IEc

# ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE TIDEWATER GOBY

Final Economic Analysis | January 9, 2008

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# EXECUTIVE SUMMARY

1. The purpose of this report is to identify and analyze the potential economic impacts associated with the proposed critical habitat designation for the tidewater goby (*Eucyclogobius newberryi)*. This report was prepared by Industrial Economics, Incorporated (IEc), under contract to the U.S. Fish and Wildlife Service (Service).

2. On November 28, 2006, the Service published a proposed critical habitat designation for the tidewater goby.[1] This proposed designation will revise the earlier November 20, 2000 critical habitat designation for this species, which included approximately 1,581 acres concentrated in Southern California. The currently proposed critical habitat designation includes 10,003 acres in 12 coastal California counties: Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles. Forty-four units are distributed among these 12 counties, and the units vary in size from one acre to 2,682 acres, with a median size of 26 acres.[2] Of the area proposed for critical habitat designation, approximately 72 percent is State-owned lands, while Federal and local government lands comprise 13 percent and the remaining 15 percent is private.

3. The study areas analyzed in this report include the proposed critical habitat units, which are primarily lagoons and estuaries, as well as buffers around the units or portions of upstream tributaries, depending on the activity in question. The precise geographic scope of the analysis for each activity is explained at length in Section 1.4.5. The Key Findings highlighted below and Exhibit ES-1 summarize the results of the economic analysis. Pre-designation and post-designation impacts are presented by unit in Exhibit ES-2. Appendix D presents detailed pre-designation and post-designation impacts by activity for each unit.

4. This final economic analysis analyzes the proposed designation as described in the proposed rule. This analysis does not reflect changes to the proposed critical habitat designation made in the final rule. Consequently, description of the habitat designation in the final rule may differ from maps and figures presented in this analysis. Changes to this document from the draft economic analysis include a new estimation of both pre-designation and post-designation grazing impacts based on new information and in

[1] U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Tidewater Goby; Proposed Rule, 71 FR 228, November 28, 2006.

[2] A geographic depiction of these units is presented in Exhibits ES-7 and details of the size and ownership type of each proposed critical habitat unit is displayed in Exhibit 1-1 in Chapter 1. Detailed maps for each unit are presented in Appendix C.

cooperation with the California Department of Fish and Game, an appendix specifically addressing incremental impacts due solely to the designation of critical habitat, and a revision of the Small Business and Regulatory Flexibility Analysis to reflect the specific incremental effects of designation.

5. Chapters 2 through 6 of this report consider all future conservation-related impacts, including impacts associated with overlapping protections from other Federal, State, and local laws that aid habitat conservation in the areas proposed for critical habitat. That is, a portion of these "co-extensive" impacts are forecast to occur regardless of critical habitat designation for the tidewater goby. Appendix A estimates the potential "incremental" impacts of critical habitat designation for the tidewater goby by attempting to isolate those impacts that would not be expected to occur absent the designation of critical habitat. Incremental impacts described in Appendix B and in Exhibit ES-7 are those precipitated specifically by this rulemaking.

**KEY FINDINGS**

**Total Post-designation Impacts**: The final economic analysis forecasts post-designation costs associated with tidewater goby conservation efforts in the study area to be $24.9 million (undiscounted dollars) over the next 20 years. The present value of these impacts, assuming a three percent discount rate, is $22.3 million ($1.50 million on an annualized basis); or $19.5 million, assuming a seven percent discount rate ($1.84 million annualized). Potential cost savings in Unit VEN-2 associated with tidewater goby conservation efforts range from $35.0 million to $90.0 million (undiscounted dollars). Combining these savings with the forecast costs of conservation efforts results in an overall net cost savings of $10.1 million to $65.1 million (undiscounted) over the next 20 years. In present value terms, net cost savings range from $9.77 million to $60.1 million (assuming a three percent discount rate) or $9.07 million to $54.0 million (assuming a seven percent discount rate).

**Quantified Impacts:** Impacts to water management activities comprise the greatest percentage of total costs, ranging from 84 percent to 85 percent of total costs, depending on the discount rate. Other activities likely to experience impacts resulting from tidewater goby conservation efforts include grazing, transportation, natural resource management, and oil and gas pipeline maintenance and construction.

- Water Management: Water management costs are estimated to be $21.0 million (undiscounted) and are primarily the cost of land acquisitions by not-for-profit conservation organizations and the California Department of Fish and Game. These organizations will allow the land to flood, avoiding the need for potentially harmful flood control actions in the adjoining water bodies that could result in the take of tidewater gobies (i.e., sandbar breaching). Project modifications to other types of flood control projects (i.e., installation of tidegates) also contribute to these costs.
- Grazing: Potential impacts to grazing activities include both the forage value losses from excluding livestock from public lands in the study area as well as the cost to build exclosure fencing. Undiscounted costs total $1.53 million, including primarily fencing installation and maintenance costs borne by public land managers.
- Transportation: Total impacts on transportation consist of project modifications implemented during road and bridge construction and maintenance to minimize adverse impacts to tidewater goby habitat. Transportation impacts are estimated to be $1.07 million in undiscounted dollars.
- Natural Resource Management: Watershed and salmonid ecosystem restoration activities requiring in-stream or in-habitat construction activities may threaten the tidewater goby and its habitat. Project modification costs to minimize potential adverse impacts are estimated to cost $1.08 million (undiscounted). This estimate also includes the costs for a habitat conservation plan (HCP) and a Safe Harbor Agreement that are in the process of being developed.
- Oil and Gas Pipeline Activity: Oil and gas pipeline activities include construction projects to install, maintain, or remove pipelines. Impacts associated with section 7 project modification activities occurred before designation. However, little new activity is anticipated after designation, because pre-designation actions primarily removed existing pipelines from the study area and new pipelines are unlikely. Post-designation impacts are anticipated to be $145,000 in undiscounted dollars.
- Appendix A: Incremental Analysis: An incremental analysis identifies those forecasted impacts specifically caused by critical habitat designation. These impacts are limited to administrative costs from section 7 consultations, which total $228,000 over the next 20 years (undiscounted).

**Activities not likely to be affected:** Certain activities identified as potential threats to tidewater goby are not expected to result in quantifiable impacts, for the following reasons:

- Development: Based on interviews with the California Coastal Commission and county and local planning authorities, significant development activity is not anticipated in the study area.
- Mining: No sand or gravel mining activity has been identified in the study area, and no new mines are anticipated.
- Crop Farming: Impacts to crop farming are not considered likely as any potential tidewater goby conservation efforts would be undertaken voluntarily by private farmers, and such efforts have not occurred to date for the purposes of tidewater goby conservation.
- Grazing on Private Lands: Impacts to grazing on private lands within the study area are not anticipated, as potential tidewater goby conservation efforts would be undertaken voluntarily by private ranchers, and such efforts have not occurred to date for the purposes of tidewater goby conservation.

**Critical Habitat Subunit with Highest Impacts:** Regardless of the discount rate applied, impacts are greatest in VEN-2, followed by SB-9 and DN-1. In units VEN-2 and DN-1, costs are driven by anticipated land acquisitions for flood control purposes. In SB-9, the costs result from project modifications to the Lower Mission Creek flood control project.

**Potential Cost Savings Attributed Coextensively to Tidewater Goby Conservation Efforts:** The City of Ventura's Water Reclamation Facility (VWRF) discharges effluent into the Santa Clara River critical habitat unit (VEN-2). This discharge sustains water levels in the tidewater goby habitat. Existing water quality control regulations have the potential to require VWRF to cease discharge of effluent into the estuary. This requirement would force the City of Ventura to build a new ocean outfall facility for the effluent. The Service has issued a letter to the permitting authority asserting that the discharge simulates a more natural environment by maintaining water levels. It recommends that the discharge be continued to protect sensitive species, including tidewater goby. The net cost savings to VWRF of installing tertiary treatment and constructing new facilities, rather than moving to an ocean outfall, ranges from $35.0 million to $90.0 million (undiscounted dollars).

**EXHIBIT ES-1SUMMARY OF POST-DESIGNATION IMPACTS (2007 - 2026), 2006$**

| IMPACT | UNDISCOUNTED | 3% DISCOUNT RATE | 7% DISCOUNT RATE |
|---|---|---|---|
| Total Economic Costs | $24.9 million | $22.3 million | $19.5 million |
| Annualized Costs | - | $1.50 million | $1.84 million |
| *Positive Impact Related to Potential Cost Savings in Unit VEN-2* | | | |
| Potential Cost Savings in VEN-2 | $35.0 million - $90.0 million | $32.0 million - $82.4 million | $28.6 million - $73.5 million |
| Total Coextensive Net Savings | $10.1 million - $65.1 million | $9.77 million - $60.1 million | $9.07 million - $54.0 million |
| Note: Totals may not sum due to rounding. | | | |

6. This analysis describes economic impacts of tidewater goby conservation efforts associated with the following categories of activity: 1) water management; 2) grazing, 3) transportation, 4) natural resource management, and 5) oil and gas pipeline construction and maintenance. Potential critical habitat designation effects on development activities are discussed, but not quantified because significant development activity is not anticipated in the study area. Administrative costs of consultations under section 7 of the Endangered Species Act (the Act) are incorporated into the chapter corresponding to relevant activity for each consultation.

7. Exhibits ES-3 through ES-5 rank the proposed critical habitat units by level of impact (undiscounted, present value assuming a three percent discount rate, and present value assuming seven percent discount rate, respectively). The unit with the highest costs is Santa Clara River (VEN-2), followed by Mission Creek / Laguna Channel (SB-9), and Lake Earl / Lake Tolowa (DN-1), regardless of the discount rate applied. These three units comprise approximately 78 percent of the total costs. Critical habitat units with impacts less than 0.02 percent of the total impacts are excluded from Exhibits ES-3 through ES-5.

8. Exhibit ES-6 provides costs by activity in undiscounted dollars and in present value terms applying discount rates of three and seven percent. Water management activities consistently have the highest costs (regardless of the discount rate), comprising over 84 percent of the estimated totals across all activities. State land grazing limitations and exclosure construction and maintenance has the second highest costs, comprising about six percent of the total. Project modifications for natural resource management and transportation result in the next largest impacts, each accounting for approximately four to five percent of total costs (regardless of the discount rate).

## EXHIBIT ES-2 SUMMARY OF IMPACTS TO ALL ACTIVITIES BY UNIT

| | | PRE-DESIGNATION IMPACTS | | | POST-DESIGNATION IMPACTS | | |
|---|---|---|---|---|---|---|---|
| UNIT | NAME | UNDISCOUNTED | PRESENT VALUE 3% | PRESENT VALUE 7% | UNDISCOUNTED | PRESENT VALUE 3% | PRESENT VALUE 7% |
| DN-1 | Lake Earl/Lake Tolowa | $5,240,000 | $6,370,000 | $8,320,000 | $3,230,000 | $2,950,000 | $2,660,000 |
| HUM-1 | Stone Lagoon | $4,380 | $5,860 | $8,440 | $8,420 | $7,270 | $6,190 |
| HUM-2 | Big Lagoon | $0 | $0 | $0 | $0 | $0 | $0 |
| HUM-3 | Humboldt Bay | $914,000 | $1,100,000 | $1,400,000 | $1,610,000 | $1,470,000 | $1,340,000 |
| HUM-4 | Eel River | $97,200 | $129,000 | $182,000 | $230,000 | $194,000 | $160,000 |
| MEN-1 | Ten Mile River | $66,400 | $80,800 | $106,000 | $152,000 | $148,000 | $145,000 |
| MEN-2 | Virgin Creek | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-3 | Pudding Creek | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-4 | Davis Lake and Manchester State Park | $0 | $0 | $0 | $0 | $0 | $0 |
| SON-1 | Salmon Creek | $20,800 | $27,800 | $39,600 | $38,900 | $33,200 | $27,900 |
| MAR-1 | Estero Americano | $0 | $0 | $0 | $293,000 | $277,000 | $257,000 |
| MAR-2 | Estero de San Antonio | $0 | $0 | $0 | $0 | $0 | $0 |
| MAR-3 | Lagunitas (Papermill) Creek | $30,800 | $41,000 | $57,800 | $226,000 | $215,000 | $205,000 |
| MAR-4 | Rodeo Lagoon | $99,200 | $120,000 | $157,000 | $20,000 | $16,700 | $13,700 |
| SM-1 | San Gregorio Creek | $0 | $0 | $0 | $24,900 | $24,900 | $24,900 |
| SM-2 | Pescadero-Butano Creek | $0 | $0 | $0 | $0 | $0 | $0 |
| SM-3 | Bean Hollow Creek (Arroyo de Los Frijoles) | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-1 | Laguna Creek | $1,340 | $1,610 | $2,080 | $0 | $0 | $0 |
| SC-2 | Baldwin Creek | $1,340 | $1,610 | $2,080 | $0 | $0 | $0 |
| SC-3 | Corcoran Lagoon | $1,340 | $1,610 | $2,080 | $0 | $0 | $0 |
| SC-4 | Aptos Creek | $1,340 | $1,610 | $2,080 | $0 | $0 | $0 |
| SC-5 | Pajaro River | $424,000 | $523,000 | $696,000 | $737,000 | $615,000 | $507,000 |
| MN-1 | Bennett Slough | $56,000 | $63,500 | $75,400 | $8,900 | $8,900 | $8,900 |
| SLO-1 | Arroyo del Corral | $1,340 | $1,610 | $2,080 | $0 | $0 | $0 |
| SLO-2 | Oak Knoll Creek (Arroyo Laguna) | $3,210 | $4,120 | $5,680 | $3,570 | $3,080 | $2,610 |
| SLO-3 | Little Pico Creek | $66,800 | $90,000 | $134,000 | $0 | $0 | $0 |
| SLO-4 | San Simeon Creek | $21,500 | $28,500 | $40,300 | $37,500 | $31,900 | $26,700 |
| SLO-5 | Villa Creek | $1,340 | $1,610 | $2,080 | $0 | $0 | $0 |

| | | PRE-DESIGNATION IMPACTS | | | POST-DESIGNATION IMPACTS | | |
|---|---|---|---|---|---|---|---|
| UNIT | NAME | UNDISCOUNTED | PRESENT VALUE 3% | PRESENT VALUE 7% | UNDISCOUNTED | PRESENT VALUE 3% | PRESENT VALUE 7% |
| SLO-6 | San Geronimo Creek | $56,000 | $62,400 | $72,600 | $0 | $0 | $0 |
| SLO-7 | Pismo Creek | $111,000 | $146,000 | $211,000 | $127,000 | $102,000 | $80,100 |
| SB-1 | Santa Maria River | $165,000 | $197,000 | $250,000 | $0 | $0 | $0 |
| SB-2 | Canada de las Agujas | $1,340 | $1,610 | $2,080 | $0 | $0 | $0 |
| SB-3 | Canada de Santa Anita | $1,340 | $1,610 | $2,080 | $0 | $0 | $0 |
| SB-4 | Canada de Alegria | $1,340 | $1,610 | $2,080 | $0 | $0 | $0 |
| SB-5 | Canada de Agua Caliente | $43,800 | $52,400 | $67,100 | $0 | $0 | $0 |
| SB-6 | Gaviota Creek | $463,000 | $576,000 | $779,000 | $328,000 | $264,000 | $208,000 |
| SB-7 | Winchester/Bell Canyon | $56,000 | $72,300 | $102,000 | $145,000 | $137,000 | $129,000 |
| SB-8 | Arroyo Burro | $29,600 | $32,200 | $36,100 | $0 | $0 | $0 |
| SB-9 | Mission Creek—Laguna Channel | $137,000 | $148,000 | $165,000 | $5,960,000 | $5,440,000 | $4,850,000 |
| VEN-1 | Ventura River | $75,200 | $97,600 | $136,000 | $1,240,000 | $1,050,000 | $859,000 |
| VEN-2 | Santa Clara River | $894,000 | $1,020,000 | $1,210,000 | $10,000,000 | $8,920,000 | $7,720,000 |
| VEN-3 | J Street Drain—Ormond Lagoon | $2,984,000 | $3,200,000 | $3,520,000 | $339,000 | $260,000 | $184,000 |
| LA-1 | Malibu Lagoon | $21,600 | $29,900 | $45,500 | $89,900 | $88,900 | $87,600 |
| LA-2 | Topanga Creek | $16,200 | $19,900 | $26,100 | $0 | $0 | $0 |
| **Total costs** | | **$12,100,000** | **$14,300,000** | **$17,900,000** | **$24,900,000** | **$22,300,000** | **$19,500,000** |
| **Potential Cost Savings in VEN-2** | | | | | **($35,000,000) - ($90,000,000)** | **($32,000,000) - ($82,400,000)** | **($28,600,000) - ($73,500,000)** |
| **Total Coextensive Net Savings** | | | | | **($10,100,000) - ($65,100,000)** | **($9,770,000) - ($60,100,000)** | **($9,070,000) - ($54,000,000)** |
| Note: Totals may not sum due to rounding. | | | | | | | |

## EXHIBIT ES-3 CRITICAL HABITAT UNITS RANKED BY MAGNITUDE OF IMPACT (UNDISCOUNTED)[1]

| UNIT | NAME | ESTIMATED IMPACTS | PERCENT OF TOTAL IMPACTS |
|---|---|---|---|
| VEN-2 | Santa Clara River | $10,000,000 | 40.16% |
| SB-9 | Mission Creek—Laguna Channel | $5,960,000 | 23.94% |
| DN-1 | Lake Earl/Lake Tolowa | $3,230,000 | 12.97% |
| HUM-3 | Humboldt Bay | $1,610,000 | 6.47% |
| VEN-1 | Ventura River | $1,240,000 | 4.98% |
| SC-5 | Pajaro River | $737,000 | 2.96% |
| VEN-3 | J Street Drain—Ormond Lagoon | $339,000 | 1.36% |
| SB-6 | Gaviota Creek | $328,000 | 1.32% |
| MAR-1 | Estero Americano | $293,000 | 1.18% |
| HUM-4 | Eel River | $230,000 | 0.92% |
| MAR-3 | Lagunitas (Papermill) Creek | $226,000 | 0.91% |
| MEN-1 | Ten Mile River | $152,000 | 0.61% |
| SB-7 | Winchester/Bell Canyon | $145,000 | 0.58% |
| SLO-7 | Pismo Creek | $127,000 | 0.51% |
| LA-1 | Malibu Lagoon | $89,900 | 0.36% |
| SON-1 | Salmon Creek | $38,900 | 0.16% |
| SLO-4 | San Simeon Creek | $37,500 | 0.15% |
| SM-1 | San Gregorio Creek | $24,900 | 0.10% |
| MAR-4 | Rodeo Lagoon | $20,000 | 0.08% |
| MN-1 | Bennett Slough | $8,900 | 0.04% |
| HUM-1 | Stone Lagoon | $8,420 | 0.03% |
| SLO-2 | Oak Knoll Creek (Arroyo Laguna) | $3,570 | 0.01% |
| *TOTAL* | | **$24,900,000** | 100.00% |

Note: Totals may not sum due to rounding.
(1) Units for which no impacts are expected are not included in this exhibit.

