

**DRAFT ECONOMIC ANALYSIS OF
CRITICAL HABITAT DESIGNATION
FOR THE FISH SLOUGH MILK-VETCH**

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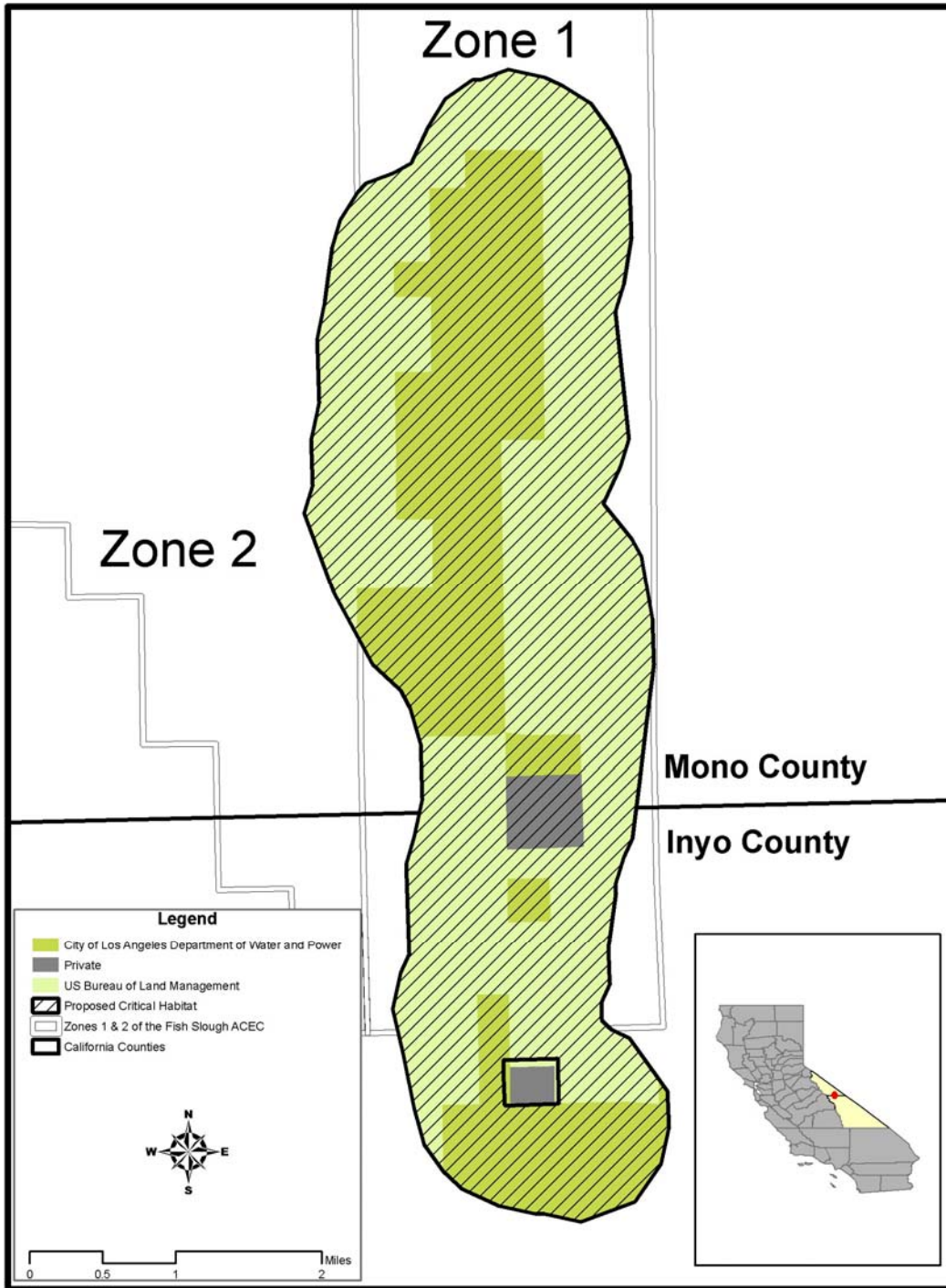
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EXECUTIVE SUMMARY

1. The purpose of this report is to assess the potential economic impacts associated with the designation of critical habitat for the Fish Slough milk-vetch (FSMV) (*Astragalus lentiginosus var. piscinensis*). This report was prepared by Industrial Economics, Incorporated for the U.S. Fish and Wildlife Service (Service).
2. The FSMV is a prostrate perennial plant belonging to the pea family. The entire known range of the species is restricted to a 6-mile long area of alkaline habitat that parallels Fish Slough, a unique wetland oasis surrounded by desert located on the border of Inyo and Mono Counties, California (see Exhibit ES-1). Fish Slough is situated in the northern end of the Owens Valley, along the eastern edge of the Sierra Nevada Mountains in central California, and is approximately eight miles north of the City of Bishop. The slough is characterized by a lake created by three natural springs flowing to the surface and surrounding vegetation. The FSMV occurs within an area designated as an Area of Critical Environmental Concern (ACEC) by the Bureau of Land Management (BLM). The ACEC was designated to protect a variety of biological and cultural resources.
3. As illustrated in Exhibit ES-1, the Service has proposed to designate one unit of critical habitat for FSMV. The proposed unit encompasses 8,490 acres (3,435 hectares) of land located within or adjacent to Fish Slough. The proposed critical habitat lands contain all known occurrences of FSMV, alkaline habitat occupied by the plant, and upland areas that provide cover sites for insect pollinators or require special management to control non-native plant species. The proposed unit also includes some, but not all, of the hydrologic features the Service believes are necessary to promote the persistence and successful recruitment of FSMV.
4. Approximately 64 percent of the proposed critical habitat unit occurs on Federal lands managed by the BLM. The Los Angeles Department of Water and Power (LADWP) owns 34 percent of the proposed critical habitat designation (CHD). The remaining two percent is owned by the California Department of Fish and Game (CDFG). No privately held lands have been included in the proposed CHD.

EXHIBIT ES-1: PROPOSED CRITICAL HABITAT FOR THE FSMV



5. Section 4(b)(2) of the Endangered Species Act (Act) requires the Service to designate critical habitat on the basis of the best scientific data available, after taking into consideration the economic impact, and any other relevant impact, of specifying any particular area as critical habitat. The Service may exclude areas from critical habitat designation when the benefits of exclusion outweigh the benefits of including the areas within critical habitat, provided the exclusion will not result in extinction of the species.

Results of the Analysis

6. This analysis focuses on the following activities as potentially impacted by conservation considerations for the FSMV:
- Agricultural production;
 - Livestock grazing;
 - Recreation;
 - Commercial mining;
 - Groundwater exportation; and
 - Resource management activities in the ACEC where the FSMV occurs.
7. This analysis captures both "pre-designation" (occurring from the time of FSMV listing to final designation of critical habitat) and "post-designation" (forecast to occur from 2005 to 2025) economic impacts to these activities. Exhibit ES-2 summarizes the quantitative results of this analysis. Estimated pre-designation costs range from \$749,000 to \$808,000 dollars (1998-2004). Total post-designation costs are approximately \$946,000 to \$978,000 (or \$501,000 to \$518,000 in present value terms and \$47,300 to \$48,900 on an annualized basis over the 20-year post-designation analysis period).

EXHIBIT ES-2: SUMMARY OF ECONOMIC IMPACTS ASSOCIATED WITH CONSERVATION MEASURES FOR THE FSMV

Cost Type	Estimated Cost
<i>Total Pre-designation costs (1998-2004)</i>	<i>\$749,000 - \$808,000</i>
<i>Total Post-designation costs (2005-2025)</i>	<i>\$946,000 - \$978,000</i>
Present Value (7% Discount Rate)	\$501,000 - \$518,000
Present Value (3% Discount Rate)	\$704,000 - \$728,000
Annualized	\$47,300 - \$48,900

8. Total estimated pre-designation costs, including costs incurred between the time of listing in 1998 through the final CHD for the FSMV in June 2005, are **\$749,000 to \$808,000**. The majority of these costs, 62 percent, are associated with resource management efforts within the Fish Slough ACEC, including modifications of impoundments and fish barriers, prescribed burning, invasive plant species control, and enforcement of off-highway vehicle (OHV) restrictions. Modifications to impoundments and fish barriers are anticipated to result in a total of three section 7 consultations, one

each regarding projects at Northwest Spring, BLM Spring, and Northeast Spring. Another 29 percent of the total pre-designation costs are associated with review and reporting on a groundwater exportation project within the Tri-Valley region.

9. Total estimated post-designation costs are anticipated to be approximately **\$946,000 to \$978,000 during the 20-year period between 2005 and 2025** (\$501,000 to \$518,000 in present value terms applying a discount rate of seven percent, or \$47,300 to \$48,900 on an annualized basis).¹ The following components comprise post-designation costs:

- Direct annual costs of species and habitat conservation activities (\$41,000 per year, primarily borne by BLM);
- Direct annual costs of monitoring and reporting on the status of potential groundwater impacts associated with mining activities (\$4,000 to \$5,600 per year);
- Direct costs of cattle enclosure maintenance and construction (\$500 per year, borne by LADWP);
- Indirect costs of reducing grazing opportunities (\$1,780 per year, borne by private ranchers); and
- Direct costs of signage for OHV routes of travel (\$500 per year, borne by BLM).

10. The Federal agencies that fund, authorize, or carry out activities within or affecting the proposed CHD for the FSMV, such as the BLM and U.S. Army Corps of Engineers (USACE), do not currently foresee initiating section 7 consultation regarding the FSMV in the 20 years post designation of critical habitat. The three consultations concerning modifications to impoundments and fish barriers are expected to occur before the final designation of critical habitat in 2005. All post-designation costs are direct costs of projects intended to benefit the FSMV, project modifications undertaken independently (that is, not a result of section 7 consultation), and indirect costs of project modifications (e.g., reduced grazing opportunities). Previous to these projects the Service has not engaged in formal section 7 consultation regarding the FSMV.² As an ACEC, Fish Slough is afforded substantial conservation measures through the standard resource management activities of the land management agencies. As a result, the major land use activities affecting the FSMV are conducted specifically for the benefit of the species and habitat. In fact, 83 percent of the forecast post-designation costs associated

¹ Present value terms are often used to compare economic costs incurred in different time periods. A “discount rate” is used to bring a series of future cash flows to their present value in order to state them in today's dollars. That is, the present value is the sum of a series of future cash flows expressed in today's dollars.

² Personal communication with USFWS, Ventura Field Office, March 2, 2004.

with FSMV protection stems from the implementation of projects specifically intended to benefit the species and habitat (prescribed burns, control of invasive plant species, plant propagation and out planting, and public outreach). Of the remaining 17 percent of post-designation costs, approximately 11 percent is for groundwater monitoring and reporting associated with mining activities, five percent is associated with exclusion of cattle grazing activity on 80 acres of land within the proposed CHD, and one percent is associated with signage of open routes for OHV use.

11. The BLM, as the primary landowner and land manager of the Fish Slough ACEC, is anticipated to bear the vast majority of future costs associated with FSMV protection (78 percent). This is due primarily to the resource management activities that the agency carries out, including habitat restoration activities, enforcement of OHV recreation guidelines, prescribed burns, public outreach, etc. LADWP is expected to bear approximately six percent of the total post-designation costs associated with excluding grazing activities within an 80-acre enclosure constructed for the protection of the FSMV and control of non-native species on its lands. Further, CDFG is expected to continue to bear costs (approximately one percent of post-designation costs) in order to control invasive non-native plant species that may adversely affect the FSMV. Approximately 15 percent of future costs may be borne by private parties, 11 percent by the Desert Aggregates mining company for groundwater monitoring and reporting, and four percent by grazing leaseholders as a result of the LADPW precluding grazing activities on 80 acres of FSMV habitat.

12. Where the information is available, it is best to present results of the economic analysis in the smallest geographical scale possible to inform the Service of the impacts of designating particular land parcels. In the case of the FSMV CHD, however, economic impacts are not separable on a sub-unit level for the following reasons:

- The Service has proposed critical habitat for the FSMV in a single parcel, or “unit.”
- The majority, 61 percent, of the pre-designation economic impacts associated with conservation of the FSMV is a result of reviewing and modifying activities that may affect the water table within Fish Slough (e.g., commercial mining, groundwater exportation, modifications of impoundments). Aside from the modifications to impoundments, these activities occur outside of the proposed designation. As a result, even if the boundaries of the proposed CHD were reduced, the impact of the activities on Fish Slough would still require review and potential modification and therefore anticipated economic impact to the activity would be the same. That is, reduction in the size of CHD would not reduce the costs related to FSMV consideration associated with these activities.
- The majority, 83 percent of post-designation economic impacts are engendered by Fish Slough ACEC resource management activities. These

activities (e.g., prescribed burns, invasive plant species control, public outreach, etc.) are conducted throughout the entire ACEC, including the lands proposed for critical habitat. Because they occur throughout the entire proposed CHD, the costs of these activities are not attributable to one particular geographic area by land ownership or otherwise.

13. The primary uncertainty in this economic analysis results from the lack of a definitive hydrological model of the Fish Slough system. The presence of water is essential for the development and perpetuation of the alkaline soils and habitat upon which the FSMV depends. It is unclear where water withdrawals for irrigation or municipal purposes outside of the CHD may drawdown the water table or reduce spring discharge within Fish Slough. As a result, the Service is not able to review these activities to determine how they may need to be modified to reduce their effect on the FSMV and habitat. This analysis therefore does not expect predict costs by farmers associated with modifications to water-intensive agricultural activities that occur outside of the CHD boundary because specific water diversion activities that may adversely affect the FSMV or habitat can not be identified at this time.

14. The purpose of this analysis is to estimate the economic impact of actions taken to protect the Federally listed Fish Slough milk-vetch (*Astragalus lentiginosus piscinensis*) (FSMV) and its habitat. It quantifies the economic effects of the designation of critical habitat, as well as any protective measures taken as a result of the listing or other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation. Costs are examined that, (a) have been incurred since the date of the species' listing and through the time of final designation of critical habitat, "pre-designation costs," and (b) are forecast to occur after the critical habitat designation is finalized, "post-designation costs."
15. This information is intended to assist the Secretary in determining whether the benefits of excluding particular areas from the designation outweigh the benefits of including those areas.³ In addition, this information allows the Service to address the requirements of Executive Orders 12866 and 13211, and the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA).⁴ The small business analysis is included in Appendix A of this report. This report also complies with direction from the U.S. 10th Circuit Court of Appeals that "co-extensive" effects should be included in the economic analysis to inform decision-makers regarding which areas to designate as critical habitat.⁵
16. This section provides the framework for this analysis. First, it describes the general analytic approach to estimating economic effects, including discussion of both efficiency and distributional effects. Next, it discusses the scope of the analysis, including the link between existing and critical habitat-related protection efforts and economic impacts. Finally, it describes the information sources that were used to conduct this economic this analysis.

³ 16 U.S.C. §1533(b)(2).

⁴ Executive Order 12866, "Regulatory Planning and Review," September 30, 1993; Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," May 18, 2001; 5 U.S.C. §§601 *et seq*; and Pub Law No. 104-121.

⁵ In 2001, the U.S. 10th Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed CHD, regardless of whether those impacts are attributable co-extensively to other causes (*New Mexico Cattle Growers Ass'n v. U.S.F.W.S.*, 248 F.3d 1277 (10th Cir. 2001)).

1.1 Approach to Estimating Economic Effects

17. This economic analysis considers both the economic efficiency and distributional effects that may result from species and habitat protection. Economic efficiency effects generally reflect “opportunity costs” associated with the commitment of resources required to accomplish species and habitat conservation. For example, if activities on private lands are constrained as a result of the critical habitat designation (CHD) or the presence of the species, and thus the market value of the land is reduced, the reduction in value represents one measure of opportunity cost, or change in economic efficiency. Similarly, costs incurred by a Federal action agency to consult with the Service under section 7 represent opportunity costs of habitat conservation as resources dedicated to the consultation effort may be allocated to other agency pursuits absent the FSMV concerns.
18. This analysis also addresses the distribution of economic impacts associated with the designation, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation activities on small entities and the energy industry (Appendix A). This information may be used by decision-makers to assess whether the effects of the designation unduly burden a particular group or economic sector. For example, while habitat conservation activities may have a relatively small impact when measured in terms of changes in national economic efficiency, individuals employed in a particular sector of the economy in the geographic area of the designation may experience greater impacts. The difference between economic efficiency effects and distributional effects, as well as their application in this analysis, are discussed in greater detail below.

1.1.1 Efficiency Effects

19. At the guidance of the Office of Management and Budget (OMB) and in compliance with Executive Order 12866 “Regulatory Planning and Review,” Federal agencies measure changes in economic efficiency in order to discern the implications on a societal level of a regulatory action.⁶ For regulations specific to the conservation of the FSMV, efficiency effects represent the opportunity cost of resources used or benefits foregone by society as a result of the regulations. Economists generally characterize opportunity costs in terms of changes in producer and consumer surpluses in affected markets.⁷

⁶ Executive Order 12866, “Regulatory Planning and Review,” September 30, 1993; U.S. Office of Management and Budget, “Circular A-4,” September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

⁷ For additional information on the definition of “surplus” and an explanation of consumer and producer surplus in the context of regulatory analysis, see Gramlich, Edward M., *A Guide to Benefit-Cost Analysis (2nd Ed.)*, Prospect Heights, Illinois: Waveland Press, Inc., 1990; and U.S. 240-R-00-003, September 2000, available at <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html>.

20. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a landowner or manager may enter into a consultation with the Service to ensure that a particular activity will not adversely affect critical habitat. The effort required for the consultation represents an economic opportunity cost, because the landowner or manager's time and effort may have been spent in an alternative activity had his or her land not been included in the designated critical habitat. In the case that compliance activity is not expected to significantly affect markets – that is, not result in a shift in the quantity of a good or service provided at a given price, or in the quantity of a good or service demanded given a change in price – the measurement of compliance costs provides a reasonable estimate of the change in economic efficiency.
21. Where habitat protection measures are expected to significantly impact a market, it may be necessary to estimate changes in producer and consumer surpluses. For example, a designation that restricts the agricultural productivity of large areas of land may shift the price and quantity of those agricultural products region-wide. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the agriculture market.
22. This analysis measures costs associated with measures taken to protect the FSMV and habitat. As noted above, in some cases, compliance costs provide a reasonable estimate of changes in economic efficiency. As the analysis of FSMV conservation efforts is not anticipated to significantly alter markets, this analysis does not engage an analysis of surplus changes in potentially affected markets, but instead relies on an analysis of total compliance costs.
23. Where data are available, the analysis attempts to capture the *net* economic impact imposed on regulated entities and the regional economy of FSMV conservation actions.⁸ That is, the economic impact of FSMV conservation to the land management agencies and regulated community net of any direct off-setting benefit they experience. For example, the fencing in of FSMV plants for protection from direct impacts of cattle grazing on LADWP lands precludes the use of the land for grazing but may also reduce the amount of time and funding that the LADWP would otherwise require to monitor the effects of grazing on the plants.

1.1.2 Distributional and Regional Economic Effects

24. Measurements of changes in economic efficiency focus on the net impact of conservation activities, without consideration of how certain economic sectors or groups of people are affected. Thus, a discussion of efficiency effects alone may disregard distributional effects. OMB encourages Federal agencies to consider distributional

⁸ The regional economy as analyzed for the FSMV CHD includes the economies of Inyo and Mono Counties, California, which contain the proposed lands, as described in Section 3.1 of this report.

effects separately from efficiency effects.⁹ This analysis considers several types of distributional effects, including impacts on small entities; impacts on energy supply, distribution, and use; and regional economic impacts. It is important to note that these are fundamentally different measures of economic impact than efficiency effects, and thus cannot be added to or compared with estimates of changes in economic efficiency.

Impacts on Small Entities and Energy Supply, Distribution, and Use

25. Appendix A of this analysis considers how small entities, including small businesses, organizations, and governments, as defined by the RFA, may be affected by proposed critical habitat designation (CHD).¹⁰ In addition, in response to Executive Order 13211 “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,” Appendix A of this analysis also considers the impacts of critical habitat on the energy industry and its customers.¹¹

Regional Economic Effects

26. Regional economic impact analysis can provide an assessment of the potential localized effects of conservation measures. Specifically, regional economic impact analysis produces a quantitative estimate of the potential magnitude of the initial change in the regional economy resulting from a regulatory action. Regional economic impacts are commonly measured using input/output models. These models rely on multipliers that represent the relationship between a change in one sector of the economy (e.g., expenditures by recreationists) and the effect of that change on economic output, income, or employment in other local industries (e.g., suppliers of goods and services to recreationists). These economic data provide a quantitative estimate of the magnitude of shifts of jobs and revenues in the local economy.
27. The use of regional input/output models in an analysis of the impacts of species and habitat conservation efforts may overstate the long-term impacts of a regulatory change. These models provide a static view of the economy of a region. That is, they measure the initial impact of a regulatory change on an economy but do not consider long-term adjustments that the economy will make in response to this change. For example, these models provide estimates of the number of jobs lost as a result of a regulatory change, but do not consider re-employment of these individuals over time or other adaptive responses by impacted businesses. In addition, the flow of goods and

⁹ U.S. Office of Management and Budget, “Circular A-4,” September 17, 2003, available at <http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf>.

