential (AR): 10-acre min. Agricultural Exclusive (AE): 36-640 acre lot min. Zoning: Rural Mtn. (RM), Ag. Rural Exclusive (ARE)	10	24
A.G. Wishon Powerhouse	61	High 90 percent - high 5 percent - low 5 percent - no dev.	Sierra National Forest Pacific Gas and Electric Company Lands associated with Kerckhoff Project	GP: Agricultural Exclusive AE (36-640 acre lot min.) Zoning: Rural Mountain RM (2-acre lot min.)	Open space	6
Bundle 17: Kerckhoff						
Kerckhoff Reservoir	182	High 85 percent - high 13 percent - low 2 percent - no dev.	Sierra National Forest Open space Rural residential	GP: Agricultural Exclusive (AE) (36-640 acre lot mini.) Zoning: Rural Mountain (RM-2) (2-acre lot min.)	2	91

Table 3-8 Estimated Development Yield for the Kings Crane-Helms Regional Bundle

Land Area	Total Acres	GIS Analysis Rating	Surrounding Land Uses	Applicable General Plan/Zoning Designations	Development Based on General Plan (EDUs)	Development Assumed in EIR Analysis (EDUs)
Auberry Service Center	18	High 97 percent - high 24 percent - low 1 percent - no dev.	Rural residential, trailer park, abandoned lumber mill	GP: Foothill Rural Residential Zoning: Rural Residential (RR) (2-acre min. lot)	Uses will remain the same	2
Bundle 18: Kings River						
Wishon Reservoir	750	High 79 percent - high 15 percent - low 6 percent - no dev.	Sierra National Forest (developed and dispersed recreation)	GP: Open Space (OS) Zoning: Resource Conservation (RC-40) (40-acre min. lot)	7	150
Keller Ranch	121	Low 44 percent - high 51 percent - low 5 percent - no dev.	Sierra National Forest	GP: Open Space (OS) Zoning: Resource Conservation (RC-40) (40-acre min. lot)	3	3
Bundle 19: Tule River						
Tule River	45	High 58 percent - high 39 percent - low 3 percent - no dev.	Doyle Springs residential community Open Space Sequoia National Forest	GP: Resource Conservation (RC) (160-acre min. lot), Mountain Residential (20,000 sq.ft. min. lot), and Quasi Public (20,000 sq.ft. min. lot) Zoning: Mountain Residential, (MR) (20,000 sq.ft. min. lot)	42	45
Bundle 20: Kern Canyon						
Kern Canyon	664	Low 31 percent - high 11 percent - low 58 percent - no dev.	Sequoia National Forest. Agriculture (Orchards) Planned communities	GP: Open Space (OS) Zoning: Recreation Forestry (RF) (A-20 or A-80 acre lot max)	30	-
Total Estimated Development	2,784					701

The resulting estimated development is 246 equivalent dwelling units.

San Joaquin Powerhouse # 2. Based on the GIS analysis, 93 percent of this Land Area is rated *high,* six percent is rated *low,* and one percent is rated *no development*. A density of ten-acre lots is assumed for this Land Area for the following reasons:

- Much of the land is bisected by hydroelectric facilities and some of it is in a linear shape inappropriate for development.
- The area is not easily accessible.
- The topography, recreation opportunities, landscape, and other features limit the development potential.

The resulting estimated development is 24 equivalent dwelling units.

A.J. Wishon Powerhouse. Based on the GIS analysis, 90 percent of this Land Area is rated *high,* five percent is rated *low,* and five percent is rated *no development*. A density of ten-acre lots is assumed for this Land Area for the following reasons:

- The area is approximately two hours driving time from Fresno.
- The land is dispersed and not conducive to development of one cohesive development with on-site services and utilities.
- Lake Wishon is an established recreation destination with numerous public facilities and one private recreational resort.

The resulting estimated development is six (6) equivalent dwelling units.

Bundle 17: Kerckhoff

Kerckhoff Reservoir. Based on the GIS analysis, 85 percent of Land Area is rated *high,* 13 percent is rated *low,* and two percent is rated *no development*. A density of two-acre lots is assumed for this Land Area for the following reasons:

- Established recreation opportunities are limited to a single day use area.
- The Land Area is located close to Fresno

The resulting estimated development for this Land Area is 91 equivalent dwelling units.

Auberry Service Center. Based on the GIS analysis, 97 percent of this Land Area is rated *high*, two percent is rated *low,* and one percent is rated *no development*. It is assumed that a buyer would be highly likely to retain the service facilities on site and continue to operate them as at present. However, two equivalent dwelling units may be built on interstitial land.

Bundle 18: Kings River

Wishon Reservoir. Based on the GIS analysis, 79 percent of this Land Area is rated *high*, 15 percent is rated *low,* and 6 percent is rated *no development*. While a substantial portion of this Land Area is rated high, a density of five-acre lots is assumed for this area for the following reasons:

Bass Lake Land Area
208 Acres
104 EDUs

CRANE VALLEY PH

SAN JOAQUIN PH #3

Manzanita Lake
Land Area
492 Acres
246 EDUs

San Joaquin PH #2
Land Area
243 Acres
24 EDUs

SAN JOAQUIN PH #2

41

SAN JOAQUIN PH #1A

A.G. WISHON PH

Kerckhoff Reservoir
Land Area
182 Acres
91 EDUs

A. J. Wishon
Powerhouse Land Area
61 Acres
6 EDUs

SHAVER LAKE

COURTRIGHT RESERVOIR

KERCKHOFF PH #1

KERCKHOFF PH #2

AUBERRY SUB

HELMS PH

Auberry Service
Center Land Area
18 Acres
2 EDUs

Wishon Reservoir
Land Area
750 Acres
150 EDUs

WOODCHUCK SUB

168

MILLERTON LAKE

KINGS RIVER PH

PINE FLAT RESERVOIR

Keller Ranch
Land Area
121 Acres
3 EDUs

198

FRESNO

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- FERC License Area
- Project Lands in Land Area
- General Location of Land Area
- State Highway
- Streams
- County Line
- Water Body
- Public Lands
- Powerhouses & Substations (Pacific Gas & Electric Company unless other owner identified)

Map Location Reference

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Figure 3 - 17
Land Areas
Kings Crane-Helms
Regional Bundle

Aspen Environmental Group

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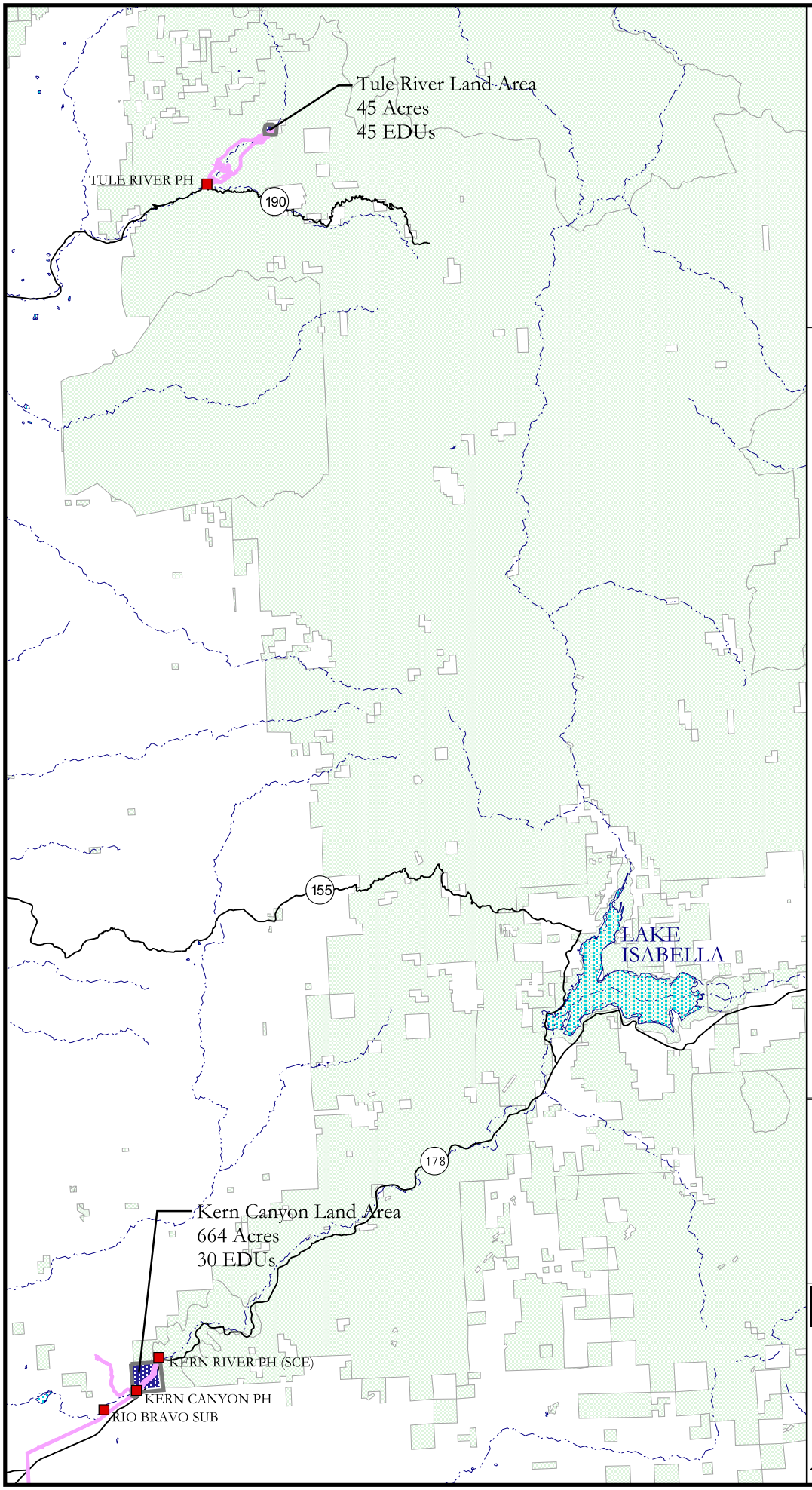

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- FERC License Area
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- Streams
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- Water Body
- Public Lands
- Powerhouses & Substations (Pacific Gas & Electric Company unless other owner identified)

Map Location Reference

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Figure 3 - 18

Land Areas

Kings Crane-Helms Regional Bundle

Aspen Environmental Group

Insert Figure 3-18 King Crane Helms page 2 of 2

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- The Land Area is accessible via a road in poor condition.
- The land surrounds Lake Wishon.

The resulting estimated development for this Land Area is 150 equivalent dwelling units.

Keller Ranch. Based on the GIS analysis, 44 percent of this Land Area is rated *high*, 51 percent is rated *low*, and five percent is rated *no development*. A density of 40-acre lots consistent with the General Plan and Fresno County zoning is assumed for this Land Area.

While the proximity of this Land Area to whitewater recreational opportunities on the Kings River would suggest the possibility that the land would be developed as a commercial or organization recreation/resort facility, because of the short seasonal nature of whitewater rafting on the Kings River, it is unlikely that high intensity of development would occur at this location.

The estimated development for this Land Area is three equivalent dwelling units.

Bundle 19: Tule River

Tule River. Based on the GIS analysis, 58 percent of this Land Area is rated *high*, 39 percent is rated *low*, and three percent is rated *no development*. The Tulare County General Plan has recognized the developability of the Tule River Land Area with a land use description of Mountain Residential (minimum lot sizes of 20,000 square feet) on a portion of the property. A density of one-acre lots across the entire property is assumed for this Land Area for the following reasons:

- Access to the Land Area is difficult.
- The Tule River, a recreation destination, bisects the property.

The resulting estimated development is 45 equivalent dwelling units.

Bundle 20: Kern Canyon

Kern Canyon. Based on the GIS analysis, 31 percent of this Land Area is rated *high*, 11 percent is rated *low*, and 58 percent is rated *no development*. A density of 20-acre lots is assumed for this area for the following reasons:

- The buildable portions of the site are near the powerhouse where high density development would not be suitable.
- The Land Area is difficult to access

The resulting estimated development is 30 equivalent dwelling units.

3.10.3 TIMBER HARVEST ASSUMPTIONS

3.10.3.1 General Background and Assumptions

A probable impact of a change in ownership could be an increase in the level and type of timber harvest. A common behavior of timberland buyers is to convert the timber asset to income in the

near term. Pacific Gas and Electric Company owns substantial timber assets that could be readily converted to cash in the near term (within the next five years). This could either occur through actions by the new owners of the various bundles, or by re-selling timberland parcels to buyers who primarily harvest and sell timber.

3.10.3.2 Timber Harvest Plans

All owners of private timberland in California are required to have an approved timber harvesting plan (THP) before harvesting of commercial timber species (Z'berg-Nejedly Forest Practice Act of 1973). The California Department of Forestry and Fire Protection (CDF) is responsible for approving a THP. The THP must be prepared by a Registered Professional Forester, who is responsible for the contents of the plan. Harvesting under a plan must be conducted by a Licensed Timber Operator.