**EXHIBIT ES-4 CRITICAL HABITAT UNITS RANKED BY LEVEL OF MAGNITUDE (3 PERCENT DISCOUNT RATE)[1]**

| UNIT | NAME | ESTIMATED IMPACTS | PERCENT OF TOTAL IMPACTS |
|---|---|---|---|
| VEN-2 | Santa Clara River | $8,920,000 | 40.00% |
| SB-9 | Mission Creek—Laguna Channel | $5,440,000 | 24.39% |
| DN-1 | Lake Earl/Lake Tolowa | $2,950,000 | 13.23% |
| HUM-3 | Humboldt Bay | $1,470,000 | 6.59% |
| VEN-1 | Ventura River | $1,050,000 | 4.71% |
| SC-5 | Pajaro River | $615,000 | 2.76% |
| MAR-1 | Estero Americano | $277,000 | 1.24% |
| SB-6 | Gaviota Creek | $264,000 | 1.18% |
| VEN-3 | J Street Drain—Ormond Lagoon | $260,000 | 1.17% |
| MAR-3 | Lagunitas (Papermill) Creek | $215,000 | 0.96% |
| HUM-4 | Eel River | $194,000 | 0.87% |
| MEN-1 | Ten Mile River | $148,000 | 0.66% |
| SB-7 | Winchester/Bell Canyon | $137,000 | 0.61% |
| SLO-7 | Pismo Creek | $102,000 | 0.46% |
| LA-1 | Malibu Lagoon | $88,900 | 0.40% |
| SON-1 | Salmon Creek | $33,200 | 0.15% |
| SLO-4 | San Simeon Creek | $31,900 | 0.14% |
| SM-1 | San Gregorio Creek | $24,900 | 0.11% |
| MAR-4 | Rodeo Lagoon | $16,700 | 0.07% |
| MN-1 | Bennett Slough | $8,900 | 0.04% |
| HUM-1 | Stone Lagoon | $7,270 | 0.03% |
| SLO-2 | Oak Knoll Creek (Arroyo Laguna) | $3,080 | 0.01% |
| *TOTAL* | | **$22,300,000** | 100.00% |

Note: Totals may not sum due to rounding.
(1) Units for which no impacts are expected are not included in this exhibit.

**EXHIBIT ES-5 CRITICAL HABITAT UNITS RANKED BY MAGNITUDE OF IMPACT (7 PERCENT DISCOUNT RATE)[1]**

| UNIT | NAME | ESTIMATED IMPACTS | PERCENT OF TOTAL IMPACTS |
|---|---|---|---|
| VEN-2 | Santa Clara River | $7,720,000 | 39.59% |
| SB-9 | Mission Creek—Laguna Channel | $4,850,000 | 24.87% |
| DN-1 | Lake Earl/Lake Tolowa | $2,660,000 | 13.64% |
| HUM-3 | Humboldt Bay | $1,340,000 | 6.87% |
| VEN-1 | Ventura River | $859,000 | 4.41% |
| SC-5 | Pajaro River | $507,000 | 2.60% |
| MAR-1 | Estero Americano | $257,000 | 1.32% |
| SB-6 | Gaviota Creek | $208,000 | 1.07% |
| MAR-3 | Lagunitas (Papermill) Creek | $205,000 | 1.05% |
| VEN-3 | J Street Drain—Ormond Lagoon | $184,000 | 0.94% |
| HUM-4 | Eel River | $160,000 | 0.82% |
| MEN-1 | Ten Mile River | $145,000 | 0.74% |
| SB-7 | Winchester/Bell Canyon | $129,000 | 0.66% |
| LA-1 | Malibu Lagoon | $87,600 | 0.45% |
| SLO-7 | Pismo Creek | $80,100 | 0.41% |
| SON-1 | Salmon Creek | $27,900 | 0.14% |
| SLO-4 | San Simeon Creek | $26,700 | 0.14% |
| SM-1 | San Gregorio Creek | $24,900 | 0.13% |
| MAR-4 | Rodeo Lagoon | $13,700 | 0.07% |
| MN-1 | Bennett Slough | $8,900 | 0.05% |
| HUM-1 | Stone Lagoon | $6,190 | 0.03% |
| SLO-2 | Oak Knoll Creek (Arroyo Laguna) | $2,610 | 0.01% |
| *TOTAL* | | **$19,500,000** | 100.00% |

Note: Totals may not sum due to rounding.
(1) Units for which no impacts are expected are not included in this exhibit.

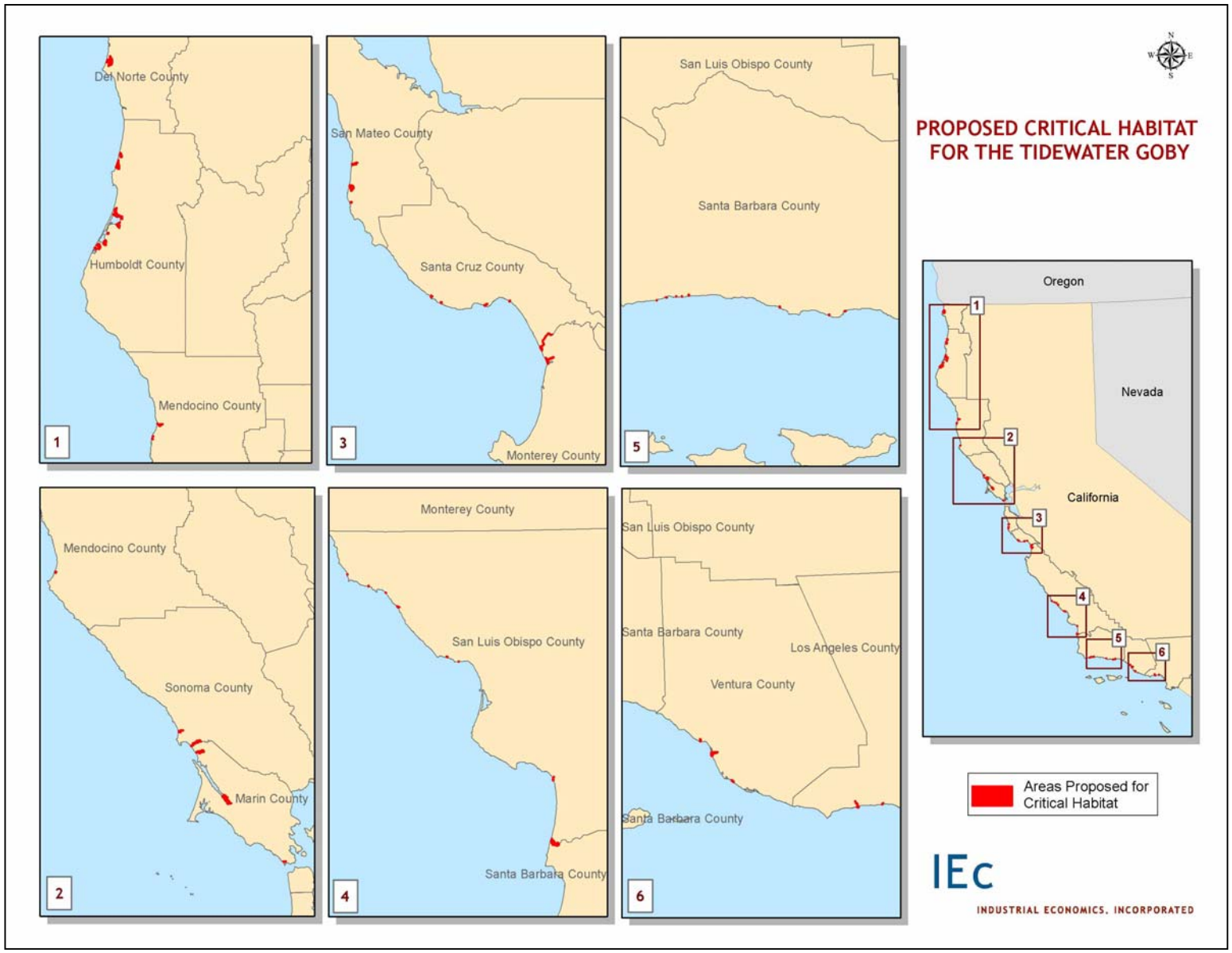
**EXHIBIT ES-6 ACTIVITIES RANKED BY LEVEL OF IMPACT**

| ACTIVITY | UNDISCOUNTED | | DISCOUNTED AT THREE PERCENT | | DISCOUNTED AT SEVEN PERCENT | |
|---|---|---|---|---|---|---|
| | ESTIMATED IMPACTS | PERCENT OF TOTAL | ESTIMATED IMPACTS | PERCENT OF TOTAL | ESTIMATED IMPACTS | PERCENT OF TOTAL |
| Water Management | $21,000,000 | 84.6% | $18,800,000 | 84.5% | $16,400,000 | 84.1% |
| Grazing | $1,530,000 | 6.2% | $1,290,000 | 5.8% | $1,080,000 | 5.5% |
| Natural Resource Management | $1,080,000 | 4.3% | $1,020,000 | 4.6% | $959,000 | 4.9% |
| Transportation | $1,070,000 | 4.3% | $1,010,000 | 4.5% | $943,000 | 4.8% |
| Oil and Gas Pipelines | $145,000 | 0.6% | $137,000 | 0.6% | $129,000 | 0.7% |
| **Total** | **$24,900,000** | 100.0% | **$22,300,000** | 100.0% | **$19,500,000** | 100.0% |
| Note: Totals may not sum due to rounding. | | | | | | |

## EXHIBIT ES-7 INCREMENTAL IMPACTS OF CRITICAL HABITAT BY UNIT (PRESENT VALUE 3%)

| UNIT | NAME | WATER MANAGEMENT | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| DN-1 | Lake Earl/Lake Tolowa | $13,000 | $0 | $0 | $0 | $13,000 |
| HUM-3 | Humboldt Bay | $0 | $41,600 | $9,760 | $0 | $51,400 |
| HUM-4 | Eel River | $0 | $0 | $4,210 | $0 | $4,210 |
| MAR-1 | Estero Americano | $0 | $0 | $9,620 | $0 | $9,620 |
| MAR-3 | Lagunitas (Peppermill) Creek | $0 | $0 | $4,880 | $0 | $4,880 |
| SM-1 | San Gregario Creek | $0 | $4,880 | $0 | $0 | $4,880 |
| SC-5 | Pajaro River | $18,200 | $13,800 | $0 | $0 | $32,000 |
| SLO-7 | Pismo Creek | $4,880 | $0 | $4,470 | $0 | $9,350 |
| SB-6 | Gaviota Creek | $19,000 | $4,600 | $0 | $0 | $23,600 |
| SB-7 | Winchester/Bell Canyon | $0 | $0 | $0 | $9,090 | $9,090 |
| SB-9 | Mission Creek—Laguna Channel | $13,900 | $8,300 | $0 | $0 | $22,200 |
| VEN-1 | Ventura River | $1,720 | $0 | $0 | $0 | $1,720 |
| VEN-2 | Santa Clara River | $4,740 | $0 | $0 | $0 | $4,740 |
| VEN-3 | J Street Drain—Ormond Lagoon | $10,200 | $0 | $0 | $0 | $10,200 |
| LA-1 | Malibu Lagoon | $0 | $0 | $4,880 | $0 | $4,880 |
| **Total** | | **$85,600** | **$73,200** | **$37,800** | **$9,090** | **$206,000** |

**EXHIBIT ES-7 PROPOSED CRITICAL HABITAT UNITS FOR TIDEWATER GOBY**



# CHAPTER 1 | FRAMEWORK FOR ANALYSIS

9. The purpose of this report is to estimate the economic impact of actions taken to protect the federally listed tidewater goby (*Eucylogobius newberryi*), and its habitat. It attempts to quantify the economic effects associated with the proposed designation of critical habitat. It does so by taking into account the impacts of conservation-related measures that are likely to be associated with future economic activities in the study area. For purposes of this analysis, study areas have been specifically defined for each affected economic activity (see Section 1.4.5 for details).[3] The analysis looks retrospectively at impacts incurred since the tidewater goby was listed, and it attempts to predict future impacts likely to occur after the proposed critical habitat designation is finalized.

10. This final economic analysis analyzes the proposed designation as described in the proposed rule. This analysis does not reflect changes to the proposed critical habitat designation made in the final rule. Consequently, description of the habitat designation in the final rule may differ from maps and figures presented in this analysis. Changes to this document from the draft economic analysis include a new estimation of both pre-designation and post-designation grazing impacts based on new information and in operation with the California Department of Fish and Game, an appendix specifically addressing incremental impacts due solely to the designation of critical habitat, and a revision of the Small Business and Regulatory Flexibility Analysis to reflect the specific incremental effects of designation.

11. Chapters 2 through 6 of this report consider all future conservation-related impacts, including impacts associated with overlapping protections from other Federal, State, and local laws that aid habitat conservation in the areas proposed for critical habitat. That is, a portion of these "co-extensive" impacts are forecast to occur regardless of critical habitat designation for the tidewater goby. Appendix A estimates the potential "incremental" impacts of critical habitat designation for the tidewater goby by attempting to isolate those impacts that would not be expected to occur absent the designation of critical habitat. Incremental impacts described in Appendix A and in Exhibit ES-7 are those precipitated specifically by this rulemaking.

12. This information is intended to assist the Secretary of the Interior (Secretary) in determining whether the benefits of excluding particular areas from the designation

[3] Impacts from economic activities occurring within these study areas have a greater likelihood of reaching proposed critical habitat units; and therefore represent areas where landowners or land managers might reasonably be expected to implement tidewater goby conservation efforts (i.e. the potential detrimental effects of their activities on proposed critical habitat are apparent to them).

outweigh the benefits of including those areas in the designation.[4] In addition, this information allows the U.S. Fish and Wildlife Service (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).[5] This report also complies with direction from the U.S. Court of Appeals for the 10th Circuit that "coextensive" effects should be included in the economic analysis to inform decision-makers regarding which areas to designate as critical habitat.[6]

13. This chapter describes the framework for the analysis. It first provides background information on the species and the proposed designation. Next, it describes the regulatory alternatives considered by the Service. It then describes the approach to estimating impacts and lays out the scope of the analysis. Information sources relied upon are summarized in the next section. The chapter concludes with a description of the organization of the remainder of this report.

## 1.1 BACKGROUND

14. On February 4, 1994, the Service published the final rule listing tidewater goby as endangered.[7] On November 20, 2000 the final rule designating critical habitat for the species in Orange and San Diego Counties, California was published.[8] The 2000 rule focused on these counties due to uncertainty regarding the listing status of the tidewater goby populations to the north. The Service published a proposed rule revising critical habitat on November 28, 2006.[9] For a description of the species and the primary constituent elements that are essential to the conservation of the species, refer to the proposed rule.

15. In its November 2006 Proposed Rule, the Service identifies 10,003 acres in 12 coastal counties in California as proposed critical habitat for the tidewater goby.[10] The proposed critical habitat includes 44 units located between the Oregon border to the north and the city of Los Angeles to the south. The units comprise primarily Federal and State lands (83 percent), but also contain some local and privately-owned lands. Exhibit 1-1 presents

[4] 16 U.S.C. §1533(b)(2)

[5] 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.