¹⁰ 5 U.S.C. § 601 *et seq.*

¹¹ Executive Order 13211, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,” May 18, 2001.

services across the regional boundaries defined in the model may change as a result of the regulation.

28. Despite these and other limitations, in certain circumstances regional economic impact analysis may provide useful information about the scale and scope of localized impacts. It is important to remember that measures of regional economic effects generally reflect shifts in resource use rather than efficiency losses. Thus, these types of distributional effects are reported separately from efficiency effects (i.e., not summed). In addition, measures of regional economic impact cannot be compared with estimates of efficiency effects, but should be considered as distinct measures of impact. As implementation of conservation measures for the FSMV is not anticipated to result in broader regional economic impacts, this analysis does not employ a regional impact analysis.

1.2 Scope of the Analysis

29. This analysis attempts to quantify economic effects CHD *as well the economic effects of the protective measures taken as a result of the listing of the FSMV or other Federal, State, and local laws that also aid habitat conservation in the areas proposed for designation*. Because habitat protection efforts affording protection to the FSMV likely contribute to the efficacy of the proposed CHD efforts, the impacts of these actions may be considered relevant for understanding the full impact of proposed designation.

1.2.1 Sections of the Act Relevant to Analysis of Critical Habitat Designation

30. The economic analysis focuses on activities that are influenced by the Service through sections 4, 7, 9, and 10 of the Act. Section 4 of the Act focuses on the listing and recovery of endangered and threatened species, as well as CHD. According to section 4, the Secretary is required to list species as endangered or threatened “solely on the basis of the best available scientific and commercial data.”¹²
31. The protections afforded to threatened and endangered species and their habitat are described in sections 7, 9, and 10 of the Act, and economic impacts resulting from these protections are the focus of this analysis:
- Section 7 of the Act requires Federal agencies to consult with the Service to ensure that any action authorized, funded, or carried out will not likely jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the species’ designated critical habitat. The administrative costs of these consultations, along with the costs of project modifications resulting from these consultations, represent compliance costs associated with the listing of the species and the designation of critical habitat.

¹² 16 U.S.C. 1533.

- Section 9 defines the actions that are prohibited by the Act. In particular, it prohibits the “take” of endangered wildlife, where “take” means to “harass, harm, pursue, or collect, or to attempt to engage in any such conduct.”¹³ The economic impacts associated with this section are manifested in sections 7 and 10. While incidental take permits are not issued for plant species such as the FSMV, the Service is obligated to ensure that proposed activities adequately minimize impact to the species.
- Under section 10(a)(1)(B) of the Act, an entity (i.e., a landowner or local government) may develop a Habitat Conservation Plan (HCP) for a listed animal species in order to meet the conditions for issuance of an incidental take permit in connection with the development and management of a property.¹⁴ The requirements posed by the HCP may have economic impacts associated with the goal of ensuring that the effects of incidental take are adequately minimized and mitigated. The designation of critical habitat does not require completion of an HCP; however, the designation may influence conservation measures provided under HCPs.

No HCPs have been developed that include the FSMV, and none are forecast in this analysis. The majority of land proposed for CHD is Federally managed. Federal agencies are not typically the sole stakeholder involved with development of an HCP. Federal agencies, however, can be the lead agency on a multi-jurisdictional HCP. Further, while HCPs are not developed solely for plant species, if listed plants occur in the area subject to the HCP the Service must consider whether the proposed activities may adversely affect or jeopardize the continued existence of the plant species. In the case of the FSMV, the species may be included in an HCP developed for the listed fish species within FSMV critical habitat; however, no such HCPs are currently proposed.

1.2.2 Other Relevant Protection Efforts

32. The protections afforded to listed species and habitat is not limited to the Act. That is, there are other legal and regulatory restrictions that may protect habitat in the absence of the Act. Other Federal agencies, as well as State and local governments, may

¹³ 16 U.S.C. 1538 and 16 U.S.C. 1532.

¹⁴ U.S. Fish and Wildlife Service, “Endangered Species and Habitat Conservation Planning.” From: <http://endangered.fws.gov/hcp/>, as viewed on August 6, 2002. While HCPs are not typically developed specifically for listed plant species, an HCP may include listed or non-listed plant species that may be affected by the project subject to the HCP.

seek to protect the natural resources under their jurisdiction.¹⁵ In addition, under certain circumstances, the designation of critical habitat may provide new information about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these costs may not have been triggered absent the designation of critical habitat, they are included in this economic analysis. In this regard, the analysis considers the extent to which the FSMV designation might trigger the completion of an environmental impact report (EIR) under the California Environmental Quality Act (CEQA).

33. CEQA is a California State statute that requires State and local agencies (known here as “lead agencies”) to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. Projects carried out by Federal agencies are not subject to CEQA provisions. CEQA regulations require a lead agency to initially presume that a project will result in a potentially significant adverse environmental impact and to prepare an EIR if the project may produce certain types of impacts, including when:

“[t]he project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory.”¹⁶

34. State law instructs the lead agency (typically a county or city community development or planning department in the case of land development projects) to examine impacts from a very broad perspective, taking into account the value of animal and plant habitats to be modified by the project. The lead agency must determine which, if any, project impacts are potentially significant and, for any such impacts identified, whether feasible mitigation measures or feasible alternatives will reduce the impacts to a level less than significant. It is within the power of a lead agency to decide that negative impacts are acceptable in light of economic, social, or other benefits generated by the project.

35. Critical habitat for the FSMV is not likely to trigger the requirements of CEQA as the habitat is primarily on Federal lands managed by the BLM, and Federal agencies are not subject to CEQA provisions. Further, the majority of proposed CHD lands fall within

¹⁵ For example, the Sikes Act Improvement Act (Sikes Act) of 1997 requires Department of Defense (DoD) military installations to develop Integrated Natural Resources Management Plans (INRMPs) that provide for the conservation, protection, and management of wildlife resources (16 U.S.C. §§ 670a - 670o). These plans must integrate natural resource management with the other activities, such as training exercises, taking place at the facility. The Bureau of Land Management (BLM) may designate

¹⁶ California Natural Resources Code §15065(a).

the Fish Slough ACEC. As such, State and local agencies are already informed of the ecological importance of the area and thus the designation is unlikely to provide new information on the ecological sensitivity of the region. The CHD for the FSMV is accordingly not anticipated to trigger any additional compliance requirements with State and local laws.

36. Staff from the BLM, LADWP, and CDFG have been working in a collaborative informal manner since the 1990s to develop and implement strategies that are designed to protect listed and endemic species in the Fish Slough ACEC. These strategies have not, however, been described in a comprehensive manner within an existing planning document.¹⁷

1.2.3 Additional Analytic Considerations

37. Previous economic impact analyses prepared to support critical habitat decisions have considered other types of economic impacts related to section 7 consultations, including time delay, regulatory uncertainty, and stigma impacts. This analysis considers these economic impacts and has determined that the FSMV proposed CHD is unlikely to have significant economic impacts of this nature.

1.2.4 Benefits

38. The published economics literature has documented that real social welfare benefits can result from the conservation and recovery of endangered and threatened species. Such benefits have also been ascribed to preservation of open space and biodiversity, both of which are associated with species conservation, but are not the purpose of critical habitat. Likewise, regional economies and communities can benefit from the preservation of healthy populations of endangered and threatened species, and the habitat on which these species depend.
39. In Executive Order 12866, OMB directs Federal agencies to provide an assessment of costs and benefits of a proposed regulatory action.¹⁸ However, in its guidance for implementing Executive Order 12866, OMB acknowledges that often, it may not be feasible to monetize, or even quantify, the benefits of environmental regulations.¹⁹ Where benefits cannot be quantified, OMB directs agencies to describe the benefits of a proposed regulation qualitatively. *Given the limitations associated with*

¹⁷ Written communication with U.S. Fish and Wildlife Service, Ventura Field Office, September 20, 2004.

¹⁸ Executive Order 12866, "Regulatory Planning and Review," September 30, 1993.

¹⁹ U.S. Office of Management and Budget, "Draft 2003 Report to Congress on the Costs and Benefits of Federal Regulations; Notice," 68 *Federal Register* 5492, February 3, 2003; and U.S. Office of Management and Budget, "Appendix 4: Guidelines to Standardize Measure of Costs and Benefits and the Format of Accounting Statements," in *Report to Congress on the Costs and Benefits of Federal Regulations*, March 22, 2000.

estimating the benefits of proposed CHD for the FSMV, the Service believes that the benefits of proposed CHD are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking. This discussion can be found in the preamble to the final rulemaking.

1.3 Analytic Time Frame

40. This analysis examines activities taking place both within and adjacent to the proposed CHD. Estimates of post-designation impacts are based on activities that are "reasonably foreseeable," including, but not limited to, activities that are currently authorized, permitted, or funded, or for which proposed plans are currently available to the public. The analysis estimates economic impacts to activities from 1998 (year of species' final listing) to 2025 (20 years from the date of final CHD). Estimated impacts are divided into pre-designation (1998-2005) and post-designation (2005-2025) impacts. The use of the lands proposed for CHD is not expected to substantially change over this time period.

1.4 Information Sources

41. The primary sources of information for this report were communications with and data provided the Service, BLM, the Los Angeles Department of Water and Power, and the California Department of Fish and Game and other regional governments, agencies, and organizations. Specifically, the analysis relies on data collected in communication with personnel from the following entities:

- U.S. Fish and Wildlife Service;
- U.S. Bureau of Land Management;
- U.S. Army Corps of Engineers;
- Los Angeles Department of Water and Power;
- Mono County Community Development Department;
- Inyo-Mono County Farm Bureau;
- California Department of Fish and Game;
- Tri-Valley Groundwater Management District; and
- California Farm Bureau Federation.

42. This analysis also relies upon publicly available documents including the BLM Bishop Resource Management Plan (April 1993), the Draft Environmental Impact Report for the Five Bridges Aggregate Pit Expansion Project (April 2004), and U.S. Filter Data Collection Report for Export of Surplus Water Report (MHA Environmental Consulting, Inc., March 2001). Publicly available data were also used to augment the economic analysis. Please refer to the reference section at the end of this document for a full list of information sources.

43. On June 4, 2004, the Service proposed to designate critical habitat for the Federally threatened FSMV, a plant that occurs in alkaline habitat within the Fish Slough ACEC in Inyo and Mono Counties, California. This section provides background on the geography, ecology, and human-uses of the proposed CHD. It details the current state of the proposed lands, including a description of management activities, land ownership and the ecology of the area. Next, it describes particular land-use activities that occur in the proposed CHD in terms of their significance to FSMV.

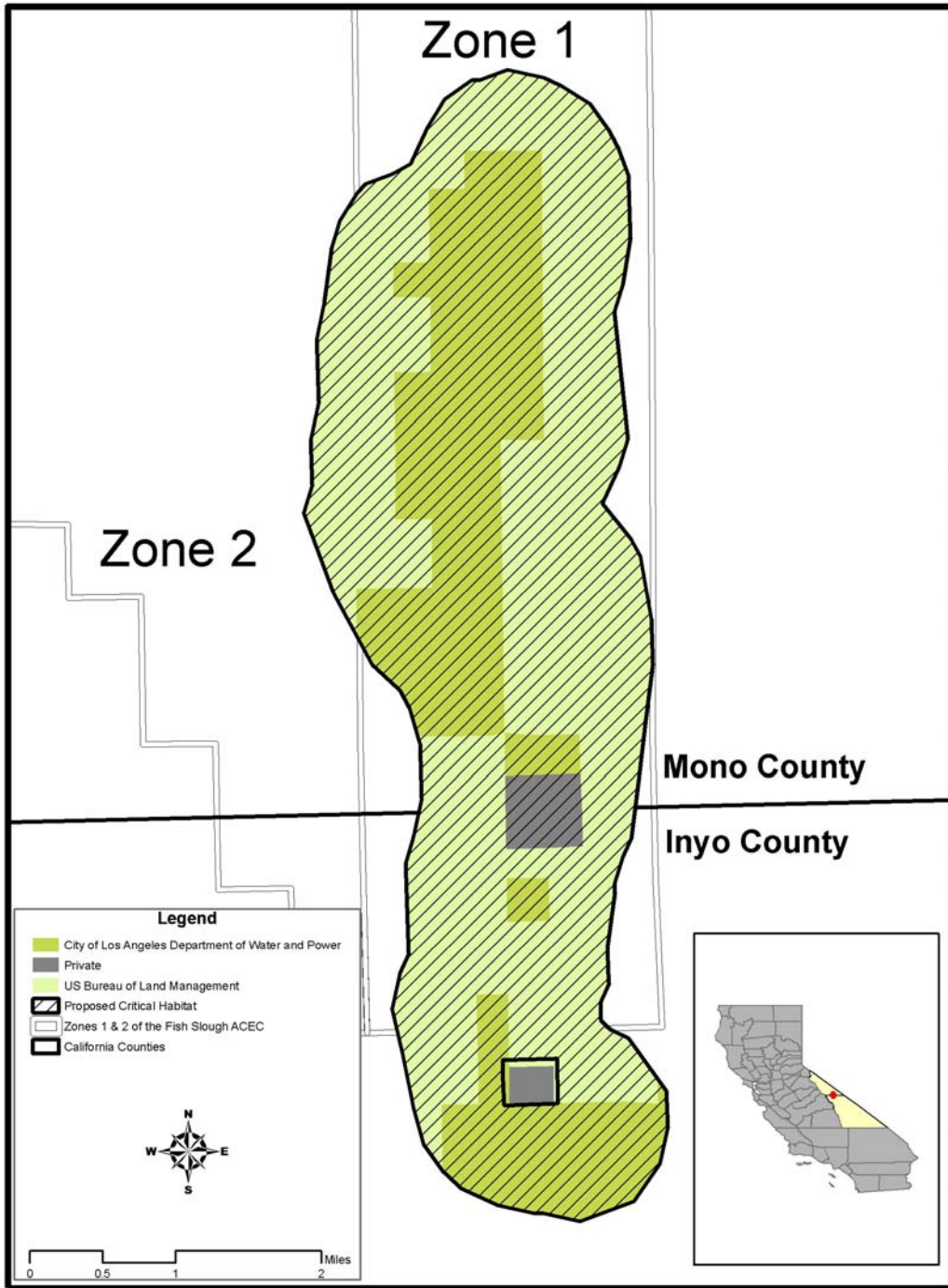
2.1 Species and Designation²⁰

2.1.1 Description of Species and Habitat

44. The FSMV is a prostrate perennial plant belonging to the pea family. The plant is characterized by few-branching stems up to 39 inches in length and is covered with stiff, appressed hairs. The plant produces lavender flowers and papery, strongly inflated fruits that are also covered in appressed hairs.
45. The entire known range of FSMV is restricted to a six-mile long area of alkaline habitat that parallels Fish Slough, a unique wetland oasis surrounded by desert located on the border of Inyo and Mono Counties, California (see Exhibit 2-1). Fish Slough is situated in the northern end of the Owens Valley area, along the eastern edge of the Sierra Nevada Mountains in central California, and is approximately eight miles north of the City of Bishop. The slough includes a lake and three natural springs; Northeast Spring and Northwest Spring are located in the northern portion of the slough, and BLM Spring occurs in the east-central portion of the slough.

²⁰ Information on the species and habitat is taken from the Proposed Designation of Critical Habitat for *Astragalus lentiginosus* var. *piscinensis* (Fish Slough Milk-vetch), published in the *Federal Register* on June 4, 2004, Vol. 69, No. 108.

EXHIBIT 2-1: PROPOSED CRITICAL HABITAT AREA FOR THE FSMV



46. The Fish Slough area includes wetlands, alkali meadows, and upland areas. Alkaline meadows are characterized by soils that have a sandy or silty texture and a white appearance as a result of residue left from evaporation of water with a relatively high salt content. The alkaline habitat area forms a ring around both the seasonally and permanently flooded wetland areas in the slough. FSMV occurs in areas with low to moderate levels of vegetative cover. The presence of water is essential for the development and perpetuation of the alkaline soils and habitat upon which the FSMV depends. Exhibit 2-2 is an image of the alkaline meadows within Fish Slough that provide habitat for the FSMV.
47. Primary constituent elements essential for the conservation of the species include:
- Alkaline soils that occur in areas with little or no slope, and which overlay a groundwater table that is 19 to 60 inches below the land surface.
 - Plant associations dominated by cordgrass-dropseed (*Spartina-Sporobolis*), or where a sparse amount of rabbit brush (*Chrysothamnus albidus*) occurs in the transition zone between cordgrass-dropseed (*Spartina-Sporobolis*) and rabbit brush-saltgrass (*Chrysothamnus albidus-Distichlis*) plant associations.
 - Upland areas within 1,000 m of the alkaline soils that: a) support sites where the listed plant's pollinator populations are likely to nest or obtain cover; b) require minimal disturbance and active management to limit the establishment of non-native plant taxa; and c) contain portions which may be suitable for restoration and recolonization by FSMV.
 - Hydrologic conditions that provide suitable periods of soil moisture and chemistry for FSMV germination, growth, reproduction, and dispersal.
48. Fish Slough can be divided into northern, central, and southern areas. A species survey conducted in 2000 documented 1,542 mature plants within Fish Slough. Sixty percent of these plants occurred in the northern portion of the slough; these lands are owned by the LADWP. Approximately 35 percent of the observed plants occurred in the central portion of the slough on lands managed by the BLM and the LADWP. The remaining five percent of the plants that were observed occurred in scattered patches in the southern portion of the slough; these lands are managed by the BLM and the LADWP. FSMV does not inhabit all of the alkaline habitat that is present in Fish Slough.

EXHIBIT 2-2: IMAGE OF FSMV ALKALINE HABITAT (photo from June 2, 2004)



2.1.2 Description of Designation

49. The Service proposed to designate one unit of critical habitat for FSMV within Mono and Inyo Counties, California. The proposed unit encompasses 8,490 acres (3,435 hectares) of land located within or adjacent to Fish Slough. The proposed critical habitat lands contain all known occurrences of FSMV, alkaline habitat occupied by the plant, and upland areas that are likely to provide cover sites for insect pollinators or require special management to control non-native plant species. The proposed unit also includes some, but not all, of the hydrologic features the Service believes are necessary to promote the persistence and successful recruitment of FSMV.
50. Within the proposed unit, the LADWP owns four separate parcels that encompass approximately 2,923 acres and account for 34 percent of the proposed CHD. The LADWP owns and managed lands within Owens Valley for the purpose of storing and exporting water to the City of Los Angeles for municipal use. The CDFG owns a single 166-acre parcel in the proposed critical habitat unit; these lands constitute two percent of the total proposed CHD. The remaining 5,401 acres, or 64 percent of the proposed CHD, occur on Federal lands managed by the BLM. One 49-acre privately owned parcel of land exists inside of the boundary of the southern portion of the proposed critical habitat unit. Because this property is not known to contain occurrences of the listed plant and

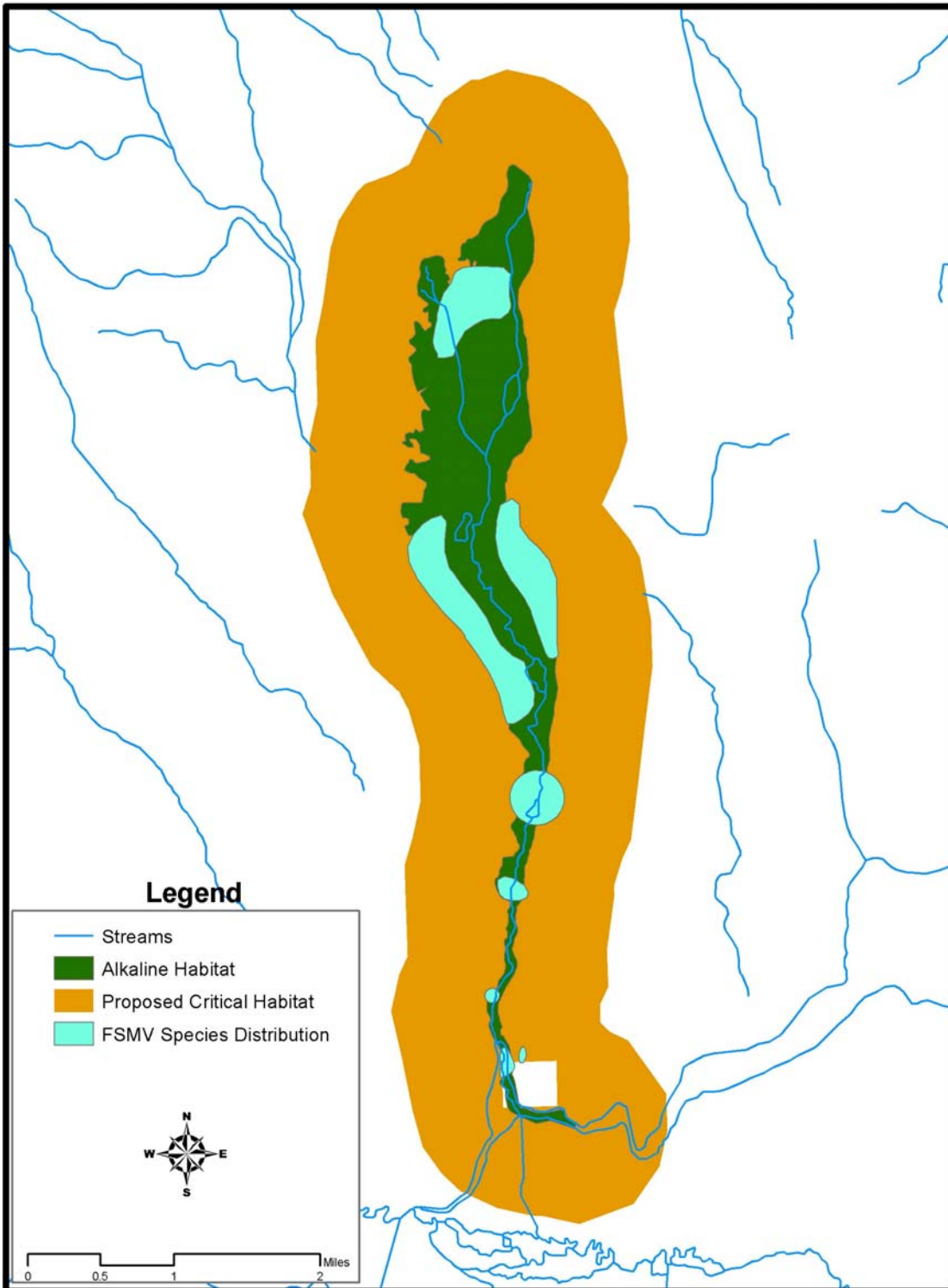
possesses little alkaline habitat, it was not considered to be essential to the conservation of the species and is therefore not proposed as critical habitat. No privately held lands have been included in the proposed CHD. A graphical depiction of land ownership within the proposed CHD is provided in Exhibit 2-1; acreage data are presented in Exhibit 2-3.