A THP must include the following components, all of which must conform to Forest Practice Rules (*Title 14, California Code of Regulations, Chapters 4 and 4.5*)**:** silvicultural methods, logging methods, retention requirements, erosion control, stream protection, protection of unstable areas, hazard control, fire protection, cumulative impacts assessment, and an archaeological assessment. A more detailed discussion of THPs and the Forest Practice Rules is included in Section 4.2, Forestry.

Forest Practice Rules

The Forest Practice Rules (*Title 14, California Code of Regulations, Chapters 4)* are very specific regarding the types of cutting methods allowed on private lands in California. The two major categories of managing forest stands are classified as either *even-aged* or *uneven-aged*. Under even-aged management, a forest is grown to a final harvest age (between 50 and 80 years), and is then regenerated after harvest by either planting or natural sprouting or seeding. Under uneven-aged management, a forest is harvested periodically (ten to 30 years), promoting an array of age and size classes; regeneration of new trees is generally accomplished naturally. Forest Practice Rules require the landowner to leave a specified number of trees for stocking following harvest.

Pacific Gas and Electric Company Timber Harvest Practices

During the past ten years, Pacific Gas and Electric Company has covered much of its core timberland ownership with THPs. During the 1990s, Pacific Gas and Electric Company scheduled harvest operations on 24,000 acres of lands that are part of the proposed divestiture. Pacific Gas and Electric Company's timber harvesting approach has centered on uneven-aged management or selection-type harvesting. Covering about 92 percent of the acres under the THPs, the major silvicultural prescriptions planned have been partial-cut methods, predominantly selection and group

selection. Even-aged prescriptions were predominantly shelterwood removal[26], which results in harvest of larger and older trees with sufficient numbers of younger aged trees on site to meet stocking requirements. Clearcutting[27] accounted for one percent of all of the acres planned for harvest. The selection prescription used most recently on a large proportion of Pacific Gas and Electric Company's lands precludes an immediate re-entry with the same selection harvest prescription. Typically, forests are harvested on a periodic basis, often between ten and 20 years, depending on the productivity of the site.

During the 1990s, Pacific Gas and Electric Company sold several parcels considered to be primarily timber properties. With few exceptions, these parcels were either sold with active THPs, or THPs were filed by the new owners. Pacific Gas and Electric Company often sold parcels with active THPs to enhance their value to prospective buyers. The new buyers typically amended the THPs, which generally resulted in increasing the volume previously proposed under the original THPs. The amount of acreage under even-aged harvesting, such as clearcutting, was also increased.

3.10.3.3 Projections of Future Change in Timber Harvest Practice

Examination of timber resources on the lands proposed to be transferred indicate that there is substantial opportunity for increased timber harvest activities if Pacific Gas and Electric Company-owned lands were managed with a greater emphasis on economic return than has occurred in the past. The analysis undertaken in this EIR considers the potential for changed timber harvest in the next five-year period. Given the assumptions about increased economic incentive for future owners, it is reasonable to assume that increased timber harvest activity would occur in that timeframe.

Timber Harvest Assumptions on FERC-Licensed Lands

In developing the assumptions for this EIR, no distinction is made between FERC-licensed and other Watershed Lands regarding the level of timber harvest that could be expected. Historically, timber harvesting has occurred on both types of properties. It should be noted, however, that land uses within a FERC license boundary are fairly tightly circumscribed to be only what is necessary for operation and protection of the hydroelectric generation facilities. Under these circumstances, while timber harvest activity has occurred within FERC license boundaries in the past, it does not

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26 Shelterwood removal involves harvest of all trees with the exception of at least 16 18-inch trees per acre. This is similar to a seed tree cut, but may require an additional seed step cut, before a new stand of trees is established. This harvest would remove most, if not all, of the merchantable trees. Following removal of the shelterwood trees, there would not be sufficient number of small trees to meet stand required stocking standards (300 trees per acre). Most of these acres are on lands located in the North Fork Feather Canyon (DeSabla watershed). Additional acres were harvested under Shelterwood Removal, but were sold to Sierra Pacific Industries and are no longer part of the ownership.

27 Under clearcutting, all merchantable trees are harvested.

often take place. As such, the timber harvest assumptions that pertain to FERC license lands are inherently conservative.

Timber Harvest Assumptions on Watershed Lands

Depending on site conditions, a new owner would likely become more aggressive and increase the amount of acreage under even-aged management (as opposed to uneven-aged management, the dominant regime now employed by Pacific Gas And Electric Company), including the use of more clearcutting. One major forest landowner that purchased lands previously managed under a selection system has converted to more even-aged management[28]. Neither system is necessarily superior to the other. However, long-term growth and harvest can often be improved by converting to an even-aged system, especially when the residual timber stands are not growing optimally.

It is assumed that all timber harvesting projected over the next five years would comply with Forest Practice Rules. Each THP or major amendment to a THP would be subject to Forest Practice Rules and regulatory review and enforcement. In addition to CDF, reviewing agencies typically include the Department of Fish and Game, Division of Mines and Geology, and the Regional Water Quality Control Boards. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service would also be consulted for spotted owls (Shasta Region north of Route 299 and Eel River Tract) and salmonids (Eel River Tract). Table 3-9 describes assumptions about timber harvest practices on Watershed Lands.

Methods for Development of Timber Harvest Assumptions

The assumptions used in this EIR concerning timber harvest and forestry are based on:

- Review of current and historic Timber Harvest Plans (THPs) filed by Pacific Gas and Electric Company;
- Review of data and information collected as a result of several formal information requests made of Pacific Gas and Electric Company;
- Direct work experience in the bio-geographical watersheds supporting the subject assets, and
- Reconnaissance visits to several active or planned Pacific Gas and Electric Company timber harvests.

Harvest assumptions were developed for both the baseline and project scenarios, and were the result of an evaluation of all commercially valuable timber properties owned by Pacific Gas and Electric Company. It is assumed that new owners would have the same timber harvest motivations whether they were owners under either the PowerMax scenario or the WaterMax scenario. The qualitative evaluation considered factors including physical harvest constraints, harvest history, harvest feasibility (both economic and logistic), and land use.

28 Several recent news articles have been published which document the trends of increased clearcutting, including: Thompson, Dan (Associated Press), Town, logging firm clash over clearcutting – Sierra Pacific at odds with community, Marysville Appeal Democrat, June 18, 2000; Associated Press, Harvest demonstrates timber giant's clear-cutting increases, Eureka Times Standard, May 4, 2000; Associated Press, Activist group may trigger backlash, Eureka Times Standard, April 27, 2000; Vogel, Nancy, Timber giant accelerates clearcutting; showdown looms, The Sacramento Bee, March 29, 2000.

Commercially valuable timberlands were assigned to one of three timber activity categories:

- Currently active THPs (included in both the baseline and Project cases);
- New THPs included in the Project case only; and
- New THPs included in both the baseline and Project cases.

Pacific Gas and Electric Company lands not assigned to one of these categories were considered unsuitable for harvest during the analysis period. Table 3-9 describes the anticipated timber harvest practices under the baseline and Project scenarios.

Table 3-10 provides a summary of the levels of timber harvest under the Baseline and Project scenarios, and identifies the differences between the two scenarios. Table 3-11 describes timber harvest activities anticipated under the Baseline harvest scenario, while Table 3-12 describes the detailed timber harvest activities under the Project harvest scenario. For most analyses, the intensity of timber harvest activities can be interpreted from the anticipated harvest acreage and percent of area harvested columns (numeric columns 4 and 5, respectively), when compared to the values in the Commercial Forest Land column (first numeric column).

The physical location of new THPs anticipated under the project harvest scenario are depicted in Figures 3-19 to 3-28.

Table 3-9 Timber Harvest Management Practices

Regional Bundle	Baseline	Project
Shasta Region		
Bundle 1 - Hat Creek	No new harvest other than salvage in the vicinity of Hat Creek.	No new harvesting, with the exception of salvage harvesting.
Bundle 2 – Pit River	Continue with the Tunnel, Masters and Baxter Bridge THPs as filed.	Continue with the Tunnel, Masters and Baxter Bridge THPs and do modest amendments to include even-aged management. Re-enter "Flatwoods" area to include both selection and even-aged management.
	Harvest another THP in the "Flatwoods Area" using selection methods.	Harvest another THP in the "Flatwoods Area" using both selection and even-aged harvesting.
	No new harvest other than salvage in the vicinity of Lake Britton.	A new THP using both section and even aged harvesting.
Bundle 3 – Kilarc-Cow Creek	No new harvest other than salvage in the vicinity of Cow Creek and Hat Creek.	A new THP using both selection and even aged harvesting.
Bundle 4 – Battle Creek	No new harvest other than salvage in the vicinity of Battle Creek Reservoir or Shingletown.	THPs in the Shingletown and North Battle Creek Reservoir areas, with both selection and even-aged harvesting, including clearcutting.
DeSabla Region		
Bundle 5 – Hamilton Branch		Selection harvest near Mountain Meadows Reservoir.
Bundle 6 –Feather River	New THP in the Big Bend area in Butte County (Poe Project) covering about 200 acres using primarily selection harvesting.	Re-enter the Canyon Dam THP to add clearcut units. New THPs in the Humbug Valley/Yellow Creek and Butt Valley Reservoir areas using both selection and even-aged harvesting. New THP in the Big Bend area in Butte County (Poe Project) using both selection harvesting and clearcutting.
Bundle 7 – Bucks Creek	No new harvest other than salvage.	New THP in the Bucks Lake area using both selection and shelterwood removal harvesting.
Bundle 8 – Butte Creek	Re-enter the former DeSabla THP area using selection harvesting.	Re-enter the former DeSabla THP area using both selection harvesting and clearcutting.
Drum Region		
Bundle 9 – North Yuba River	Currently active THPs 2-99-019NEV, 2-96-464PLA, 2-99-212PLA and 25 percent of 2-99-185PLA would be harvested in the years 2000 or 2001. Currently active THPs 2-98-011PLA, 2-97-300NEV, 2-97-301NEV, 2-99-188NEV and the remainder of THP 2-99-185PLA would be harvested in the period 2002 to 2006.	Currently active THPs 2-99-019NEV, 2-96-464PLA, 2-99-212PLA and 25 percent of 2-99-185PLA would be harvested in the years 2000 or 2001 (same as Baseline). Currently active THPs 2-98-011PLA, 2-97-300NEV, 2-97-301NEV, 2-99-188NEV and the remainder of THP 2-99-185PLA would be harvested in the period 2002 to 2006 (same as Baseline) except these THPs would be amended to increase the amount of even-aged management. Four new THP areas would be submitted for harvesting (Liberty Hill, Lake Valley, Dutch Flat and Alta). Two of these "new" THPs, Liberty Hill and Lake Valley, are resubmittals of THPs 2-95-065NEV and 2-94-456PLA which were harvested during the past decade.
Bundle 10 – Potter Valley	Harvest a relatively light volume on the Potter Valley (Eel River) Tract, given informal agreement with "Friends of Trout Creek"	Add an extensive THP to re-cover most of the Potter Valley property with both even and uneven age harvesting methods.

Table 3-9 Timber Harvest Management Practices

Regional Bundle	Baseline	Project
Bundle 11 – South Yuba-Bear River	No new harvest	No new harvest.
Bundle 12 – Chili Bar	No new harvest	No new harvest.
	Motherlode Region	
Bundle 13 – Mokelumne	No new harvest	Three additional THPs for the Bear River Reservoir, Cole Creek and Panther Creek areas.
Bundle 14 – Stanislaus River	Currently active THP 4-99-90AMA would be harvested in the years 2000 or 2001. A new THP would be submitted for the vicinity of Rushing Meadow/Lyon's Reservoir in the Phoenix Project area.	Currently active THP 4-99-90AMA would be harvested in the years 2000 or 2001 (same as baseline). A new THP would be submitted for the vicinity of Rushing Meadow/Lyon's Reservoir in the Phoenix Project area (same as baseline). Under this aggressive scenario, this THP would be enlarged and would contain some even age silviculture. Small THPs would be prepared and submitted for the Spring Gap Project area covering "old" THP areas 4-94-159TUO & 4-94-43TUO and the Stanislaus Forebay.
Bundle 15 – Merced River	No new harvest	No new harvest.
	Kings Crane-Helms Region	
Bundle 16 – Crane Valley	No new harvest, with the exception of salvage harvesting near Bass Lake and Manzanita Lake.	Low intensity harvest near Bass Lake and Manzanita Lake using selection harvesting.
Bundle 18 – Kings River	No new harvest, with the exception of salvage harvesting near Lake Wishon.	Low intensity harvest near Lake Wishon using selection harvesting.