[6] In 2001, the U.S. Court of Appeals for the 10th Circuit instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat designation, 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)).

[7] 59 FR 5494.

[8] 65 FR 69693.

[9] U.S. Fish and Wildlife Service, Revised Critical Habitat Designation for the Tidewater Goby Proposed Rule, November 28, 2006. 71 FR 68914.

[10] Ibid. The 12 counties include: Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles Counties, California.

the land ownership for each unit. For maps of the proposed critical habitat, see Exhibit ES-7 in the Executive Summary for an overview of the entire critical habitat designation, and Appendix C for more detailed maps by unit.

16. The Service identifies threats to the tidewater goby in the November 2006 Proposed Rule and in the Recovery Plan (see Exhibit 1-1).[11,12] The economic activities occurring within or near proposed critical habitat causing these threats were identified based on these documents, as well as discussions with the relevant Service Field Offices. These included the following types of activities:

- Water management activities (including flood control; sandbar breaching; sewage treatment; dam operations, maintenance and removals; and, groundwater withdrawals);
- Grazing;
- Crop farming;
- Transportation;
- Oil and gas pipeline construction and maintenance;
- Natural resource management (e.g., restoration projects); and
- Development.

17. Each of these activities is addressed in a separate chapter of the report, with the exception of crop farming. To date, there is no history of tidewater goby-related section 7 consultation or habitat conservation activity related to crop farming operations. Therefore, the analysis considers the extent to which the critical habitat might provide additional information regarding the potential for farming activity to affect the tidewater goby, thereby leading to the implementation of conservation efforts. For example, in order to mitigate for the potential threats posed by crop farming activities, measures similar to those included in the Fish Friendly Farming® program could be considered. However, this voluntary program was designed for Coho salmon and steelhead trout (rather than tidewater goby) and has not been applied in most of the counties in the study area.[13] Further, current knowledge regarding the tidewater goby's tolerance for impaired

[11] Ibid. Also, U.S. Fish and Wildlife Service. 2005. Recovery Plan for the Tidewater Goby (*Eucyclogobius newberryi*). U.S. Fish and Wildlife Service, Portland, Oregon. vi + 199 pp.

[12] Some activities such as gravel mining and recreation were discussed as potential threats. These potential threats (among others) were explored further and found to have no predictable effects. In the case of mining, there is no gravel mining expected within the relevant study area. For the case of recreation, multiple stakeholders at the Federal, State, County, Municipal, and recreational levels were queried. Their responses indicated that potential modifications to recreational activities due to the tidewater goby were improbable.

[13] Fish Friendly Farming® is a voluntary certification program for vineyard properties that are managed to restore fish and wildlife habitat and improve water quality. The program provides for compliance with the Endangered Species Act, as well as State and Federal water quality laws. Participants receive certification from three regulatory agencies: the California Department of Fish and Game, the Regional Water Quality Control Board, and the National Marine Fisheries Service. The program involves a sediment source inventory performed by independent evaluators on-site, then development and

water quality is limited; thus, the extent to which actions would be needed to avoid impacts to water quality in tidewater goby habitat is uncertain. Crop farming activity in the study area does not have a federal nexus. As application of fish friendly farming measures for protection of the tidewater goby and its habitat has not been contemplated in the past, and any application of these measures would be entirely voluntary, impacts to crop farming activities are not anticipated.

implementation of a Farm Conservation Plan by the farmer. This program currently operates in four counties: Mendocino, Sonoma, Napa and Solano. See http://www.fishfriendlyfarming.org.

## EXHIBIT 1-1 PROPOSED CRITICAL HABITAT OWNERSHIP AND THREATS BY UNIT

| UNIT | NAME | COUNTY | LANDOWNERS (ACRES) | | | | | THREATS[2] |
|---|---|---|---|---|---|---|---|---|
| | | | FEDERAL | STATE | LOCAL[1] | PRIVATE | TOTAL | |
| DN-1 | Lake Earl/Lake Tolowa | Del Norte | | 2,682 | | | 2,682 | 1,4 |
| HUM-1 | Stone Lagoon | Humboldt | | 586 | | | 586 | 4 |
| HUM-2 | Big Lagoon | | | 1,505 | | | 1,505 | 4 |
| HUM-3 | Humboldt Bay | | 879 | 296 | 90 | 213 | 1,478 | 1,3,4,5 |
| HUM-4 | Eel River | | | 32 | | 236 | 268 | 4,5 |
| MEN-1 | Ten Mile River | Mendocino | | 218 | | | 218 | 4 |
| MEN-2 | Virgin Creek | | | 11 | | | 11 | 1,4 |
| MEN-3 | Pudding Creek | | | 23 | | | 23 | 1,4 |
| MEN-4 | Davis Lake and Manchester State Park | | | 24 | | | 24 | 4 |
| SON-1 | Salmon Creek | Sonoma | | 41 | | 59 | 100 | 1,2,4,5 |
| MAR-1 | Estero Americano | Marin | 1 | 6 | | 288 | 295 | 1,4,5 |
| MAR-2 | Estero de San Antonio | | | 60 | | 118 | 178 | 1,2,4,5 |
| MAR-3 | Lagunitas (Papermill) Creek | | 176 | 666 | | 7 | 849 | 1,3,4,5 |
| MAR-4 | Rodeo Lagoon | | 40 | | | | 40 | 1 |
| SM-1 | San Gregorio Creek | San Mateo | | 39 | | | 39 | 1,3 |
| SM-2 | Pescadero-Butano Creek | | | 218 | | | 218 | 1,3,4 |
| SM-3 | Bean Hollow Creek (Arroyo de Los Frijoles) | | | 3 | | 7 | 10 | 1,2 |
| SC-1 | Laguna Creek | Santa Cruz | | 26 | | | 26 | 2,4 |
| SC-2 | Baldwin Creek | | | 17 | | | 17 | 2,4 |
| SC-3 | Corcoran Lagoon | | | 5 | 6 | 21 | 32 | 1,4 |
| SC-4 | Aptos Creek | | | 3 | | | 3 | 1,3,4 |
| SC-5 | Pajaro River | Santa Cruz | | 158 | 10 | 8 | 176 | 1,3,4 |
| MN-1 | Bennett Slough | Monterey | | 82 | 5 | 68 | 155 | 1,2,3,4 |
| SLO-1 | Arroyo del Corral | San Luis Obispo | | 5 | | | 5 | 1,5 |
| SLO-2 | Oak Knoll Creek (Arroyo Laguna) | | | 3 | | | 3 | 1,3 |
| SLO-3 | Little Pico Creek | | | 2 | | | 2 | 5 |
| SLO-4 | San Simeon Creek | | | 16 | | | 16 | 2,4,5 |
| SLO-5 | Villa Creek | | | 5 | | | 5 | 1,2,4,5 |
| SLO-6 | San Geronimo Creek | | | 1 | | | 1 | 5 |
| SLO-7 | Pismo Creek | | | 12 | 1 | 5 | 18 | 1,3,4 |
| SB-1 | Santa Maria River | Santa Barbara | | 149 | 33 | 286 | 468 | 1,2,4,5 |
| SB-2 | Canada de las Agujas | | | | | 1 | 1 | 1,4 |

| | | | LANDOWNERS (ACRES) | | | | | |
|---|---|---|---|---|---|---|---|---|
| UNIT | NAME | COUNTY | FEDERAL | STATE | LOCAL[1] | PRIVATE | TOTAL | THREATS[2] |
| SB-3 | Canada de Santa Anita | | | | | 3 | 3 | 4 |
| SB-4 | Canada de Alegria | | | | | 1 | 1 | 1,2,4,5 |
| SB-5 | Canada de Agua Caliente | | | | | 1 | 1 | 1,4 |
| SB-6 | Gaviota Creek | | | 8 | | 1 | 9 | 1,3,4,5 |
| SB-7 | Winchester/Bell Canyon | | | | 1 | 5 | 6 | 4 |
| SB-8 | Arroyo Burro | | | | 2 | | 2 | 1,3,4 |
| SB-9 | Mission Creek—Laguna Channel | | | 9 | 5 | | 14 | 1,3,4 |
| VEN-1 | Ventura River | | | 26 | 16 | 9 | 51 | 1,2,3,4 |
| VEN-2 | Santa Clara River | Ventura | | 218 | 22 | 110 | 350 | 1,2,3,4 |
| VEN-3 | J Street Drain—Ormond Lagoon | | | 5 | 40 | | 45 | 1,3,4 |
| LA-1 | Malibu Lagoon | Los Angeles | | 58 | | 6 | 64 | 1,2,3,4 |
| LA-2 | Topanga Creek | | | 5 | | | 5 | 1,2,3,4 |
| **Total:** | | | **1,096** | **7,223** | **231** | **1,453** | **10,003** | |
| **Percent of Total:** | | | **11%** | **72%** | **2%** | **15%** | **100%** | |

Notes:
(1) Local land is either city or county owned.
(2) Based on Proposed Rule (71 FR 68925); see the rule for a description of the primary constituent elements (PCEs). Codes for Threats:
1 – Coastal development projects that result in the loss or alteration of coastal wetland habitat affecting PCEs 1, 2, 3 and 4.
2 – Water diversions, alterations of water flows, and groundwater overdrafting upstream of coastal lagoons and estuaries that negatively impact the species' breeding and foraging activities and PCEs 1, 2 and 3.
3 – Channelization of habitats where the species occurs affecting PCEs 1, 2, 3 and 4.
4 – Non-point and point source pollution or discharge of agricultural and sewage effluents that are likely to impact the species health or breeding and foraging activities and PCE 1.
5 – Cattle grazing and feral pig activity that results in increased sedimentation of coastal lagoons and riparian habitats, removes vegetative cover, increases ambient water temperatures, and eliminates plunge pools and undercut banks utilized by tidewater gobies affecting PCE 1.

## 1.2 REGULATORY ALTERNATIVES

18. Executive Order 12866 directs Federal Agencies to evaluate regulatory alternatives. The Service identifies 44 units proposed for critical habitat designation. As an alternative to the proposed rule, section 4(b)(2) of the Act allows the Service to exclude additional areas proposed for designation based on economic impact and other relevant impact. Consideration of impacts at a unit level may result in alternate combinations of potential habitat that may or may not ultimately be designated as critical habitat. As a result, the impacts of multiple combinations of potential habitat are also available to the Service.

## 1.3 APPROACH TO ESTIMATING ECONOMIC IMPACTS

19. This economic analysis considers economic efficiency effects that may result from activities to protect the tidewater goby (hereinafter referred to collectively as "conservation efforts"). Economic efficiency effects generally reflect "opportunity costs" associated with the commitment of resources required to accomplish species and habitat conservation. For example, if activities that can take place on a parcel of land are limited as a result of the designation or the presence of the species, and thus the market value of the land is reduced, this reduction in value represents one measure of opportunity cost or change in economic efficiency. Similarly, the costs incurred by a Federal action agency to consult with the Service under section 7 of the Act represent opportunity costs of required conservation efforts.

### 1.3.1 EFFICIENCY EFFECTS

20. 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 understand how society, as a whole, will be affected by a regulatory action. In the context of regulations that protect tidewater goby habitat, these 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.[14]

21. In some instances, compliance costs may provide a reasonable approximation for the efficiency effects associated with a regulatory action. For example, a Federal land manager, such as the U.S. Army Corps of Engineers, may enter into a consultation with the Service to ensure that a particular activity will not adversely modify critical habitat. The effort required for the consultation is an economic opportunity cost, because the landowner or manager's time and effort would have been spent in an alternative activity had the parcel not been included in the designation. When 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 can provide a reasonable estimate of the change in economic efficiency.

22. 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, habitat protection measures that limit development may affect private development companies and/or potential home buyers by shifting the price and quantity of housing

[14] 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. Environmental Protection Agency, *Guidelines for Preparing Economic Analyses,* EPA 240-R-00-003, September 2000, available at http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/Guidelines.html.

supplied in a region. In this case, changes in economic efficiency (i.e., social welfare) can be measured by considering changes in producer and consumer surplus in the market.

23. For this analysis, incremental impacts primarily result from administrative section 7 consultation costs for Federal and State agencies. These administrative costs do not shift supply or demand for products in markets. As a result, there are unlikely to be social welfare changes to consumer or producer surplus.

### 1.3.2 IMPACTS ON SMALL ENTITIES AND ENERGY SUPPLY, DISTRIBUTION, AND USE

24. This analysis also considers how small entities, including small businesses, organizations, and governments, as defined by the Regulatory Flexibility Act, might be affected by future conservation efforts for the tidewater goby.[15] In addition, in response to Executive Order 13211 "Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use," this analysis considers the future impacts of tidewater goby conservation efforts on the energy industry and its customers.[16]

## 1.4 SCOPE OF THE ANALYSIS

25. This analysis identifies those economic activities believed to most likely threaten the listed species and its habitat and, where possible, quantifies the economic impact to avoid, mitigate, or compensate for such threats within the boundaries, or adjacent to, proposed critical habitat. In instances where critical habitat is being proposed after a species is listed, some future impacts may be unavoidable, regardless of the final designation and exclusions under 4(b)(2). However, due to the difficulty in making a credible distinction between listing and critical habitat effects within critical habitat boundaries, this analysis considers future conservation-related impacts that are coextensive with the designation.[17,18]

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[15] 5 U.S.C. § 601 *et seq*.

[16] Executive Order 13211, *Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use,* May 18, 2001.

[17] In 2001, the U.S. Court of Appeals for the 10th Circuit instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes (New Mexico Cattle Growers Assn v. U.S.F.W.S., 248 F.3d 1277 (10th Cir. 2001)).

[18] Issued in 2004, a Ninth Circuit judicial opinion invalidated the Service's regulation defining destruction or adverse modification of critical habitat (Gifford Pinchot Task Force v. United States Fish and Wildlife Service), and the Service does not rely on the regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Pursuant to the Service Director's Memo dated December 9, 2004, and the statutory provisions of the Act, destruction or adverse modification is determined on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional (or retain the current ability for the primary constituent elements to be functionally established) to serve its intended conservation role for the species.

**CALCULATING PRESENT VALUE AND ANNUALIZED IMPACTS**

For each land use activity, this analysis compares economic impacts incurred in different time periods in present value terms. The present value represents the value of a payment or stream of payments in common dollar terms. That is, it is the sum of a series of past or future cash flows expressed in today's dollars. Translation of economic impacts of past or future costs to present value terms requires the following: a) past or projected future costs of conservation efforts; and b) the specific years in which these impacts have been or are expected to be incurred. With these data, the present value of the past or future stream of impacts ($PV_c$) of conservation efforts from year t to T is measured in 2007 dollars according to the following standard formula:[a]

$$PV_c = \sum_{t}^{T} \frac{C_t}{(1+r)^{t-2007}}$$

$C_t$ = cost of conservation efforts in year t

r = discount rate[b]

Impacts of conservation efforts for each activity in each unit are also expressed as annualized values. Annualized values are calculated to provide comparison of impacts across activities with varying forecast periods (T). For this analysis, however, all activities employ a forecast period of 20 years, 2007 through 2026. Annualized impacts of future conservation efforts ($APV_c$) are calculated by the following standard formula:

$$APV_c = PV_c \left[ \frac{r}{1-(1+r)^{-(N)}} \right]$$

N = number of years in the forecast period (in this analysis, 20 years)

[a] To derive the present value of past conservation efforts for this analysis, t is 1994 and T is 2006; to derive the present value of future conservation efforts, t is 2007 and T is 2026.

[b] To discount and annualize costs, guidance provided by the OMB specifies the use of a real rate of seven percent. In addition, OMB recommends sensitivity analysis using other discount rates such as three percent, which some economists believe better reflects the social rate of time preference. (U.S. Office of Management and Budget, Circular A-4, September 17, 2003 and 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.)

26. Coextensive effects may also include impacts associated with overlapping protective measures of other Federal, State, and local laws that aid habitat conservation in the areas proposed for designation. In past instances, some of these measures have been precipitated by the listing of the species and impending designation of critical habitat. Because habitat conservation efforts affording protection to a listed species likely contribute to the efficacy of the critical habitat designation efforts, the impacts of these

actions are considered relevant for understanding the full effect of the proposed critical habitat designation. Enforcement actions taken in response to violations of the Act, however, are not included.

### 1.4.1 SECTIONS OF THE ACT RELEVANT TO THE ANALYSIS

27. This 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 critical habitat designation. In this section, the Secretary is required to list species as endangered or threatened "solely on the basis of the best scientific and commercial data available."[19] Section 4 also requires the Secretary to designate critical habitat "on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impact, of specifying any particular area as critical habitat."[20]
- 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 critical habitat.[21]
- 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, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct."[22]
- Under section 10(a)(1)(B) of the Act, an entity (e.g., 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.[23]

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[19] 16 U.S.C. 1533.

[20] 16 U.S.C. 1533.