EXHIBIT 2-3: LAND OWNERSHIP WITHIN PROPOSED CRITICAL HABITAT FOR FSMV

Unit name	BLM	CDFG	LADWP	Total
Fish Slough unit (acres)	5,401	166	2,923	8,490
Percent of Total	63.6%	2.0%	34.4%	100.0%

51. The primary activities that occur within or adjacent to the proposed designation include agriculture, livestock grazing, recreational activities (e.g., OHV use and recreational fishing), commercial mining, groundwater extraction and exportation, and conservation activities implemented by stakeholder agencies. More detailed descriptions of landowners and activities are provided in the remainder of the chapter.

EXHIBIT 2-4: HYDROLOGICAL FEATURES WITHIN THE PROPOSED CHD FOR FSMV



2.1.3 Fish Slough Area of Critical Environmental Concern (ACEC)

52. Approximately 36,000 acres of upland, wetland, and alkaline habitat in the Fish Slough area was identified for designation as a BLM ACEC in 1982. In order to qualify as an ACEC, an area must meet the BLM definition of “relevant,” meaning special management action is required to prevent damage, and “important,” meaning it must have qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern.²¹ ACECs are defined in the Federal Land Policy and Management Act as an area:

"(W)ithin the public lands where special management attention is required (when such areas are developed or used or where no development is required) to protect and prevent irreparable damage to important historical, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards."²²

53. Fish Slough, situated between the Sierra Nevada Mountains to the west and the White Mountains to the east, was designated an ACEC to provide protection for the Federally endangered Owens pupfish (*Cyprinodon radiosus*), additional unique fish species, several rare plant taxa including the FSMV, and an undescribed mollusk species. Fish Slough is also recognized for its significant cultural and scenic values that warrant special management, including multiple Native American petroglyph sites.

54. The water moving through Fish Slough flows southward about seven miles and empties into the Owens River six miles north of Bishop, California. The Fish Slough ACEC is divided into three management zones. Zone 1 consists of the Fish Slough Ecological Area, and includes the Owens Valley Native Fish Sanctuary, three springs, and the marsh of the slough. Zone 2 includes the western aquifer of the Volcanic Tablelands and Zone 3 is the northern aquifer of the Volcanic Tablelands. The majority of the proposed CHD lands are within Zone 1 of the ACEC, which is managed to ensure stable and healthy populations of native plants and animals. A small portion of the CHD is located in Zone 2 of the ACEC, or occurs outside of the southern portion of Zone 1 of the ACEC.

55. Exhibit 2-4 displays the primary hydrological features within the proposed CHD for the FSMV, along with the general distribution of the FSMV as gathered from species surveys.

56. The area is managed and protected by a coalition of stakeholders including BLM, LADWP, CDFG, and the Service. The establishment of the Fish Slough ACEC has

²¹ Bureau of Land Management, Bishop Resource Area, *Management Plan for Fish Slough: An Area of Critical Environmental Concern*, October 1984.

²² U.S. Department of the Interior, Bureau of Land Management and the Office of the Solicitor, *The Federal Land Policy and Management Act of 1976, As Amended*, October 2001.

provided habitat protection for FSMV and protective measures for the plant were implemented over a decade prior to the listing of the plant in 1998. The management objectives for the Fish Slough ACEC include:

- Providing ecological management, protection, and/or enhancement of Fish Slough as an ecological natural area;
- Preserving the integrity of the Fish Slough ecosystem by protecting and maintaining the quality and quantity of the groundwater aquifer which supports it;
- Preserving and enhancing the natural integrity of Fish Slough and its associated habitats;
- Ensuring stable and healthy populations of native plant and animal species of the area;
- Maintaining the characteristics of the existing natural landscape such that contrasts to the basic elements when caused by management activities will not attract undue attention;
- Providing for instruction and research in the natural sciences in harmony with managing Fish Slough as a natural area and as a benchmark of undisturbed habitats for ecological studies related to the Owens Valley; and
- Maintaining public access and use of the area in harmony with maintaining the natural integrity of Fish Slough and its associated habitats.²³

2.1.4 Owens Basin Wetland and Aquatic Species Recovery Plan, Inyo and Mono Counties

57. In 1998, the Service completed its multiple species recovery plan of the Owens Valley. The Owens Basin Recovery Plan's management guidelines aim to alert land managers to the presence of special status species in the Owens Valley area, identify management actions that are necessary to conserve these species, and avert further declines of these species in the Owens Basin. Management activities that have been identified, and which are intended to benefit the FSMV include:

- Protection of spring discharges within Fish Slough;
- Modification of livestock grazing to ensure that the FSMV habitat is not being degraded;

²³ Bureau of Land Management, October 1984.

- Restoration of previously suitable habitat that no longer supports FSMV;
- Removal and control of non-native plant species and other threats that may arise;
- Protection of lands on which FSMV occurs through a conservation easement or other permanent mechanism;
- Research to determine its critical life history and habitat components; and
- Ongoing monitoring efforts.²⁴

2.1.5 Overlap with Other Listed Species

58. Two endangered fish species, the Owens pupfish (*Cyprinodon radiosus*) and Owens tui chub (*Siphateles bicolor snyderi*) are native to the proposed CHD for the FSMV. The pupfish currently occupies portions of the BLM spring outflow above a fish barrier that is designed to prevent non-native bass from entering the springhead. Tui chub are likely to be absent from Fish Slough at the present time due to the presence of predatory bass.²⁵ This species has not been reintroduced into the bass-free area above the fish barrier.²⁶ If a section 7 consultation is triggered for any listed species in Fish Slough, the consultation process will need to address all of the listed species that may be affected by the proposed action. As such, the potential presence of the two fish species in Fish Slough may benefit the FSMV as well. Many management actions within Fish Slough have been directed towards Owens pupfish recovery and protection, such as construction of fish barriers. Costs of habitat restoration projects driven by efforts to preserve Owens pupfish habitat that may benefit the FSMV are considered in this analysis. To the extent possible, this economic analysis parses costs related specifically to FSMV conservation where multiple species are subject to a single section 7 consultation.

2.2 Land Use Activities in the Proposed CHD

59. The Service has identified the following activities that may occur within the proposed CHD as potentially affecting the conservation status of the FSMV or habitat:

²⁴ U.S. Fish and Wildlife Service, Owens Basin Wetland and Aquatic Species Recovery Plan, Inyo and Mono Counties, California, 1998.

²⁵ Written communication from U.S. Fish and Wildlife Service, Ventura Field Office, August 13, 2004.

²⁶ Written communication from U.S. Fish and Wildlife Service, Ventura Field Office, September 20, 2004.

1. Habitat destruction from motorized OHV use;²⁷
 2. Cattle grazing activities;
 3. Changes in wetland habitat through creation of dams, fish barriers, and impoundments to create sport fish habitat and manage native fish;
 4. Ground water pumping or water diversions that alter the hydrology of Fish Slough;
 5. Competition with non-native plant species; and
 6. Herbivory by native animals.
60. Modifying land-use activities within the region may mitigate the first four of these potential threats. This analysis focuses on these activities as most likely to be affected by CHD for the FSMV. The potential impact of these activities on the FSMV is described below, the socioeconomic climate surrounding these activities is discussed in Section 3, and the estimated economic impacts to these activities associated with CHD for the FSMV is detailed in Section 4 of this analysis.

2.2.1 Off-Highway Vehicle Activities

61. Soil compaction and topographic changes resulting from road presence and use of vehicles off of roads that are designated for vehicle use may affect soil moisture regimes in Fish Slough, and potentially result in changes in seasonal inundation patterns that may adversely affect FSMV. Within Fish Slough, approximately 19 miles of roads exist within 3,280 feet of the alkaline habitats that are occupied by the FSMV. A road bisects one cluster of FSMV on the east side of Fish Slough and unauthorized OHV use in the central portion of Fish Slough has occurred. The use of motorized vehicles off of designated routes is not allowed in the Fish Slough ACEC. This OHV policy has been implemented since the late 1980s, a decade prior to the listing of the FSMV.²⁸

2.2.2 Grazing Activities

62. Excessive levels of cattle grazing in Fish Slough may result in a number of adverse effects to FSMV habitat. First, the composition of the local plant community may be altered by reducing or eliminating species that cannot tolerate trampling and increasing the abundance of plant species that are tolerant to trampling. Second, non-native taxa may be introduced as a result of grazing activities (e.g., introduction of seeds of non-native species from supplemental livestock feed). Third, the creation of cattle trails may reduce the amount of habitat that may otherwise be occupied by FSMV.

²⁷ In the context of this report, to be consistent with BLM terminology, “off-highway” vehicle recreation refers to vehicle activity off of designated routes, though those routes may not necessarily all be considered highways.

²⁸ Bureau of Land Management, October 1984.

Finally, trampling by livestock may reduce the number of burrows or other nesting sites available for bee pollinators. One allotment is currently grazed within Fish Slough under the management of LADWP.

2.2.3 Dam removal and modification projects

63. Dams, impoundments, and fish barriers have been created within Fish Slough in some cases to provide sport fish habitat, and in others to provide shallow water habitat for native fish (e.g., the endangered Owens pupfish).²⁹ These historic projects have altered Slough hydrology by increasing the size of permanently flooded habitats, modifying surface water drainage patterns, and increasing the length of time that alkaline habitat is subject to elevated soil moisture conditions. BLM and CDFG have recently removed two dams in order to lower water tables and prevent flooding of alkaline habitat.

2.2.4 Activities impacting Fish Slough hydrology

64. LADWP has quantified the amount of water passing through Fish Slough over the past 80 years and has documented decreases in water flows. The volume of water moving through Fish Slough declined from 148 to 152 cubic feet per second (cfs) in the 1920s to 84 to 96 cfs in the early 1960s. Causative factors for reduced flows in Fish Slough water are speculative. To date, isotopic studies to determine the origin of water that discharges within Fish Slough have been inconclusive. While no definitive information exists regarding the sources of water that discharge from springs in Fish Slough, available data indicate the Casa Diablo Mountain area (located 9.5 miles northwest of Fish Slough), the Tri-Valley area (consisting of Chalfant, Hammil, and Benton Valleys), or a combination of these two areas is the most likely source.
65. Understanding the hydrological system is further complicated by the presence of several fault lines in Fish Slough and surrounding areas. These features likely affect the presence, distribution, and volume of groundwater present in the local area.³⁰ Due to the expense of conducting hydrologic studies and the complexity of the hydrologic system, no additional studies to examine Fish Slough hydrology are currently proposed.³¹
66. Despite the uncertainty of the hydrologic system, water diversion activities occurring in unknown regions outside of the proposed CHD may impact the FSMV by decreasing the water level within the slough thereby decreasing the amount of available alkaline habitat. While definitive information about the origin of the water in Fish Slough does not exist, groundwater in the two valleys located to the east and northeast of Fish Slough (Chalfant and Hammil Valleys respectively) may move down gradient to

²⁹ Personal communication with Steve Parmenter, CDFG, June 2, 2004.

³⁰ Personal communication with Terry Russi and Anne Halford, BLM, June 2, 2004.

³¹ Ibid.

Fish Slough.³² Therefore it is possible that groundwater withdrawal from these Valleys may impact the FSMV. Water may be withdrawn or diverted within these valleys for the purposes of agriculture (i.e., irrigation), mining, or municipal use.

67. Water withdrawals from areas surrounding Fish Slough include the following.

- One commercial farm reliant on irrigation exists in Chalfant Valley, and six in Hammil Valley. These farms are primarily dedicated to alfalfa hay production, but may occasionally produce carrots, garlic, and potatoes.³³
- The Desert Aggregate Mine exists approximately 0.75 miles to the south of Fish Slough and withdraws water down gradient of Fish Slough.
- The City of Los Angeles withdraws groundwater for municipal use from Owens Valley locations that are down gradient of Fish Slough.

2.3 Land Management Agencies

68. While economically productive activities such as agriculture, ranching, and mining exist adjacent to and may affect the proposed CHD, land-use within the proposed CHD is dominated by conservation and management strategies carried out by BLM, LADWP, and CDFG. Such activities include habitat restoration and conservation projects, dam modification and removal, prescribed burns, and other management activities (i.e., enforcement of OHV restrictions, road repair, and road barrier construction).

- **Bureau of Land Management (BLM) Activities.** The Bishop Field Office of the BLM has managed Fish Slough ACEC since 1982. Activities that occur on BLM-managed lands within Fish Slough include conservation projects; species and habitat management projects (e.g., monitoring, surveys, and non-native vegetation control); public outreach activities; management of recreational activities; road repair; and controlled burns. Additionally, BLM coordinates with other agencies (e.g. LADWP and CDFG) on dam removal and modification projects and species and hydrological studies.
- **Los Angeles Department of Water and Power (LADWP) Activities.** The City of Los Angeles has owned land, water options, and rights-of-way within Owens Valley since 1905. LADWP implements groundwater

³² MHA Environmental Consulting, Inc., *Task 1 Report: Preliminary Data Collection and Hydrologic Models for the U.S. Filter Tri-Valley Surplus Groundwater Program, Mono County, California*, March 9, 2001; and U.S. Fish and Wildlife Service, June 4, 2004.

³³ Personal communication with TVGMD, June 3, 2004.

pumping and watershed management activities within the region. The agency also manages one grazing allotment within the proposed CHD. Management strategies considering the FSMV include construction and maintenance of a cattle enclosure to protect the FSMV, and species and habitat management initiatives (e.g., monitoring and surveying). In addition, LADWP oversees one commercial mine operation located to the south of Fish Slough on City of Los Angeles lands.

- **California Department of Fish and Game (CDFG) Activities.** CDFG manages native fish, plants, and natural communities within the state of California through habitat protection and maintenance. The agency owns approximately 166 acres of land within the proposed CHD and has implemented numerous conservation projects, including habitat restoration projects (e.g., dam removal and modification), non-native fish control projects, and monitoring/surveying for native fish species.
- **ACEC Joint Management Committee.** BLM, LADWP, and CDFG jointly manage Fish Slough and implement habitat restoration and conservation projects. The agencies, and the Service, meet annually to discuss land management activities and new issues that have the potential to affect native species and their habitats.

69. The U.S. Army Corps of Engineers (USACE) is responsible for carrying out and permitting activities with the potential to affect riverine, estuarine, and marine areas. Within Fish Slough, the USACE Regulatory Division grants permits according section 404 of the Clean Water Act, discharge of dredge or fill materials.³⁴ Such permits may be required for construction of an impoundment of fish barrier within the slough.

70. Additionally, the Tri-Valley Groundwater Management District (TVGMD) was established in 1989 to oversee and regulate groundwater resources within Benton, Hammil, and Chalfant Valleys in Mono County. The District is authorized to issue water permits for the export of groundwater as well as oversee and regulate irrigation in the region.

³⁴ Clean Water Act, 33 U.S.C. §1251 (1987).

71. This section summarizes key economic and demographic information for the counties that may be impacted by the proposed CHD for the FSMV. This analysis focuses on ongoing land use activities within the proposed CHD that are most likely to be affected by the presence of the FSMV or habitat. County level data are presented to provide context for the discussion of economic impacts and to illuminate trends that may influence these impacts.
72. To provide context and comparison for the economic analysis, this section first provides demographic information for the broader study area, Inyo and Mono Counties, including Hammil and Chalfant Valleys, and more specifically the City of Bishop, which is the closest populated area to the proposed CHD. This section then details economic activities taking place within and surrounding the proposed CHD.

3.1 Economic Profile of Inyo and Mono Counties

73. The majority of Inyo and Mono County lands are administered or owned by Federal, State, and municipal agencies. Inyo County experienced a population decline from 1990 to 2000 while Mono County grew by a quarter during the period and is anticipated to continue to grow over the next 20 years (Exhibit 3-1). The principal sectors in which citizens are employed in the two counties are government, and leisure and hospitality services. This is driven by the landscape of the counties, which is dominated by public lands primarily used for recreation, including OHV use, fishing, and rock climbing, and bouldering.

3.1.1 Geography and Land Ownership

74. Inyo County encompasses 6,529,980 acres of land and is the second-largest County in California. Approximately 92 percent of County lands are Federally owned and managed. The City of Los Angeles owns 3.9 percent; State agencies manage approximately 2.4 percent; and private ownership comprises only 1.7 percent of total County lands.

75. Mono County comprises 1,939,200 acres, 88 percent of which is under Federal ownership. Additionally, another six percent of lands are privately owned. The LADWP owns three percent and State agencies the remaining lands within Mono County.³⁵
76. The high level of Federal land ownership within the counties limits the amount of private land use activities taking place. For example, private development within the two-County area is constrained by public ownership of lands and ownership of water rights by the Los Angeles Department of Water and Power.³⁶ Further, there are no available private lands to be purchased for agricultural use. Agricultural use in the two-County area is saturated, and entry is not possible under current land ownership conditions.³⁷

3.1.2 Population Patterns

77. In 2000, Inyo County had a population of 17,945, a two percent decrease from 1990 figures. The County's largest city, Bishop, had a population of 3,575 in 2000. Inyo County is anticipated to experience minimal growth over the next twenty years, with population forecast to grow three percent to reach 18,404 in 2020. From 1990 to 2000, population within Mono County grew by 18 percent to 12,853. Population is projected to grow an additional 26 percent over the next 20 years, approximately the same growth rate of the State. Exhibit 3-1 provides population estimates and projections for the two counties within the context of the broader geographic region.

EXHIBIT 3-1: POPULATION ESTIMATES FOR COUNTIES SURROUNDING THE PROPOSED CHD

REGION	1990	2000	2010	2020	% Increase 1990-2000	% Increase 2000-2020
United States	248,709,873	281,421,906	--	--	13.2%	--
California	29,760,021	35,116,033	39,246,767	43,851,741	18.0%	25%
Inyo County	18,281	17,945	18,396	18,404	-1.8%	3%
Mono County	9,956	12,853	14,705	16,248	29.1%	26%
Bishop		3,575				

Sources: (1) U.S. Census Bureau, State & County QuickFacts, accessed at <http://quickfacts.census.gov/qfd/> on June 9, 2004; (2) California Department of Finance, Demographic Research Unit, Population Projections, http://www.dof.ca.gov/HTML/DEMOGRAP/DRU_Publications/Projections/P1.htm accessed on June 9, 2004

³⁵ Personal communication with Mono County Community Development Department, June 24, 2004.

³⁶ Inyo County Planning Department, 2004 and Mono County General Plan, http://www.monocounty.ca.gov/online_services/documents/gp_ch2.pdf.

³⁷ Personal communication with TVGMD, June 3, 2004.