Table 3-10 Summary of Timber Harvest Assumptions

Project Areas	Even-Aged Harvest (acres)			Uneven-Aged Harvest (acres)			Harvest Volume (mbf)[a]		
	Baseline	Project	Difference	Baseline	Project	Difference	Baseline	Project	Difference
Shasta Region									
Hat Creek	0	0	0	0	0	0	50[b]	50[b]	0
Pit 1	0	0	0	0	0	0	25[b]	25[b]	0
Pit 3, 4 & 5	0	885	885	2,800	2,915	115	19,850	36,795	16,945
McCloud-Pit	0	600	600	2,900	2,800	-100	14,750	23,200	8,450
Kilarc-Cow Creek	0	50	50	0	300	300	50[b]	850	800
Battle Creek	0	250	250	0	550	550	300[b]	6,600	6,300
Subtotal	0	1,785	1,785	5,700	6,565	865	35,025	67,520	32,495
DeSabla Region									
Upper NF Feather River	0	300	300	0	300	300	500[b]	5,650	5,150
Bucks Creek	0	250	250	0	250	250	50[b]	3,850	3,800
Rock Creek-Cresta	0	0	0	0	300	300	50[b]	1,600	1,550
Poe	10	80	70	190	170	-20	1,200	2,100	900
DeSabla-Centerville	0	50	50	300	150	-150	1,550	1,550	0
Hamilton Branch	0	0	0	0	80	80	50[2]	400	350
Lime Saddle	0	0	0	0	0	0	0	0	0
Coal Canyon	0	0	0	0	0	0	0	0	0
Subtotal	10	680	670	490	1,250	760	3,400	15,150	11,750
Drum Region									
Narrows	0	0	0	0	0	0	0	0	0
Potter Valley	30	275	245	330	2,625	2,295	4,050	20,000	15,950
Drum-Spaulding	397	950	553	2,741	4,428	1,687	23,075	35,190	12,115
Chili Bar	0	0	0	0	0	0	0	0	0
Subtotal	427	1,225	798	3,071	7,053	3,982	27,125	55,190	28,065
Motherlode Region									
Mokelumne River	0	30	30	0	820	820	800[2]	4,750	3,950

Table 3-10 Summary of Timber Harvest Assumptions

Project Areas	Even-Aged Harvest (acres)			Uneven-Aged Harvest (acres)			Harvest Volume (mbf)[a]		
	Baseline	Project	Difference	Baseline	Project	Difference	Baseline	Project	Difference
Spring Gap	0	20	20	0	60	60	200[b]	600	400
Phoenix	0	60	60	500	440	-60	2,900	3,500	600
Merced Falls	0	0	0	0	0	0	0	0	0
Subtotal	0	110	110	500	1,320	820	3,900	8,850	4,950
Kings Crane-Helms Region									
Crane Valley	0	0	0	0	100	100	100[b]	300	200
Kerckhoff	0	0	0	0	0	0	0	0	0
Helms	0	0	0	0	100	100	50[b]	500	450
Haas-Kings River	0	0	0	0	0	0	0	0	0
Balch	0	0	0	0	0	0	0	0	0
Tule River	0	0	0	0	0	0	0	0	0
Kern Canyon	0	0	0	0	0	0	0	0	0
Subtotal	0	0	0	0	200	200	150	800	650
Project Total	**437**	**3,800**	**3,363**	**9,761**	**16,388**	**6,627**	**69,600**	**147,510**	**77,910**

1. Includes projected timber harvest and salvage.
2. Salvage only.

mfb = thousand board feet

Table 3-11 Baseline Harvest Scenario

Starting January 1, 2002		Projected Acres to be Harvested Years 2002-2006			Percent Treated	Projected Harvest Volume Years 2002-2006				Salvage	Total	Assumptions
						Even-aged:		Uneven-aged				
Area (Bundle No.)	Timber-land Acres	Even-aged	Uneven-aged	Total		Mbf/acre	MBF	Mbf/acre	MBF	MBF		
Shasta Region											0	
Hat Creek (1)	100	0	0	0	0 percent		0		0	50	50	Continuation of no-harvest except salvage
Pit 1 (2)	0	0	0	0	0		0		0	25	25	Continuation of no-harvest except salvage
Pit 3, 4 & 5 (2)	10,500	0	2,800	2,800	27 percent		0	5	19,600	250	19,850	Tunnel and Baxter Bridge THP to carry-over and selection cut 1,000 acres:
McCloud-Pit (2)	6,600	0	2,900	2,900	44 percent		0	5	14,500	250	14,750	Baxter Bridge and Masters THP to carry over & Selection Cut on 1,000 acres
Kilarc-Cow Creek (3)	900	0	0	0	0 percent		0		0	50	50	Continuation of no-harvest except salvage
Battle Creek (4)	2,400	0	0	0	0 percent		0		0	300	300	Continuation of no-harvest except salvage
Sub-Total	20,500	0	5,700	5,700	28 percent		0		34,100	925	35,025	
DeSabla Region												
Upper North Fork Feather River (6)	2,900	0	0	0	0 percent		0		0	500	500	No THPs; only salvage harvest
Bucks Creek (7)	1,000	0	0	0	0 percent		0		0	50	50	No THPs; only salvage harvest
Rock Creek-Cresta (6)	600	0	0	0	0 percent		0		0	50	50	No THPs; only salvage harvest; no re-entry in helicopter
Poe (6)	1,800	10	190	200	11 percent	15	150	5	950	100	1,200	THP at Big Bend's; salvage harvest; no re-entry in helicopter
DeSabla-Centerville (8)	700	0	300	300	43 percent		0	5	1,500	50	1,550	Assumes re-entry in DeSabla
Hamilton Branch (5)	100	0	0	0	0 percent		0		0	50	50	No THPs; only salvage harvest
Lime Saddle (8)	0	0	0	0	0		0		0		0	
Coal Canyon (8)	0	0	0	0	0		0		0		0	
Sub-Total	7,100	10	490	500	7 percent		150		2,450	800	3,400	

Table 3-11 Baseline Harvest Scenario

Starting January 1, 2002		Projected Acres to be Harvested Years 2002-2006			Percent Treated	Projected Harvest Volume Years 2002-2006				Salvage	Total	Assumptions
						Even-aged:		Uneven-aged				
Area (Bundle No.)	Timber-land Acres	Even-aged	Uneven-aged	Total		Mbf/acre	MBF	Mbf/acre	MBF	MBF		
											0	
Drum Region												
Drum-Spaulding (11)	9,400	397	2,741	3,138	33 percent	10	3,970	5	13,705	5,400	23,075	C/O 97-300&301; 98-011; 99-185&188
Narrows (9)	0	0	0	0	0		0		0		0	
Chili Bar (12)	0	0	0	0	0		0		0		0	
Potter Valley (10)	3,400	30	330	360	11 percent	25	750	10	3,300		4,050	Add new THP
Sub-Total	12,800	427	3,071	3,498	27 percent		4,720		17,005	5,400	27,125	
Motherlode Region												
Mokelumne (13)	2,100	0	0	0	0 percent		0		0	800	800	No THPs carry over
Spring Gap (14)	200	0	0	0	0 percent		0		0	200	200	
Phoenix (14)	600	0	500	500	83 percent		0	5	2,500	400	2,900	Add new THP @ Rushing Mdws.
Merced Falls (15)	0	0	0	0	0		0		0		0	
Sub-Total	2,900	0	500	500	17 percent		0		2,500	1,400	3,900	
											0	
Kings Crane Region											0	
Crane Valley (16)	100	0	0	0	0 percent		0		0	100	100	
Kerckhoff (17)	0	0	0	0	0		0		0		0	
Helms (18)	100	0	0	0	0 percent		0		0	50	50	
Haas-Kings River (18)	0	0	0	0	0		0		0		0	
Balch (18)	0	0	0	0	0		0		0		0	

Table 3-11 Baseline Harvest Scenario

Starting January 1, 2002		Projected Acres to be Harvested Years 2002-2006			Percent Treated	Projected Harvest Volume Years 2002-2006				Salvage	Total	Assumptions
						Even-aged:		Uneven-aged				
Area (Bundle No.)	Timber-land Acres	Even-aged	Uneven-aged	Total		Mbf/acre	MBF	Mbf/acre	MBF	MBF		
Tule River (19)	0	0	0	0	0		0		0		0	
Kern Canyon (20)	0	0	0	0	0		0		0		0	
Subtotal	200	0	0	0	0 percent		0		0	150	150	
TOTAL - ALL REGIONS	43,500	437	9,761	10,198	23 percent		4,870		56,055	8,725	69,600	
Annual Equivalent		87	1,952	2,040			974		11,211	1,745	**13,920**	
		4 percent	96 percent							**13 percent**		

Note: MBF = Thousand board feet.

Table 3-12 Project Harvest Scenario

Starting January 1, 2002		Projected Acres to be Harvested Years 2002-2006			Projected Harvest Volume Years 2002-2006					Salvage	Total	Assumptions
						Even-aged:		Uneven-aged				
Area (Bundle No.)	Timber-Land Acres	Even-aged	Uneven-aged	Total	Percent Treated	Mbf/acre	MBF	Mbf/acre	MBF	MBF		
Shasta Region											0	
Hat Creek (1)	100			0	0 percent		0		0	50	50	Continuation of no-harvest except salvage
Pit 1(2)	0			0	0 percent		0		0	25	25	Continuation of no-harvest except salvage
Pit 3, 4 & 5 233 (2)	10,500	885	2,915	3,800	36 percent	15	13,275	8	23,320	200	36,795	Tunnel; Baxter Bridge to carry-over:+2,000 acre's harvest including entry at Lake Britton
McCloud-Pit 2106 (2)	6,600	600	2,800	3,400	52 percent	15	9,000	5	14,000	200	23,200	Baxter Bridge and Masters THP to carry over; +1,500 acre THP
Kilarc-Cow Creek (3)	900	50	300	350	39 percent	5	250	2	600		850	Rehab treatments near Cow Creek; Sanitation cut elsewhere
Battle Creek (4)	2,400	250	550	800	33 percent	15	3,750	5	2,750	100	6,600	Selection and clearcut harvest over 800 acres at Battle Creek Reservoir and Shingletown
Subtotal	20,500	1,785	6,565	8,350	41 percent		26,275		31,925	575	67,520	
DeSabla Region												
Upper North Fork Feather Rive (6)r	2,900	300	300	600	21 percent	15	4,500	3	900	250	5,650	Re-entry in Canyon Dam THP to do even-aged openings; Sanitation/Selection at Butt Valley
Bucks Creek (7)	1,000	250	250	500	50 percent	10	2,500	5	1,250	100	3,850	THP near Buck's Lake including shelterwood removal; No THP in Canyon
Rock Creek-Cresta (6)	600		300	300	50 percent		0	5	1,500	100	1,600	Selection entry near Humbug
Poe (6)	1,800	80	170	250	14 percent	15	1,200	5	850	50	2,100	Re-entry on tractor; only salvage harvest; no re-entry in helicopter; THP at Big Bend
DeSabla-Centerville (8)	700	50	150	200	29 percent	15	750	5	750	50	1,550	Assumes re-entry in DeSabla with more even-aged
Hamilton Branch (5)	100		80	80	80 percent	5	0	5	400		400	Selection entry around Mtn. Meadows Reservoir
Lime Saddle (8)	0			0			0		0		0	
Coal Canyon (8)	0			0			0		0		0	
Subtotal	7,100	680	1,250	1,930	27 percent		8,950		5,650	550	15,150	