[21] Issued in 2004, a Ninth Circuit judicial opinion invalidated the Service's regulation defining destruction or adverse modification of critical habitat (Gifford Pinchot Task Force v. United States Fish and Wildlife Service), and the Service does not rely on the regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Pursuant to the Service Director's Memo dated December 9, 2004, and the statutory provisions of the Act, destruction or adverse modification is determined on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would remain functional (or retain the current ability for the primary constituent elements to be functionally established) to serve its intended conservation role for the species.

[22] 16 U.S.C. 1532.

[23] U.S. Fish and Wildlife Service, "Endangered Species and Habitat Conservation Planning," August 6, 2002, accessed at http://endangered.fws.gov/hcp/.

### 1.4.2 OTHER RELEVANT PROTECTION EFFORTS

28. The protection of listed species and habitat is not limited to the Act. Other Federal agencies, as well as State and local governments, may also seek to protect the natural resources under their jurisdiction.[24] For the purpose of this analysis, such protective efforts are considered to be coextensive with the protection offered by critical habitat, and costs associated with these efforts are included in this report. In addition, under certain circumstances, the critical habitat designation may provide new information to a community 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 would not have been triggered absent the designation of critical habitat, they are included in this economic analysis.

### 1.4.3 ADDITIONAL ANALYTIC CONSIDERATIONS

29. This analysis also considers the potential for other types of economic impacts that can be related to section 7 consultations in general and critical habitat designation in particular, including time delay, regulatory uncertainty, and stigma impacts.

#### Time Delay and Regulatory Uncertainty Impacts

30. Time delay impacts are costs resulting from project delays associated with the consultation process or compliance with other regulations. Regulatory uncertainty costs occur in anticipation of having to modify project parameters (e.g., retaining outside experts or legal counsel to better understand responsibilities with regard to critical habitat). Time delays and regulatory uncertainty impacts are not anticipated in this case, because the Federal agencies involved in consultations are familiar with the process.

#### Stigma Impacts

31. Stigma refers to the change in economic value of a particular project or activity due to negative (or positive) perceptions of the role critical habitat will play in developing, implementing, or conducting that policy. For example, changes to private property values associated with public attitudes about the limits and costs of implementing a project in critical habitat are known as "stigma" impacts. This analysis does not quantify impacts related to development activity due to the uncertainty of these impacts (as discussed in Chapter 7). Due to the nature of economic impacts forecast in this analysis, stigma impacts are not anticipated.

### 1.4.4 BENEFITS

32. Under Executive Order 12866, OMB directs Federal agencies to provide an assessment of both the social costs and benefits of proposed regulatory actions.[25] OMB's Circular A-4

[24] 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.

[25] Executive Order 12866, *Regulatory Planning and Review*, September 30, 1993.

distinguishes two types of economic benefits: *direct benefits and ancillary benefits*. Ancillary benefits are defined as favorable impacts of a rulemaking that are typically unrelated, or secondary, to the statutory purpose of the rulemaking.[26]

33. In the context of critical habitat designation, the primary purpose of the rulemaking (i.e., the direct benefit) is the potential to enhance conservation of the species. The published economics literature has documented that social welfare benefits can result from the conservation and recovery of endangered and threatened species. In its guidance for implementing Executive Order 12866, OMB acknowledges that it may not be feasible to monetize, or even quantify, the benefits of environmental regulations due to either an absence of defensible, relevant studies or a lack of resources on the implementing agency's part to conduct new research.[27] *Rather than rely on economic measures, the Service believes that the direct benefits of the proposed rule are best expressed in biological terms that can be weighed against the expected cost impacts of the rulemaking.*

34. Critical habitat designation may also generate ancillary benefits. Critical habitat aids in the conservation of species specifically by protecting the primary constituent elements on which the species depends. To this end, critical habitat designation can result in maintenance of particular environmental conditions that may generate other social benefits aside from the preservation of the species. That is, management actions undertaken to conserve a species or habitat may have coincident, positive social welfare implications, such as increased recreational opportunities in a region. While they are not the primary purpose of critical habitat, these ancillary benefits may result in gains in employment, output, or income that may offset the direct, negative impacts to a region's economy resulting from actions to conserve a species or its habitat.

35. It is often difficult to evaluate the ancillary benefits of critical habitat designation. To the extent that the ancillary benefits of the rulemaking may be captured by the market through an identifiable shift in resource allocation, they are factored into the overall economic impact assessment. For example, if habitat preserves are created to protect a species, the value of existing residential property adjacent to those preserves may increase, resulting in a measurable positive impact.

36. Ancillary benefits are expected in this case, in particular with regard to potential benefits to the City of Ventura related to operation of the Ventura Water Reclamation Facility. The City of Ventura could potentially experience a net benefit of $35.0 million to $90.0 million if it is able to continue discharging effluent to the Santa Clara River estuary as a result of tidewater goby conservation efforts.[28] These impacts are discussed in Section 2.3.

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[26] 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.

[27] Ibid.

[28] Personal communication with Dan Pfeifer, City of Ventura Public Works Department, May 23, 2007.

### 1.4.5 GEOGRAPHIC SCOPE OF THE ANALYSIS

37. The geographic scope of the analysis includes areas proposed for critical habitat designation and additional upstream and upgradient areas. Because most of the proposed critical habitat units are small and the units are primarily lagoons, estuaries, or backwater marshes, there are very few economic activities that take place within the habitat.[29] As a result, many of the identified threats to the tidewater goby and its habitat are the result of economic activities that occur upstream or upgradient from the proposed critical habitat units.

38. The "study area" for purposes of this analysis includes areas within the proposed critical habitat as well as areas where economic activities have the potential to affect the proposed critical habitat. Impacts from economic activities occurring within these study areas have a greater likelihood of reaching proposed critical habitat units; and therefore, represent areas where landowners or land managers might reasonably be expected to implement conservation measures (i.e., the potential detrimental effects of their activities on proposed critical habitat are apparent to them). Study areas for each economic activity are identified in Exhibit 1-2. Note that these study areas are defined for purposes of this economic analysis only.

39. In developing the upstream study area, the potential impact to the tidewater goby and its habitat was assumed to differ based on the type of economic activity as well as distance from the proposed critical habitat area. Ideally, this analysis would develop zones of potential impact for each proposed critical habitat unit by economic activity, taking into account such influencing factors as hydrology, sediment budget loads, and stream bed morphology. However, an activity-based, unit-by-unit study is outside the scope of this analysis.

40. Because activity-based, unit-by-unit analyses are not readily available, this analysis instead assigns a standard study area for each economic activity that reflects the potential impact of that activity on the tidewater goby and its habitat. Specifically, IEc contracted with Stillwater Sciences (Stillwater) to obtain assistance in defining the relevant upstream and/or upgradient study area for purposes of this analysis. Stillwater has extensive experience in California in the areas of stream morphology, hydrology, sediment and contaminant loads, and tidewater goby conservation. Based on information provided by Stillwater, the Service developed a series of study areas for each economic activity.[30] For example, the study area associated with cattle grazing is 100 meters upstream of the proposed critical habitat unit whereas the study area for dams is 1,000 meters upstream of the proposed critical habitat unit.

[29] Fifteen of the tidewater goby units are less than ten acres each and 27 of the units are less than 50 acres each. Many of these units, such as Bean Hollow Creek (SM-3) or Villa Creek (SLO-5) and San Geronimo Creek (SLO-6) are simply estuaries where a river or creek flows into the Pacific Ocean. Larger units, such as Lake Earl and Lake Tolowa (DN-1) contain entire bodies of water where creeks and rivers create lagoons that empty into the ocean.

[30] Email communications from the Service, April 23, April 25, and May 31, 2007.

**EXHIBIT 1-2 STUDY AREAS DEFINED FOR PURPOSES OF THE ECONOMIC ANALYSIS**

| ECONOMIC ACTIVITY | STUDY AREA |
|---|---|
| Flood control - channelization | Within proposed critical habitat and 1,000 meters upstream of unit |
| Flood control – tide gate maintenance or removal | Within proposed critical habitat only |
| Flood control – land/easement acquisition | Within proposed critical habitat and 200 meters around unit (including upstream) |
| Sandbar breaching | Within proposed critical habitat only |
| Dam operations, maintenance and removals | Within proposed critical habitat and 1,000 meters upstream of unit |
| Wastewater treatment | Within proposed critical habitat and 200 meters around unit |
| Groundwater withdrawals | Within proposed critical habitat and 100 meters around unit |
| Watershed and salmonid restoration | Within proposed critical habitat and 100 meters around unit |
| Cattle grazing | Within proposed critical habitat and 100 meters upstream |
| Crop farming | Within proposed critical habitat and 100 meters around unit |
| Transportation – new construction and retrofitting | Within proposed critical habitat and 200 meters around unit |
| Oil and gas pipeline construction | Within proposed critical habitat and 200 meters around unit |
| Sand and gravel mining | Within proposed critical habitat and 200 meters upstream of unit |
| New commercial and residential development | Within proposed critical habitat and 200 meters around unit |
| Source: Email communications from Service, April 23, April 25 and May 31, 2007. | |

41. For this proposed critical habitat designation, impacts are reported for each critical habitat unit identified in the proposed rule. For maps of the proposed critical habitat units see Appendix C.

### 1.4.6 ANALYTIC TIME FRAME

42. The analysis estimates impacts 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. This analysis estimates economic impacts to activities from 1994 (year of the species' final listing) to 2026 (20 years from the final designation anticipated in 2007). Estimated impacts are divided into pre-designation (1994-2006) and post-designation (2007-2026) impacts. Forecasts of economic conditions and other factors beyond the next 20 years would be speculative.

## 1.5 INFORMATION SOURCES

43. The primary sources of information for this report were communications with and data provided by personnel from the Service, Federal action agencies, local and State agencies, and non-governmental organizations within California. Specifically, the analysis relies on data collected in communication with personnel from the following entities:

- California Coastal Commission (CCC);
- California Coastal Conservancy;
- California Department of Fish and Game (CDFG);
- California Department of Forest and Fire Protection;
- California Department of State Parks and Recreation;
- California Fire Marshall;
- California Land Stewardship Council;
- California Public Utilities Commission;
- County and city planning departments;
- County and city public works departments;
- County assessor's offices;
- Environmental consultants for local agencies;
- National Park Service (NPS);
- Private pipeline operating companies;
- Regional Water Quality Control Boards;
- Resource Conservation Districts;
- The Nature Conservancy (TNC);
- The Wine Institute;
- Trust for Public Land (TPL);
- U.S. Army Corps of Engineers (USACE);
- U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS); and
- U.S. Pipeline and Hazardous Material Safety Administration.

44. In addition, this analysis relies upon the Service's section 7 consultation records, public comments, and published reports. The reference section at the end of this document provides a full list of information sources.

## 1.6 STRUCTURE OF THE REPORT

45. The remainder of this report is organized as follows:

- Chapter 2: Impacts to Water Management Activities;
- Chapter 3: Impacts to Grazing Activities;
- Chapter 4: Impacts to Transportation Activities;
- Chapter 5: Impacts to Natural Resources Management Activities;
- Chapter 6: Impacts to Oil and Gas Pipeline Construction and Maintenance Activities;
- Chapter 7: Impacts to Development Activities;
- References;
- Appendix A: Incremental Analysis of Critical Habitat Designation for the Tidewater Goby;
- Appendix B: Small Business Analysis and Energy Impact Analysis;
- Appendix C: Proposed Critical Habitat Maps;
- Appendix D: Detailed Unit by Unit Impacts; and
- Appendix E: Flood Control Project Details.

# CHAPTER 2 | POTENTIAL ECONOMIC IMPACTS TO WATER MANAGEMENT

46. This chapter describes how conservation efforts to protect the tidewater goby and its habitat may affect water management activities in the study area. Water management activities considered in this chapter include:

- Flood control efforts;
- Sandbar breaching;
- Sewage treatment;
- Dam operations, maintenance, and removals; and,
- Groundwater withdrawals.

47. These activities were identified through a review of historical section 7 consultation efforts related to the tidewater goby, review of public comments on the proposed rule, and interviews with a wide range of stakeholders. Water management activities threaten the tidewater goby and its habitat through channelization of habitat, water diversions or alteration of water flows, discharge of sewage effluents, and groundwater overdrafting upstream.[31] However, evidence suggests that tidewater goby may also benefit from the discharge of sewage effluents in cases where water flows are not otherwise sufficient to maintain suitable habitat for the species.

48. While a variety of water management activities occur in the study area, historical impacts resulting from tidewater goby conservation efforts have been limited to two types of activities: flood control and sandbar breaching. The primary post-designation impacts associated with flood control are expected to result from voluntary actions undertaken by resource agencies and non-profit organizations to purchase lands or flood easements on private property in order to prevent structured flood control (e.g., channelization). In addition, some administrative impacts and project modifications are expected related to flood control and sandbar breaching projects. These project modifications include surveying and monitoring costs, as well as installing sediment barriers and fish features (i.e., refugia, substrate).

49. The potential for significant benefits associated with a wastewater treatment facility in the study area also exists. These impacts relate to potential cost savings if the Ventura Water Reclamation Facility is allowed to continue discharging effluent into the Santa Clara

[31] U.S. Fish and Wildlife Service. 2005. Recovery Plan for the Tidewater Goby (*Eucyclogobius newberryi*). U.S. Fish and Wildlife Service, Portland, Oregon. vi + 199 pp. Also, U.S. Fish and Wildlife Service, Revised Critical Habitat Designation for the Tidewater Goby Proposed Rule, November 28, 2006. 71 FR 68914.

River estuary as opposed to building a more costly ocean outfall.[32] A tentative permit issued by the Los Angeles Regional Water Quality Control Board directs the facility to eliminate its discharge to the estuary over the next 10 years.[33] However, the U.S. Fish and Wildlife Service (Service) has expressed concern regarding potential take of tidewater goby if this discharge is eliminated.[34] Public comments on this permit are being reviewed and the permit will be decided at the board meeting on August 9, 2007.[35] Potential impacts to groundwater withdrawals, and dam operation, maintenance and removal are discussed qualitatively.

50. This chapter is organized into six sections. The chapter includes a section for each of the five water management activities: flood control activities; sandbar breaching; sewage treatment; dam operations, maintenance and removals; and, groundwater withdrawals. The last section summarizes total water management impacts.

**Tidewater Goby Study Area for Water Management Activities**

Because most of the proposed critical habitat units are small and the units are primarily lagoons, estuaries, or backwater marshes, few economic activities take place within the habitat. As a result, some water management activities that may threaten the tidewater goby and its habitat are likely to occur upstream or upgradient from the proposed critical habitat units. As discussed in Chapter 1, for purposes of the economic analysis, the Service has defined the appropriate study areas as follows[1]:

- For dams and flood control activity including channelization, the study area extends 1,000 meters upstream.
- For tidegate construction or maintenance, the study area is within the proposed critical habitat unit only.
- For land or easement acquisitions made to avoid post-designation flood control efforts, the analysis applies a study area of 200 meters around the proposed critical habitat area, based on the study area defined for development activity.[2]
- For sewage treatment, study area includes an area 200 meters around the proposed critical habitat unit.

[1] Study area includes proposed critical habitat unit as well as the defined buffer or upstream area. Email communications from Service, April 23 and April 25, 2007.
[2] Email communication from Service, May 31, 2007.

[32] Personal communication with Dan Pfeifer, City of Ventura Public Works Department, May 23, 2007.

[33] Information regarding the tentative permit and copies of public comments are available at http://www.waterboards.ca.gov/losangeles/html/permits/tentative_order/Individual/Ventura/Ventura.html, accessed on July 16, 2007.

[34] Ibid.

[35] Ibid.

## 2.1 IMPACTS TO FLOOD CONTROL ACTIVITY IN THE STUDY AREA

51. This section quantifies impacts associated with two types of activities related to flood control. First, impacts are quantified for efforts undertaken to acquire property or flood easements within the study area. Second, impacts of undertaking section 7 consultations and implementing project modifications for flood control projects are quantified.

### 2.1.1 ACQUISITION OF PROPERTY AND FLOOD EASEMENTS

52. While not specifically due to the tidewater goby and its habitat, there have been a number of voluntary actions undertaken by resource agencies and non-profit organizations to limit development and the associated need for future flood control activity (e.g., channelization) in the study area. Specifically, the California Department of Fish and Game (CDFG), the California Coastal Conservancy and the Nature Conservancy (TNC) have each purchased lands or flood easements within the study area for this purpose. These efforts are expected to continue in the future, in addition to efforts by the Trust for Public Lands. These efforts are summarized by critical habitat unit in Exhibit 2-1. For purposes of this analysis, these purchases are considered coextensive impacts of tidewater goby conservation efforts because, in part, these purchases reflect a desire to avoid take of the species, which could occur if additional flood control efforts (e.g. sandbar breaching or channelization) become necessary to protect new development.

53. Because there are no readily available data that identify the locations of potential land and flood easement purchases, efforts to purchase lands or easements were identified through interviews with action agencies including U.S. Army Corps of Engineers (USACE), the California Coastal Commission (CCC), and local planning departments. Based on research efforts to identify water management activities (summarized in Appendix E), purchases are expected in only four critical habitat units, as summarized in Exhibit 2-1. Total pre- and post-designation water management impacts are presented in Exhibits 2-10 and 2-11, respectively, at the end of this chapter.