3.1.3 Business Patterns

78. The U.S. Census Bureau provides information on annual payrolls and the number of businesses within Inyo and Mono County industries. In 2001, the principal industries within the Counties, in terms of annual payroll, included accommodation and food service (28 percent), health care and social assistance (16 percent), and retail trade (15 percent). Annual payroll within these three industries totaled \$144 million, or 59 percent of total County payroll.

79. Exhibit 3-2 details industry and payroll data for Inyo and Mono Counties combined. The “Total Establishments” column displays the total number of physical locations at which business activities were conducted with one or more paid employee in the year 2001. These figures provide a measure of the average density of commercial and industrial establishments in the region. For all of Inyo County, 599 businesses operated in these economic sectors with one or more paid employee and had a collective annual payroll of \$114 million. Within Mono County, 560 businesses operated with a collective payroll of \$130 million.

EXHIBIT 3-2: 2001 COUNTY BUSINESS PATTERNS – INYO AND MONO COUNTIES (2001 Dollars)

Industry Code Description	Annual payroll (\$million)	Percent of total annual payroll	Total Number of Establishments
Forestry, fishing, hunting, and agriculture support	\$0	0.0%	6
Mining	\$0	0.0%	8
Utilities	\$0	0.0%	9
Construction	\$24,400	10.0%	172
Manufacturing	\$7,623	3.1%	29
Wholesale trade	\$5,171	2.1%	27
Retail trade	\$36,373	14.9%	205
Transportation & warehousing	\$1,745	0.7%	21
Information	\$3,858	1.6%	20
Finance & insurance	\$18,019	7.4%	32
Real estate & rental & leasing	\$7,176	2.9%	62
Professional, scientific & technical services	\$10,472	4.3%	72
Management of companies & enterprises	\$0	0.0%	2
Admin, support, waste mgt, remediation services	\$7,164	2.9%	39
Educational services	\$0	0.0%	3
Health care and social assistance	\$39,178	16.1%	81
Arts, entertainment & recreation	\$6,346	2.6%	34
Accommodation & food services	\$68,316	28.0%	214
Other services (except public administration)	\$7,995	3.3%	110
Auxiliaries (exc corporate, subsidiary & regional mgt)	\$0	0.0%	1
Unclassified establishments	\$0	0.0%	12
Total	\$243,836	100.0%	1,159

Source: U.S. Census Bureau, County Business Patterns, <http://censtats.census.gov/cgi-bin/cbpnaic/cbpsect.pl> accessed on June 8, 2004.

3.1.4 Employment by Industry

80. The largest employers within Inyo and Mono County in 2003 were government; leisure and hospitality services; and trade, transportation and utilities sectors. In Inyo County, government jobs accounted for 41 percent of all employment; leisure and hospitality service jobs represented 17.4 percent; and trade, transportation, and utilities employment constituted 17.0 percent of total employment. In Mono County, leisure and hospitality services represented nearly 41 percent of County jobs while government-related jobs accounted for an additional 22 percent. Exhibit 3-3 summarizes employment by industry within Inyo and Mono Counties in 2003.

EXHIBIT 3-3: EMPLOYMENT BY INDUSTRY IN INYO AND MONO COUNTIES (2003)

	INYO COUNTY		MONO COUNTY	
	Number of Employees	% Total Employees	Number of Employees	% Total Employees
Total Farm	40	0.5%	20	0.3%
Total Nonfarm	7,710		6,960	
Goods Producing			640	9.2%
Natural Resources and Mining	10	0.1%	n/a	
Construction	230	3.0%	n/a	
Manufacturing	210	2.7%	n/a	
Service Producing				
Trade, Transportation and Utilities	1,320	17.0%	780	11.2%
Information	140	1.8%	0	0.0%
Financial Activities	170	2.2%	440	6.3%
Professional and Business	440	5.7%	380	5.4%
Services				
Educational and Health Services	360	4.6%	100	1.4%
Leisure and Hospitality	1,350	17.4%	2,840	40.7%
Other Services	270	3.5%	240	3.4%
Government	3,210	41.4%	1,540	22.1%
Total, All Industries	7,750	100%	6,980	100%

Source: California Employment Development Department, <http://www.calmis.ca.gov/htmlfile/subject/indtable.htm> accessed on June 9, 2004.

3.1.5 Unemployment

81. Both Inyo and Mono Counties have experienced slightly lower levels of unemployment relative to the State. Average unemployment in 2003 was 6.4 percent in Inyo County and 5.6 percent in Mono County, compared to California's rate of 6.7 percent. The 2003 average unemployment rate within Bishop, which is the closest town to the proposed CHD for the FSMV, was 4.6 percent. Bishop has historically experienced lower unemployment rates relative to County, State, and National levels. Exhibit 3-4 summarizes unemployment rates for the geographic region of concern.

EXHIBIT 3-4: UNEMPLOYMENT RATES WITHIN AREA CONTAINING PROPOSED CRITICAL HABITAT

Year	All U.S.	California	Inyo County	Mono County	Bishop
1990	5.6%	5.80%	7.1%	5.9%	5.2%
1995	5.6%	7.80%	9.4%	10.8%	6.9%
2000	4.0%	4.90%	5.5%	5.6%	4.0%
2003	6.0%	6.7%	6.4%	5.6%	4.6%

Source: Bureau of Labor Statistics and California, Employment Development Department, Labor Market Information, <http://www.calmis.ca.gov/htmlfile/subject/lftable.htm>, accessed on June 9, 2004.

3.2 Economic Activities in Critical Habitat Region

82. Industries located within Inyo and Mono Counties may benefit from the land-intensive activities that occur within and adjacent to the proposed CHD. These activities include:

- Agriculture,
- Livestock grazing,
- Recreational activities (e.g., OHV use and recreational fishing),
- Commercial mining, and
- Groundwater exportation.

83. In addition, the Fish Slough ACEC containing the critical habitat is jointly managed by the BLM, CDFG, and LADWP. These agencies undertake habitat conservation activities, such as construction and removal of impoundments, and prescribed burning. These activities are undertaken to preserve the distinct ecosystem and the native species comprising it, including the FSMV.

84. The social and economic climate surrounding these activities within the Counties in general, and the proposed CHD lands in particular, is discussed below. The economic impacts of managing these activities for the needs of the FSMV and habitat, are discussed in Section 4 of this analysis.

3.2.1 Agriculture

85. Historically, agriculture played an important role in Inyo and Mono County economies. Livestock production and the production of water-intensive crops including alfalfa hay, carrots, pasture and range crops, and turf and irrigated pasture have dominated private land uses within the Counties.³⁸ In 2003, the total value of total agricultural production was \$14.2 million in Inyo County and \$21.8 million in Mono County. Exhibit 3-5 details information on agricultural production values and leading agricultural commodities in the two-County area.

EXHIBIT 3-5: 2003 AGRICULTURAL PRODUCTION WITHIN THE STUDY AREA (\$1,000)

	Inyo County	Mono County
Number of Farms	85	63
Number of Acres	226,788	54,366
Number of Farms dependent on irrigation	49	46
Number of Irrigated Acres	23,201	25,669
Gross Value of Production without Timber	\$14,240	\$21,835
Gross Value of Production with Timber	\$14,240	\$21,894
Field Crops	\$3,036	\$6,597
Seed Crops	\$0	\$0
Vegetable Crops	\$770	\$5,345
Fruit and Nut Crops	\$50	\$0
Nursery, Flowers and Foliage	\$3,810	\$0
Apiary Products	\$240	\$0
Livestock	\$6,333	\$9,818
Livestock Products	\$0	\$75
Total Value	\$14,239	\$21,835

Source: U.S. Department of Agriculture, "Summary of County Agricultural Commissioner' Reports, Gross Values by Commodity Groups – California 2001-02," September 2003, accessed at <http://www.nass.usda.gov/ca/bul/agcom/indexcav.htm> on June 10, 2004; Census of Agriculture – County Data, USDA National Agricultural Statistics Service.

86. Despite its historical and cultural significance, agricultural production is not a dominant source of employment or earnings within Inyo and Mono Counties. Earnings for agricultural commodities represent less than 0.5 percent of total earnings in the two-

³⁸ Environmental Impact Report for the Review of the Mono Basin Water Rights of the City of Los Angeles, accessed at <http://www.monobasinresearch.org/images/mbeir/dchapter3/3g.pdf> on June 11, 2004.

County area; employment within the sector accounts for just over one percent of total employment.³⁹

87. In 2002, 85 commercial farms operated on 226,788 acres of land within Inyo County. Of these farms, 49, or 58 percent, were dependent on irrigation for agriculture production. In Mono County, 63 farms operated on 54,366 acres of land; approximately 46 (73 percent) of these farms relied on irrigation for production.⁴⁰
88. Within the lands closest to the proposed CHD, seven commercial farms exist in the two main valleys, Hammil and Chalfant, located north and northeast of Fish Slough. These farms produce alfalfa, carrots, garlic, tomatoes and pasture crops.⁴¹ Each of these farms is dependent on irrigation for agricultural production, particularly considering that the region has experienced drought conditions for the past ten years. No farms exist directly within or abutting the proposed CHD for the FSMV.
89. Due to the lack of available private lands within the region and the scarcity of water resources characteristic of the desert ecosystem, the expansion of the agricultural production industry is not anticipated within the region.⁴²

3.2.2 Livestock Grazing

90. While declining in relative economic importance, livestock ranching remains an important cultural component within the region.⁴³ Within the agriculture sector, however, livestock production is the leading source of income within Inyo and Mono Counties. Approximately 15,000 cattle were grazed in the two-County area in 2003. In that year, the value of agricultural production for cattle and calves accounted for \$6.3 million within Inyo County and \$9.8 million in Mono County, collectively representing 45 percent of total farm production values in the region.⁴⁴

³⁹ Data Cash receipts from livestock and products represent less than one percent of 2002 personal income in Inyo and Mono Counties, Bureau of Economic Analysis, <http://www.bea.doc.gov/bea/regional/reis>. Data are based on 2002 farm receipts as a percent of total county receipts based on: 2001 Data: Re <http://www.usda.gov/nass/sso-rpts.htm>. Employment data is based on U.S. Census Bureau, *2001 County Business Patterns*, accessed at <http://censtats.census.gov/cbpnaic/cbpnaic.shtml>.

⁴⁰ 2002 Census of Agriculture - County Data, USDA National Agricultural Statistics Service. Irrigated land includes land watered by any artificial or controlled means, such as sprinklers, flooding, furrows or ditches, sub-irrigation, and spreader dikes. Included are supplemental, partial, and preplant irrigation. Each acre was counted only once regardless of the number of times it was irrigated.

⁴¹ Personal Communication with TVGMD, June 3, 2004.

⁴² Ibid.

⁴³ Cash receipts from livestock and products represent less than one percent of 2002 personal income in Inyo and Mono Counties, Bureau of Economic Analysis, <http://www.bea.doc.gov/bea/regional/reis>.

⁴⁴ California Agricultural Statistics Service, "California Livestock Inventory by Class and County, January 1, 2003 Final", accessed at <http://www.nass.usda.gov/ca/rev/lvstk/indexlv.htm> on June 10, 2004.

91. Due to the limited availability of private lands within Inyo and Mono Counties, ranchers are highly dependent on Federal, State, and municipal agency grazing leases. The BLM Bishop Field office currently permits grazing on approximately 60 allotments within the two counties; no grazing is allowed, however, on BLM lands within or directly adjacent to the proposed CHD for the FSMV.
92. The United States Forest Service (USFS) and the LADWP also permit grazing on their lands within Inyo and Mono Counties. Ranchers that graze cattle on Federal and LADWP lands are subject to standards and guidelines set forth by the agencies to minimize environmental impacts. Management practices may include seasonal restrictions on cattle presence, utilization rates, fencing, and monitoring of grazing activities. Compliance with grazing permit conditions may impose substantial costs on ranchers and impact the economic viability of their operations. Given land availability constraints and grazing management restrictions, the expansion of ranch operations within Inyo and Mono Counties is not anticipated. In fact, LADWP anticipates a general reduction in grazing activity within the two-County area.⁴⁵
93. Grazing is not permitted on BLM managed lands in the Fish Slough ACEC, nor are there plans to permit grazing activities on BLM-administered lands within the proposed CHD lands over the next twenty years. According to the 1993 Bishop Resource Management Plan, BLM prohibits livestock grazing in the Fish Slough area.⁴⁶ The Agency determined that it was not economical to permit and manage grazing within the Fish Slough ACEC. This is due to the high alkalinity of the Fish Slough area, which is not conducive to range and forage for livestock.⁴⁷
94. One leaseholder currently grazes cattle on an LADWP-managed allotment within the proposed CHD for the FSMV. Grazing has been permitted on this allotment since the early 1900s. The leaseholder currently grazes 40 head of cattle on Fish Slough lands between late summer and early spring, and on Federal lands in other areas outside of the proposed CHD during the remainder of the year. While the leaseholder grazed as many as 400 cattle on the allotment within the proposed CHD in 1998, increased permit restrictions on Federal allotments have compelled the rancher to reduce operations to its current level of 40 head.

3.2.3 Recreational Activities

95. Recreational activities that occur within or adjacent to Fish Slough and the proposed CHD include OHV use and fishing.

⁴⁵ Personal communication with LADWP, June 3, 2004.

⁴⁶ Bureau of Land Management, *Bishop Resource Management Plan Record of Decision*, April 1993.

⁴⁷ Personal communication with Terry Russi and Anne Halford, BLM, June 2, 2004.

Off-Highway Vehicle Recreation

96. The eastern Sierra region contains thousands of miles of trails and roads that are open to OHV recreation. Approximately 19 miles of roads are available for OHV use within the alkaline habitats in Fish Slough. A permit is not required to use these trails and roads. On the east side of the Slough, one road bisects a cluster of FSMV plants; OHV use has also been documented in the central portion of the Slough. In the late 1980s, the BLM Bishop Field Office inventoried existing trails and dirt roads within the region and determined that no new routes are necessary within Fish Slough. All areas of the Slough are accessible with existing routes and no new routes are necessary.⁴⁸
97. Fish Slough attracts approximately 2,000 recreational OHV users per year.⁴⁹ Recreationists visiting the areas within or surrounding the CHD boundaries are allowed to ride only on authorized routes. In the past, OHV use has occurred illegally off of designated routes through the creation of “volunteer routes,” and this has the potential to adversely modify FSMV habitat. BLM and LADWP engage in enforcement of the Fish Slough ACEC to ensure that visitors keep to designated routes. Volunteer routes created by illegal OHV use are obliterated and the agencies may construct rock barriers to keep vehicles on trails and routes.

Recreational Fishing

98. Recreational fishing is a popular activity in the eastern Sierras, including the Fish Slough area. The unrestricted portions of Fish Slough, Fish Slough Lake, and inundated areas south of Fish Slough Lake, are open to fishing all year for anglers with state-issued licenses.⁵⁰ Dams and fish barriers were constructed in the past within Fish Slough to create sport fish habitat for stocked trout and bass. In other areas these nonnative species have been removed to benefit the Federally listed Owens pupfish and Owens tui chub. Native fish management occurs in less than three percent of Fish Slough’s aquatic area.
99. The Fish Slough ACEC experiences approximately 1,000 recreational fishing trips per year. Anglers typically drive to the inundated areas created by the impoundments. Fish Slough Lake is the inundated area with the largest surface area in Fish Slough and some anglers may use small boats for fishing; others engage in fly-fishing from the shore. Recreational fishing areas within Fish Slough represent approximately five percent of total recreational fishing sites within the region.⁵¹

⁴⁸ Personal communication with Terry Russi and Anne Halford, BLM, June 2, 2004.

⁴⁹ Ibid.

⁵⁰ Personal Communication with Anne Halford, BLM, August 24, 2004.

⁵¹ Personal communication with Anne Halford, BLM, June 2, 2004 and August 24, 2004.

3.2.4 Commercial Mining

100. While mining has historically played an important role within Inyo and Mono County economies, the industry has experienced steady decline over the past century. Employment within the mining sector currently represents less than 4.5 percent of total employment in the two-County area. Within the area within and surrounding the proposed CHD, one commercial gravel mine and processing plant is situated adjacent to the proposed CHD for the FSMV, to the southeast of Fish Slough. The mine, known as the Five Bridges Aggregate Pit, is operated by the Desert Aggregates mining company under a long-term lease with the Los Angeles Department of Water and Power.
101. The Five Bridges Aggregate Pit covers 231 acres of land owned by LADWP and is located 3.5 miles north of Bishop. Gravel mining operations have been conducted at this site under a LADWP lease since the 1950s. The principal operations for sand and gravel excavation include on-site hauling, dumping, crushing, washing, sorting, stockpiling, concrete batching, and off-site hauling. The present rate of production is between 100,000 tons/year and 250,000 tons/year, depending on regional demand within a given year. Between 1999 and 2001, annual production averaged 225,000 tons per year. State and County agencies, including Inyo County and the California Department of Transportation, are the largest purchasers of gravel in the region.⁵²
102. In 2001, the average value of construction sand and gravel sold within California was \$7.25 per metric ton. Categories of sand and gravel production include concrete aggregates, asphalt concrete aggregates, plaster and gunite sands, concrete products, road base and coverings, fill, and other unspecified uses.⁵³ Assuming the average annual production of the Five Bridges Aggregate Pit, 225,000 tons, is all marketable, the value of production associated with this mine is approximately \$1.6 million per year.

3.2.5 Groundwater Exportation

103. Under an agreement between Inyo County and the LADWP, LADWP pumps and diverts groundwater from several well fields in the Owens Valley Groundwater Basin area, just south of Fish Slough and proposed CHD, to the city of Los Angeles.⁵⁴ LADWP has proposed to pump a total of 85,750 acre-feet of water from Owens Valley well fields during the 2004-2005 runoff year.⁵⁵ As these wells occur down gradient of Fish Slough,

⁵² Secor International, Inc., *The Five Bridges Aggregate Pit Expansion Project Draft Environmental Impact Report*, 3-5, accessed at <http://www.countyofinyo.org/planning/5bridges.html> in June 2004.

⁵³ USGS, California State Minerals Information, Minerals Yearbook, accessed at <http://minerals.usgs.gov/minerals/pubs/state/ca.html> on June 28, 2004.

⁵⁴ Inyo County Water Department, "Agreement Between the County of Inyo and the City of Los Angeles and Its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County," 1982, accessed at http://www.inyowater.org/Water_Resources/water_agreement/default.html#History%20and%20Preliminary%20Statement in June 2004.

⁵⁵ LADWP Annual Owens Valley Report, 2004-05 Runoff Year, accessed at <http://www.ladwp.com/ladwp/cms/ladwp005719.jsp> on June 18, 2004.

the impact of the groundwater drawdown in Owen's Valley on the hydrology within the Fish Slough ACEC is unclear.⁵⁶ In addition to Owens Valley, groundwater may be exported from any of the valleys surrounding the proposed CHD, Hammil, Chalfant, or Benton, for municipal or agricultural use.

104. A well field used to collect groundwater near Laws, a town in northern Owens Valley, Inyo County, has multiple wells that are adjacent to the southernmost portion of Fish Slough. In wet years, these areas are used to store groundwater. Approximately 4,000 to 5,000 acre-feet of water are pumped from Laws for irrigation purposes on an annual basis.

3.2.6 ACEC Conservation Activities

105. The land management agencies (BLM, DFG, and LADWP) work cooperatively to provide protection to the natural resources of the Fish Slough ACEC. This includes managing the hydrologic system as well as controlling for non-native vegetation and exotic fish species. Currently, the removal of dams and impoundments within Fish Slough is being undertaken by the three management agencies to restore the ecosystem to its natural state, a flowing system instead of the current impounded state. These dam removals are expected to improve habitat conditions for the FSMV in the long run.⁵⁷ Additionally, the management agencies engage in species monitoring and prescribed burning activities within the proposed critical habitat area. Prescribed burns are conducted for the benefit of species inhabiting Fish Slough; more specifically, the most recent burning activity was conducted to see where hydrological modifications need to be performed in order to restore natural stream flow and protect the FSMV from inundation.

⁵⁶ Personal communication with LADWP, June 3, 2004.

⁵⁷ Personal communication with Steve Parmenter, CDFG, June 2, 2004.