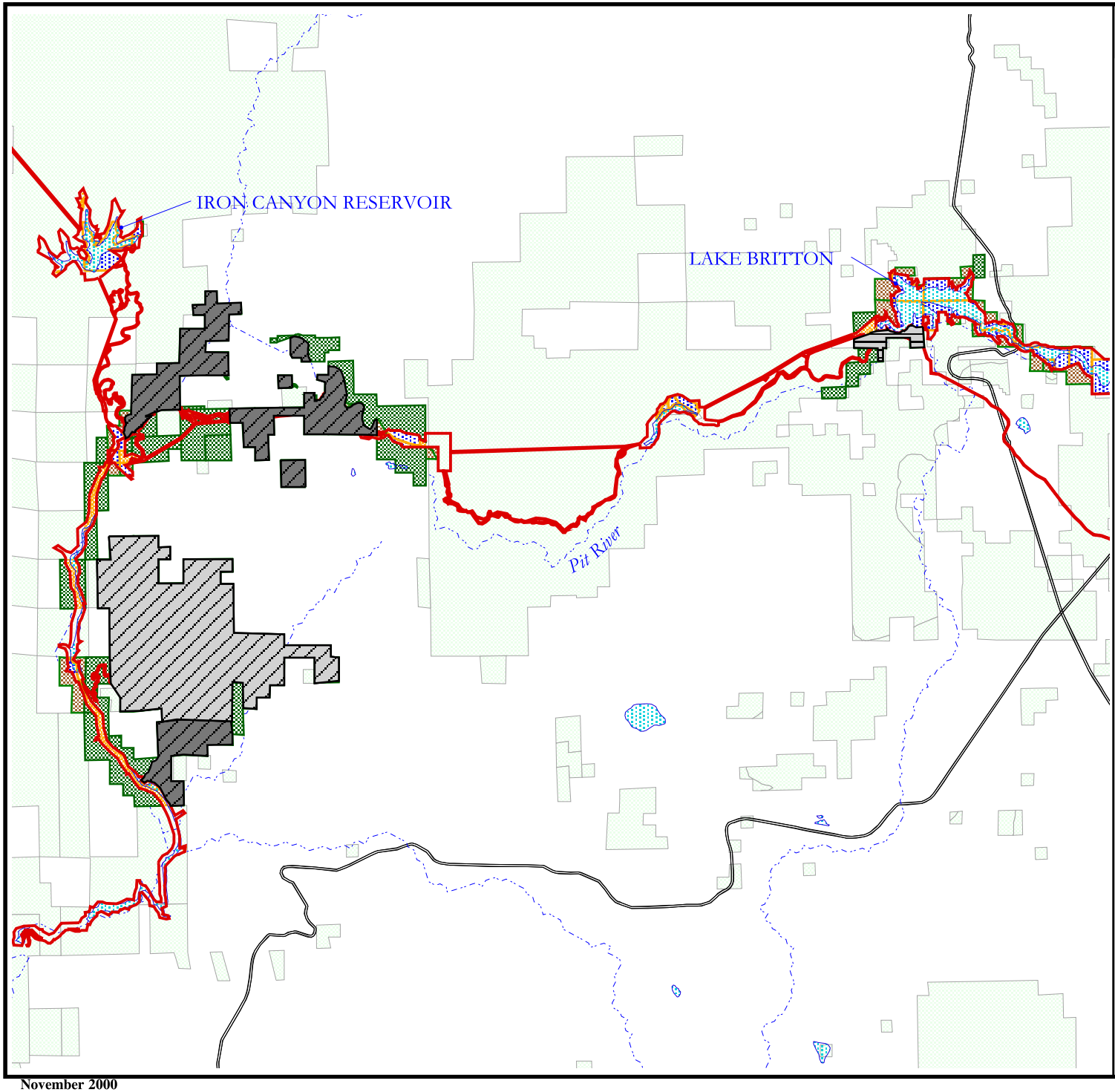
Table 3-12 Project Harvest Scenario

Starting January 1, 2002		Projected Acres to be Harvested Years 2002-2006			Projected Harvest Volume Years 2002-2006					Salvage	Total	Assumptions
						Even-aged:		Uneven-aged				
Area (Bundle No.)	Timber-Land Acres	Even-aged	Uneven-aged	Total	Percent Treated	Mbf/acre	MBF	Mbf/acre	MBF	MBF		
Drum Region												
Drum-Spaulding (11)	9,400	950	4,428	5,378	57 percent	12	11,050	5	21,340	2,800	35,190	C/O + new THPs + amended THPs
Narrows (9)	0			0			0		0		0	
Chili Bar (12)	0			0			0		0		0	
Potter Valley (10)	3,400	275	2,625	2,900	85 percent	25	6,875	5	13,125		20,000	Add new THP
Subtotal	12,800	1,225	7,053	8,278	65 percent		17,925		34,465	2,800	55,190	
Motherlode Region												
Mokelumne (13)	2,100	30	820	850	40 percent	15	450	5	4,100	200	4,750	Add new THPs
Spring Gap (14)	200	20	60	80	40 percent	10	200	5	300	100	600	
Phoenix (14)	600	60	440	500	83 percent	20	1,200	5	2,200	100	3,500	Add new THP @ Rushing Mdws.
Merced Falls (15)	0	0	0	0			0		0		0	
Subtotal	2,900	110	1,320	1,430	49 percent		1,850		6,600	400	8,850	
Kings Crane Region											0	
Crane Valley (16)	100		100	100	100 percent		0	3	300	50	350	Selection Harvest near Bass Lake and Manzanita Lake
Kerckhoff (17)	0			0			0		0		0	
Helms (18)	100		100	100	100 percent		0	5	500		500	Selection Harvest near Wishon Res.
Haas-Kings River (18)	0			0			0		0		0	
Balch (18)	0			0			0		0		0	
Tule River 19)	0			0			0		0		0	
Kern Canyon (20)	0			0			0		0		0	

Table 3-12 Project Harvest Scenario

Starting January 1, 2002		Projected Acres to be Harvested Years 2002-2006				Projected Harvest Volume Years 2002-2006				Salvage	Total	Assumptions
						Even-aged:		Uneven-aged				
Area (Bundle No.)	Timber-Land Acres	Even-aged	Uneven-aged	Total	Percent Treated	Mbf/acre	MBF	Mbf/acre	MBF	MBF		
Subtotal	200	0	200	200	100 percent		0		800	50	850	
TOTAL - ALL REGIONS	43,500	3,800	16,388	20,188	46 percent		55,000		88,185	4,325	147,510	
Annual Equivalent		760	3,278	4,038			11,000		17,637	865	29,502	
		19 percent	81 percent							**3 percent**		

Note: MBF = Thousand board feet.



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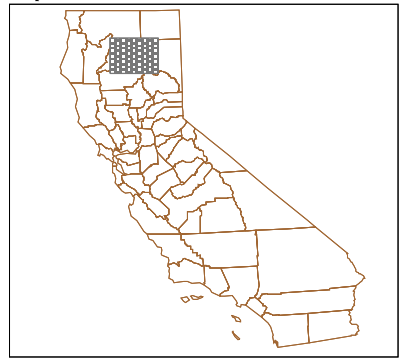
"This map is not a survey of legal boundaries or a depiction of actual FERC boundaries or watershed land boundaries. It should not be relied upon for such boundaries. Please see Figure 2-18 for full disclosure statement."

- FERC License Area
  - Water
  - Land
- Watershed Lands
  - Contiguous Land
  - Associated Land
- General Bundle Area
- State Highway
- Roads
- County Line
- Public Lands
- Powerhouses & Substations (Pacific Gas & Electric Company unless other owner identified)
- Timber Harvest Baseline
- Timber Harvest Project
- Both Baseline & Project
- Existing Timber Harvest Plans
- Projected Timber Harvest Plans

Map Location Reference



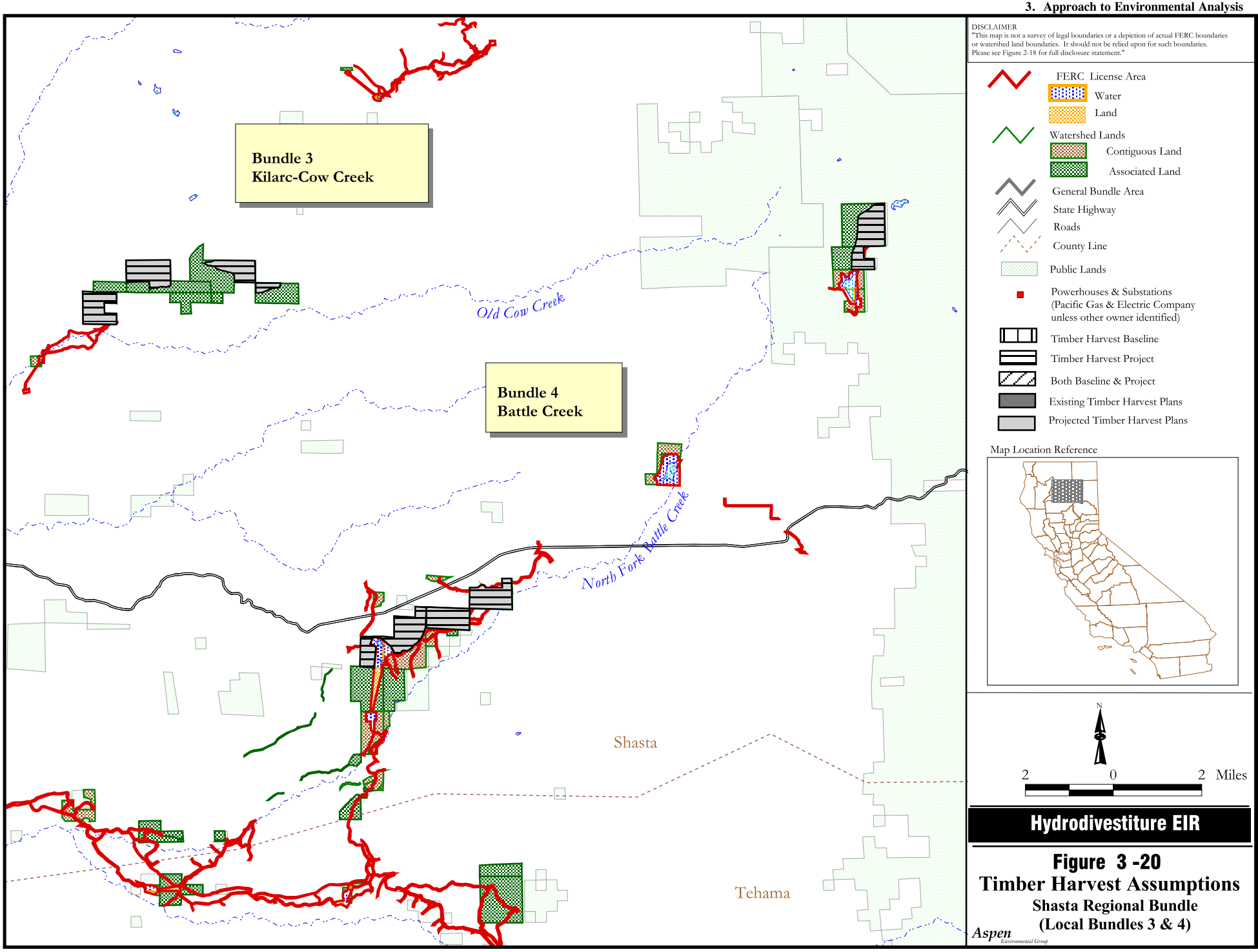
N

2 0 2 Miles

Hydrodivestiture EIR

Figure 3 -19
Timber Harvest Assumptions
Shasta Regional Bundle
(Local Bundle 2)

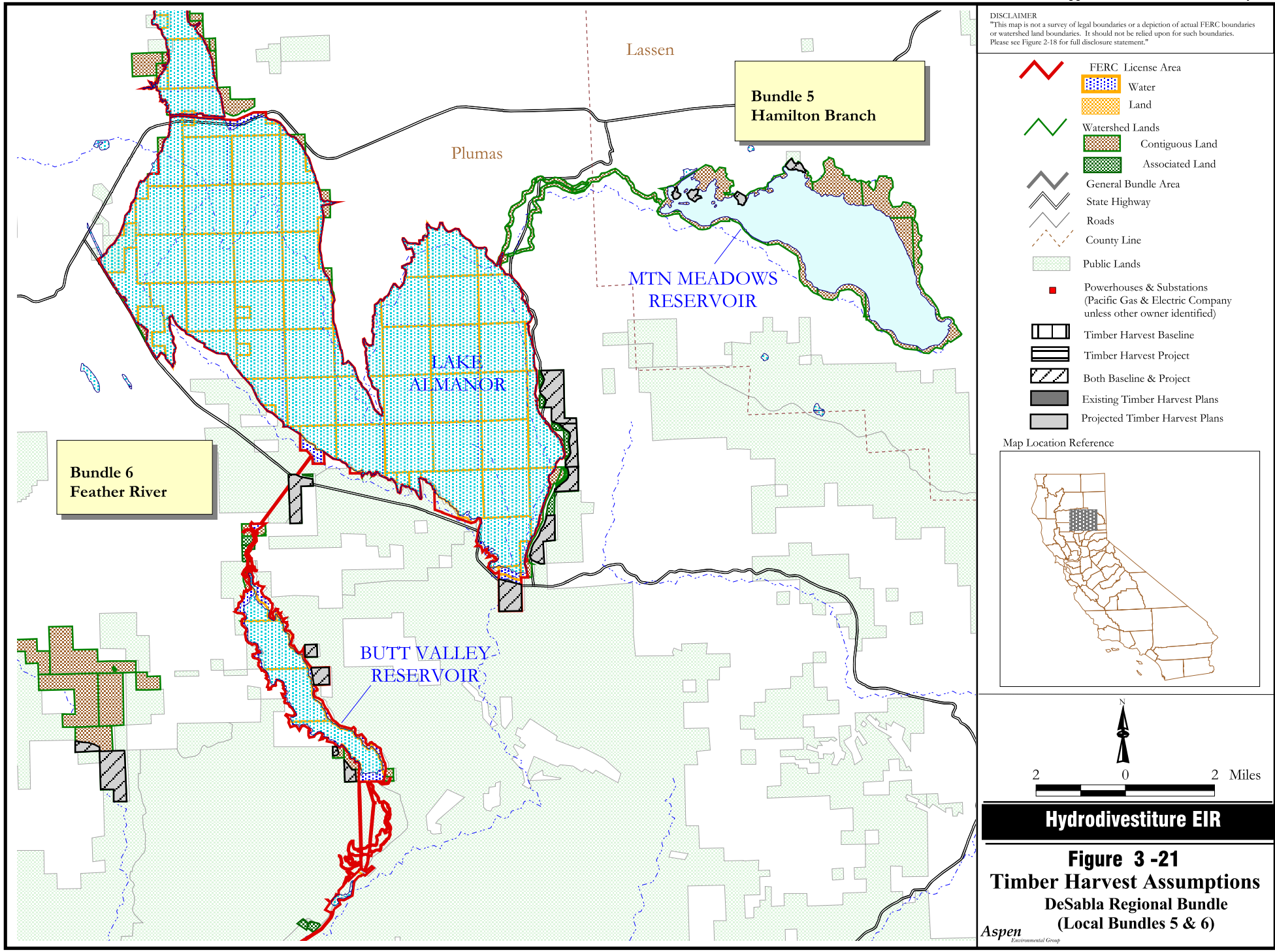
Aspen Environmental Group



Hydrodivestiture EIR

Figure 3 -20
Timber Harvest Assumptions
Shasta Regional Bundle
(Local Bundles 3 & 4)