54. In estimating pre- and post- designation impacts, where possible, only the portion of land or flood easement acquisition costs for areas within the study area have been included. However, in instances where a parcel likely to be included in future purchases fell partly outside of the study area, but the entire parcel would likely need to be purchased to acquire the portion of lands in the study area, the cost for the entire parcel has been included.

## EXHIBIT 2-1 SUMMARY OF PROPERTY ACQUISITION

| CRITICAL HABITAT UNIT | GENERAL DESCRIPTION | PRE-DESIGNATION IMPACTS | EXPECTED POST-DESIGNATION IMPACTS |
|---|---|---|---|
| DN-1 Lake Earl/Lake Tolowa | California Department of Fish and Game (CDFG) is actively purchasing lands and flood easements around Lake Earl, including portions of Pacific Shores Subdivision. Part of the goal is to obtain all of the lands that typically flood between manual breachings of the sandbar, to avoid pressure for additional flood control efforts (e.g., to avoid sandbar breaching efforts during the tidewater goby breeding period).[1] | $4.53 million (undiscounted) between 1995 – 2006.[1] | Analysis assumes CDFG (or parties acting on behalf of CDFG) will spend approximately $2.50 million to purchase additional lands over the next five years (2008 – 2013). [2] |
| VEN-1 Ventura River | The Trust for Public Land (TPL) is currently in the planning stages for a project focused on acquiring lands to protect the lower six miles of the Ventura River. TPL has recently received a grant from the California Coastal Conservancy for planning purposes; and acquisitions could begin as early as 2008.[3] Conservation purposes include:[3]<br>• Facilitate natural flood management and avoid channelization<br>• Maintain natural river flow<br>• Protect habitat for sensitive species<br>• Provide water quality benefits | None. | California Coastal Conservancy grant for planning purposes of $100,000 in 2007.<br><br>TPL will look to purchase approximately 60 acres within study area at an estimated cost of $1.04 million (undiscounted) over 12 years (2008 – 2019).[4] |
| VEN-2 Santa Clara | The Nature Conservancy (TNC) has been actively purchasing lands in the Santa Clara River since 2001, with a focus on high quality riparian areas. TNC is currently updating their plan for this area, which will be completed in October 2007. Future goals include purchasing lands in the floodplain to help mitigate impacts of potential flooding, and to prevent structured flood control (channelization). TNC is looking at several acquisitions in the river mouth and estuary area.[5] | None in study area.[6] | Approximately $10.0 million over the next 7 years (2008 – 2014).[7] |
| VEN-3 J-Street Drain – Ormond Lagoon | TNC and the California Coastal Conservancy were primarily focused on wetlands preservation around Ormond lagoon with their pre-designation property purchases in this area, but were also are also interested in avoiding flood control efforts that would be required if these lands are developed. Benefits to tidewater goby were also expected to occur as a result of these past purchases and any post-designation purchases.[8] | Estimate $2.60 million spent in 2005 for portion of TNC purchases that fall within study area.[9] | None likely within 20-year timeframe. Near-term purchases will likely fall outside of study area.[10] |

Notes:

(1) Personal communication with Karen Kovacs, CDFG, April 12, 2007 and email from Karen Kovacs, CDFG, May 23, 2007.

(2) Personal communication with Patty McCleary, Smith River Alliance, June 4, 2007.

(3) Personal communication with Marc Landgraf, TPL, May 25, 2007.

(4) Acreage determined based on IEc GIS analysis and personal communication with Marc Landgraf, TPL, May 25, 2007. Includes only the area above highway 101 as the area below the highway is already in public ownership. Of the 60 acres in the study area above highway 101, approximately 4 acres are within an existing RV park which could cost up to $1.0 million to acquire. The remaining 56 acres are valued at $800/acre because of the limited development potential for these lands which all fall within the floodway. Land values based on personal communication with Mark Landgraf, May 25, 2007.

(5) Personal communication with E.J. Remson, TNC, May 21, 2007.

(6) IEc analysis of GIS information provided by Bob Cohen, TNC, May 29, 2007.

(7) Personal communication with E.J. Remson, TNC, May 21, 2007. While data are not available to forecast exactly what will be purchased within the study area, the reasonableness of this estimate was verified based on the acreage of lands in the river channel and outside the river channel, and applying average per acre costs for purchases in this area ($1,000/per acre for river channel lands and $60,000/acre for land currently in agricultural or other active use, per email from E.J. Remson, TNC, May 23, 2007).

(8) Personal communication with Sandi Matsumoto, TNC, May 25, 2007.

(9) Pre-designation purchases in the area include purchase of 265 acres by TNC for $13 m in 2005 (of which 20% falls in study area based on map provided by TNC, and IEc GIS analysis) (personal communication with Sandi Matsumoto, TNC, May 25, 2007). Also, 276 acres purchased by Coastal Conservancy $10.6 m in 2006 fell outside study area (California Coastal Conservancy. Southern California Wetlands Recovery Project 2006 Work Plan Update. Downloaded from http://www.scwrp.org/work_plan.htm).

(10) Email communication from Sandi Matsumoto, TNC, May 29, 2007.

### 2.1.2 IMPACTS TO FLOOD CONTROL PROJECTS

55. Most of the flood projects undertaken in the study area are either conducted or permitted by USACE; thus, these projects have a Federal nexus and will require section 7 consultation with the Service. For example, when a local flood control district or county public works department undertakes a flood control project in or near tidewater goby habitat, this work will usually require a permit from USACE. In particular, flood control projects may fall under the following laws:

- *Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).* This law prohibits the obstruction or alteration of navigable waters of the United States without a permit from USACE.
- *Section 404 of the Clean Water Act (33 U.S.C. 1344).* Section 301 of this Act prohibits the discharge of dredged or fill material into waters of the United States without a Section 404 permit from USACE.

56. The section 7 consultation history for tidewater goby contains 19 consultations on flood control; however, nine of these were for activities in areas not included in the study area. Exhibit 2-2 displays the number of section 7 consultations related to flood control activities, by critical habitat unit, conducted from 1994 through 2006.

**EXHIBIT 2-2 HISTORICAL FLOOD CONTROL SECTION 7 CONSULTATIONS IN CRITICAL HABITAT**

| CRITICAL HABITAT UNIT | TYPE OF CONSULTATION | |
|---|---|---|
| | PROGRAMMATIC | FORMAL |
| SC-5: Pajaro River | | 1 |
| SLO-7: Pismo Creek | | 1 |
| SB-6: Gaviota Creek | | 3 |
| SB-9: Mission Creek – Laguna Channel | | 1 |
| VEN-3: J-Street Drain – Ormond Lagoon | 1 | 2 |
| Multiple Units[1] | 1 | |
| TOTALS | 2 | 8 |

Source: IEc analysis of section 7 consultation history.
Notes:
(1) Multiple units refers to all units in the five counties covered by the programmatic consultation (Ventura, Santa Barbara, San Luis Obispo, Monterey, and Santa Cruz Counties). U.S. Fish and Wildlife Service. Programmatic Consultation and Conference for Listed Coastal Species, Ventura, Santa Barbara, San Luis Obispo, Monterey, and Santa Cruz Counties, California (1-8-96-11), August 29, 1997.

57. Impacts to flood control activities are categorized into administrative costs and project modification costs. Administrative costs include costs borne by the Service, USACE, and third-party permit applicants to undergo section 7 consultations. Costs associated with these consultations include the administrative costs associated with conducting the consultations, such as the costs of time spent in meetings, preparing letters, and development of a biological assessment and a biological opinion, as needed. Typical administrative costs of section 7 consultation efforts are provided in Exhibit 2-3.

**EXHIBIT 2-3 ESTIMATED ADMINISTRATIVE COSTS OF CONSULTATION AND TECHNICAL ASSISTANCE EFFORTS (PER EFFORT)**

| CONSULTATION TYPE | SERVICE | ACTION AGENCY | THIRD PARTY | BIOLOGICAL ASSESSMENT | TOTAL COST |
|---|---|---|---|---|---|
| Technical Assistance | $520 | n/a | $1,050 | n/a | **$1,500** |
| Informal Consultation | $2,250 | $2,900 | $2,050 | $2,000 | **$9,500** |
| Formal Consultation | $5,050 | $5,750 | $3,500 | $4,800 | **$19,500** |
| Programmatic Consultation | $15,250 | $12,750 | n/a | $5,600 | **$33,600** |

Source: IEc analysis based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2006, and review of consultation records from several Service field offices across the country. Confirmed by local Action Agencies (personal communication with Jane Hicks, USACE, March 27, 2007).
Note: Totals may not sum due to rounding.

58. In order to expedite the section 7 consultation process, in 1997, the Service completed a programmatic consultation with USACE considering the effects of actions that USACE may permit for Listed Coastal Species, including the tidewater goby. This consultation covers the USACE actions in five coastal counties, including Ventura, Santa Barbara, San Luis Obispo, Monterey, and Santa Cruz counties. This consultation presents both measures that are intended to reduce or avoid the potential adverse effects on all of the listed species and measures specifically to avoid adverse effects to tidewater goby. These mitigation measures are summarized in Exhibit 2-4. These general mitigation measures are expected to impact post-designation flood control projects, as well as other types of projects permitted by USACE (i.e., bridge construction, oil & gas pipeline construction and maintenance).

**EXHIBIT 2-4 MITIGATION MEASURES FROM USACE PROGRAMMATIC CONSULTATION**

| MITIGATION MEASURES FROM USACE PROGRAMMATIC CONSULTATION |
|---|
| **MITIGATION MEASURES FOR ALL LISTED SPECIES** |
| All project workers shall be given information on listed species in the project area and the specific protective measures to be followed during implementation of the proposed action. |
| Designated person (determined by USACE & Service) monitors compliance; Monitor can halt action if take levels exceeded. |
| Trash that may attract predators shall be properly contained and removed from site regularly. |
| Fueling & maintenance of equipment shall occur 20 meters from any aquatic habitat. |
| **MITIGATION MEASURES FOR TIDEWATER GOBY** |
| Work activities shall be completed outside of primary breeding season (April & May). |
| Minimize and clearly delineate project area (access routes, staging areas and total area of activity). |
| Only qualified personnel shall capture, handle, and monitor tidewater gobies. |
| If de-watering, tidewater gobies shall be moved to the nearest appropriate habitat, within the same stream. If most practical, hold tidewater gobies in captivity until completion of project. |
| If pumping, intakes screened with wire mesh not larger than 5 mm. |
| If areas are de-watered, water above barrier shall be pumped downstream at an appropriate rate to maintain downstream flows during construction; when barriers removed, minimize disturbance to substrate. |
| If substrate of stream or lagoon altered, it shall be graded or otherwise treated to approximate pre-construction conditions. |
| Pre- and post-activity water quality monitoring. |
| Source: U.S. Fish and Wildlife Service. Programmatic Consultation and Conference for Listed Coastal Species, Ventura, Santa Barbara, San Luis Obispo, Monterey, and Santa Cruz Counties, California (1-8-96-11), August 29, 1997. |

59. The following methodology was applied to estimate section 7 consultation-related impacts to flood control activities resulting from tidewater goby conservation efforts over the next 20 years:

- ***Forecast the number and type (e.g., maintenance or one-time construction) of projects expected to occur in each critical habitat unit***, based on historical records and interviews with USACE, and other State and local agencies involved in flood control efforts including CCC and local flood control districts and public works departments. Expected future flood control projects are discussed in Exhibit 2-5. A summary of the results of research efforts to identify potential post-designation flood control efforts is presented in Appendix E.
- ***Estimate post-designation administrative costs***. For each of the forecast flood control projects, determine appropriate consultation effort and apply the corresponding typical administrative costs from Exhibit 2-3.
- ***Estimate costs of project modifications (e.g., relocation of gobies, silt fencing, hiring biologist) for each project expected within the study area.*** Where specific cost information is available for a particular project, this information is applied;

otherwise, average per-project costs are applied (average costs are illustrated in Exhibit 2-6).

60. Exhibit 2-5 summarizes expected flood control activities in the study area that have the potential to be affected by tidewater goby conservation efforts over the next 20 years. Pre- and post-designation impacts to these activities are included at the end of this chapter in Exhibits 2-10 and 2-11, respectively.

**EXHIBIT 2-5 EXPECTED POST-DESIGNATION FLOOD CONTROL PROJECTS IN STUDY AREA (2007 – 2026)**

| CRITICAL HABITAT UNIT[1] | EXPECTED SECTION 7 CONSULTATIONS | EXPECTED PROJECT MODIFCATION COSTS | FLOOD CONTROL ACTIVITES LIKELY TO BE AFFECTED |
|---|---|---|---|
| SC-5: Pajaro River | 1 Formal<br>3 Informal | Costs of relocating goby and onsite monitoring $19,500 in 2016 as part of Pajaro River flood control project. [2] | • USACE flood control project sponsored by Congress Member Farr in the planning (pre-DEIS) stages. Draft proposal includes raising levees and putting in a tidegate (which would only open in the case of a 100 year flood). This project will entail formal consultation in 2008. [3]<br>• Updating the USACE flood control operations manual for the Pajaro River to incorporate tidewater goby critical habitat. [3]<br>• Renewal of five-year permit for routine flood control maintenance work conducted by Santa Cruz and Monterey counties will require informal consultation in 2013, 2018, and 2023. Typical administrative costs have been applied for these efforts. [3] |
| SB-6: Gaviota Creek | 5 Formal | Total $176,000 (undiscounted) based on typical project modification costs (i.e., $35,200 per project) for five future projects. | • Based on historical rate of consultation, one flood control project expected to occur every 4 years (i.e., in 2008, 2012, 2016, 2020, and 2024). |
| SB-9: Mission Creek – Laguna Channel | 2 Formal | Total $5.80 million (undiscounted) for tidewater goby conservation efforts associated with the Lower Mission Creek Flood Control project (detailed in Exhibit 2-7). | • USACE flood control project consulted on in 2001, will likely be reinitiated in 2008. Timing of construction uncertain due to funding, earliest that construction could begin would be 2010; thus, the analysis assumes that tidewater goby conservation efforts associated with construction occur in 2010. Draft proposal includes installing fish friendly features, and substantial tidewater goby mitigation costs. [3]<br>• Administrative costs associated with updating the USACE flood control operations manual. [4] |
| VEN-3: J-Street Drain – Ormond Lagoon | 1 Formal<br>1 Programmatic | $286,000 for modifications to two flood control projects. Costs associated with each project expected to be similar to costs for pre-designation projects with similar level of effort (e.g., $143,000/project). [5] | • Flood control efforts by Ventura Watershed Protection District - two projects, one in J-Street Drain and another in Oxnard Drain. Timing uncertain but assume they both occur in 2016. [5] |

Notes:
(1) No future flood control work expected in SLO-7 Pismo Creek per Mike Gruver, City of Pismo Creek, May 2, 2007.
(2) Email communication from Christopher Eng, USACE, May 15 & 18, 2007.
(3) Personal communication with Christopher Eng, USACE, May 4, 2007.
(4) Personal communication with Gail Campos, USACE, May 11, 2007.
(5) Personal communication with Theresa Stevens, Ventura Watershed Control District, May 12, 2007.

**EXHIBIT 2-6 AVERAGE PROJECT MODIFICATION COSTS**

| MITIGATION MEASURE | PER PROJECT COST (2007$) |
|---|---|
| Worker education programs conducted by authorized biologist. | $3,500 |
| Tidewater goby survey/sampling. | $1,200 |
| Relocation of tidewater gobies by authorized biologist. | $14,500 |
| Onsite monitoring by authorized biologist. | $1,200 |
| Water quality monitoring. | $3,000 |
| Installation of erosion control devices (i.e., siltation fences). | $11,800 |
| **Total** | **$35,200** |

Source: Average costs for each activity based on personal communications with personnel at USACE, County of Santa Cruz Department of Public Works, Padre Associates, CDFG, Storrer Environmental Services, and EDAW. Also, Natural Resource Conservation Service (NRCS) State Approved Cost Share List for Fiscal Year 2007.

61. The majority of flood control project modifications are associated with a major flood control project on the Lower Mission Creek in Santa Barbara County. USACE is currently in the planning stages of this project. The Service issued a biological opinion on this project in 2001; however, due to funding issues it is unclear when the project will occur. The earliest that construction could begin would be 2010; thus, the analysis assumes that tidewater goby conservation efforts associated with construction occur in 2010.[36] In 2005, a Tidewater Goby Management Plan for the Lower Mission Creek Flood Control Project was developed. This plan details 15 management actions that will be incorporated in the project.[37] Impacts of efforts that are undertaken for the tidewater goby are detailed in Exhibit 2-7. The local sponsors (County of Santa Barbara and City of Santa Barbara) will share these costs equally with the USACE.

[36] Personal communication with Gail Campos, USACE, May 11, 2007.

[37] U.S. Army Corps of Engineers, Los Angeles District, County of Santa Barbara and City of Santa Barbara. 2005. Tidewater Goby Management Plan Lower Mission Creek Flood Control Project. Prepared by City of Santa Barbara Department of Public Works and URS Consultants. April.