106. This section considers the economic impacts of actions taken to protect the FSMV and its habitat. It quantifies the economic effects of the proposed CHD, as well as protective measures taken as a result of the species' listing or other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation. First, it provides an estimate of *pre-designation impacts*, which are associated with species and habitat conservation efforts in place from the time of listing to final designation of critical habitat. Economic costs associated with these management efforts may be on-going until the time of final designation. Second, this section provides estimates of *post-designation impacts*, potential future impacts associated with the proposed CHD and other species and habitat conservation management efforts related to the FSMV.
107. The total pre-designation costs associated with FSMV conservation are estimated approximately **\$749,000 to \$808,000** (1998 through 2004); post designation costs, applying a discount rate of seven percent are forecast to be **\$501,000 to \$518,000** over the next 20 years, or **\$47,300 to \$48,900 annually**.⁵⁸ Although pre-designation costs are estimated over a period of seven years, they are estimated to be greater in present value terms than the 20-year post-designation costs. This is due to the implementation of multiple habitat restoration projects that preclude the need for similar projects in the future. The following examples underscore the role of pre-designation projects in minimizing the post-designation economic impacts of FSMV conservation.
- *Pre-designation removal of impoundments within Fish Slough.* Once the four impoundments within Fish Slough are modified, as described in Section 4.1.6, the slough will return to a more natural flowing state and no further modification to impoundments will be necessary within the slough.
 - *Pre-designation research on surplus groundwater.* In 2001, a proposal for groundwater exportation from the Tri-Valley area resulted in a formal feasibility study to determine the availability of excess groundwater for

⁵⁸ Present value terms are often used to compare economic costs incurred in different time periods. A "discount rate" is used to bring a series of future cash flows to their present value in order to state them in today's dollars. That is, the present value is the sum of a series of future cash flows expressed in today's dollars.

exportation and included an assessment of environmental impacts of the proposed exportation (see Section 4.1.5). This study concluded that no surplus groundwater was available within these valleys for exportation. As a result, this analysis does not anticipate future project proposals related to groundwater exportation from valleys surrounding the slough.

- *Pre-designation proposal to expand nearby commercial mine.* The Five Bridges Aggregate Pit proposed expansion of its operations in 2004. The primary FSMV concern with regard to this project is the potential drawdown of groundwater as described in Section 4.1.4 of this analysis. Desert Aggregates proposes to construct monitoring wells to provide information on the affect of the activity on the groundwater table within Fish Slough. As the expansion of the mine is planned over a 36 year time period and all conservation measures related to the FSMV are planned pre-designation of CH, this analysis only expects administrative costs of monitoring and reporting for post-designation costs to mining activities.

108. The impacts associated with past and potential future species and habitat management efforts are manifested in economic efficiency effects as outlined below.

- Administrative Costs: Costs associated with engaging in section 7 consultation, including time spent attending meetings, preparing letters and biological assessments, and in the case of formal consultations, the development of a Biological Opinion by the Service are quantified as administrative costs. Section 7 consultation can require substantial administrative effort on the part of all participants. These impacts are measured as the cost of labor required to fulfill these managerial duties. Estimates of per-effort costs associated with informal and formal consultations are presented in Exhibit 4-1. Costs of the biological assessment are typically borne by the action agency. Unless otherwise stated, this table is used to develop total administrative costs for consultations associated with activities within the proposed CHD for the FSMV.
- Project Modification Costs: Species and habitat management efforts that involve section 7 consultation may result in project modifications to avoid or minimize adverse effects to listed species. Costs of implementing these modifications may, for example, be increased labor (e.g., time spent in construction) or material requirements (e.g., fencing purchase) that may occur at one point in time and/or be ongoing cost.

EXHIBIT 4-1: ESTIMATED ADMINISTRATIVE COSTS OF CONSULTATION AND TECHNICAL ASSISTANCE EFFORTS FOR FSMV (PER EFFORT)⁵⁹

Consultation Type	Service	Action Agency	Third Party	Biological Assessment	Total Costs
Technical Assistance	\$260 - \$680	--	\$600 - \$1,500	--	\$860 - \$2,180
Informal Consultation	\$1,000 - \$3,100	\$1,300 - \$3,900	\$1,200 - \$2,900	\$0 - \$4,000	\$3,500 - \$13,900
Formal Consultation	\$3,100 - \$6,100	\$3,900 - \$6,500	\$2,900 - \$4,100	\$4,000 - \$5,600	\$13,900 - \$22,300

109. The remainder of this section details these economic impacts. The first section discusses pre-designation impacts, including all management efforts that have occurred since the time of the listing of the FSMV in October 1998 through when the final designation is established in June 2005. The second section discusses post-designation impacts forecast to occur from 2005 through 2025. Appendix A presents a screening level analysis of the potential effects of proposed CHD on small entities (i.e., small businesses, small organizations, and small government jurisdictions) to satisfy the requirements of the Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. Pursuant to Executive Order No. 13211, Appendix A also reports the potential impacts the proposed CHD is likely to have on the energy industry.⁶⁰

110. Where the information is available, it is best to present results of the economic analysis in the smallest geographic scale possible to inform the Service of the impacts of designating particular land parcels. In the case of the FSMV CHD the Service has proposed critical habitat in a single parcel, or “unit,” and economic impacts are not separable on a sub-unit level for the following reasons:

- The majority, 61 percent, of the pre-designation economic impacts is engendered by activities that may affect the water table within Fish Slough (these costs as detailed in Exhibit 4-2 include those associated with commercial mining, groundwater exportation, removal of impoundments within the slough). Aside from the removal of impoundments, each of these activities occurs outside of the proposed designation and any reduction in the size of the proposed CHD would not change the anticipated economic impact to the activity.
- The majority, 83 percent of post-designation economic impacts are engendered by Fish Slough ACEC resource management activities. These are costs as detailed within Exhibit 4-9 are associated with prescribed burns, invasive species control, public outreach, etc. and are conducted throughout the entire ACEC, including the lands proposed for critical habitat. Because they occur throughout the entire proposed CHD, the

⁵⁹ IEc analysis based on data from the Federal Government General Schedule Rates, Office of Personnel Management, a review of consultation records from several Service field offices across the country, and communications with Biologists in the Service. Low and high estimates primarily reflect variations in staff wages and time involvement by staff.

⁶⁰ Regulatory Flexibility Act, 5 U.S.C. 601 et. seq.

costs of these activities are not attributable to one particular geographic area by land ownership or otherwise.

4.1 Pre-Designation Impacts

111. This section of the analysis examines the six land use activities described in Section 3.2. Pre-designation economic impacts associated with these activities' consideration of FSMV are summarized in Exhibit 4-2, and detailed in Sections 4.1 of this analysis. Total estimated pre-designation costs, including costs incurred between the time of listing in 1998 through the final CHD for the FSMV in June 2005, are **\$749,000 to \$808,000**. The majority of these costs, 62 percent, are associated with resource management efforts within the Fish Slough ACEC, including removal of impoundments and fish barriers, prescribed burning, invasive species control, and enforcement of OHV restrictions. Another 29 percent of the total pre-designation costs are associated with review, evaluation, and associated studies of a proposed groundwater exportation project within the Tri-Valley region.

EXHIBIT 4-2: SUMMARY OF FSMV PRE-DESIGNATION CONSERVATION EFFORTS AND ASSOCIATED COSTS

Activity	Date	Description of Economic Impacts of Conservation Effort (cost bearer)	Cost (\$2004)
<i>Direct Costs</i>			
Grazing	1998 - 2004	• Costs of materials for maintenance of cattle enclosure (LADWP)	\$3,500
Mining	2004	• Administrative costs of technical assistance (Service and Desert Aggregates) and construction and monitoring of groundwater monitoring wells (Desert Aggregates)	\$40,900 - \$52,800
Recreation	1998 - 2004	• Costs of signage marking open routes of travel (BLM)	\$3,500
Groundwater Exportation	2001	• Costs associated with review and evaluation, including associated studies, of proposed U.S. Filter project to export groundwater from Tri-Valley Region, and the cost of development of the project report (U.S. Filter)	\$235,000
Multiple ACEC Management Activities	1998 - 2004	• Costs of staff time for monitoring of species, coordination with other land management agencies, enforcement of recreational use guidelines, and public outreach activities related to the FSMV (BLM)	\$210,000
Prescribed burns	1998, 2001, 2004	• Costs of prescribed burn activities including preparation of area and staff time for coordinators and fire fighters (BLM)	\$60,000
Control of invasive species	1998 – 2004	• Control of invasive species within proposed critical habitat area (CDFG and LADWP)	\$21,000
Propagation of FSMV	1998, 2001, 2004	• Propagation and germination of FSMV plants to aid in recovery of species (BLM)	\$4,500
Northwest Spring project	2004	• Administrative costs of consultation and project costs for removal of fish barrier and installation of new infrastructure at Northwest Spring (CADFG, LADWP, USACE, Service)	\$50,400 - \$58,800
Red Willow Dam project	2004	• Project costs for removal of Red Willow Dam (CDFG, BLM)	\$27,300
BLM Spring	2004	• Administrative costs of consultation and project costs for removal of lower dam and installation of fish barrier at BLM spring (CDFG, Service)	\$30,000 - \$60,000
Northeast Spring	2004	• Administrative costs of consultation and project costs for removal of fish barrier and installation of new infrastructure at Northeast Spring (LADWP, USACE, Service)	\$50,400 - \$58,800
Total Direct Costs			\$736,000 - \$795,000
<i>Indirect Costs</i>			
Grazing	1998 – 2004	• Indirect costs of precluding grazing activities on 80 acres of land within the proposed CHD lands (grazing leaseholder)	\$12,500
TOTAL PRE-DESIGNATION COSTS			\$749,000 - \$808,000

Note: Figures may not sum due to rounding

112. These costs are separable by year and cost bearer as highlighted in Exhibits 4-3 and 4-4. The greatest portion of these costs, 39 percent, will be borne in year 2004 in association with the modification of impoundments within the Fish Slough ACEC. An additional 36 percent were incurred in year 2001, corresponding with the review and evaluation (including report preparation and development of a preliminary hydrological model) of the proposed U.S. Filter groundwater exportation project as detailed in Section 4.1.5.⁶¹

EXHIBIT 4-3: PRE-DESIGNATION COSTS BY YEAR (\$2004)

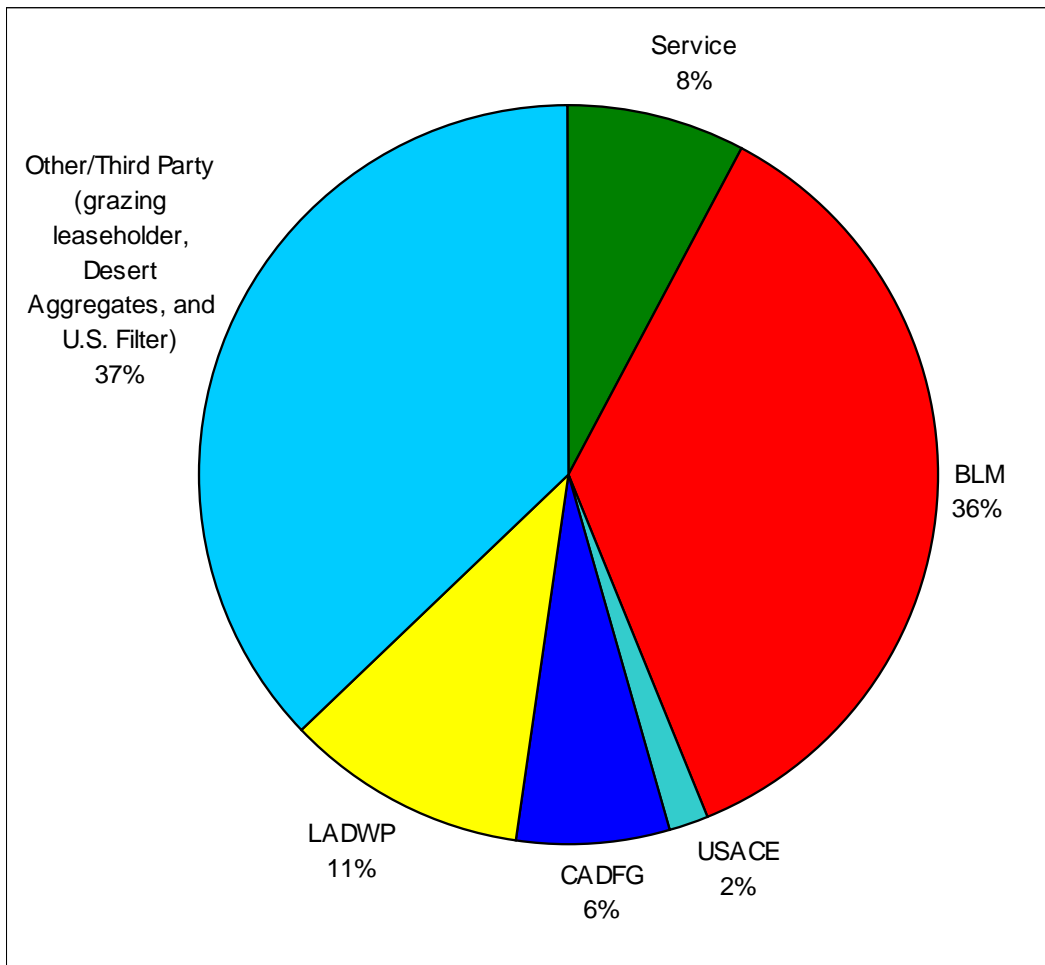
YEAR	TOTAL COST (LOW)	TOTAL COST (HIGH)	PERCENT OF TOTAL COST
1998	\$57,300	\$57,300	7.1%
1999	\$35,800	\$35,800	4.4%
2000	\$35,800	\$35,800	4.4%
2001	\$292,000	\$292,000	36.2%
2002	\$35,800	\$35,800	4.4%
2003	\$35,800	\$35,800	4.4%
2004	\$256,000	\$315,000	39.0%
TOTAL	\$749,000	\$808,000	100%

Note: Figures may not sum due to rounding.

113. As shown in Exhibit 4-4, the BLM bore approximately 36 percent of total estimated pre-designation costs. This is due primarily to resource management activities that were undertaken within the Fish Slough ACEC that benefit the FSMV, including recreation management, prescribed burning, species propagation, and impoundment removal and modification. Third parties are estimated to have incurred an additional 38 percent of the pre-designation costs. The two main third parties are Desert Aggregates, a commercial sand and gravel mining company, and U.S. Filter Resources, which proposed to export groundwater from the Tri-Valley area to the City of Los Angeles as detailed in Section 4.1.5 of this analysis. The remaining 27 percent of calculated costs are anticipated to be distributed as described in Exhibit 4-4.

⁶¹ The assessment of the environmental implications of the proposed U.S. Filter groundwater exportation project is a requirement of the California Environmental Quality Act (CEQA) and would be required regardless of the CHD for the FSMV. This environmental review, however, did consider the impact of the project on the FSMV and is therefore included in this analysis.

EXHIBIT 4-4: PRE-DESIGNATION COSTS BY PARTY BEARING (\$2004)



114. Sections 4.1.1 through 4.1.6 provide detailed descriptions of all pre-designation activities that consider the FSMV and the economic impacts of this consideration.

4.1.1 Agriculture

This analysis estimates zero pre-designation economic impacts to agricultural production activities.

115. There have been no consultations regarding the FSMV with respect to agricultural activities since the species' listing in 1998. The Service's concern with agriculture with respect to the FSMV is the drawdown of the Fish Slough groundwater table associated with irrigation of crops (primarily alfalfa). Section 3.2.1 of this analysis details the socioeconomic profile of agricultural activity in the valleys surrounding Fish Slough,

Hammil and Chalfant. No farms exist within the proposed critical habitat boundaries for the FSMV as the alkaline soils that support that plant are not amenable to crop production.⁶²

116. Agricultural activities have not been impacted in the past by consideration of the FSMV. This is primarily due to the uncertainty surrounding the groundwater hydrology within the surrounding valleys (see Section 2.2.4 for complete discussion). That is, the Service has not consulted on agricultural activities because it is unclear where groundwater withdrawals may impact the slough's water table, thereby altering the extent of the alkaline habitat area on which the FSMV depends. Further, no Federal management of agricultural activities exists absent funding from a cooperative program such as the Natural Resource Conservation Service's (NRCS) Environmental Quality Incentives Program (EQIP) program. Through EQIP, the NRCS provides technical and financial assistance for the installation or implementation of structural and management conservation practices on agricultural land to farmers and ranchers who face particular land and water quality threats.⁶³ Regardless of the Federal funding status of agricultural activities (such as irrigation practices), no information exists on the effect of groundwater withdrawal from surrounding valleys on the FSMV.
117. As a result of these factors, no pre-designation impacts to agricultural activities have been incurred as a result of the FSMV.

4.1.2 Livestock Grazing

Economic impacts to livestock grazing activities represent two percent of the total pre-designation impacts.

Description of Activity

118. Since the listing of the FSMV in 1998, no formal section 7 consultations have occurred regarding the affect of grazing activities on the plant. This is primarily due to the fact that the BLM does not permit grazing on their lands within the proposed CHD and no Federal nexus exists to trigger a consultation with respect to grazing on LADWP lands. LADWP currently authorizes one leaseholder to graze cattle on its land within the Fish Slough with the exception of one 80-acre cattle enclosure. In the late 1990s, the leaseholder grazed approximately 400 head of cattle within the Fish Slough area. Due to ecological concerns, this number is now decreased by an order of magnitude to 40 head. The 80-acre cattle enclosure that protects the FSMV from grazing impacts was constructed in 1992, six years prior to the listing of the FSMV as threatened. This analysis considers economic impacts of FSMV protections beginning with the time of the species' listing in 1998. Accordingly, the cost of the construction of the enclosure is not included in this analysis.

⁶² Personal communication with Anne Halford and Terry Russi, BLM, June 2, 2004.

⁶³ Natural Resource Conservation Service, "Environmental Quality Incentives Program," accessed at <http://www.nrcs.usda.gov/programs/eqip/> on June 28, 2004.

Economic Impacts

119. Annual maintenance of the cattle enclosure, however, does benefit the FSMV and is an ongoing activity. Accordingly, costs associated with maintenance of the cattle enclosure are included in this analysis. The LADWP estimates that direct costs of fence maintenance and repair are approximately \$500 per year, resulting in a total cost of **\$3,500 in pre-designation costs**. The costs of materials are supplied to the leaseholder by LADWP.⁶⁴
120. In addition to the direct maintenance costs, there may be indirect costs to the leaseholder associated with precluding grazing activity within the 80-acre cattle enclosure. In 1982, the Fish Slough grazing allotment on LADWP lands comprised 2,335 acres. Accounting for the 80-acre cattle enclosure, this area is estimated to currently include approximately 2,255 acres.⁶⁵ This analysis derives the value of an acre of grazing land based on the potential per acre cattle production. It is further assumed that the economically viable utilization of these particular grazing lands is 0.02 head of cattle per acre annually, which is the number of head currently grazed (40) divided by acres available for grazing (2,255). Accordingly, the 80-acres of land excluded from grazing activity could support approximately 1.6 head of cattle, at a value of approximately \$1,780.⁶⁶ Pre-designation impacts associated with precluding grazing from 80 acres of land are therefore estimated to be approximately **\$12,500** from 1998 through 2004. This value likely overstates the impact of FSMV protection to the leaseholder as this estimate reflects the value of cattle; that is it does not exclude the costs of production that are avoided due to the decreased number of cattle grazed in the area. Because less cattle is grazed (lost grazing opportunity for 1.6 heads of cattle), the costs of production (e.g., feeding and care for those cattle) are also no longer spent. Cost of production may be a substantial portion of the per head value of cattle. For example, in the western United States in 1996, total ranching operations costs comprised approximately 80 percent of the value of production.⁶⁷
121. Importantly, the economic impacts associated with fence maintenance and reduced grazing lands are not a result of section 7 consultation regarding the FSMV. While these activities do benefit the species and habitat, the LADWP efforts to preserve

⁶⁴ Personal communication with Paula Hubbard and Brian Tillemans, LADWP, June 3, 2004.

⁶⁵ Bureau of Land Management, Bishop Resource Area, *Management Plan for Fish Slough: An Area of Critical Environmental Concern*, October 1984, page 20.

⁶⁶ National Agricultural Statistics Service, National Agricultural Statistics, 2002, Chapter 7: Statistics of Cattle, Hogs, and Sheep, Table 7-3- All Cattle and Calves: Number and Value by States, Jan 1 2001-2002, accessed at http://www.usda.gov/nass/pubs/agr02/02_ch7.pdf on June 24, 2004. In 2002 the value per head of cattle in California was \$1,060. Inflating this estimate to 2004 dollars using the U.S. Bureau of Labor Statistics Consumer Price Index, results in the value per head of \$1,114. This value multiplied by 1.6 head of cattle is \$1,780 per year.

⁶⁷ U.S. Department of Agriculture, *Characteristics and Production Costs of U.S. Cow-Calf Operations*, Statistical Bulletin 974-3, November 2001.

the species are not triggered due to implementation of the section 7 provisions of the Endangered Species Act.