Aspen Environmental Group


Lassen
Plumas
Bundle 5
Hamilton Branch
Bundle 6
Feather River
MTN MEADOWS
RESERVOIR
LAKE
ALMANOR
BUTT VALLEY
RESERVOIR
DISCLAIMER
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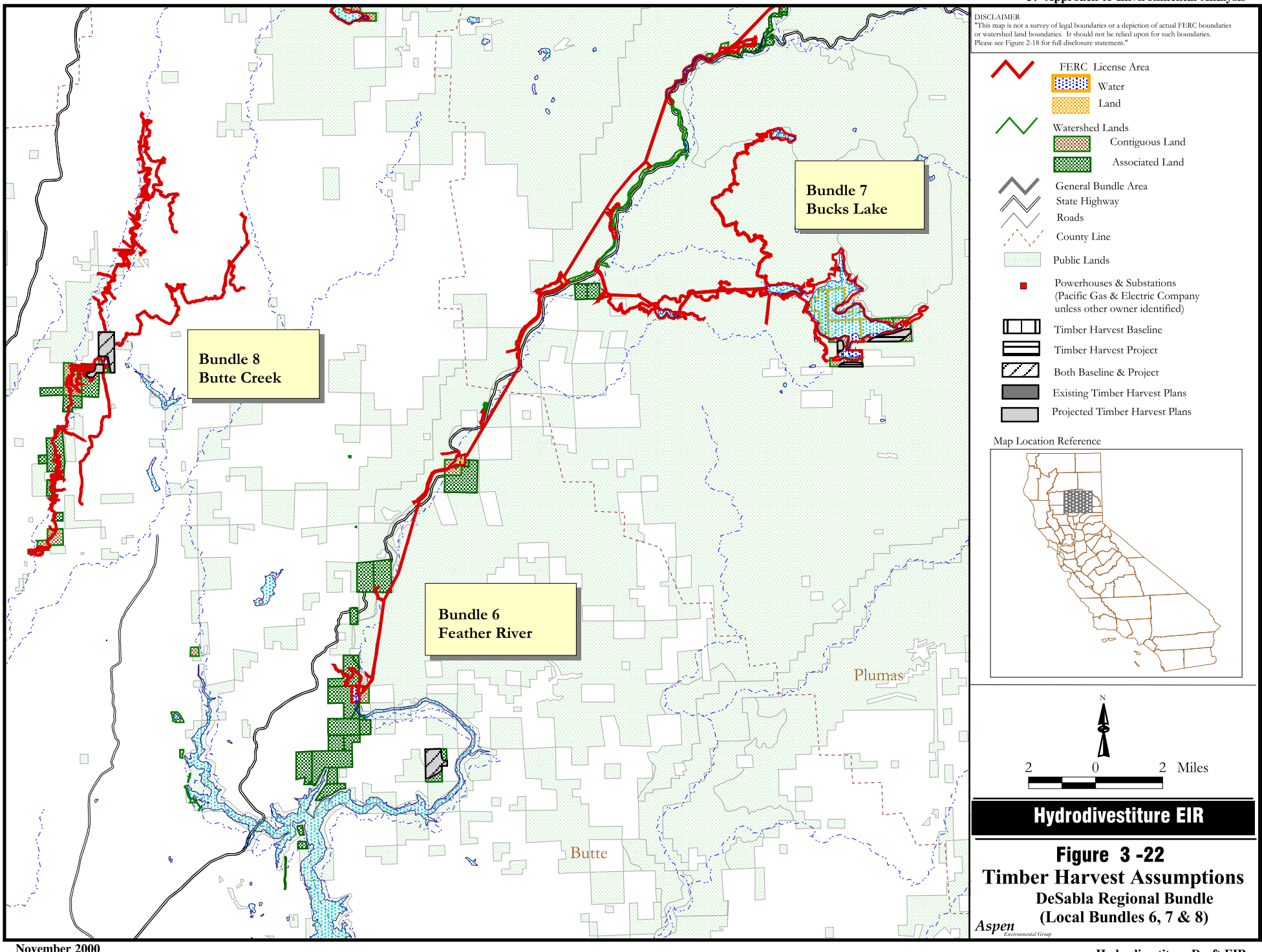
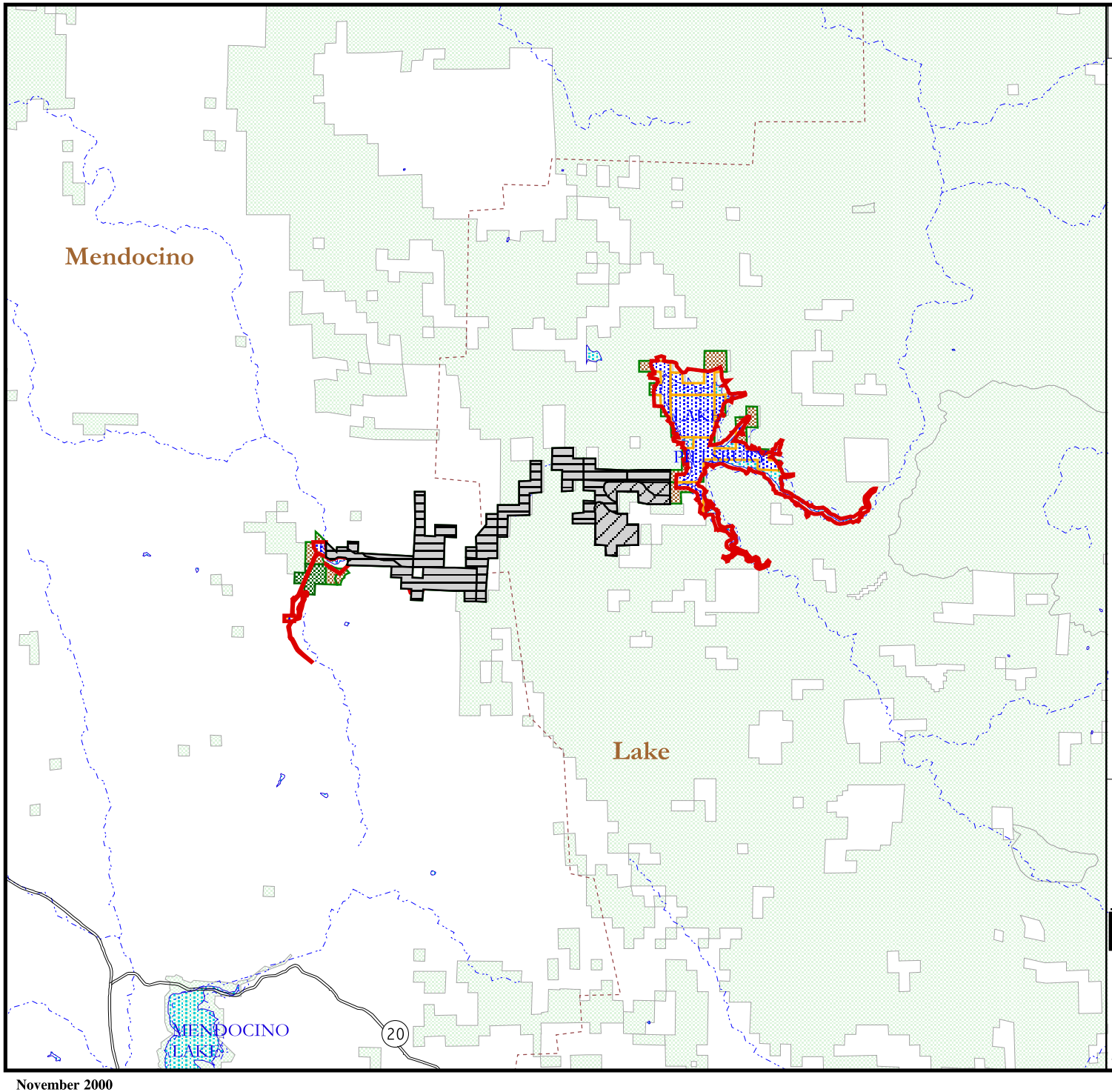
FERC License Area
Water
Land
Watershed Lands
Contiguous Land
Associated Land
General Bundle Area
State Highway
Roads
County Line
Public Lands
Powerhouses & Substations
(Pacific Gas & Electric Company unless other owner identified)
Timber Harvest Baseline
Timber Harvest Project
Both Baseline & Project
Existing Timber Harvest Plans
Projected Timber Harvest Plans
Map Location Reference
N
2
0
2 Miles
Hydrodivestiture EIR
Figure 3 -21
Timber Harvest Assumptions
DeSabla Regional Bundle
(Local Bundles 5 & 6)
Aspen
Environmental Group



Hydrodivestiture EIR

Figure 3 -22
Timber Harvest Assumptions
DeSabla Regional Bundle
(Local Bundles 6, 7 & 8)

Aspen Environmental Group



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- FERC License Area
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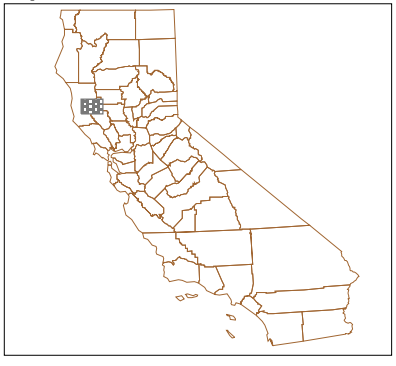
- Timber Harvest Project
- Both Baseline & Project
- Existing Timber Harvest Plans
- Projected Timber Harvest Plans

Map Location Reference



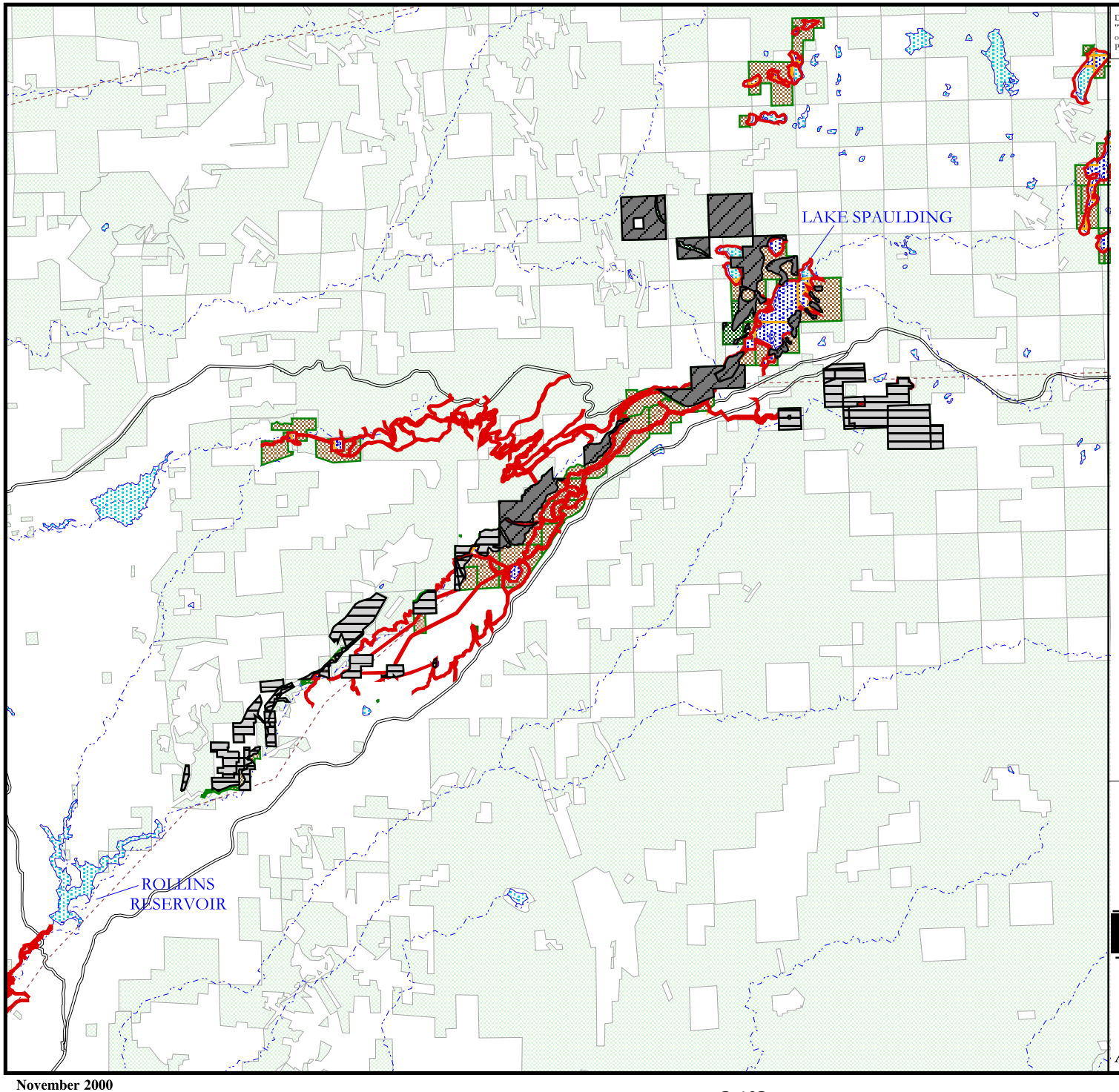
N

2 0 2 Miles

Hydrodivestiture EIR

Figure 3 -23
Timber Harvest Assumptions
Drum Regional Bundle
(Local Bundle 10)