**EXHIBIT 2-7 TIDEWATER GOBY CONSERVATION EFFORTS FOR MISSION CREEK FLOOD CONTROL PROJECT**

| CONSERVATION MEASURE | COST ($2007) |
|---|---|
| 1 - Fish Features | $4,780,000 |
| 2 - Substrate Modification | $128,000 |
| 3 - Dewatering and Fish Rescue Plans | $7,000 |
| 5 - Dewatering and Fish Rescue Operations – Includes $2,000 for Corps to prepare and monitor contract, and $1,000/day for 3 biologists onsite for 2 days | $8,000 |
| 6 - Limit on Dewatered Areas | $1,000 |
| 7- Onsite Monitor | $254,000 |
| 8 - Worker Training | $3,500 |
| 10 - Separate Two Lagoons | $56,200 |
| Environmental Mitigation | $405,000 |
| Planting and Maintenance | $150,000 |
| **TOTAL** | **$5,800,000** |

Source: Email communication from Gail Campos, USACE, May 16 & 17, 2007.
Notes: There were no costs associated with management plan items 4 and 9. Also, this exhibit may understate costs because information is not available regarding some potential costs that may be incurred by the County of Santa Barbara and City of Santa Barbara for management plan actions 11 – 15 of the (including establishing a contingency population, undertaking specific maintenance procedures, lagoon management, re-colonization procedures, and monitoring and adaptive management program). However, several of these are not expected to have substantial costs associated with the activity, and data were not available regarding these costs.
Note: Totals may not sum due to rounding.

62. Flood control impacts are uncertain because the timing of future projects is not known with certainty in most cases, and in some cases, the alternatives for projects have not been developed. Where project construction alternatives have not been developed (e.g., VEN-3), estimated costs may be over- or under-stated depending on whether construction efforts occur within areas where tidewater goby are found.

## 2.2 IMPACTS TO SANDBAR BREACHING ACTIVITY IN THE STUDY AREA

63. Similar to flood control activities, sandbar breaching activity is regulated by USACE. Of the 44 critical habitat units proposed for designation, at least 40 have some form of sandbar across the mouth of the lagoon or estuary on an intermittent basis.[38] Based on the section 7 consultation history for tidewater goby, artificial breaching of these sandbars has only been conducted under USACE permits in two locations since 1994, DN-1 (Lake Earl/Lake Tolowa) and SC-5 (Pajaro River). In both of these instances, the reason for manual breaching is to protect infrastructure and residential development. This section focuses on impacts to sandbar breaching activity at these two locations. Based on

[38] U.S. Fish and Wildlife Service, Revised Critical Habitat Designation for the Tidewater Goby Proposed Rule, November 28, 2006.

discussion with USACE and other agencies, sandbar breaching permits are not expected for other locations.[39]

64. Discussion with the Service, USACE personnel, and various other sources indicates that unauthorized artificial breaching activity may have occurred in the past or may be occurring at other locations, for the purposes of increasing recreational activity or protecting infrastructure.[40] The Service undertook enforcement efforts for an illegal breaching in one instance, at Lake Earl. However, in general, it is difficult to enforce against this unauthorized activity, due to a lack of evidence and the infrequency of such events. Neither USACE nor the Service, nor CDFG anticipate any changes to enforcement or education/outreach associated with tidewater goby conservation efforts.[41] This analysis does not include any economic impacts associated with this unauthorized illegal activity, because these actions are difficult to predict.

65. Pre- and post-designation impacts to sandbar breaching activity are discussed below by unit, and included in Exhibits 2-10 and 2-11 respectively.

### 2.2.1 DN-1 LAKE EARL/LAKE TOLOWA

66. The Service has participated in eight consultations (two formal and six informal) related to sandbar breaching at Lake Earl. The analysis further assumes that the 10-year permit consulted on in 2005 will undergo formal consultation due to the critical habitat designation in 2008 and then for permit renewal again in 2018. Average section 7 consultation costs (shown in Exhibit 2-3) are applied to these consultation efforts.

67. In years where breaching is necessary, the Lake Earl sandbar breaching is performed by Del Norte County Public Works, but some of the tidewater goby conservation efforts related to this activity are performed by CDFG. Tidewater goby conservation efforts associated with the sandbar breaching activity at Lake Earl and their costs are presented in Exhibit 2-8. Each time that Del Norte County undertakes manual breaching efforts, CDFG conducts tidewater goby surveying/monitoring at a cost of approximately $10,000 and the county conducts water quality monitoring at a cost of approximately $4,000. These activities are assumed to occur on average once a year. CDFG has also been working with the Service to develop a long term monitoring strategy; costs related to these efforts are uncertain, but for purposes of the analysis are estimated to be up to $10,000 over the next five years.[42]

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[39] Personal communication with various USACE personnel in 2007 including: David Ammerman, (March 22); Aaron Allen (March 27), Antal Szijj (March 28), Lisa Mangionne (March 29), Peter LaCivita (April 9), Jack Malone (April 30), and Jane Hicks (March 27). See Appendix E for a summary of the results of research efforts by unit.

[40] Ibid.

[41] Personal communication with Listing and Recovery Coordinator - Wildlife, Service Ventura Field Office, April 6, 2007; Karen Kovacs, CDFG, April 12, 2007; and Jane Hicks, USACE, March 27, 2007.

[42] Personal communication with Karen Kovacs, CDFG, April 12, 2007 indicates that costs to date have totaled $5,000 for various meetings and planning efforts for long –term monitoring; these costs are doubled and spread over the next five years to estimate post-designation impacts.

**EXHIBIT 2-8 LAKE EARL SANDBAR BREACHING MITIGATION MEASURES**

| TIDEWATER GOBY CONSERVATION EFFORT | COST (2007$) |
|---|---|
| PER PROJECT MEASURES | |
| Water Quality monitoring (Del Norte County Public Works) | $4,000/per project |
| Tidewater goby surveying and relocation, and associated reporting efforts (CDFG) | $10,000/per project |
| ONE-TIME MEASURES | |
| Develop a long-term monitoring plan for tidewater goby (CDFG) | $5,000 in past; $10,000 over next five years (2008 – 2013) |
| Develop Lake Earl Management Plan (CDFG) | $200,000 (2005 – 2006) |
| Source: Personal communication with Karen Kovacs, CDFG, April 12, 2007. | |

### 2.2.2 SC-5 PAJARO RIVER

68. The seasonal Pajaro River sandbar has been mechanically breached for flood control purposes since the 1950s. In 1992, the County of Santa Cruz entered into an interim breaching agreement with the USACE, the CCC, the CDFG and the California State Parks and Recreation Department. Although this permit has expired, the County has continued to coordinate breaching activities with these agencies. In particular, a section 7 consultation for these activities was conducted in 1999, and then in 2006, the County initiated a breaching permit application to CCC. The analysis further assumes that the formal section 7 consultation will be initiated due to the critical habitat designation and permit renewal in 2008 and then again in 2018. Average section 7 consultation costs (shown in Exhibit 2-3) are applied to these consultation efforts.

69. As a special condition to its 2006 breaching permit application the County commissioned a report that analyzed various alternatives to breaching the Pajaro River. This report studied 11 alternatives which ranged in cost from $0.20 million to $2.10 million.[43] The report considered a variety of alternatives including widening the levee, building flood walls, installing flap covers or tide gates, elevating roads that could be subject to flooding, and flood proofing of sanitary sewers and pump stations. The studied alternatives were not considered economically feasible by the County.[44] The cost of this study was $66,000 in 2007. [45]

70. Project modifications related to tidewater goby conservation efforts for the sandbar breaching activity at the Pajaro River also include surveying and monitoring. The County of Santa Cruz has a contract for $20,000 per year with a consulting firm to conduct

[43] Schaaf & Wheeler. 2007. Pajaro River Breaching Alternatives Analysis Work Program. County of Santa Cruz, California. March 16, 2007.

[44] Personal communication with Don Hill, County of Santa Cruz Department of Public Works, April 9, 2007.

[45] Personal communication with Justine Wolcott, County of Santa Cruz Department of Public Works, June 26, 2007.

surveying and monitoring each time that the County of Santa Cruz undertakes manual breaching efforts at the Pajaro River mouth. These activities are assumed to occur on average once a year.[46]

## 2.3 IMPACTS TO WASTEWATER TREATMENT ACTIVITY IN THE STUDY AREA

71. This analysis considers the potential for operation of wastewater treatment plants and septic systems to be impacted by tidewater goby conservation efforts. The Service has identified sewage effluent and non-point source pollution as threats to the tidewater goby and its habitat.[47] However, little is known concerning the effects of different types of effluent. In at least one case, the Service does not believe that there are any adverse effects to the tidewater goby from discharge of effluent from a wastewater treatment plant. Specifically, the Service believes that the discharge of effluent from Ventura Water Reclamation Facility (VWRF) on the Santa Clara River (VEN-2) may be benefiting the tidewater goby by offsetting upstream water diversions.[48] As a result, tidewater goby conservation efforts have the potential to result in significant benefits for the operators of this facility.

72. Another source of sewage effluent is from pre-existing septic systems which may deteriorate.[49] In the case of individual leaking septic systems, impacts to this activity are not quantified for the following reasons:

- There have not been past impacts to this activity;
- There is limited understanding of how this activity impacts the tidewater goby or its habitat; and,
- The type of mitigation measures that would be required to avoid adverse affects to the tidewater goby and its habitat are unknown.

73. Pre-designation impacts to wastewater treatment activities are limited to two section 7 technical assistance consultations by the National Park Service for efforts related to wastewater discharges in MAR-4, Rodeo Lagoon, in 1996. Impacts include the average costs for these technical assistance consultation efforts (per project costs shown in Exhibit 2-3) and surveying and monitoring of $8,400. These were both one-time accidental

[46] Ibid.

[47] U.S. Fish and Wildlife Service. 2005. Recovery Plan for the Tidewater Goby (*Eucyclogobius newberryi*). U.S. Fish and Wildlife Service, Portland, Oregon. vi + 199 pp. Also, 71 FR 68925.

[48] Personal communication with Biologist, Service Ventura Field Office, April 10, 2007. Letter from Steve Henry, Assistant Field Supervisor, Ventura Field Office, U.S. Fish and Wildlife Service to Blythe Ponek-Bacharowski, Los Angeles Regional Water Quality Control Board, dated May 30, 2007 re: Comments on the Issuance of National Pollutant Discharge Elimination System (NYPDES) Permit No. CA 0053651 Ventura Water Reclamation Facility. Available at: http://www.waterboards.ca.gov/losangeles/html/permits/tentative_order/Individual/Ventura/Ventura.html, accessed on July 16, 2007.

[49] Releases resulting from installation permitting violations would be subject to legal action, and are subject to mandatory remediation. This analysis does not consider incidental unpermitted releases.

occurrences; thus no post-designation activity is forecast based on this historical activity.[50]

74. The following methodology was applied to estimate impacts to wastewater facility operations resulting from tidewater goby conservation efforts over the next 20 years.

- ***Determine potential locations of affected facilities based on GIS analysis and interviews.*** GIS analysis of U.S. Environmental Protection Agency (EPA) information regarding the location of National Pollutant Discharge Elimination System (NPDES) permits determined that no facilities fall within the study area, and four facilities are located nearby.[51] However, based on discussion with the Service and other affected agencies, two potentially affected wastewater treatment facilities in or near the study area were identified.
- ***For affected wastewater treatment facilities,* e*stimate potential impacts of tidewater goby conservation efforts.*** For the two potentially affected wastewater treatment facilities, impacts are estimated based on information specific to each facility provided by the Service and affected agencies.

75. Two wastewater treatment plants, one in the SLO-7 Pismo Creek unit and another in the VEN-3 Santa Clara River unit, have the potential to be affected by tidewater goby conservation efforts. Post-designation impacts to wastewater treatment activities are discussed below by unit, and included in the summary Exhibits 2-10 and 2-11, respectively.

### 2.3.1 SLO-7 PISMO CREEK

76. There is a water treatment facility for oil production that has applied for a permit to discharge into Pismo Creek, potentially increasing dissolved oxygen and the overall amount of water in the creek. The USACE is currently evaluating this permit application. One of the issues being considered is whether the increase in flow has potential to affect tidewater goby due to changes in water quality. The facility is owned/operated by Plains Exploration and Production Co. The company has hired a tidewater goby biologist to conduct research on this issue. USACE very recently initiated consultation on this project. At this time, potential project modifications associated with this consultation are unknown.[52]

### 2.3.2 VEN-2 SANTA CLARA RIVER

77. The VWRF has the potential to reap significant benefits as a result of tidewater goby conservation efforts. Tidewater goby live in an outfall channel of the facility. Starting in 1988, the Regional Water Quality Board (RWQCB) included a condition in their permit

[50] Personal communication with Darren Fong, NPS, May 15, 2007.

[51] IEc GIS analysis of information from Environmental Protection Agency Water Discharge Permit System (http://epa/gob/enviro/html/qmr.html). The analysis identified one facility within 500 meters of the study area for each of the following proposed CHD units: HUM-3, SC-5, VEN-2 and VEN-3.

[52] Personal communication with Lisa Mangionne, USACE, March 29, 2007.

that requires that the plant must discharge 5.60 million gallons per day. Recently, as part of its NPDES permitting process, the RWQCB issued a tentative permit that would require the facility eliminate its effluent discharge into the estuary over a 10-year period.[53] This requirement was incorporated in the tentative permit due to concerns related to the Water Quality Control Policy for Enclosed Bays and Estuaries of California, which requires that the discharge of municipal wastewaters to enclosed bays and estuaries shall be phased out at the earliest practicable date. However, eliminating this effluent has the potential to harm tidewater goby and its habitat. To obtain an exemption from this requirement, the VWRF must demonstrate that the discharge provides benefits and enhances the quality of receiving waters. The public comment period for this permit was extended to July 11, 2007 for comments related to the endangered species and water quality aspects of the permit. The RWQCB will be deciding on this permit at its August 9, 2007 meeting.[54]

78. If the City of Ventura is required to discontinue discharging its effluent into the lagoon, the City has indicated that it would have to build an ocean outfall, which would entail additional costs in the range of $35.0 million - $90.0 million.[55] Alternatively, if the City is allowed to continue discharging its effluent into the estuary, in part due to tidewater goby concerns, the City stands to avoid these costs. The Service has submitted comments to the RWQCB stating that "the wastewater discharge the City provides to the estuary is likely simulating a more 'natural' state than no discharge at all because it replaces water removed from the Santa Clara River upstream, before it reaches the estuary." These comments also state "under current conditions in the watershed, the wastewater discharge provides conditions that are beneficial to this population of tidewater gobies."[56] At the time of writing it is unclear how these issues will be resolved; thus, these potential post-designation net benefits are included as a separate line item from total impacts.

79. The analysis also recognizes that there have been various pre-designation impacts to the operation of the VWRF resulting from tidewater goby conservation efforts. These pre-

[53] Los Angeles Regional Water Quality Control Board. 2007. Tentative Permits. Ventura Water Reclamation Facility (Municipal) NPDES Permit. Available at: http://www.waterboards.ca.gov/losangeles/html/permits/tentative_order/Individual/VEntura/Ventura.html. Accessed June 3, 2007.

[54] Ibid.

[55] Estimated costs to build ocean outfall are between $65.0 to $115 million (including secondary treatment and capacity upgrades). The costs of continued discharge to the estuary (including tertiary and capacity upgrades) are estimated to be $25.0 to $30.0 million. Low end cost savings are $65.0 million less $30.0 million = $35.0 million savings and high end costs savings are $115 million less $25.0 million = $90.0 million savings. Personal communication with Dan Pfeifer, City of Ventura Public Works Department, May 23, 2007.

[56] Letter from Steve Henry, Assistant Field Supervisor, Ventura Field Office, U.S. Fish and Wildlife Service to Blythe Ponek-Bacharowski, Los Angeles Regional Water Quality Control Board, dated May 30, 2007 re: Comments on the Issuance of National Pollutant Discharge Elimination System (NPDES) Permit No. CA 0053651 Ventura Water Reclamation Facility. Available at: http://www.waterboards.ca.gov/losangeles/html/permits/tentative_order/Individual/Ventura/Ventura.html, accessed on July 16, 2007.

designation impacts are related to various studies associated with the permitting of this facility, and are detailed in Exhibit 2-9. These studies are associated with efforts to gain a better understanding of the tidewater goby population in this area.

**EXHIBIT 2-9 TIDEWATER GOBY CONSERVATION EFFORTS AT VWRF**

| DATE | CONSERVATION EFFORT | COST ($2007) |
|---|---|---|
| December 1998 | Bio-assessment of Santa Clara River Estuary: Identified Benthic Macro Invertebrate populations in estuary and VWRF outfall channel | $72,400 |
| October 2001 | Macro invertebrate Bio-assessment and Resident Species Study Plans: Identified Benthic Macro Invertebrate populations and species abundance based on fresh and salt water preference | $326,000 |
| June 2001 | Metals Translator Study: Identified dissolved metal faction of VWRF effluent | $48,500 |
| May 2005 | Enhancement Study: Researched the relationship between VWRF discharge and estuary ecology | $440,000 |
| **TOTAL** | | **$887,000** |

Source: Email communication with Dan Pfeifer, City of Ventura, April 17, 2007. Note that these studies are related to all species in the estuary; however, as tidewater goby was one of the covered species, these coextensive costs are included in the analysis.
Note: Totals may not sum due to rounding.