4.1.3 Recreational Activities

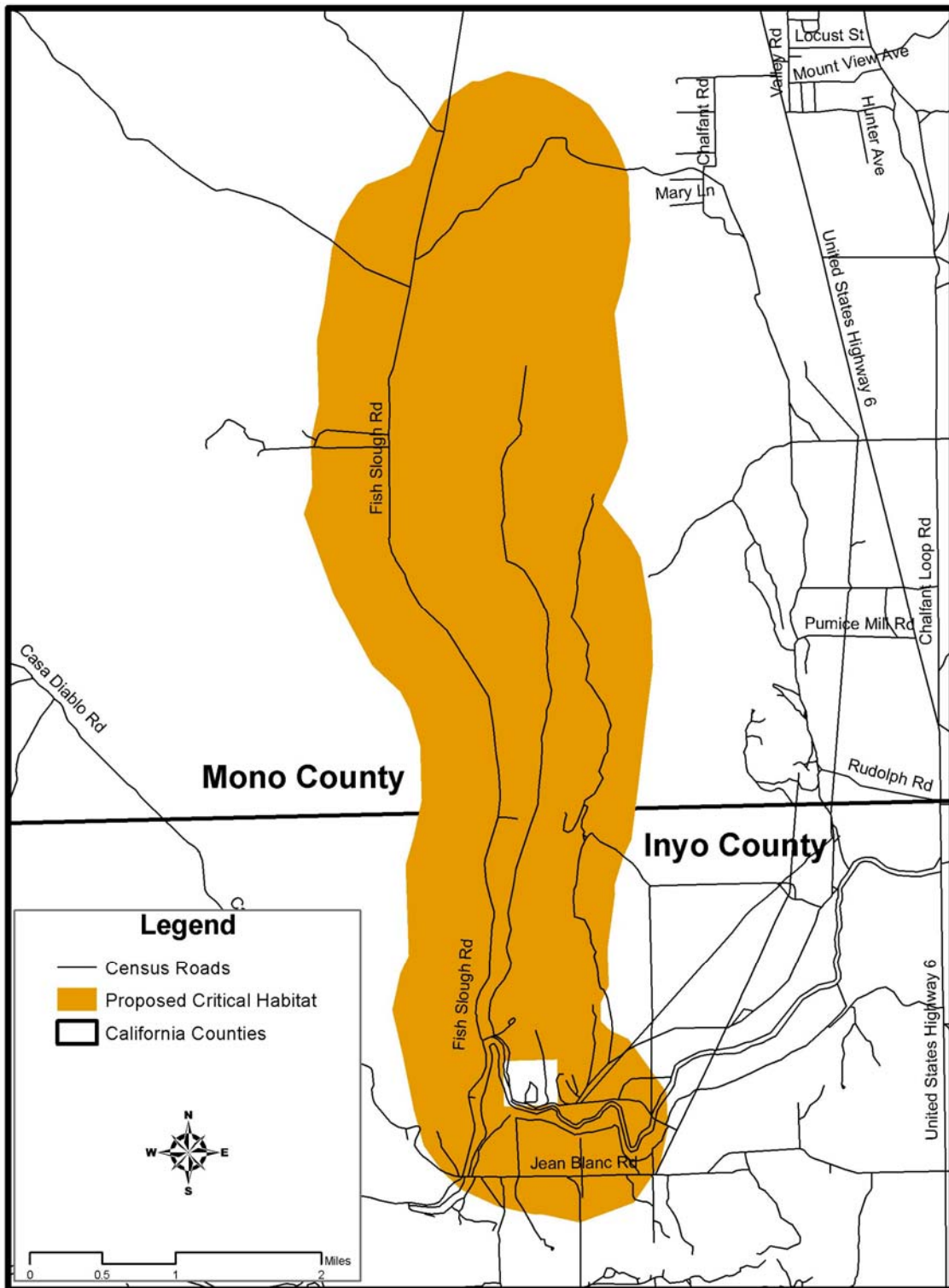
Economic impacts to recreational activities represent 0.4 percent of the total pre-designation impacts.

Description of Activity

122. No consultations have occurred regarding the FSMV with respect to recreational activities within the proposed CHD. This is primarily because the majority of the proposed CHD is managed according to the Fish Slough ACEC management plan developed in 1984, which is designed to preserve the area's natural resources. As a result, few activities are allowed to occur within the critical habitat lands that have the potential to adversely affect the FSMV or habitat and therefore require consultation. The Fish Slough ACEC provides recreational opportunities to area residents and tourists in the form of recreational fishing, OHV use, cultural and historical resources (e.g., Native American petroglyphs). The ACEC also has the potential to provide habitat for two other Federally-listed species in addition to the FSMV; these include the Owens pupfish and Owens tui chub. In order to provide protection to the natural resources within the ACEC, the BLM, CDFG, and LADWP manage recreational uses of Fish Slough; most pertinent to the FSMV is the management of OHVs in the proposed CHD.
123. In compliance with the management plan, the BLM inventoried all existing OHV routes within the Fish Slough ACEC in the late 1980s. This survey determined that all areas of interest within Fish Slough were accessible using existing routes and there was no need for additional routing within the area. Since that time, these routes have been the only recognized routes of travel and OHV are required to remain on these routes only. Signs are posted throughout the area informing the OHV users of the requirement to remain on the designated routes. In the case that this regulation is not adhered and a new "volunteer route" is created, BLM staff obliterates the new routes.⁶⁸ Exhibit 4-5 illustrates the existing routes of travel within the proposed CHD portion of the Fish Slough ACEC.

⁶⁸ Personal communication with Anne Halford and Terry Russi, BLM, June 2, 2004.

EXHIBIT 4-5 EXISTING ROUTES OF TRAVEL WITHIN THE PROPOSED CHD FOR THE FSMV



Economic Impacts

124. The direct costs of vehicle management activities include approximately \$500 per year for posting signage to mark the open routes.⁶⁹ This benefits the FSMV and habitat by encouraging OHV users in the area to remain on the open routes which minimizes the chances of direct impact to the plant from crushing under vehicles.
125. To further encourage adherence to routes open to travel, the BLM constructed a rock barrier on portions of Fish Slough Road near the existing populations of the FSMV. Fish Slough Road is the most traveled route as it leads to Fish Slough Lake, the largest recreational fishing spot within Fish Slough. Approximately 1,000 vehicle trips per year pass through this road.⁷⁰ Construction of the barrier required minimal effort and has served its purpose effectively. A photograph of the rock barrier is provided in Exhibit 4-6.

EXHIBIT 4-6 ROCK BARRIER ON FISH SLOUGH ROAD (photo from June 2, 2004)



⁶⁹ Personal communication with Anne Halford and Terry Russi, BLM, June 2, 2004.

⁷⁰ Ibid.

126. In addition to the costs of signage and barrier construction, the BLM undertakes obliteration of volunteer routes within the Fish Slough ACEC to discourage creation of new roads in the area. Raking over of volunteer routes occur approximately twice monthly. The BLM also monitors the area periodically to ticket any OHV users that venture off of the existing routes.
127. The number and distribution of routes open to OHV traffic in the CHD has not changed since the late 1980s, ten years before the listing of the FSMV. This analysis therefore does not assume that conservation of the FSMV and habitat has reduced the opportunity for OHV recreation in the proposed CHD area. Accordingly, the only costs resulting for management of OHV use in the proposed CHD are direct costs to the BLM of signing, barrier construction, new road obliteration, and enforcement.
128. The direct pre-designation costs of signage are \$500 per year, or **\$3,500** since the listing of the FSMV. The direct costs of the remaining vehicle management activities are captured in the time and salaries of BLM employees and are not separable by activity. As a result the costs of these activities to the BLM is encompassed in the total estimated costs of FSMV conservation for the BLM as discussed in Section 4.1.6 of this analysis.

4.1.4 Commercial Mining

*Economic impacts to commercial mining activities represent **6.5 percent** of the total pre-designation impacts.*

Description of Activity

129. No consultations on the impacts of mining activities on the FSMV have occurred in the past. The Five Bridges Aggregate Pit, a gravel mine operated by the Desert Aggregates mining company under a long-term lease with LADWP, exists approximately 3.5 miles north of Bishop, south of the proposed CHD. The Five Bridges Aggregate Pit covers 231 acres of land.
130. In September 2002, Desert Aggregates submitted an application to Inyo County to expand mining operations under a project titled "Desert Aggregates Five Bridges Road Proposed Expansion Operations and Reclamation Plan". The proposed project extends mining operations and concurrent reclamation onto an additional 392 acres north and east of the current mining site. The expansion is proposed to occur in five phases over a 32-year time frame, through 2036, with an additional three-year period to implement reclamation and re-vegetation. The project site is estimated to contain approximately seven million tons of aggregate material with 15 percent of the mined material considered unsuitable for use or for sale. Production is anticipated to continue at a rate of approximately 250,000 tons per year throughout the 32-year time frame.⁷¹

⁷¹ Secor International, Inc., 2004.

131. Of the 392 acres comprising the proposed expansion area, 264 will be excavated for mining activities and the remaining 128 designated as setback and berm areas, roads, right-of-ways, and set-asides for sensitive vegetation. The mining activity in the proposed expansion area includes digging of shallow depressions, 11 to 17 feet in depth.
132. In compliance with the California Environmental Quality Act (CEQA), Inyo County has prepared a Draft Environmental Impact Report (EIR) to assess significant environmental effects associated with the Desert Aggregates Five Bridges Road Proposed Expansion Operations and Reclamation Plan. CEQA is a California State statute requiring State and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. CEQA regulations require a lead agency to prepare an EIR if the proposed project may produce certain types of impacts, including when:
- “[t]he project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory.”⁷²*
133. In addition to identifying potential environmental effects associated with a proposed project, EIRs propose methods to minimize or eliminate significant effects, and evaluate a reasonable range of alternatives that would meet the major objectives of the proposed project while reducing or avoiding significant environmental effects.
134. The potential significant environmental effects of the proposed project relevant to the FSMV are (1) decreasing the viability of sensitive plant communities, and (2) lowering the level of groundwater from de-watering of the mine pits.
135. With regard to sensitive plant communities, the draft EIR finds that the proposed project may result in significant effects, such as the loss of alkali meadow vegetation. While Desert Aggregates proposes to backfill, re-vegetate, and monitor the areas post mining activity, it is not possible to determine how successful the revegetation efforts will be. As a result, the draft EIR concludes that the proposed project may result in significant impacts to native sensitive species.
136. Literature searches and three field surveys were conducted to collect data that could be incorporated into the draft EIR of the rare species that may inhabit the project area. These studies determined that the FSMV does not occur on the project site, and has a low probability of occurring within the vicinity of the project site. Accordingly, the

⁷² California Natural Resources Code §15065(a). Categories of “environmental impact” evaluated in the context of CEQA review and/or EIR preparation typically include geological, air quality, water quality, noise, light/glare, land use planning, population, housing, transportation/circulation, public service, utility system, energy, human health, aesthetic, recreational, and cultural resource impacts.

Service's major concern regarding the potential affect of the proposed mine expansion project on the FSMV is the affect of the project on water levels within Fish Slough.

137. Desert Aggregates proposes two main mitigation measures to reduce the projects impact on the local groundwater table: (1) establishment of a groundwater monitoring system using existing and new wells; and (2) mining in "cells" of between 15 to 20 acres to reduce the dewatering volumes necessary for excavation and reduce amount of barren areas. Implementation of these measures is anticipated to reduce the level of impact on groundwater levels of the project to "less than significant." The draft EIR concludes that following implementation of these measures, "The potential impacts on groundwater levels and off-site biological resources were assessed in Sections 4.1 and 4.3 and found to be less than significant with mitigation. This is consistent with the goals of the agreement with respect to groundwater level effects."⁷³

Economic Impacts

138. Multiple factors contribute to the need for mitigation of groundwater effects of this project, including:

- CEQA compliance,
- California Surface Mining and Reclamation Act (SMARA) compliance⁷⁴, and
- Consideration of the BLM's Fish Slough ACEC.

139. Because of the proximity of the Fish Slough ACEC to the mining operation, Desert Aggregates is required to consider the impact of the mine on the ACEC resources, including the FSMV. Consideration of the ACEC in general, and the FSMV in particular, is one of the causative factors of the groundwater effects monitoring associated with the mining expansion. Groundwater monitoring activities assist in the management of the FSMV by providing data about the groundwater levels within Fish Slough throughout the course of the project. This analysis includes the cost of Desert Aggregates' groundwater monitoring program as an economic cost to the project incurred due to consideration for the FSMV.

140. The major costs of the groundwater monitoring for the project are the construction of three monitoring wells. Each well may cost approximately \$12,000 to \$15,000 to drill.⁷⁵ Desert Aggregates and LADWP do not expect that these wells will identify

⁷³ Secor International, Inc., 2004, page 4.6-8.

⁷⁴ California Public Resources Code, Division 2, Chapter 9, Section 2710 et seq. The California Surface Mining and Reclamation Act of 1975 specifies that surface mining and reclamation activity must be conducted such that: "(a) Adverse environmental effects are prevented or minimized and that mined lands are reclaimed to a usable condition which is readily adaptable for alternative land uses. (b) The production and conservation of minerals are encouraged, while giving consideration to values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment. (c) Residual hazards to public health and safety are eliminated."

⁷⁵ Personal communication with LADWP, June 3, 2004.

impacts to groundwater levels associated with this project. This analysis therefore assumes that well construction and the administrative costs of well monitoring and reporting on results are the sole modifications of this project plan relevant to conservation for the FSMV. Regular monitoring of the well and reporting on results is anticipated to cost on the level of a biological assessment, \$4,000 to \$5,600 as described in Figure 4-1. Accordingly, this analysis estimates that, in 2004, pre-designation of CH for the FSMV, mining activities will result in economic impacts of **\$40,000 to \$50,600** for construction of groundwater monitoring wells.

141. While no formal section 7 consultation regarding this project has been initiated, the consultants developing the draft EIR did contact the Service and the Service responded with general thoughts on the elements that should be included in the DEIR regarding the FSMV. As such, in addition to the costs of well construction, this analysis includes the administrative costs of this technical assistance effort, of **\$860 to \$2,180**, as identified in Exhibit 4-1.
142. These costs are not attributable solely to FSMV protective efforts in general or CHD in particular. The monitoring wells would be required in the absence of the FSMV species in order to ensure minimal disturbance to the groundwater table in the Fish Slough ACEC in accordance with CEQA and SMARA.

4.1.5 Groundwater Exportation

Economic impacts to groundwater exportation activities represent 29.1 percent of the total pre-designation impacts.

Description of Activity

143. The Service has not consulted on groundwater exportation activities regarding the FSMV in the past. The Service, however, is concerned that groundwater withdrawals from unknown regions outside of the proposed CHD for municipal or other uses may lower the water levels within the slough thereby decreasing the extent of available alkaline habitat for the FSMV.
144. Definitive information does not exist regarding the sources of water that discharge from springs in Fish Slough. Data indicate the Casa Diablo Mountain area, portions of the Tri-Valley area (i.e., Chalfant and Hammil Valleys), or a combination of these two areas is the most likely source.⁷⁶ Therefore it is possible that groundwater withdrawal from these valleys may impact the FSMV.

(a) Owens Valley

145. Under an agreement between Inyo County and the LADWP, LADWP pumps and diverts groundwater from several well fields in the Owens Valley Groundwater Basin

⁷⁶ MHA Environmental Consulting, Inc., 2004.

area, just south of Fish Slough and proposed CHD, to the city of Los Angeles.⁷⁷ As the LADWP wells occur down gradient of Fish Slough, the impact of the groundwater exportation from Owens Valley on the hydrology within the Fish Slough ACEC is unclear.⁷⁸ The Service has not consulted on LADWP groundwater exportation activities in the past.

(b) Tri-Valley Area

146. The Tri-Valley Groundwater Management District (TVGMD) governs excess water within Hammil, Chalfant, and Benton Valleys. That is, the primary function of the TVGMD is to review proposals for water withdrawals from the valley for exportation in order to ensure that they are feasible and comply with CEQA. TVGMD was developed in the early 1990s out of concern that the previously unregulated levels of groundwater exportation would impede agricultural production by decreasing water available for irrigation.⁷⁹
147. Since the creation of the TVGMD, few proposals for groundwater exportation have been proposed to the Board. In 2001, U.S. Filter Water Resources, Inc (U.S. Filter) proposed the “U.S. Filter Tri-Valley Surplus Groundwater Program.” The proposed project involved exportation of up to 13,700 acre-feet per year of surplus groundwater from three separate well fields in Benton, Hammil, and Chalfant Valleys for the City of Los Angeles and the LADWP.⁸⁰ The TVGMD requested that U.S. Filter conduct a study to determine the extent of surplus groundwater in the region, and the potential environmental impacts of the proposed project.⁸¹
148. The preliminary hydrologic model used for the report suggested that current levels of pumping in the Tri-Valley area may have caused some reduction in flow at Fish Slough. The report does caveat, however, “This is a tentative conclusion at best given the lack of data to calibrate a pre-development model. Because of the importance of Fish Slough as an environmental resource, it will be necessary to collect additional geochemical/isotopic data in the Fish Slough area to confirm or modify this conclusion.”⁸²

⁷⁷ Agreement Between the County of Inyo and the City of Los Angeles and Its Department of Water and Power on a Long Term Groundwater Management Plan for Owens Valley and Inyo County, DATE, accessed at http://www.inyowater.org/Water_Resources/water_agreement/default.html#History%20and%20Preliminary%20Statement in June 2004.

⁷⁸ Personal communication with LADWP, June 3, 2004.

⁷⁹ Personal communication with TVGMD, June 4, 2004.

⁸⁰ MHA Environmental Consulting, Inc., 2001.

⁸¹ Personal communication with TVGMD, June 4, 2004.

⁸² MHA Environmental Consulting, Inc., 2001, page 6-37.

149. The U.S. Filter report concluded that the groundwater exportation project was not feasible as currently pumping exceeds current recharge in both Hammil and Chalfant Valleys.⁸³ That is, the water proposed for exportation did not exist; no excess groundwater was available for export and so the project was abandoned. The second phase of the U.S. Filter report was to develop a hydrologic model of the region to determine more precisely the impact of groundwater withdrawals from the Tri-Valley region on environmental resources, including Fish Slough. U.S. Filter did not invest in this second phase, as, due to the lack of exportable water, the results of the Phase 2 study would not change the project status.⁸⁴

Economic Impacts

150. Because the TVGMD's early review of this project in compliance with CEQA revealed that it was not practicable due to the lack of water available for exportation in the Valleys, no consultation was initiated with the Service. Further, the project did not involve a Federal nexus to require consultation.
151. Multiple factors precipitated the development of the environmental impact review of the proposed groundwater exportation project, including:
- CEQA compliance,
 - TVGMD review in the context of impacts on local farmers, and
 - Consideration of the BLM's Fish Slough ACEC.
152. Because of the proximity of the Fish Slough ACEC to the proposed project, consideration of the its resources (e.g., water table and listed species), including the FSMV, is one of the causative factors of the development of the hydrologic report associated with the U.S. Filter project. The total cost of the report development, incurred by U.S. Filter was approximately **\$235,000**.⁸⁵ Because the costs of the report stemming specifically from consideration of the FSMV are not separable from the total report cost, this analysis includes the cost of the report development as an economic cost to the project associated with protection for the FSMV. It is important to note, however, that the project report would be necessary regardless of the presence of the FSMV or habitat.

4.1.6 ACEC Conservation Activities

*Economic impacts to ACEC conservation activities represent **62 percent** of the total pre-designation impacts.*

⁸³ Ibid.

⁸⁴ Personal communication with TVGMD, June 4, 2004.

⁸⁵ Ibid.

Description of Activity

153. Because the FSMV occurs within a BLM-designated ACEC, it is afforded protections through the standard resource management activities of the ACEC land management agencies, BLM, CDFG, and LADWP. Resource management activities that offer protection to the FSMV and habitat include:

- Control of unauthorized OHV activity;
- Prescribed burning;
- Invasive species control;
- FSMV germination and propagation; and
- Modification to impoundments and fish barriers.

154. The BLM and CDFG work in coordination on the burning activities within the Fish Slough ACEC. Prescribed burning is a frequently-used management tool to rid an area of dead vegetation, setback the growth of invasive plant species, and encourage re-growth of native species. Exhibit 4-7 illustrates an area within the proposed CHD for the FSMV following prescribed burn activity in early 2004.

EXHIBIT 4-7: FISH SLOUGH ACEC POST PRESCRIBED BURN ACTIVITY (photo provided by BLM)



155. Fish Slough is subject to invasion by a number of nonnative species, such as tamarisk, Russian olive, and perennial pepperweed. Control of these nonnative species is primarily undertaken by the CDFG staff one to five days annually.⁸⁶ Further the LADWP engages in control of invasive species on its land within the proposed CHD.⁸⁷
156. The FSMV is relatively easy to propagate in a controlled environment. In order to meet the Fish Slough ACEC management goal of maintaining native species, the BLM undertakes germination and propagation of the species at the nearby White Mountains Research Station. These projects have been successful in establishing new plants in recent years.⁸⁸
157. Dams, impoundments, and fish barriers were created within Fish Slough in some cases to provide sport fish habitat, and in others to provide fish barriers that promote the recovery of rare and endangered native fishes, including the Owens pupfish and Owens

⁸⁶ Communication with Steve Parmenter, CDFG, April 21, 2004.