Aspen Environmental Group



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- FERC License Area
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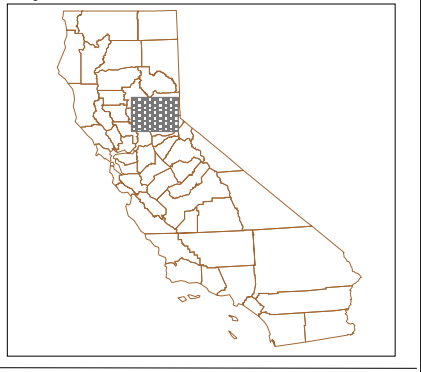
- Timber Harvest Project
- Both Baseline & Project
- Existing Timber Harvest Plans
- Projected Timber Harvest Plans

Map Location Reference



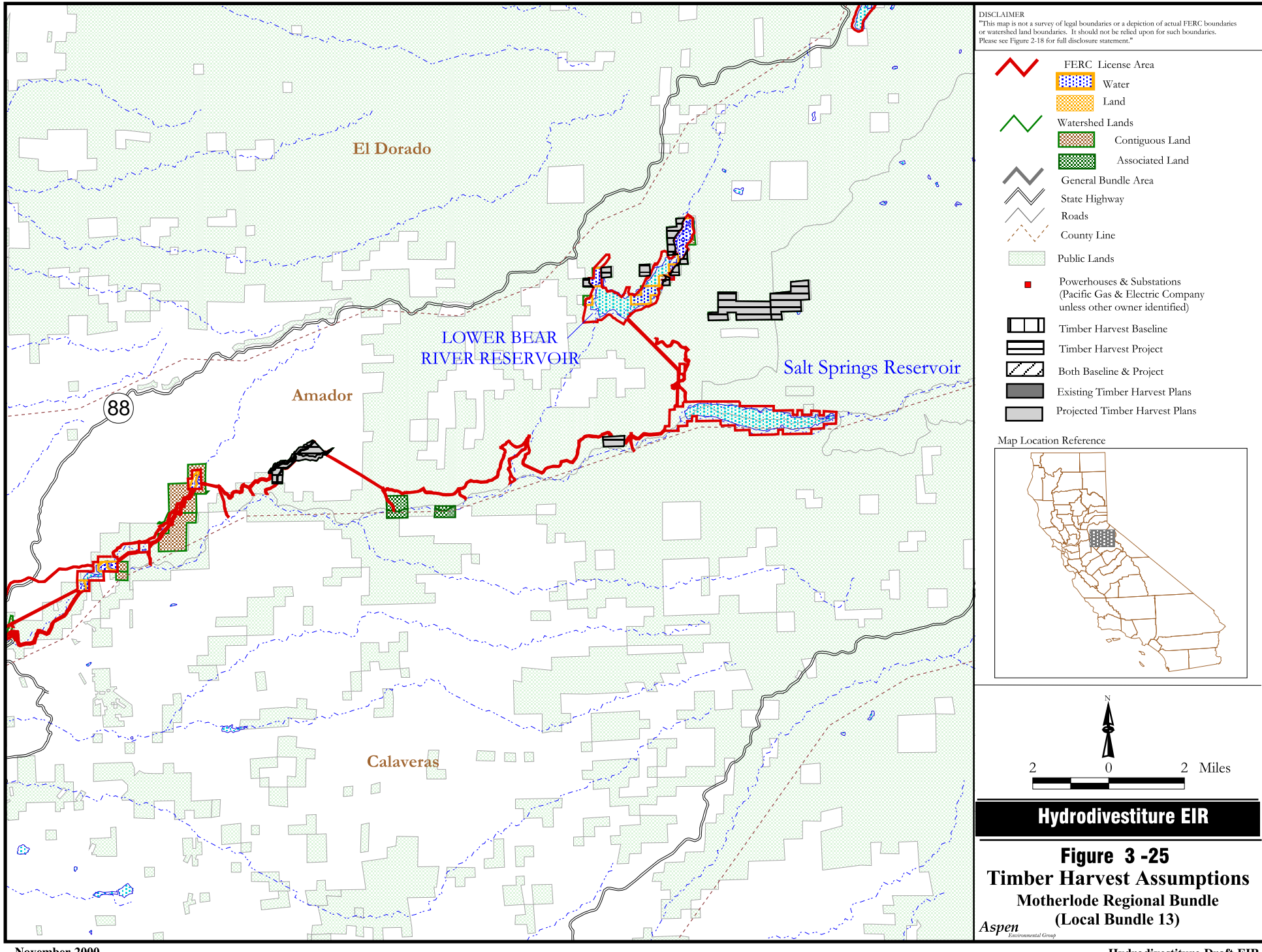
N

2 0 2 Miles

Hydrodivestiture EIR

Figure 3 -24
Timber Harvest Assumptions
Drum Regional Bundle
(Local Bundle 11)

Aspen Environmental Group


El Dorado
Amador
Calaveras
88
LOWER BEAR
RIVER RESERVOIR
Salt Springs Reservoir
DISCLAIMER
"This map is not a survey of legal boundaries or a depiction of actual FERC boundaries or watershed land boundaries. It should not be relied upon for such boundaries. Please see Figure 2-18 for full disclosure statement."
FERC License Area
Water
Land
Watershed Lands
Contiguous Land
Associated Land
General Bundle Area
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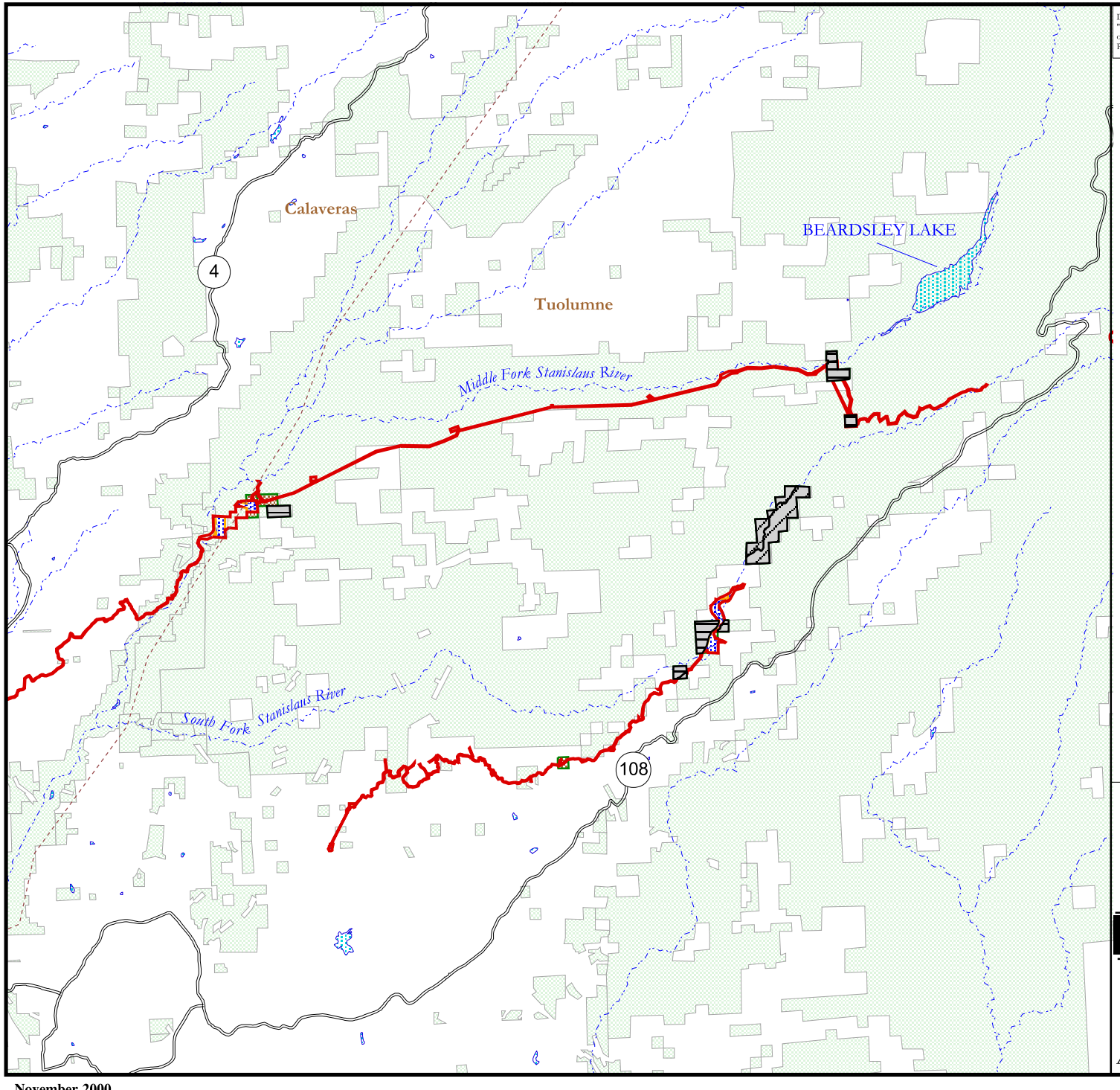
Roads
County Line
Public Lands
Powerhouses & Substations (Pacific Gas & Electric Company unless other owner identified)
Timber Harvest Baseline
Timber Harvest Project
Both Baseline & Project
Existing Timber Harvest Plans
Projected Timber Harvest Plans
Map Location Reference
N
2 0 2 Miles
Hydrodivestiture EIR
Figure 3 -25
Timber Harvest Assumptions
Motherlode Regional Bundle
(Local Bundle 13)
Aspen Environmental Group



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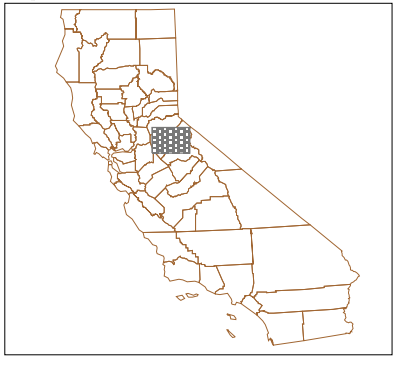
Map Location Reference