## 2.4 IMPACTS TO DAM OPERATIONS, MAINTENANCE AND REMOVALS IN THE STUDY AREA

80. Alterations to dam operations, or removal of dams, have the potential to adversely affect tidewater goby. In one instance in the past, a section 7 consultation was conducted for a proposed removal of a dam upstream from tidewater goby habitat on the Ventura River (VEN-1).[57] The Service determined that this project would not affect goby because it was too remote from the tidewater goby and its habitat. GIS analysis indicates that there are no major dams located within the study area; thus, impacts to these activities are not considered in the analysis.

## 2.5 IMPACTS TO GROUNDWATER WITHDRAWAL ACTIVITY IN THE STUDY AREA

81. The Service has identified groundwater overdrafting as a potential threat to tidewater goby habitat.[58] Overdrafting of the upper aquifer could degrade habitat by decreasing the water table to the point that less fresh surface and ground water is available to flow into the critical habitat unit. There is no readily available information to determine the extent or location of current and potential future locations of groundwater withdrawals in the

[57] U.S. Fish and Wildlife Service. "Matilija Dam Ecosystem Restoration Project" Formal Consultation # 1-8-04-F-38, with the US Army Corps of Engineers. March 31, 2005.

[58] U.S. Fish and Wildlife Service, Revised Critical Habitat Designation for the Tidewater Goby Proposed Rule, November 28, 2006. 71 FR 68925

study area. Because of this lack of information, as well as the following reasons, the analysis does not forecast potential impacts to groundwater withdrawal activities.

- The likelihood of impacts to groundwater withdrawal activity is uncertain. There have not been any past tidewater goby conservation efforts associated with this activity. However, population growth could exacerbate this problem as groundwater sources are tapped to provide water supply for new development.
- There is limited understanding of how this activity impacts the tidewater goby or its habitat. For example, causal linkages between individual well withdrawals and reduced groundwater levels may be difficult to prove.
- The types of mitigation measures that would be required to avoid adverse effects to the tidewater goby and its habitat are unknown.

82. While the analysis does not forecast impacts to this activity, during interviews with affected agencies several areas have been identified where there may be potential for issues relating to groundwater withdrawals in the future. These include:

- SON-1 Salmon Creek: A water district in this area may wish to increase groundwater withdrawals.[59]
- SC-5 Pajaro River: The Pajaro Valley Water Management Agency consulted on various projects related to its Revised Basin Management Plan in 2004.[60] This consultation identified groundwater overdrafting as a concern for this area. However, this consultation was primarily concerned with construction of a pipeline to import water to replace groundwater withdrawals (costs related to pipeline projects are included in Chapter 6).
- VEN-2 Santa Clara River: Newhall Ranch development upstream may have some groundwater withdrawal issues. [61]

## 2.6 SUMMARY OF WATER MANAGEMENT IMPACTS

83. Exhibits 2-10 and 2-11 summarize pre- and post-designation impacts for all water management activities, respectively.

84. The unit with the highest flood control land acquisition costs, as well as potential benefits, is VEN-2, Santa Clara River. A map illustrating this unit is displayed in Exhibit 2-12.

[59] Personal communication with Biologist, Service Sacramento Field Office, February 14, 2007.

[60] U.S. Fish and Wildlife Service. 2004. Biological and Conference Opinion for the Pajaro Valley Water Management Agency's Revised Basin Management Plan Projects (SCC-416, ENV 7.00) San Benito, Santa Cruz, Santa Clara, and Monterey Counties, California, Formal Consultation # 1-8-03-F-44, with the Bureau of Reclamation. March 19, 2004.

[61] Personal communication with Karen Waln, City of Ventura, April 10, 2007.

## EXHIBIT 2-10 SUMMARY OF PRE-DESIGNATION IMPACTS TO WATER MANAGEMENT ACTIVITIES 1994 - 2006

| COUNTY | UNIT | NAME | UNDISCOUNTED | PRESENT VALUE 3% | PRESENT VALUE 7% |
|---|---|---|---|---|---|
| Del Norte | DN-1 | Lake Earl/Lake Tolowa | $5,020,000 | $6,080,000 | $7,910,000 |
| Humboldt | HUM-1 | Stone Lagoon | $0 | $0 | $0 |
| | HUM-2 | Big Lagoon | $0 | $0 | $0 |
| | HUM-3 | Humboldt Bay | $0 | $0 | $0 |
| | HUM-4 | Eel River | $0 | $0 | $0 |
| Mendocino | MEN-1 | Ten Mile River | $0 | $0 | $0 |
| | MEN-2 | Virgin Creek | $0 | $0 | $0 |
| | MEN-3 | Pudding Creek | $0 | $0 | $0 |
| | MEN-4 | Davis Lake and Manchester State Park | $0 | $0 | $0 |
| Sonoma | SON-1 | Salmon Creek | $0 | $0 | $0 |
| Marin | MAR-1 | Estero Americano | $0 | $0 | $0 |
| | MAR-2 | Estero de San Antonio | $0 | $0 | $0 |
| | MAR-3 | Lagunitas (Papermill) Creek | $0 | $0 | $0 |
| | MAR-4 | Rodeo Lagoon | $11,400 | $15,200 | $22,300 |
| San Mateo | SM-1 | San Gregorio Creek | $0 | $0 | $0 |
| | SM-2 | Pescadero-Butano Creek | $0 | $0 | $0 |
| | SM-3 | Bean Hollow Creek (Arroyo de Los Frijoles) | $0 | $0 | $0 |
| Santa Cruz | SC-1 | Laguna Creek | $1,340 | $1,610 | $2,080 |
| | SC-2 | Baldwin Creek | $1,340 | $1,610 | $2,080 |
| | SC-3 | Corcoran Lagoon | $1,340 | $1,610 | $2,080 |
| | SC-4 | Aptos Creek | $1,340 | $1,610 | $2,080 |
| | SC-5 | Pajaro River | $300,000 | $370,000 | $494,000 |
| Monterey | MN-1 | Bennett Slough | $1,340 | $1,610 | $2,080 |
| San Luis Obispo | SLO-1 | Arroyo del Corral | $1,340 | $1,610 | $2,080 |
| | SLO-2 | Oak Knoll Creek (Arroyo Laguna) | $1,340 | $1,610 | $2,080 |
| | SLO-3 | Little Pico Creek | $1,340 | $1,610 | $2,080 |
| | SLO-4 | San Simeon Creek | $1,340 | $1,610 | $2,080 |
| | SLO-5 | Villa Creek | $1,340 | $1,610 | $2,080 |
| | SLO-6 | San Geronimo Creek | $1,340 | $1,610 | $2,080 |
| | SLO-7 | Pismo Creek | $56,000 | $75,200 | $112,000 |
| Santa Barbara | SB-1 | Santa Maria River | $1,340 | $1,610 | $2,080 |
| | SB-2 | Canada de las Agujas | $1,340 | $1,610 | $2,080 |
| | SB-3 | Canada de Santa Anita | $1,340 | $1,610 | $2,080 |
| | SB-4 | Canada de Alegria | $1,340 | $1,610 | $2,080 |
| | SB-5 | Canada de Agua Caliente | $1,340 | $1,610 | $2,080 |
| | SB-6 | Gaviota Creek | $165,000 | $212,000 | $295,000 |

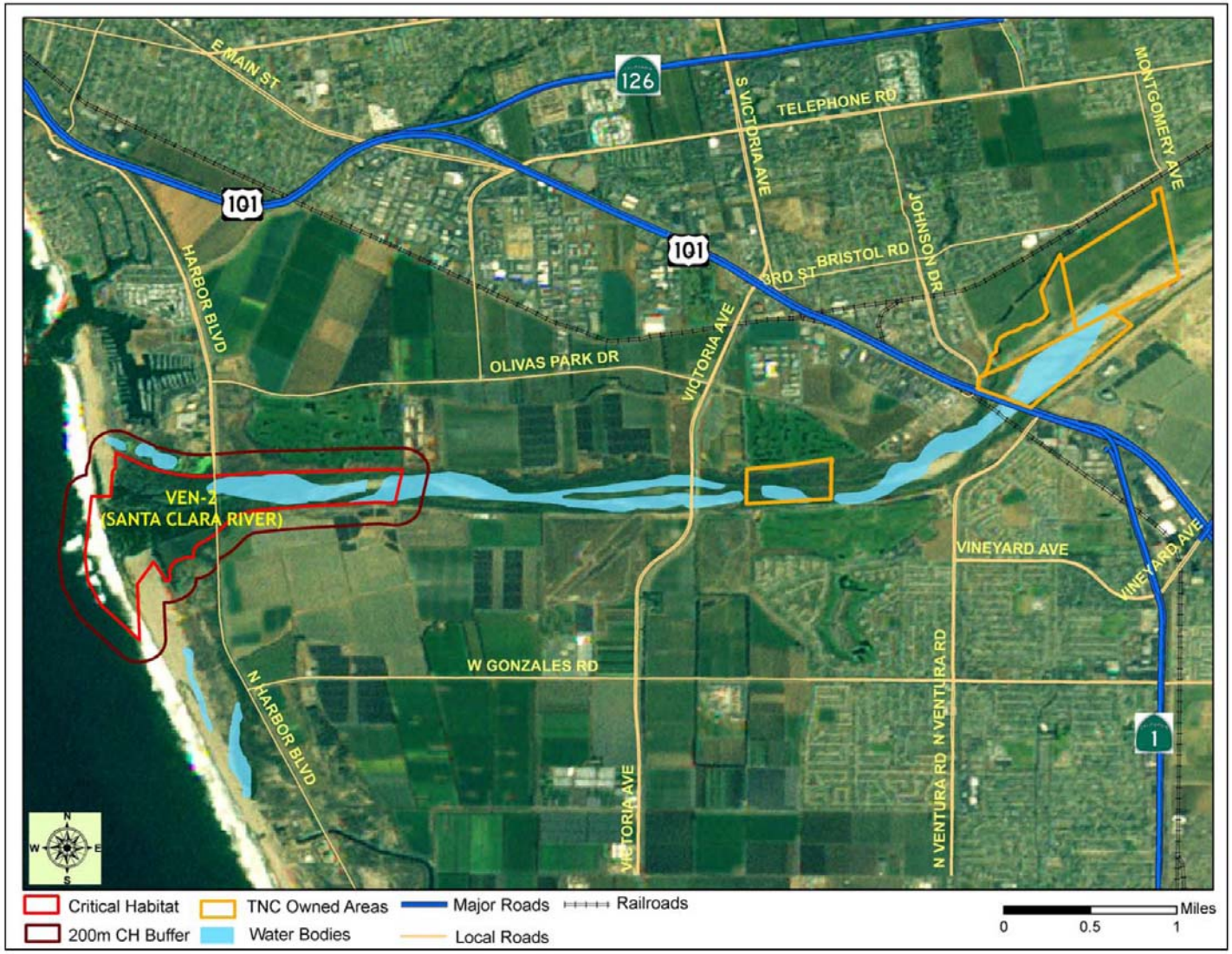
| COUNTY | UNIT | NAME | UNDISCOUNTED | PRESENT VALUE 3% | PRESENT VALUE 7% |
|---|---|---|---|---|---|
| | SB-7 | Winchester/Bell Canyon | $1,340 | $1,610 | $2,080 |
| | SB-8 | Arroyo Burro | $1,340 | $1,610 | $2,080 |
| | SB-9 | Mission Creek—Laguna Channel | $121,000 | $131,000 | $147,000 |
| Ventura | VEN-1 | Ventura River | $1,340 | $1,610 | $2,080 |
| | VEN-2 | Santa Clara River | $889,000 | $1,010,000 | $1,200,000 |
| | VEN-3 | J Street Drain—Ormond Lagoon | $2,890,000 | $3,100,000 | $3,390,000 |
| Los Angeles | LA-1 | Malibu Lagoon | $0 | $0 | $0 |
| | LA-2 | Topanga Creek | $0 | $0 | $0 |
| **TOTAL** | | | **$9,470,000** | **$11,000,000** | **$13,600,000** |
| Note: Totals may not sum due to rounding. | | | | | |

## EXHIBIT 2-11 SUMMARY OF POST-DESIGNATION IMPACTS TO WATER MANAGEMENT ACTIVITIES 2007 - 2026

| COUNTY | UNIT | NAME | UNDISCOUNTED | PRESENT VALUE 3% | PRESENT VALUE 7% | ANNUALIZED 3% | ANNUALIZED 7% |
|---|---|---|---|---|---|---|---|
| Del Norte | DN-1 | Lake Earl/Lake Tolowa | $2,830,000 | $2,620,000 | $2,390,000 | $176,000 | $225,000 |
| Humboldt | HUM-1 | Stone Lagoon | $0 | $0 | $0 | $0 | $0 |
| | HUM-2 | Big Lagoon | $0 | $0 | $0 | $0 | $0 |
| | HUM-3 | Humboldt Bay | $0 | $0 | $0 | $0 | $0 |
| | HUM-4 | Eel River | $0 | $0 | $0 | $0 | $0 |
| Mendocino | MEN-1 | Ten Mile River | $0 | $0 | $0 | $0 | $0 |
| | MEN-2 | Virgin Creek | $0 | $0 | $0 | $0 | $0 |
| | MEN-3 | Pudding Creek | $0 | $0 | $0 | $0 | $0 |
| | MEN-4 | Davis Lake and Manchester State Park | $0 | $0 | $0 | $0 | $0 |
| Sonoma | SON-1 | Salmon Creek | $0 | $0 | $0 | $0 | $0 |
| Marin | MAR-1 | Estero Americano | $0 | $0 | $0 | $0 | $0 |
| | MAR-2 | Estero de San Antonio | $0 | $0 | $0 | $0 | $0 |
| | MAR-3 | Lagunitas (Papermill) Creek | $0 | $0 | $0 | $0 | $0 |
| | MAR-4 | Rodeo Lagoon | $0 | $0 | $0 | $0 | $0 |
| San Mateo | SM-1 | San Gregorio Creek | $0 | $0 | $0 | $0 | $0 |
| | SM-2 | Pescadero-Butano Creek | $0 | $0 | $0 | $0 | $0 |
| | SM-3 | Bean Hollow Creek (Arroyo de Los Frijoles) | $0 | $0 | $0 | $0 | $0 |
| Santa Cruz | SC-1 | Laguna Creek | $0 | $0 | $0 | $0 | $0 |
| | SC-2 | Baldwin Creek | $0 | $0 | $0 | $0 | $0 |
| | SC-3 | Corcoran Lagoon | $0 | $0 | $0 | $0 | $0 |
| | SC-4 | Aptos Creek | $0 | $0 | $0 | $0 | $0 |
| | SC-5 | Pajaro River | $573,000 | $460,000 | $363,000 | $30,900 | $34,300 |
| Monterey | MN-1 | Bennett Slough | $0 | $0 | $0 | $0 | $0 |
| San Luis Obispo | SLO-1 | Arroyo del Corral | $0 | $0 | $0 | $0 | $0 |
| | SLO-2 | Oak Knoll Creek (Arroyo Laguna) | $0 | $0 | $0 | $0 | $0 |
| | SLO-3 | Little Pico Creek | $0 | $0 | $0 | $0 | $0 |
| | SLO-4 | San Simeon Creek | $0 | $0 | $0 | $0 | $0 |
| | SLO-5 | Villa Creek | $0 | $0 | $0 | $0 | $0 |
| | SLO-6 | San Geronimo Creek | $0 | $0 | $0 | $0 | $0 |
| | SLO-7 | Pismo Creek | $19,500 | $19,500 | $19,500 | $1,310 | $1,840 |

| COUNTY | UNIT | NAME | UNDISCOUNTED | PRESENT VALUE 3% | PRESENT VALUE 7% | ANNUALIZED 3% | ANNUALIZED 7% |
|---|---|---|---|---|---|---|---|
| Santa Barbara | SB-1 | Santa Maria River | $0 | $0 | $0 | $0 | $0 |
| | SB-2 | Canada de las Agujas | $0 | $0 | $0 | $0 | $0 |
| | SB-3 | Canada de Santa Anita | $0 | $0 | $0 | $0 | $0 |
| | SB-4 | Canada de Alegria | $0 | $0 | $0 | $0 | $0 |
| | SB-5 | Canada de Agua Caliente | $0 | $0 | $0 | $0 | $0 |
| | SB-6 | Gaviota Creek | $274,000 | $213,000 | $160,000 | $14,300 | $15,100 |
| | SB-7 | Winchester/Bell Canyon | $0 | $0 | $0 | $0 | $0 |
| | SB-8 | Arroyo Burro | $0 | $0 | $0 | $0 | $0 |
| | SB-9 | Mission Creek—Laguna Channel | $5,830,000 | $5,340,000 | $4,770,000 | $359,000 | $450,000 |
| Ventura | VEN-1 | Ventura River | $1,150,000 | $974,000 | $796,000 | $65,400 | $75,100 |
| | VEN-2 | Santa Clara River | $10,000,000 | $8,920,000 | $7,720,000 | $600,000 | $728,000 |
| | VEN-3 | J Street Drain—Ormond Lagoon | $339,000 | $260,000 | $184,000 | $17,500 | $17,400 |
| Los Angeles | LA-1 | Malibu Lagoon | $0 | $0 | $0 | $0 | $0 |
| | LA-2 | Topanga Creek | $0 | $0 | $0 | $0 | $0 |
| **Total** | | | **$21,000,000** | **$18,800,000** | **$16,400,000** | **$1,260,000** | **$1,550,000** |
| Potential Benefits | VEN-2 | Santa Clara River | ($35,000,000)- ($90,000,000) | ($32,000,000) – ($82,400,000) | ($28,600,000) – ($73,500,000) | ($2,150,000) – ($5,540,000) | ($2,700,000) - ($6,930,000) |
| **Total Including Potential Benefits** | | | ($14,000,000) - ($69,000,000) | ($13,200,000) – ($63,600,000) | ($12,200,000) – ($57,100,000) | ($889,000) – ($4,270,000) | ($1,150,000) - ($5,390,000) |
| Note: Totals may not sum due to rounding. | | | | | | | |

**EXHIBIT 2-12 PROPOSED CRITICAL HABITAT UNIT VEN-2**



# CHAPTER 3 | POTENTIAL ECONOMIC IMPACTS TO GRAZING

85. This chapter estimates the expected economic impacts of conservation measures to protect the tidewater goby and its habitat from the potential effects of livestock grazing. According to the proposed rule, livestock grazing may affect tidewater goby habitat by causing atypical sedimentation, removing vegetative cover that stabilizes stream banks, increasing ambient water temperatures, or eliminating plunge pools and undercut banks.[62]

86. Historically the California Department of Fish and Game (CDFG) has managed grazing on state lands in wetlands and along the banks of bodies of water and their tributaries. These management practices are co-extensive with other tidewater goby conservation practices. The economic impacts of these practices are included as part of the baseline characterization for this analysis. The study area used in this chapter approximates the areas where grazing is managed by CDFG. This approximation is used in order to generate an estimate of the impacts of grazing restrictions.