⁸⁷ Communication with Paula Hubbard, LADWP, October 4, 2004.

⁸⁸ Personal communication with Anne Halford and Terry Russi, BLM, June 2, 2004.

tui chub.⁸⁹ Impoundment of the naturally flowing slough, however, has increased the size of permanently flooded habitats, modified surface water drainage patterns, and increased the length of time that alkaline habitat is subject to elevated soil moisture conditions. In response, the land management agencies have agreed to remove nonessential dams, and to consider modifying retained dams to reduce the height of impounded water.

158. Removal and modification of impoundment and related structures within the proposed CHD have been proposed by CDFG to occur before the final designation of critical habitat in June 2005. The project descriptions are as follows.

- **Northwest Springs.** Two dams currently exist in this area known as the Owens Valley Native Fish Sanctuary. In 1989 the CDFG proposed to breach the lower dam and replace the outlet with a fish barrier. In 2000, the USACE issued a letter of verification that the project was authorized under a nationwide 27 permit, which was good for two years. Approximately two years ago impoundment above the lower dam was drained through the existing apparatus which drew the water level down approximately 2.5 feet, almost to the natural level. Construction of a new fish barrier was halted as the original USACE 404 nationwide permit expired. The new barrier will lower the water level further as the project involves removal of a pipe structure, which is currently slowing the flow of the water. The system was initially impounded to provide habitat for the Owens Valley native fishes. Native fishes, however, have not been present in the area following the invasion by largemouth bass in 1988.⁹⁰

CDFG subsequently applied for a new USACE 404 permit, and the USACE is currently engaged in formal section 7 consultation with the Service regarding the project's impacts on the FSMV. If approved, the project is anticipated to be completed in summer 2004.⁹¹ The project work will be completed by CDFG and LADWP staff.

- **Red Willow Dam.** The Red Willow dam was constructed before the BLM managed the Fish Slough area by a local sporting goods store owner in the 1950s to provide sportfishing habitat. The dam remains the largest hydraulic perturbation in Fish Slough and currently serves no desired resource management function. There is a risk to downstream FSMV populations if the dam fails. The impounded waters have also created a cattail marsh habitat, which may displace potential FSMV habitat. Removal of the structure is expected to restore 22 acres of Fish Slough.

⁸⁹ Personal communication with Steve Parmenter, CDFG, June 2, 2004 and August 25, 2004.

⁹⁰ Ibid.

⁹¹ Personal communication with Steve Parmenter, CDGF, June 2, 2004; personal communication with Bruce Henderson, USACE, June 16, 2004.

The CDFG has been awarded a grant to co-fund removal of the dam. The CDFG hopes to complete the project in 2004.⁹²

- **BLM Spring.** In 2003 CDFG and BLM replaced a barrier at BLM Spring to improve its function and to reduce its effect on local hydrology. Surface water elevation was reduced approximately 0.5 feet in 500 feet of channel, and Owens pupfish were successfully reintroduced in 2003 after a six year absence.⁹³

A second project at BLM Spring would remove a lower dam and replace it with a smaller fish barrier 1,000 feet below the renovated fish barrier. The dam now spreads water over a wide expanse of land, essentially inundating alkali marsh and converting it to tule marsh/saltgrass meadow. This effect may displace potential FSMV habitat. The new fish barrier would be a smaller structure located further downstream to reduce or negate potential impacts to FSMV habitat. The project would remove hundreds of cubic yards of gravel and restore one site, while installing a new structure in a previously undisturbed location. Hand work and low ground pressure vehicles would be used to limit disturbance. This project would involve partnership between CDFG and BLM and would include environmental review and construction.⁹⁴

- **Northeast Spring.** A dam was constructed at Northeast Spring to impound waters. Subsequently, the dam was raised to facilitate installation of a streamflow gauging device. As a result, the aquatic plant community was altered and the pond became overgrown with emergent vegetation. The Fish Slough management agencies agree on the need to eliminate or reduce the height of this dam to restore the native plant communities. While this project has not yet been formally proposed, CDFG anticipates moving forward as soon as possible and hopes to have the project completed before spring 2005.⁹⁵

Economic Impacts

159. The ACEC resource management activities are not conducted solely for the benefit of the FSMV. These activities do, however, benefit the FSMV, and as such the costs of these activities are included within this analysis. Because of their beneficial nature, the Service has not consulted with the BLM or other agencies on these activities

⁹² Personal communication with Steve Parmenter, CDFG, June 2, 2004 and August 25, 2004.

⁹³ Personal communication with Steve Parmenter, CDFG, June 2, 2004, August 25, 2004, and October 4, 2004.

⁹⁴ Personal communication with Steve Parmenter, CDFG, August 25, 2004.

⁹⁵ Ibid.

to date with the exception of the ongoing consultation regarding construction of the fish barrier at Northwest Spring.

160. The BLM estimates that management activities associated specifically with the FSMV result in costs of approximately \$30,000 annually. This includes staff time for monitoring of species, coordination with other land management agencies, enforcement of recreational use guidelines as described in Section 4.1.1, and public outreach.⁹⁶ Accordingly, these FSMV management activities have cost the BLM approximately **\$210,000** since the species' listing in 1998.
161. The following costs are estimated in addition to BLM's annual estimate of costs related specifically to the FSMV.
162. The prescribed burning activities within the Fish Slough ACEC occur on a three to five year cycle and are estimated to cost the BLM approximately \$20,000 including preparing the area, and labor costs of participants and fire fighters.⁹⁷ It is unclear how often the prescribed burn activities within the Fish Slough ACEC may occur within the proposed CHD for the FSMV. This analysis conservatively assumes that the prescribed burns occur every three years and always occur within the proposed CHD for the FSMV. Accordingly, this analysis estimates that the BLM has incurred costs of **\$60,000** associated with three prescribed burns since the listing of the FSMV in 1998.
163. Control of nonnative species by CDFG requires one to five person-days per year and is anticipated to cost up to \$500 annually.⁹⁸ This analysis therefore estimates CDFG has incurred costs of approximately **\$3,500** associated with control of invasive species within the proposed CHD for the FSMV. LADWP also conducts control of non-native species on lands within the proposed CHD, spending approximately \$2,500 per year, or **\$17,500**, since 1998 on these efforts.
164. Germination and propagation of the FSMV is undertaken by the BLM approximately every three to five years and is anticipated to cost the agency approximately \$1,500.⁹⁹ This analysis accordingly estimates that the BLM has incurred costs of approximately **\$4,500** pre-designation of CH for the FSMV.
165. Removal and modification of impoundment and related structures within the proposed CHD are anticipated to occur before the final designation of critical habitat for the FSMV and to result in the following costs.
- **Northwest Spring.** The Service has indicated that the consultation regarding this project may be resolved informally. Currently, however,

⁹⁶ Personal communication with Anne Halford and Terry Russi, BLM, June 2, 2004.

⁹⁷ Communication with Anne Halford, BLM, June 24, 2004.

⁹⁸ Personal communication with Anna Halford and Terri Russi, BLM, June 2, 2004.

⁹⁹ Ibid.

the Service is engaged in a formal consultation with the USACE and this analysis accordingly anticipates that the administrative costs of a formal consultation of \$13,900 to \$22,300 may be borne by CDFG, USACE, and the Service associated with review of this project. Additionally, the USFWS contributed \$10,000 and CDFG funded \$6,500 for the project work; the LADWP is also contributing an additional \$20,000 to the project. Accordingly the entire project is anticipated to result in costs of **\$50,400 to \$58,800.**¹⁰⁰

- **Red Willow Dam.** Removal of the Red Willow Dam does not require a USACE 404 permit and therefore consultation with the Service is not anticipated. The current grant proposal indicates a project cost of approximately **\$27,300.**¹⁰¹ The BLM and CDFG aim to complete this project in 2004.
- **BLM Springs.** No definitive cost estimate is available for the removal or reduction of height for the lower dam and replacement of the fish barrier at BLM Springs. The CDFG anticipates that costs may be on the order of magnitude to the removal and replacement of the fish barrier at Northwest Spring as described above. Although the dam itself is smaller, this project involves more difficult materials, more sensitive working conditions, and more exacting environmental review requirements. CDFG therefore estimates that the project will cost between **\$30,000 and \$60,000**, including the administrative costs of formal internal section 7 consultation with the Service of \$13,900 to \$22,300. The most likely funding mechanism for the project is a Section 6 Cooperative Endangered Species Fund grant from the Service which would contribute approximately 75% of the project modification costs, or \$12,075 to \$28,275, and CDFG will bear the remaining cost of \$4,025 to \$9,425.¹⁰²
- **Northeast Spring.** While restoration work at this location does not yet include a precise design proposal, CDFG notes that this work will be similar in scale, access, material requirements, and objective to work conducted at Northwest Spring, including breaching and installing a stream flow gauge. Similar to the Northwest Spring project, this analysis assumes a formal consultation will be conducted with the USACE and project modification costs will be borne by LADWP as this project occurs

¹⁰⁰ Personal communication with Steve Parmenter, CDFG, June 2, 2004; personal communication with LADWP, June 3, 2004; letter from David Castanon, USACE to the Service, March 31, 2004.

¹⁰¹ Bureau of Land Management to National Park Service, FY 2004 Challenge Cost Share Application, "Restoration of Fish Slough Alkali Wetlands."

¹⁰² Personal communication with Steve Parmenter, CDFG, August 25, 2004.

on LADWP lands within the Fish Slough. Total project and consultation costs are therefore anticipated to be approximately **\$50,400 to \$58,800**.¹⁰³

166. Removal of the impoundments within Fish Slough directly benefits the FSMV and will return the hydraulic system to a flowing rather than impounded state. The direct costs of these projects are detailed above. The effect of the impoundment removals on recreational fishing opportunities is unclear. Fish Slough Lake is a recreational fishing resource in the region. The lake is small and isolated within the Fish Slough ACEC as illustrated in Exhibit 4-8. Further, the areas directly surrounding the Fish Slough ACEC provide significant substitute opportunities for recreational anglers displaced from Fish Slough Lake. In fact, Fish Slough Lake, a natural water body which is expected to remain unaffected by dam modification projects, represents five percent of available recreational fishing opportunity in the area.¹⁰⁴ As a result, this analysis forecasts a negligible, if any, level of indirect economic impacts to recreational anglers within the region.

EXHIBIT 4-8: FISH SLOUGH LAKE (photo from June 2, 2004)



¹⁰³ Ibid.

¹⁰⁴ Personal communication with Anne Halford and Terry Russi, BLM, June 2, 2004; personal communication with Steve Parmenter, CDFG, August 25, 2004.

4.2 Post-Designation Impacts

167. This section forecasts, over a 20-year time horizon, costs that may occur after the proposed designation is finalized in June 2005. It discusses future management actions involving species and habitat protection, including a discussion of the types of economic impacts associated with each component of these management actions. Post-designation impacts associated with FSMV conservation are summarized in Exhibit 4-9 and detailed in the following discussion. Total nominal post-designation costs from 2005-2025 are anticipated to be approximately \$946,000 to \$978,000.¹⁰⁵ Applying a 7 percent discount rate, the present value of future costs associated with FSMV conservation is approximately **\$501,000 to \$518,000, or \$47,300 to \$48,900 per year over 20 years.**
168. Estimated post-designation costs include:
- Direct annual costs of species and habitat conservation activities (\$41,000 per year);
 - Direct annual costs of monitoring and reporting on the status of groundwater impacts associated with mining activities (\$4,000 to \$5,600 per year);
 - Direct costs of cattle exclosure maintenance and construction (\$500 per year);
 - Indirect costs of reducing grazing opportunities (\$1,780 per year); and
 - Direct costs of signage for OHV routes of travel (\$500 per year).
169. As a result of conversations with relevant Federal agencies, no post-designation section 7 consultations are currently anticipated for the species. All post-designation costs are direct costs of projects intended to benefit the FSMV, project modifications undertaken independently (that is, not a result of section 7 consultation), and indirect costs of project modifications (e.g., reduced grazing opportunities).
170. The only pre-designation consultations regarding the FSMV are associated with USACE 404 permitting of the removal and re-construction of new fish barriers at BLM Spring, Northwest Spring, and Northeast Spring as described in Section 4.1.6 of this analysis. Both projects are anticipated to occur within the next year and the costs of consultation are therefore captured in the pre-designation costs. Following these construction projects, along with the modifications to Red Willow dam in 2004 (pre-designation), no impoundment structures will exist in Fish Slough. Accordingly, this analysis does not anticipate future consultations regarding modifications to hydrological structures.

¹⁰⁵ The “nominal” cost is the undiscounted sum of the future costs. That is, it does not incorporate a discount rate, which is used to bring a series of future cash flows to their present value in order to state them in today's dollars.

171. Previous to these projects the Service has not engaged in formal section 7 consultation regarding the FSMV.¹⁰⁶ The lack of section 7 activity regarding the species is partly due to the ACEC status of the lands inhabited by the species. As an ACEC, Fish Slough is afforded substantial conservation measures through the standard resource management activities of the land management agencies, and therefore activities with the potential to result in adverse affect on the FSMV or habitat are unlikely to occur. As a result, the major land use activities occurring are conducted specifically for the benefit of the FSMV and habitat. In fact, 83 percent of the forecast post-designation costs associated with FSMV protection stems from the implementation of projects specifically intended to benefit the species and habitat (prescribed burns, control of invasive species, propagation and germination, and public outreach).
172. Of the remaining 17 percent of post-designation costs, approximately 11 percent are associated with monitoring of potential groundwater impacts from commercial mining. Another five percent of total post-designation costs is associated with exclusion of cattle grazing activity on 80 acres of land within the proposed CHD, and one percent is associated with signage of open routes for OHV use. These costs are detailed in Section 4.2.1 through 4.2.6 of this analysis.

¹⁰⁶ Personal communication with USFWS, Ventura Field Office, March 2, 2004.

EXHIBIT 4-9: SUMMARY OF FSMV POST-DESIGNATION CONSERVATION EFFORTS (2005-2025)

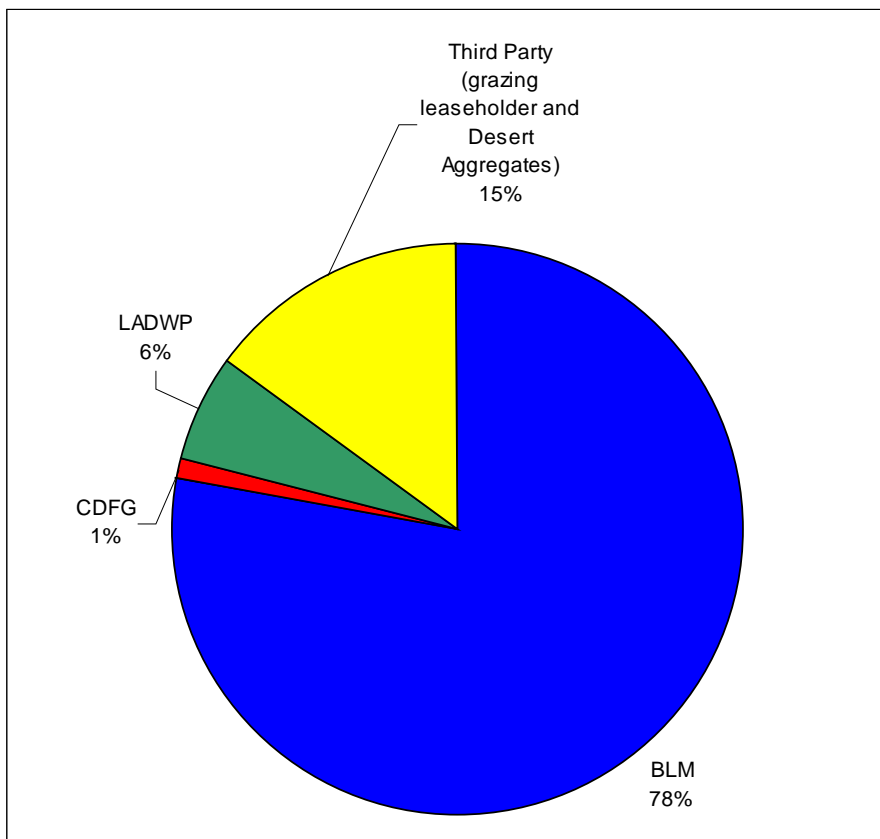
Activity	Date	Description of Economic Impacts of Conservation Effort (cost bearer)	Cost
<i>Direct Costs</i>			
Grazing	2005-2025	<ul style="list-style-type: none"> Costs of materials for maintenance of cattle enclosure (LADWP) 	\$10,000
Mining	2005-2025	<ul style="list-style-type: none"> Costs of monitoring and reporting on the potential groundwater impacts associated with commercial mining activities (Desert Aggregates) 	\$80,000 - \$112,000
Recreation	2005-2025	<ul style="list-style-type: none"> Costs of signage marking open routes of travel (BLM) 	\$10,000
Multiple ACEC Management Activities	2005-2025	<ul style="list-style-type: none"> Costs of staff time for monitoring of species, coordination with other land management agencies, enforcement of recreational use guidelines, and public outreach activities related to the FSMV (BLM) 	\$600,000
Prescribed burns	2005-2025	<ul style="list-style-type: none"> Costs of prescribed burn activities including preparation of area and staff time for coordinators and fire fighters (BLM) 	\$140,000
Control of invasive species	2005-2025	<ul style="list-style-type: none"> Control of invasive species within proposed critical habitat area (CDFG and LADWP) 	\$60,000
Propagation of FSMV	2005-2025	<ul style="list-style-type: none"> Propagation and germination of FSMV plants to aid in recovery of species (BLM) 	\$10,500
Total Direct Costs			\$911,000 - \$943,000
<i>Indirect Costs</i>			
Grazing	2005-2025	<ul style="list-style-type: none"> Indirect costs of precluding grazing activities on 80 acres of land within the proposed CHD lands (grazing leaseholder) 	\$35,600
TOTAL POST-DESIGNATION COSTS			\$946,000 - \$978,000
<i>Present Value (7% discount rate)*</i>			<i>\$501,000 - \$518,000</i>
<i>Present Value (3% discount rate)*</i>			<i>\$704,000 - \$728,000</i>
<i>Annualized</i>			<i>\$47,300 - \$48,900</i>

Note: Figures may not sum due to rounding.

* Present value terms are often used to compare economic costs incurred in different time periods. A discount rate is used to bring a series of future cash flows to their present value in order to state them in today's dollars. That is, the present value is the sum of a series of future cash flows expressed in today's dollars.

173. Exhibit 4-10 illustrates the breakdown of post-designation costs by bearer. The BLM, as the primary landowner and land manager of the Fish Slough ACEC is anticipated to bear the vast majority of costs associated with FSMV protection, 78 percent. This is due primarily to the resource management activities that the agency carries out, including enforcement of OHV recreation guidelines, prescribed burns, public outreach, etc. LADWP is expected to continue to bear costs associated with excluding grazing activities within the 80-acre enclosure constructed for the protection of the FSMV and conducting control of non-native species, six percent of total post-designation costs. Further, CDFG is expected to continue to bear costs associated with invasive species control that benefits the FSMV totally approximately one percent of the total post designation costs. The remaining 15 percent of costs are expected to be borne by third parties. Specifically, 11 percent of these are related to Desert Aggregates groundwater monitoring of their commercial mining operation, and four percent are indirect costs to the grazing leaseholder of precluding grazing activities on 80 acres of FSMV habitat.
174. Costs to the Service are anticipated to be negligible, as no post-designation consultations are currently proposed or foreseeable within the proposed CHD. Although the Service may continue to review plans for CDFG and BLM projects within the Fish Slough ACEC, this review is anticipated to involve minimal time and cost as these activities are conducted for the benefit of the species and habitat.

EXHIBIT 4-10: POST-DESIGNATION COSTS BY BEARER



4.2.1 Agriculture

This analysis does not forecast any post-designation economic impacts to agricultural production activities.

175. Agricultural activities such as irrigation have not been impacted in the past by consideration of the FSMV due primarily to the lack of information on the effect of groundwater withdrawal from surrounding valleys on the FSMV. Section 2.2.4 of this analysis includes a discussion on the uncertainty surrounding the area hydrology and Section 3.2.1 details the socioeconomic profile of agricultural activity in the surrounding valleys. As a result of this uncertainty, this analysis does not expect conservation measures for the FSMV to result in post-designation economic impacts to agricultural activities.
176. In the case that a definitive hydrological model of the area is created, and information becomes available regarding where withdrawal of groundwater may lower the water table in Fish Slough, the Service may consult on agricultural activities to assure that irrigation practices minimize impact on the FSMV and habitat. Due to the complexity of the hydrological system of the region, however, such a model is unlikely to be developed.¹⁰⁷

4.2.2 Livestock Grazing

Economic impacts to livestock grazing activities represent 4.7 percent of the total post-designation impacts.