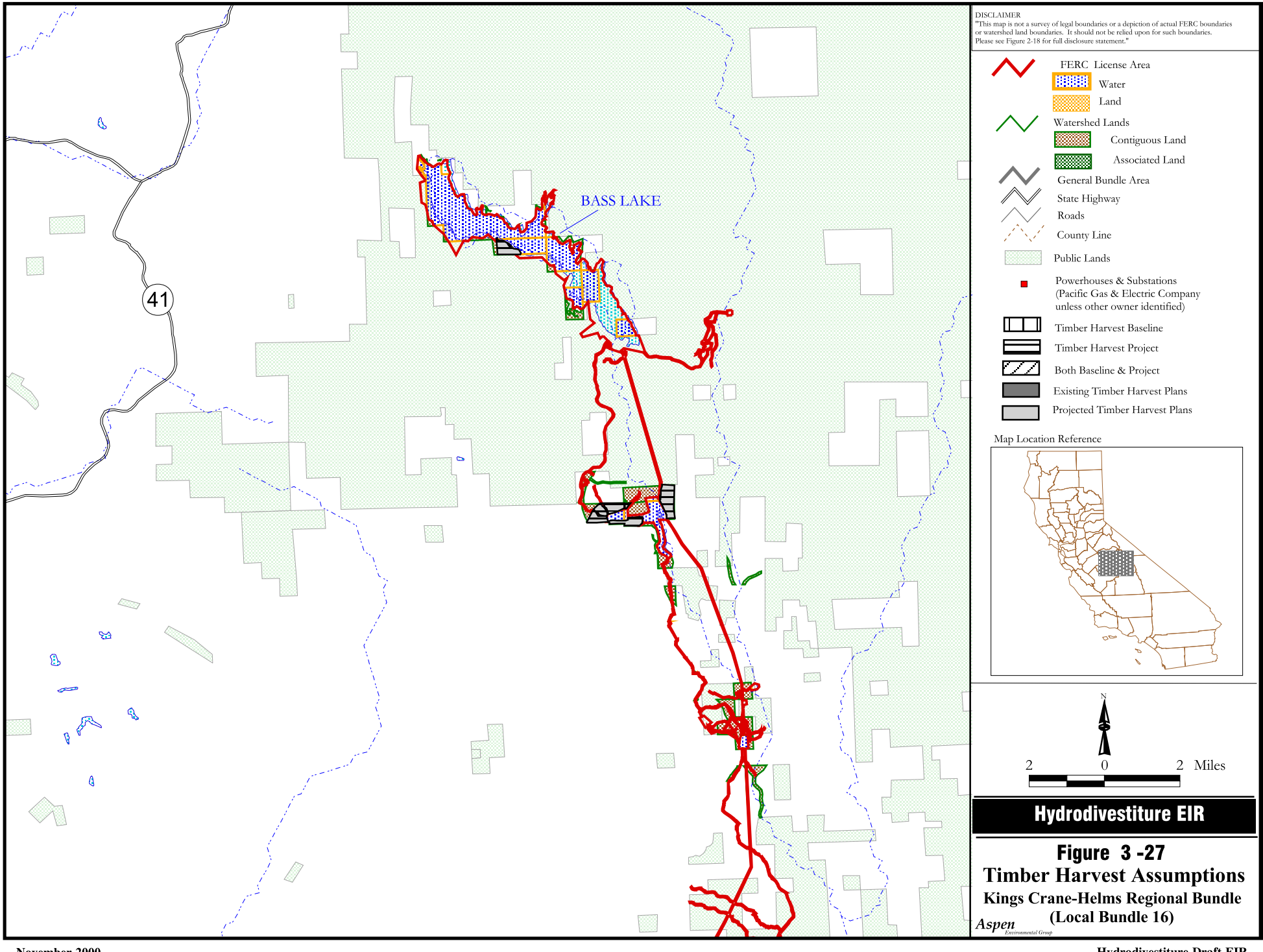
N

2 0 2 Miles

Hydrodivestiture EIR

Figure 3 -26
Timber Harvest Assumptions
Motherlode Regional Bundle (Local Bundle 14)

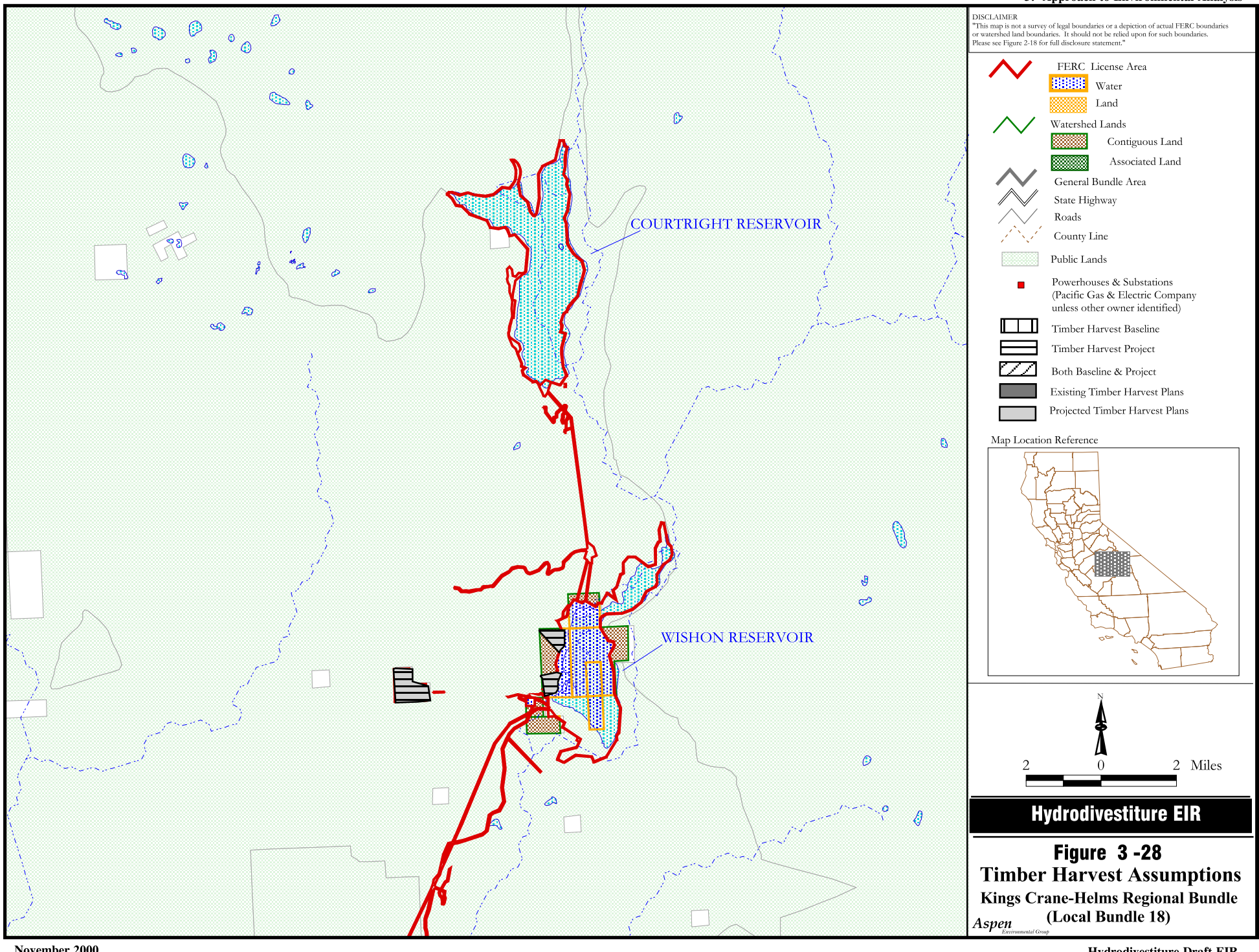
Aspen Environmental Group



Hydrodivestiture EIR

Figure 3 -27
Timber Harvest Assumptions
Kings Crane-Helms Regional Bundle (Local Bundle 16)

Aspen Environmental Group



Hydrodivestiture EIR

Figure 3 -28
Timber Harvest Assumptions
Kings Crane-Helms Regional Bundle (Local Bundle 18)

Aspen Environmental Group

3.10.4 FUTURE WATER RIGHTS AND CONTRACT CHANGES

As part of its hydroelectric system, Pacific Gas and Electric Company holds a number of consumptive water rights in excess of the water needed for hydroelectric generation. Typically, Pacific Gas and Electric Company acquired these rights along with certain hydroelectric facilities when it bought smaller systems during the 20th century. Pacific Gas and Electric Company's consumptive water rights are made up primarily of pre-1914 appropriative and riparian rights.

Appendix D details Pacific Gas and Electric Company's consumptive and non-consumptive water rights, as claimed by Pacific Gas and Electric Company[29]. Appendix D's water contracts table was prepared using information provided in the PEA by Pacific Gas and Electric Company, as well as information contained in records kept by the California State Water Resources Control Board. The table lists Pacific Gas and Electric Company's water rights associated with each FERC license, as well as those associated with the unlicensed facilities. Pacific Gas and Electric Company's consumptive water rights are those that show a use other than "P" (power) in the "Purpose of Use" column. Typical consumptive uses include "I" (irrigation), "D" (domestic), "M" (municipal), and "PS" (public service).

Insofar as its hydroelectric operations do not actually consume water, Pacific Gas and Electric Company has had little direct use for the consumptive water rights it owns, other than to provide incidental supplies to powerhouses, Pacific Gas and Electric Company camps, and employee cottages. As a result, Pacific Gas and Electric Company has allowed other parties to put the consumptive water rights to beneficial uses.

In addition, in some instances when Pacific Gas and Electric Company acquired its consumptive water rights, substantial amounts were already obligated by contract to be delivered to irrigation and domestic users within the originating watersheds. Pacific Gas and Electric Company also took on contractual or court-ordered obligations to make available for diversion by third parties specified flows from Pacific Gas and Electric Company's system.

For the most part, Pacific Gas and Electric Company continues to supply water to the various districts and individuals who have been putting it to use for the past several years. Pacific Gas and Electric Company also claims it has attempted to comply with Court-ordered flow or release

29 The validity of Pacific Gas And Electric Company's water rights claims, as well as the water rights claims of other persons diverting from within, or downstream of, the watersheds in which Pacific Gas And Electric Company operates, have not been evaluated. Such an analysis would require years of investigation, evidence gathering, and review, as well as substantial testimony by numerous parties. That review is neither authorized nor required for this environmental review under CEQA. Any dispute concerning Pacific Gas And Electric Company's water rights should be brought before the State Water Resources Control Board or in a court of competent jurisdiction. This EIR assumes that Pacific Gas And Electric Company's hydroelectric operations have been conducted in accordance with applicable State law governing use of water in California, as well as applicable Federal laws governing operation of hydroelectric facilities. Scoping comments for this project have not identified disputes regarding Pacific Gas and Electric Company's water rights claims.

obligations and has consistently extended or renewed water supply contracts with those persons or districts dependent upon Pacific Gas and Electric Company supplies.

Pacific Gas and Electric Company's water deliveries to third parties are typically made under the terms of written agreements with those parties. Pacific Gas and Electric Company's contracts and related obligations are summarized in Appendix D. Pacific Gas and Electric Company's contracts vary a great deal from one another, and represent the complicated nature of Pacific Gas and Electric Company's system. Some agreements, such as the Lodi Decree, rely on complicated criteria requiring Pacific Gas and Electric Company to make average monthly releases from its facilities on the Mokelumne River. Other agreements, such as the 1963 agreement with Nevada Irrigation District (NID), describe a detailed and complicated arrangement by which Pacific Gas and Electric Company and NID coordinate water storage and use operations to maximize both hydropower production and water supplies. Still other agreements represent fairly straight-forward contracts by which Pacific Gas and Electric Company sells and delivers water to third parties.

During the scoping process for this EIR, several agencies, districts, and individuals expressed concern regarding the possible effect of the project on Pacific Gas and Electric Company's contractual obligations to provide water supplies for consumptive uses. The comments focused on the ability of a new owner to terminate or modify the water supply agreements to the detriment of those persons dependent upon the water supply. Pacific Gas and Electric Company has responded that it will assign to the new owner(s) its existing contractual duties, thus ensuring continued deliveries under the terms of the agreements.

Assuming Pacific Gas and Electric Company can assign its contractual duties to supply water, the question remains whether the assignee (i.e., the new owners) could subsequently terminate the agreements, thereby having a negative effect on the persons or districts benefiting under such agreements.

Many of Pacific Gas and Electric Company's water supply contracts can be terminated only by mutual consent of the parties. In other words, both parties must agree to terminate the contract before it can be canceled — there is no unilateral termination. It is reasonable to assume that the obligations under these agreements will continue to be met after divestiture by whoever owns the associated Pacific Gas and Electric Company facility or bundle. Accordingly, for those contracts and agreements, there is expected to be no change as a result of the project. Similarly, court ordered flow or release obligations are also expected to be met in the future, as are water supply and flow release obligations that run with the applicable FERC licenses. In addition to the foregoing, there are several contracts that may be terminated on relatively short notice by Pacific Gas and Electric Company, and still others that are scheduled to terminate on specific dates and that may not be renewed by a new owner. Given the concerns expressed about new, profit-driven owners of Pacific Gas And Electric Company's facilities who might wish to maximize revenues and minimize expenses, it is these contracts that would be most vulnerable as a result of the project.

The categorization of the water supply contracts among these termination possibilities is indicated in the water contracts table in Appendix D.

For purposes of the environmental analysis and in order to bracket the range of project impacts, this EIR assumes that those contracts that can be terminated on relatively short notice (i.e., less than five months) may be terminated within the time frame shown on in Appendix D and shortly after the sale concludes. For the most part, contracts within this category are fairly small in terms of the quantities of water involved, and typically will affect individuals or small groups of users. Those persons could be forced to develop or use alternative water supplies to replace any water that may be lost as a result of the project.

With regard to those contracts having specific termination dates (i.e., the date the contract is scheduled to end), as indicated by the dates shown in the "Exp. Date" column in Appendix D, the EIR also makes the conservative assumption that those contracts may not be renewed. The environmental effects associated with the loss of available water supply to the entities that currently hold the contracts is explored in Chapter 4 of this EIR, particularly in Sections 4.8 Agriculture and 4.11 Public Services and Utilities. The potential growth-inducing effects of the consequent reallocation of water to entities that do not currently hold the rights to such water are discussed in Section of 5.1, Growth Inducing Effects.