177. Annual maintenance of the existing cattle enclosure within the Fish Slough grazing allotment on LADWP lands is expected to be necessary during the next 20 years. The LADWP estimates that direct costs of fence maintenance and repair are approximately \$500 per year, resulting in a cost of **\$10,000 in post-designation** costs (2005–2025). The costs of materials are supplied to the leaseholder by LADWP.¹⁰⁸
178. Further, the indirect costs to the leaseholder associated with precluding grazing activity within the 80-acre cattle enclosure are anticipated to continue over the next 20 years. Assuming the value per head of cattle remains relatively constant in that time, the annual value lost to the leaseholder due to continuing suspension of grazing activity within the enclosure is \$1,780.¹⁰⁹ Indirect impacts are therefore estimated to be

¹⁰⁷ Personal communication with Anne Halford and Terry Russi, BLM, June 2, 2004; personal communication with TVGMD, June 4, 2004.

¹⁰⁸ Personal communication with Paula Hubbard and Brian Tillemans, LADWP, June 3, 2004.

¹⁰⁹ National Agricultural Statistics Service, National Agricultural Statistics, 2002, Chapter 7: Statistics of Cattle, Hogs, and Sheep, Table 7-3- All Cattle and Calves: Number and Value by States, Jan 1 2001-2002, accessed at http://www.usda.gov/nass/pubs/agr02/02_ch7.pdf on June 24, 2004. In 2002 the value per head of cattle in California was \$1,060. Inflating this estimate to 2004 dollars using the U.S. Bureau of Labor Statistics Consumer

approximately or **\$35,600** over the next 20 years. As noted in Section 4.1.2, this value likely overstates the impact of FSMV protection to the leaseholder as the value of cattle as calculated does not exclude the avoided costs of production. Costs to the leaseholder of cattle production may be decreased as a result of the decreased number of cattle grazed in the area. Because less cattle is grazed (lost grazing opportunity for 1.6 heads of cattle), the costs of production (e.g., feeding and care for those cattle) are also no longer spent. Cost of production may be a substantial portion of the per head value of cattle. In the western United States in 1996, total ranching operations costs comprised approximately 80 percent of the value of production.¹¹⁰

179. These fence maintenance and reduced grazing acreage impacts are not a result of section 7 consultation regarding the FSMV.

180. LADWP initiated an effort to develop a grazing management plan for its lands, including the allotment within Fish Slough. The plan is anticipated to stipulate restrictions on seasonal use, number of cattle, and areas precluded from grazing. The development of this plan is currently delayed. The LADWP intends to cooperate with other land management agencies in the area (e.g., U.S. Forest Service and BLM) to determine appropriate management strategies. While the agency does plan to complete the plan within the next 20 years, it is not anticipated to significantly change the grazing activity of the current leaseholder within Fish Slough.¹¹¹

4.2.3 Recreational Activities

Economic impacts to recreational activities represent 1.0 percent of the total post-designation impacts.

Description of Activity

181. The BLM does not anticipate designating additional routes within the proposed CHD.¹¹² Signs are posted throughout the area to remind OHV users to remain on the existing routes. BLM also engages in obliteration of volunteer routes, construction of rock barriers where necessary, and enforcement of OHV use guidelines as described in Section 4.1.3 of this analysis.

Price Index, results in the value per head of \$1,114. This value multiplied by 1.6 head of cattle (0.02 head per acre within 80-acre enclosure) is \$1,780 per year.

¹¹⁰ U.S. Department of Agriculture, *Characteristics and Production Costs of U.S. Cow-Calf Operations*, Statistical Bulletin 974-3, November 2001.

¹¹¹ Personal communication with Paula Hubbard and Brian Tillemans, LADWP, June 3, 2004.

¹¹² Personal communication with Anna Halford and Terry Russi, BLM, June 2, 2004.

Economic Impacts

182. The direct costs of vehicle management activities include approximately \$500 per year for posting signage to mark the routes that are open for vehicle travel.¹¹³ This analysis therefore estimates a cost to the BLM of **\$10,000** over the next 20 years for signing open routes, which minimizes the direct impact of vehicles on the FSMV.
183. The direct costs of the remaining vehicle management activities are captured in the time and salaries of BLM employees and are not separable by activity. As a result the costs of these activities to the BLM is encompassed in the total estimated costs of FSMV conservation for the BLM as discussed in Section 4.2.6 of this analysis.
184. The number and extent of routes open to OHV traffic has not changed since the late 1980s, ten years before the listing of the FSMV. This analysis therefore does not assume any reduced opportunities for OHV recreation associated with the proposed CHD area. Accordingly, the only costs resulting for management of OHV use in the proposed CHD are direct costs to the BLM of signing, barrier construction, new road obliteration, and enforcement.

4.2.4 Commercial Mining

Economic impacts to commercial mining represent 11.5 percent of the total post-designation impacts.

Description of Activity

185. The Five Bridges Aggregate Pit is the only commercial mine within the proximity of Fish Slough and the expansion project for this mine is planned over a 32-year time frame. Details of the mine's proposed expansion are provided in Section 4.1.4 of this analysis. The main provisions for the FSMV associated with this project is construction of groundwater monitoring wells to provide information on the impact of the project on the groundwater table levels. These wells will be constructed in 2004 pre-designation of critical habitat for the FSMV. While LADWP and Desert Aggregates do not expect that the monitoring of these wells will reveal impacts to the groundwater table, this analysis assumes that monitoring and reporting on the status of groundwater levels will occur annually.

Economic Impacts

186. This analysis expects administrative efforts of monitoring the wells and drafting reports on relevant findings will result in costs approximately equal to those of drafting a biological assessment, \$4,000 to \$5,600 annually. As these costs are anticipated to be incurred annually through the life of the mine, this analysis estimates costs of **\$80,000 to**

¹¹³ Ibid.

\$112,000 over the next twenty years associated with monitoring and reporting on the groundwater impacts of mining activities.

4.2.5 Groundwater Exportation

This analysis does not forecast any post-designation economic impacts to groundwater exportation activities.

(a) Owens Valley

187. To date, the Service has not reviewed the LADWP water exportation activities, exporting water from Owens Valley for the City of Los Angeles. Because the well fields employed for this activity occur down-gradient of Fish Slough and proposed CHD, the LADWP does not believe that its pumping activities impact the water table within Fish Slough and therefore, do not anticipate the need for modification to these activities in the future.¹¹⁴

188. Section 2.2.4 of this analysis includes a discussion on the uncertainty surrounding the area hydrology. As a result of this uncertainty, this analysis does not expect any post-designation impacts to water exportation activities to be associated with protection for the FSMV and habitat.

(b) Tri-Valley Area

189. The 2001 U.S. Filter report concluded that the groundwater exportation project as proposed from Benton, Hammil and Chalfant Valleys was not feasible as currently pumping exceeds current recharge in both Hammil and Chalfant Valleys.¹¹⁵ Since the creation of the TVGMD in the early 1990s, no surplus groundwater has been available in the Tri-Valley area for exportation and it is unclear whether it will be available within the future. No proposals for groundwater exportation projects have been made since the U.S. Filter proposal in 2001. Furthermore, the expense and complexity of the hydrologic system make conclusive hydrological results unlikely, and as a result no additional studies to examine Fish Slough hydrology have been proposed.¹¹⁶ This analysis does not therefore foresee any impacts to groundwater exportation activities due to consideration of the FSMV in the next 20 years.

¹¹⁴ Personal communication with Paula Hubbard and Brian Tillemans, LADWP, June 3, 2004.

¹¹⁵ MHA Environmental Consulting, Inc., 2001, page 6-37.

¹¹⁶ Personal communication with Terry Russi and Anne Halford, BLM, June 2, 2004.

4.2.6 ACEC Conservation Activities

*Economic costs associated with ACEC management activities related to the FSMV represent **82.9 percent** of the total post-designation impacts.*

190. The agencies that manage lands within the Fish Slough ACEC are anticipated to continue the following resource management activities that offer protection to the FSMV.
- Regulation of OHC activities;
 - Prescribed burning;
 - Invasive species control; and
 - FSMV germination and propagation.
191. All activities regarding modification of area hydrology, such as removal of impoundments and fish barriers are anticipated to occur before the final CHD for the FSMV as described in Section 4.1.6 of this analysis. The direct costs of these activities are therefore all quantified as pre-designation costs. No indirect economic impacts to recreational anglers are anticipated as Fish Slough Lake is not anticipated to be effected by impoundment removals, substantial nearby substitute fishing sites exist, and Fish Slough Lake is a relatively seldom used fishing resource in comparison to other sites within the region outside of Fish Slough.¹¹⁷
192. The BLM estimates that management activities associated specifically with the FSMV result in costs of approximately \$30,000 annually. This includes staff time for monitoring of the species, coordination with other land management agencies, enforcement of recreational use guidelines as described in Section 4.1.1, and public outreach.¹¹⁸ Accordingly, these FSMV management activities are forecast to cost the BLM approximately **\$600,000** over the next 20 years.
193. Additionally, the following costs of resource management described in detail in Section 4.1.6 of this analysis are anticipated over the next twenty years:
- **Prescribed burns.** Assuming prescribed burning continues on a three to five year schedule within the Fish Slough ACEC, this analysis forecasts approximately seven events over the next 20 years, resulting in costs to the BLM of **\$140,000**.¹¹⁹

¹¹⁷ Personal communication with Steve Parmenter, CDFG, October 5, 2004.

¹¹⁸ Personal communication with Terry Russi and Anne Halford, BLM, June 2, 2004.

¹¹⁹ Prescribed burn activities are estimated to cost \$20,000 per event. Communication with Anne Halford, BLM, June 24, 2004.

- **Invasive species control.** Control of nonnative species by CDFG is expected to cost up to \$500 annually.¹²⁰ Additionally, LADWP anticipates spending \$2,500 for control of non-native species on its land within the proposed CHD.¹²¹ This analysis therefore estimates CDFG will incur costs of approximately **\$60,000** over the next 20 years associated with control of invasive species within the proposed CHD for the FSMV.
- **FSMV germination and propagation.** Assuming species germination and propagation continues at a rate of once every three to five years, these activities may cost the BLM approximately **\$10,500** over the next 20 years.¹²²

¹²⁰ Personal communication with Anna Halford and Terri Russi, BLM, June 2, 2004.

¹²¹ Communication with Paula Hubbard, LADWP, October 4, 2004.

¹²² Germination and propagation of the FSMV is undertaken by the BLM approximately every three to five years and is anticipated to cost the agency approximately \$1,500 per year. Personal communication with Anne Halford and Terry Russi, BLM, June 2, 2004.

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Personal communication with:

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- U.S. Army Corps of Engineers (USACE);
- Los Angeles Department of Water and Power (LADWP);
- Mono County Community Development Department;
- Inyo-Mono County Farm Bureau;
- California Department of Fish and Game (DFG);
- Tri-Valley Groundwater Management District (TVGMD); and
- California Farm Bureau Federation.

APPENDIX A:

ANALYSIS OF IMPACTS TO SMALL ENTITIES AND ENERGY MARKETS

1. This appendix considers the extent to which the analytic results presented in this analysis reflect impacts to small businesses or energy markets. The analysis of the effect of FSMV habitat conservation on small entities is conducted pursuant to the Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) in 1996. The energy analysis is required by Executive Order No. 13211.

A.1 SBREFA Analysis

2. This section considers the extent to which the analytic results presented above reflect impacts to small businesses. The small business analysis presented in this section is based on information gathered from the Small Business Administration (SBA), U.S. Census Bureau, U.S. Department of Agriculture, and Dun and Bradstreet, and comparisons with the results of the economic analysis.¹²³ The following summarizes the sources of potential future impacts on small businesses as a result of future FSMV conservation efforts. This analysis anticipates that future economic impacts to small entities as a result of the aforementioned critical habitat-related efforts will be negligible, if any.
3. Lands proposed for critical habitat designation include only Federal, State, and City-owned lands; the majority (85 percent) of forecast economic impacts are anticipated to be associated with direct costs to these Federal, State, and municipal (City of Los Angeles) agencies. As a result, these economic costs are not anticipated to translate into impacts to small businesses and entities. Activities anticipated to occur within the next 20 years within or adjacent to the proposed critical habitat for the FSMV that potentially effect small businesses include:
 - Agricultural production,
 - Livestock grazing,
 - Recreation, and
 - Commercial mining.

The following discussion of small business impacts contemplates potential restrictions on these activities associated with FSMV management efforts.

¹²³ This information was gathered in a Dialog search of File 516, Dun and Bradstreet, "Dun's Market Identifiers."

A.1.1 Agricultural Production

4. Agricultural production dependent on groundwater irrigation occurs in the valleys located to the east and northeast of Fish Slough, Hammil and Chalfant. Six farms operate within Chalfant and one in Hammil Valley. This analysis assumes that all farms operating within the two valleys in Mono County are small entities. No studies have conclusively identified the sources of water that discharge from springs into Fish Slough. As a result, groundwater withdrawal activities for agricultural production are unlikely to change as a result of the presence of the FSMV in the region. Thus, no impacts to small entities within the agricultural production industry are expected.

A.1.2 Livestock Grazing

5. Livestock grazing restrictions that are related to FSMV conservation efforts are anticipated to affect the one rancher that operates on LADWP lands within Fish Slough. Based on the size of the leaseholder's herd (currently at approximately 40 head of cattle and eight horses), the ranching operation is assumed to be a small entity.¹²⁴ The leaseholder currently alternates grazing operations between Forest Service lands and the LADWP allotment, and is subject to standards and guidelines set forth by both agencies. Limited availability of privately held allotments within the region and increased Forest Service grazing restrictions have increased the leaseholder's reliance on the Fish Slough allotment.
6. No Federal nexus exists for the grazing activity occurring on LADWP lands. Further, the LADWP has required the leaseholder to abstain from grazing on 80 acres of habitat occupied by the FSMV since 1992, six years prior to the listing of the FSMV. While this past action may have adversely impacted this rancher, this small entity is not anticipated to incur any additional costs associated with FSMV conservation.

A.1.3 Recreation

7. Modification and removal of dam and impoundment structures within Fish Slough is not expected to decrease recreational fishing opportunities in the region. Local businesses may benefit from trip-related expenditures incurred by sport fishing enthusiasts and are therefore potentially impacted by FSMV management efforts. Fish Slough currently experiences approximately 2,000 vehicle-trips per year. It is unclear exactly what percentage of these vehicle trips may be attributable to sport-fishing.¹²⁵ According to BLM, recreational fishing opportunities within Fish Slough represent approximately five percent of total fishing opportunities within the two-county area. Given that Fish Slough Lake, the most popular fishing resource within the Fish Slough ACEC, is not anticipated to be effected by impoundment removal projects, recreational

¹²⁴ The Small Business Administration size standard for entities within Beef Cattle Ranching and Farming (NAICS 112111) is \$750,000.

¹²⁵ Personal communication with BLM Bishop Office, Terry Russi and Anne Halford, June 2, 2004.

anglers are not anticipated to experience an economic impact as a result of these projects.¹²⁶ Further, the acceptable substitute sites are available to Fish Slough visitors. This analysis accordingly does not anticipate impacts to small businesses that benefit from recreational fishing trip expenditures.

8. Further, OHV activities within Fish Slough are not likely to be impacted by the proposed critical habitat designation. BLM has allowed OHV use within or adjacent to Fish Slough on designated open routes since the 1980s. BLM policy is not anticipated to change over the next twenty years, nor do plans exist to expand existing routes.¹²⁷ Impacts to local businesses that benefit from expenditures incurred by OHV recreation are therefore not likely to occur.

A.1.4 Commercial Mining

9. Only one commercial mine, the Five Bridges Aggregate Pit, operated by Desert Aggregates has the potential to affect FSMV habitat. The proposed expansion of this mining operation resulted in project modification costs to Desert Aggregates of approximately \$45,000 at the high-end of constructing monitoring wells to obtain information on the potential impact of the mining activity on groundwater levels. Construction of these wells is a pre-designation impact as this activity will occur before the designation of critical habitat for the FSMV. Costs of monitoring and reporting on the status of the impacts of mining on the groundwater table, however, are anticipated to be incurred annually at the cost of \$4,000 to \$5,600 per year to Desert Aggregates. The monitoring activity is not solely for the benefit of the FSMV, but is intended to ensure moderation of the impacts of mining to the groundwater table in general, should these develop.
10. As highlighted in Exhibit A-1, the all businesses related to grazing, mining, agricultural production and sport-fishing/OHV recreation within Inyo and Mono Counties are considered small. As a result, this analysis assumes that the all revenue and expenditures associated with these activities are related to or are incurred by small entities. Exhibit A-1 reports the total number of businesses in Inyo and Mono Counties that may be associated with these expenditures, by NAICS (North American Industry Classification System) code. This exhibit also indicates the number of these businesses that are classified as small. Information on small entities within the agriculture industry is gathered from the 2002 Census of Agriculture. In 2002, 20 crop-producing and 45 cattle-producing operations existed within Inyo County and 32 crop-producing and 32 cattle-producing operations existed within Mono County. This analysis assumes that all of these operations represent small entities.¹²⁸ In Inyo County, two entities exist within

¹²⁶ Personal communication with Steve Parmenter, CDFG, October 5, 2004.

¹²⁷ Personal communication with BLM Bishop Office, Terry Russi and Anne Halford, June 2, 2004.

¹²⁸ The 2002 Agricultural Census does not provide detailed information on cash receipts for farms generating sales of \$100,000 or more. Farms generating sales \$100,000 or more are assumed to not exceed SBA's size standards (\$750,000). The number of small entities is therefore likely overstated.

Construction Sand and Gravel Mining and one business is within Recreational Vehicle Dealer industry. Within Mono County, one business engages in Construction Sand and Gravel Mining activities and no businesses operate within the Recreational Vehicle Dealers sector (441210). Businesses within these industries are assumed to represent small entities.¹²⁹

11. Overall, economic impacts to the types of small businesses summarized in Exhibit A-1 as a result of future FSMV conservation efforts are anticipated to be negligible.

EXHIBIT A-1: TOTAL NUMBER OF RETAIL SMALL BUSINESSES ASSOCIATED WITH AGRICULTURE, GRAZING, AND MINING ACTIVITIES WITHIN INYO AND MONO COUNTIES

NAICS Code	Expenditure Category / Small Business Size Standards	Inyo County		Mono County	
		All Businesses	Small Businesses	All Businesses	Small Businesses
<i>Agricultural Production*</i>					
111	Harvested Cropland (\$0.75 million)	20	20	32	32
112	Cattle and Calves (\$0.75 million)	45	45	32	32
<i>Mining (except Oil and Gas)</i>					
212321	Construction Sand and Gravel Mining (500 employees)	2	2	1	1
<i>Motor Vehicle and Parts Dealers</i>					
441210	Recreational Vehicle Dealers (\$6,000,000)	1	1	0	0

* Agriculture business data is gathered from the 2002 Census of Agriculture accessed at <http://www.nass.usda.gov/census/census02/volume1/ca/index2.htm>. 2002 Census does not provide detailed information on cash receipts for farms generating sales of \$100,000 or more. Farms generating sales of \$100,000 or more are assumed to not exceed SBA's size standards (\$750,000). The number of small entities is therefore likely overstated.

Source: 2002 Census of Agriculture and 2001 County Business Patterns

A.2 Potential Impacts to the Energy Industry

12. Pursuant to Executive Order No. 13211, "Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use," issued May 18, 2001, Federal agencies must prepare and submit a "Statement of Energy Effects" for all "significant energy actions." The purpose of this requirement is to ensure that all Federal agencies "appropriately weigh and consider the effects of the Federal Government's regulations on

¹²⁹ 2001 County Business Patterns indicate that these businesses operate with 0-99 employees and/or generate sales less than SBA size standards.

the supply, distribution, and use of energy.”¹³⁰ The Office of Management and Budget has provided guidance for implementing this Executive Order that outlines nine outcomes that may constitute “a significant adverse effect” when compared without the regulatory action under consideration:

- Reductions in crude oil supply in excess of 10,000 barrels per day (bbls);
- Reductions in fuel production in excess of 4,000 barrels per day;
- Reductions in coal production in excess of 5 million tons per year;
- Reductions in natural gas production in excess of 25 million Mcf per year;
- Reductions in electricity production in excess of 1 billion kilowatts-hours per year or in excess of 500 megawatts of installed capacity;
- Increases in energy use required by the regulatory action that exceed the thresholds above;
- Increases in the cost of energy production in excess of one percent;
- Increases in the cost of energy distribution in excess of one percent; or
- Other similarly adverse outcomes.¹³¹

13. None of these criteria are relevant to this analysis. This analysis does not foresee any energy-related activity occurring within the proposed CHD.

¹³⁰ Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.

¹³¹ Memorandum For Heads of Executive Department Agencies, and Independent Regulatory Agencies, Guidance For Implementing E.O. 13211, M-01-27, Office of Management and Budget, July 13, 2001, <http://www.whitehouse.gov/omb/memoranda/m01-27.html>.