3.10.5 FUTURE MINERAL EXTRACTION CHANGES

3.10.5.1 Introduction

The purpose of this discussion is to describe locations where a new owner could engage in mining activities. The potential for mineral extraction to occur as a result of change in ownership is based on a review of readily available published information, and consultation with county planners.

Articles within each FERC license generally address certain allowable land uses or changes in land use within the area subject to FERC jurisdiction. Mining is not specifically precluded nor allowed by the license articles. Nonetheless, any change in land use within the license boundary that would result in mining would require extensive environmental review, and would be subject to approval by FERC. Therefore, the potential for a new owner to engage in extractive mineral operations is assumed to be limited to lands not included in the FERC license, i.e., Pacific Gas and Electric Company-owned Watershed Lands.

3.10.5.2 Methodology

Sources of published information included completed mineral resource mapping and compilation of active mines data prepared by the California Division of Mines and Geology (CDMG) under the Surface Mining and Reclamation Act (SMARA), and extensive databases developed and maintained by the U.S. Geological Survey (Mineral Availability System and Mineral Resource Data System). This information was used to characterize locations where significant mineral resources have been

identified. For purposes of the analysis, mineral lands classified by the State Mining and Geology Board under SMARA as Mineral Resource Zone 2 (MRZ-2) were considered as having the greatest potential for extractive mining operations[30]. Proprietary information or unpublished technical studies were not considered. Where CDMG data was not available, mineral resource location data maintained by the U.S. Geological Survey was used to generally characterize potential resource locations within Project Lands. The readily available published information provides an adequate basis to identify, for purposes of this discussion, where mineral lands coincide with Project Lands.

County planners were contacted in conjunction with the development of land use assumptions to identify locations where, to the best of the planners knowledge, mining could occur on Project Lands. Adopted land use and zoning, personal knowledge of pending projects, and familiarity with local concerns identified by the planners and/or land use assumptions team were reviewed. Many planners noted that although mining is an allowable use on some project parcels, development other than mining would be more likely to occur. Further, in light of potential environmental effects associated with mining and the length of time necessary to prepare environmental documents, obtain necessary land use approvals, and secure permits, most locations were identified by planners as having low potential for mining.

It should be recognized that the presence of or potential for mineral deposits and whether such resources would be mined (regardless of location) is market-driven, must be economically viable, and is highly regulated through permitting, planning, and monitoring processes in local jurisdictions that implement applicable Federal and State regulations and standards. In many cases, the geographic location, topography, and access may be a limiting factor, regardless of the availability of the resource or the potential for mining based on historic practices. On the other hand, there is always the possibility that new deposits could be discovered in areas where exploration and mapping to date has not identified a significant resource.

Based on this information, it is assumed that there is low or no potential for mining on Watershed Lands in the following areas: Shasta (Bundles 3 and 4); DeSabla (all Bundles); Drum-Spaulding (all Bundles); Motherlode (Bundles 13 and 15); and Kings Crane-Helms (all Bundles). Therefore, Project Lands in those areas are excluded from further consideration.

There are a few permitted, active mines operated by private companies on lands leased from Pacific Gas and Electric Company or immediately adjacent to Pacific Gas and Electric Company lands. For purposes of developing these assumptions, it is assumed these mines would continue to operate such that there would be no change in existing conditions related to the privately-operated mining

30 The MRZ 2 classification adopted by the State Mining and Geology Board is defined as "an area where adequate information indicates that significant mineral deposits are present or where it is judged that a high likelihood exists for their presence. This zone shall be applied to known mineral deposits where well-developed lines of reasoning, based upon economic geologic principles and adequate data, demonstrate that the likelihood for occurrence of significant mineral deposits is high." The classification may be a factor in the discovery and development of mineral deposits that would tend to be economically beneficial to society.

operations. Increased mining activities on privately-owned lands or public lands adjacent to project lands are outside the scope of the EIR analysis and are not considered.

3.10.5.3 Mineral Development Assumptions

For purposes of the analysis in the EIR, based on the methodology summarized above, the potential for extractive mineral operations to occur is assumed to be limited to specific areas within the Shasta Regional Bundle and the Motherlode Regional Bundle. These areas and commodities are summarized below.

Shasta Region – Bundle 1 (Hat Creek) and Bundle 2 (Pit River)

The area in the vicinity of Lake Britton contains substantial deposits of diatomaceous earth, some of which have been classified as MRZ 2[31]. According to information developed by the CDMG, diatomite resources will continue to be in demand, due to projected population increases in Shasta County and the quality of mineral resources. The CDMG also notes that aggregate resources along the Pit River are an important resource because of the quality of the material. Active mines are present in these areas (CDMG Open-File Report 97-03, 1997). The Shasta County Zoning Code allows mining activities in the "TP" Timber Production District with a use permit. Mining is also a permitted use in *all* districts subject to a permit and special conditions (Shasta Zoning Code 17.88). Pacific Gas and Electric Company parcels between Pit 1 Powerhouse and Pit 3 Powerhouse and in the vicinity of Hat Creek 2 Powerhouse in Bundle 1 (Hat Creek) directly south of Bundle 2 are considered subject to potential mining activities.

Motherlode Region - Bundle 14 (Stanislaus River)

County planners have identified one parcel (APN 22-11-17, in Tuolumne County) where there is a potential for mining quartz.

3.11 OTHER RELATED PROJECTS

3.11.1 INTRODUCTION

The proposed project involves numerous streams and facilities covering a large portion of the Southern Cascades and the Sierra Nevada, and portions of the Central Valley and the north Coast Range. As such, there are numerous other projects under the authority of the CPUC and other local, regional, State and Federal agencies that could involve the same rivers, streams, reservoirs,

31 At the urging of Pacific Gas and Electric Company, Shasta County has postponed rezoning Lake Britton, a "geologically significant area" for mineral resource extraction, until the FERC relicensing process is complete. On April 16, 1999, Pacific Gas and Electric Company forwarded a letter to Mr. Bill Walker of the Shasta County Planning Department requesting that the County defer any action on establishing a Mineral Resource Overlay Zone for the Lake Britton area. Specifically, Pacific Gas and Electric Company requested deferral at least until Land Management Studies conducted through the relicensing process were complete (Pacific Gas and Electric Company, 1999).

and lands as the project. To the extent that these projects could affect the same environmental resources as the proposed project, they are discussed and their environmental consequences described in Section 5.4. Several of these other projects are particularly related to the project because they are proposals related to some of the same lands and/or hydroelectric facilities as are included in the project. As such, the discussion below provides information about these related projects and explains how they are addressed in this EIR.

3.11.2 PROJECTS BEFORE THE CPUC

Pacific Gas and Electric Company has applications pending before the CPUC related to the disposition of two specific holdings associated with the Pit 1 Bundle in the Shasta Regional Bundle.

The applications, described below, would affect lands that are considered as part of the project. These applications are separate from the project and, if they were approved prior to the proposed auction, would supercede the project. The McArthur Swamp and Burney Falls applications are considered in this EIR as cumulative projects, and thus are part of the evaluation presented in Section 5.4.

Notwithstanding the presence of these proposed actions, this EIR considers the full implications of the proposed project on the Pacific Gas and Electric Company-owned lands involved in the McArthur Swamp and Burney Falls applications. In all likely cases, the environmental impacts described for the proposed project related to these Pacific Gas and Electric Company assets are more environmentally deleterious than those that may be subsequently described in environmental documents associated with the specific applications described above.

3.11.2.1 McArthur Swamp

CPUC Application 00-05-029 is a joint application from Pacific Gas and Electric Company and the California Waterfowl Association. Under this proposal Pacific Gas and Electric Company would donate the McArthur Swamp property (approximately 7,400 acres of land and water) to the California Waterfowl Association for conservation and wetlands preservation purposes.

3.11.2.2 Burney Falls

CPUC Application 00-05-030 is a joint application of Pacific Gas and Electric Company, the California Waterfowl Association, and the California State Department of Parks and Recreation. Under this proposal, Pacific Gas and Electric Company would transfer the four-acre "Bowman Ditch," in the Pit 1 Bundle, and approximately 182 acres of the McArthur/Burney Falls State Park, in the Pit 3, 4 and 5 Bundle, to the Department of Parks and Recreation. In turn, the Department of Parks and Recreation would transfer to Pacific Gas and Electric Company approximately 544 acres of land located in Ahjumawi Lava Springs State Park. Pacific Gas and Electric Company would then transfer the land in Ahjumawi Lava Springs State Park to the California Waterfowl

Association. This latter action would only occur if the transfer of McArthur Swamp described above is also approved.

3.11.3 PROJECTS BEFORE THE FEDERAL ENERGY REGULATORY COMMISSION (FERC)

As is discussed above in this chapter, and elsewhere in this EIR, the FERC has regulatory authority over the operations of hydroelectric projects that come under its jurisdiction, including 26 of the 29 hydroelectric projects included in the Pacific Gas and Electric Company hydroelectric assets. In a number of cases, there are ongoing FERC relicensing procedures or other proposed changes to FERC licenses associated with portions of the proposed project. For the most part, those FERC proceedings are long-term efforts that are not specifically addressed in this EIR due to the speculative nature of their outcomes. However, there are several FERC proceedings which may have the potential to affect the operations of certain of the Pacific Gas and Electric Company hydroelectric assets in the relatively short-term. They are discussed below.

3.11.3.1 Potter Valley Project (FERC 0077)

The Potter Valley hydroelectric facilities are the key component of the Potter Valley Bundle. In late May 2000, the FERC published the Final Environmental Impact Statement (FEIS) for the *Proposed Changes in Minimum Flow Requirements at the Potter Valley Project (FERC Project No. 77-110)*. The FEIS examined the potential environmental effects of Pacific Gas and Electric Company's proposed increases in minimum flow requirements from the Potter Valley Project (PVP). The proposed changes were the result of a ten-year study of the effects of project operations on downstream fish resources; the study itself was a requirement of Article 39 of the PVP FERC license.

As of the date of publication of this Draft EIR, the FERC has not yet taken action on the proposed changes to the minimum flow requirements from the PVP. Further, the FERC has received substantial comments on the subject of minimum flows from the PVP, and the ultimate outcome of the FERC proceeding is unknown. As such, the analysis of the Potter Valley Bundle in this EIR is based on long-term implementation of the existing FERC license conditions, including minimum flow requirements. This approach is appropriate at this time and is inherently conservative in terms of the analysis of fisheries resources in the Eel River.

3.11.3.2 Mokelumne Project (FERC 0137)

The Mokelumne Project (FERC 0137) hydroelectric facilities are the key component of the Mokelumne Bundle. On July 21, 2000, the Mokelumne Relicensing Settlement Agreement was issued. The parties to the agreement include the FERC, Pacific Gas and Electric Company, the U.S. Forest Service, the U.S. Bureau of Land Management, the California Department of Fish and Game, the California Department of Boating and Waterways, the National Heritage Institute, American Whitewater, Friends of the River, and Foothill Conservancy.

The intent of the settlement agreement is to resolve streamflow issues for ecological and recreational purposes in support of the FERC issuing a new project license. Other issues to be addressed in the settlement agreement include operation of reservoirs, recreation access facilities, summertime power generation flows, adaptive management, and monitoring. Of particular note is that the settlement agreement would require the breaching of existing diversion dams on East and West Panther Creeks and Beaver Creek, and restoring the creeks to natural, unimpaired flows. As of the date of the publication of this Draft EIR, the FERC has not yet taken formal action or the proposed settlement agreement. As such, the analysis of the Mokelumne River Bundle in the EIR is based on long-term implementation of the existing FERC license conditions, including those for the Mokelumne River facilities. This approach is appropriate at this time and is inherently conservative in terms of the analysis of environmental resources in the Mokelumne River.

3.11.3.3 Rock Creek-Cresta Project (FERC 1962)

The Rock Creek-Cresta hydroelectric facilities are part of the Feather River Bundle. On September 18, 2000, a draft Relicensing Settlement Agreement for the Rock Creek-Cresta Project (FERC Project 1962) was issued. The parties to the agreement included the FERC, Pacific Gas and Electric Company, the U.S. Forest Service, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, the California State Water Resources Control Board, the Natural Heritage Institute, American Whitewater, Friends of the River, Plumas County, California Outdoors, California Trout, Chico Paddleheads, and Shasta Paddlers.

The intent of the Settlement is to resolve streamflow issues for ecological purposes and river-based recreational use and other issues in support of the FERC issuing a new project license. As of the date of publication of this Draft EIR, the FERC has not yet taken formal action on the proposed Settlement Agreement. Further, several additional key parties have indicated disagreement with key elements of the Settlement Agreement. As such, the analysis of the Feather River Bundle in this Draft EIR is based on long-term implementation of the existing FERC license conditions, including those for the Rock Creek-Cresta facilities. This approach is appropriate at this time and is inherently conservative in terms of the analysis of environmental resources in the Feather River.