**Tidewater Goby Study Area for Grazing**

Most of the proposed critical habitat units are small and the units are primarily lagoons, estuaries, or backwater marshes. Grazing activities that may threaten the tidewater goby and its habitat are likely to occur within the boundaries of the proposed critical habitat unit and upstream or upgradient from the proposed critical habitat units. As discussed in Chapter 1, for purposes of the economic analysis, the Service determined that the appropriate study area for grazing includes the area within the proposed critical habitat unit and an area within a 50 meter buffer extending 100 meters upstream of the proposed critical habitat unit along the course of all tributaries.[1]

1 Email communications from Service, April 23 and April 25, 2007.

87. No section 7 consultations or habitat conservation plans (HCPs) were completed for grazing activities within the study area and none are expected. The Service conducted one section 7 consultation in Santa Barbara County in 2001 that concerned grazing management plans in several National Forests, but the areas covered are well upstream of the study area.

88. The CDFG grazing practices in the tidewater goby study area include the construction and maintenance of fixed fences to exclude grazing in some areas, as well as the placement and movement of temporary fencing to graze different areas at different times. These practices have been in place since before listing and are predicted to continue unchanged

[62] 71 FR 68925, 71 FR 68937.

for the next 20 years. The impacts of this practice are the fencing and maintenance costs incurred by CDFG and the forage value that is foregone in places where permanent, fixed fencing does not allow grazing.

89. In order to calculate the approximate value of fencing costs and forage value foregone, livestock are assumed to be excluded from public lands within the study area to protect tidewater goby habitat. The model used to approximate the fencing costs for CDFG bases its estimates on fixed fencing; there are no reliable estimates available for costs of temporary fencing. CDFG concurred that this was a reasonable approach.[63] Costs in this scenario include both the economic impacts of excluding livestock from public lands in the study area as well as the cost to build and maintain exclosure fencing.

90. This chapter begins by describing grazing in the study area and explaining the methodology used to estimate impacts within the study area. Next, the chapter reviews how the direct costs of building and maintaining exclosures (fencing) and the lost forage value from the grazing opportunities foregone are calculated. The chapter concludes with estimates of the pre and post designation costs of fencing construction and maintenance, and of forage values foregone.

## 3.1 ESTIMATION METHODOLOGY

91. This methodology assumes that fencing is built to exclude cattle from public grazing lands in the study area because it is a policy alternative for which there is precedent, and it directly addresses the threat of grazing noted in the proposed rule.[64] In addition, grazing may directly cause take of tidewater gobies living in and upstream of estuaries. Grazing on public lands is managed by the California Department of Fish and Game (CDFG) in State wildlife areas around Lake Earl / Lake Tolowa, and Humboldt Bay.[65] Existing grazing management includes the construction and maintenance of some fixed fencing that excludes cattle from some areas in addition to the use of portable fencing that allows variation of the allowable grazing area based on seasonal and water level considerations. This analysis estimates the costs of these practices by first identifying the amount of state land within the study area and calculating the amount of fencing that would be required to exclude livestock through use of a Geographic Information System (GIS). The model then estimates the costs of building and maintaining fences to exclude cattle from the potentially affected waterways. Third, forage prices are obtained from the published literature and used to estimate the foregone forage value in the study area.

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[63] Personal communication with Bob Smith, California Department of Fish and Game, October 12, 2007.

[64] Tidewater goby conservation measures on private lands are unlikely because of the lack of Federal nexus compelling action and the lack of precedent for such action. However, fencing to restrict grazing from impacting tidewater gobies on state lands is a policy of the California Department of Fish and Game. The current and historical application of this fencing policy on state lands provides precedence for similar actions in the future.

[65] The estimates provided within this framework have been reviewed by CDFG, who find them reasonably accurate. CDFG has reviewed the estimation methodology and suggested improvements to earlier models that were later incorporated. Personal communication with Bob Smith, California Department of Fish and Game, October 12, 2007.

### 3.1.1 IDENTIFYING POTENTIALLY AFFECTED GRAZING ACRES

92. Much of the study area, especially in the northern counties, consists of agricultural grazing lands. Cattle are the predominant type of livestock in the study area.[66] The distribution of land ownership types and economic uses in the study area is estimated using a Geographic Information System (GIS). For estimating the amount of land that may be available for public grazing within the defined study area, this analysis combines information from several geographic datasets. For study areas located in Sonoma, Marin, San Mateo, Santa Cruz, San Luis Obispo, Santa Barbara, Ventura and Los Angeles counties, this analysis utilizes geographic data on grazing land distribution from the California Farmland Mapping and Monitoring Program. For grazing study areas located within Humboldt County, the analysis utilizes parcel land use data and assumes that all agricultural lands are available for grazing purposes (i.e., no crop farming activities are expected to occur on agricultural lands within Humboldt county). For areas within Mendocino County, all lands classified as rangelands within the study area are considered to be potential grazing lands. For Del Norte County, the analysis assumes that all dry land within the study area may be available for grazing.

93. The GIS analysis calculates a total of 1,877 grazing acres in the study area. Of these acres, 1,695 acres (90 percent) are privately owned. The remaining 182 acres are managed by the State, 87 percent of which is located in Del Norte and Humboldt counties. Exhibit 3-1 displays the calculated amount of public grazing lands within the grazing study area. The exhibit also shows the linear extent of the boundary that would need to be fenced in order to exclude cattle from the study area.

[66] Data from the 2002 US Department of Agriculture, National Agricultural Statistics Service indicate that cattle made up over 85 percent of livestock in Humboldt, Del Norte Counties, Marin, and Mendocino counties, which together account for 88 percent of the potential grazing land in the study area.

**EXHIBIT 3-1 ACRES OF PUBLIC GRAZING LANDS BY UNIT**

| UNIT | UNIT NAME | PUBLIC GRAZING LANDS IN STUDY AREA | EXCLOSURE DISTANCE (MI) |
|---|---|---|---|
| DN-1 | Lake Earl/Lake Tolowa | 65.90 | 4.66 |
| HUM-1 | Stone Lagoon | 0.02 | 0.14 |
| HUM-3 | Humboldt Bay | 71.44 | 9.74 |
| HUM-4 | Eel River | 26.98 | 2.12 |
| MEN-1 | Ten Mile River | 0.53 | 0.23 |
| SON-1 | Salmon Creek | 2.67 | 0.56 |
| MAR-3 | Lagunitas Creek | 7.42 | 0.71 |
| SLO-2 | Oak Knoll Creek | 0.06 | 0.06 |
| SLO-4 | San Simeon Creek | 3.03 | 0.53 |
| VEN-1 | Ventura River | 3.73 | 1.33 |
| **TOTAL** | | **181.78** | **20.08** |

Note: Totals may not sum due to rounding.
This information was produced by a GIS analysis of data from a variety of sources including: Environmental Systems Research Institute, Detailed National Water Body data; California Spatial Information Library, Public Conservation and Trust Lands v05_2 (httep://gis.ca.gov/BrowseCatalog.epl); University of California at Santa Barbara Biogeography Lab, California Gap Analysis (http://www.biogeog.ucsb.edu/projects/gap/gap_data.html); California Department of Conservation Farmland Mapping and Monitoring Program for grazing and farming data (http://www.consrv.ca.gov/DLRP/fmmp/map_products/download_gis_data.htm); Mendocino County, California for land use files; Service GIS sources for proposed critical habitat data and Humboldt and Monterey County parcel data

### 3.1.2 COST OF FENCING

93. The cost of fencing includes the construction cost to build barbed-wire fencing along the perimeter of the study area that intersects with existing grazing land and ongoing maintenance costs. Erecting fencing along this boundary would serve to keep cattle on existing grazing land from entering the study area.[67] The distance to be fenced is not the entire perimeter of the total study area; parts of the study area that do not intersect State grazing land are assumed to not require fencing to keep cattle out.

94. This analysis assumes that fencing is built in 2007, because this fencing would be necessary to exclude cattle from the study area in the current and future years. CDFG estimates that fencing lasts for approximately ten years before needing to be replaced.[68] To capture replacement impacts, the fencing construction cost is assumed to occur again in

[67] The estimated exclosure costs do not consider existing fencing used by the California Department of Fish and Game. The Department of Fish and Game uses portable fencing to manage grazing on a portion of the state land in the study area; this fencing would be interior to the proposed study area exclosures. (Written Communication from Karen Kovacs, Senior Biologist Supervisor, Wildlife Programs Branch, California Department of Fish and Game, July 12, 2007). This report estimates costs for permanent fencing as a preferred alternative to temporary, portable fencing.

[68] Personal communication with Bob Smith, California Department of Fish and Game, October 12, 2007.

2017 in the post-designation period and in 1997 in the pre-designation period. Exclosure construction costs are estimated to be $5 per foot.[69] Maintenance on exclosures is estimated to cost $2,000 for five miles per year.[70] The total exclosure costs for construction are presented in Exhibit 3-2, both as the yearly undiscounted amount, the undiscounted pre-designation total (1994-2006), and the undiscounted post-designation total (2007-2027).

**EXHIBIT 3-2 EXCLOSURE COSTS PER UNIT**

| UNIT | UNIT NAME | EXCLOSURE CONSTRUCTION COSTS ($2006) | YEARLY EXCLOSURE MAINTENANCE COSTS ($2006) | TOTAL PRE-DESIGNATION COSTS ($2006) | TOTAL POST-DESIGNATION COSTS ($2006) |
|---|---|---|---|---|---|
| DN-1 | Lake Earl/Lake Tolowa | $123,000 | $1,860 | $147,000 | $283,000 |
| HUM-1 | Stone Lagoon | $3,640 | $55 | $4,360 | $8,390 |
| HUM-3 | Humboldt Bay | $257,000 | $3,890 | $308,000 | $592,000 |
| HUM-4 | Eel River | $56,000 | $849 | $67,100 | $129,000 |
| MEN-1 | Ten Mile River | $6,110 | $93 | $7,310 | $14,100 |
| SON-1 | Salmon Creek | $14,900 | $226 | $17,800 | $34,300 |
| MAR-3 | Lagunitas Creek | $18,800 | $285 | $22,500 | $43,300 |
| SLO-2 | Oak Knoll Creek | $1,510 | $23 | $1,800 | $3,470 |
| SLO-4 | San Simeon Creek | $14,000 | $212 | $16,800 | $32,300 |
| VEN-1 | Ventura River | $35,000 | $530 | $41,900 | $80,600 |
| **TOTAL** | | **$530,000** | **$8,030** | **$634,000** | **$1,220,000** |

Note: Totals may not sum due to rounding. All values are in present undiscounted dollars.

### 3.1.3 RESOURCE LOSS FROM REDUCED GRAZING

95. Determining the economic impact to grazing activities requires an estimate of the number of acres of grazing lands (shown in Exhibit 3-1) and a measure of the number of cattle that could be supported by these lands. The measurement of forage capacity that is used to make comparisons across different parcels of land is the Animal Unit Month (AUM). An AUM is the forage for one cow and calf for one month.

96. To estimate the forage productivity of grazing lands, this analysis relies on a 1989 study prepared for the California Department of Forestry and Fire Protection that profiled the California Livestock Industry. Carrying capacity estimates from this study are applied to the State grazing lands analyzed in this chapter. The weighted average of carrying

[69] A conservation district watershed management plan has calculated the cost to build riparian fencing. The area the estimates were made for is in the study area. See Gold Ridge Conservation District, "The Esterao Americano Watershed Management Plan, Version 1" February, 2007, p. 145.

[70] Personal communication with Bob Smith, California Department of Fish and Game, October 12, 2007.

capacity is calculated to be approximately 0.93 AUMs per acre.[71] The quantity of lost AUMs per unit can then be calculated by multiplying the acreage by the carrying capacity ratio. This result is then multiplied by six, the number of months in the grazing season managed by CDFG, to produce an annual value that represents the quantity of feed that the acreage provides.[72] The total number of AUMs for the study area in each unit is provided in Exhibit 3-3.

97. To estimate the economic losses associated with potential AUM reductions, this analysis utilizes the private annual grazing fee rate per AUM for California of $15.40 per foregone AUM (2006 dollars).[73] This grazing fee rate is multiplied by the yearly per acre AUM loss for the land where grazing is prohibited. The product is the yearly loss of forage value from not grazing the area of land from which the cattle are excluded; the total cost is summed (and discounted as appropriate) across years. Exhibit 3-3 presents the yearly forage value, the undiscounted pre-designation total of forage values foregone, and the undiscounted post-designation total of forage values foregone for each critical habitat unit.

**EXHIBIT 3-3 AUMS AND FORAGE VALUES PER UNIT**

| UNIT | UNIT NAME | TOTAL AUMS PER YEAR | 1 YEAR FORAGE VALUE ($2006) | TOTAL PRE-DESIGNATION FORAGE VALUES ($2006) | TOTAL POST-DESIGNATION FORAGE VALUES ($2006) |
|---|---|---|---|---|---|
| DN-1 | Lake Earl/Lake Tolowa | 367.80 | $5,660 | $73,600 | $113,000 |
| HUM-1 | Stone Lagoon | 0.10 | $1 | $19 | $30 |
| HUM-3 | Humboldt Bay | 398.69 | $6,140 | $79,800 | $123,000 |
| HUM-4 | Eel River | 150.56 | $2,320 | $30,100 | $46,400 |
| MEN-1 | Ten Mile River | 2.94 | $45 | $589 | $907 |
| SON-1 | Salmon Creek | 14.93 | $230 | $3,000 | $4,600 |
| MAR-3 | Lagunitas Creek | 41.39 | $637 | $8,290 | $12,700 |
| SLO-2 | Oak Knoll Creek | 0.34 | $5 | $69 | $106 |
| SLO-4 | San Simeon Creek | 16.90 | $260 | $3,380 | $5,200 |
| VEN-1 | Ventura River | 20.81 | $320 | $4,170 | $6,410 |
| **TOTAL** | | **1,014.47** | **$15,600** | **$203,000** | **$312,000** |
| Note: Totals may not sum due to rounding. All values are in present undiscounted dollars. | | | | | |

[71] This carrying capacity value is based on descriptions of the productivity of the grazing land from Written Communication from Karen Kovacs, Senior Biologist Supervisor, Wildlife Programs Branch, California Department of Fish and Game, July 12, 2007 and consideration of the types of grazing topography studied in the California Department of Forestry and Fire Protection Report.

[72] Personal communication with Bob Smith, California Department of Fish and Game, October 12, 2007.

[73] Fritz, Mike, "Latest Grazing Rates Survey: Rates Inching Up" BEEF MAGAZINE (Mar 1, 2006), accessed May 25, 2007 at: http://beef-mag.com/mag/beef_latest_grazing_rates/ While the state's negotiated forage rates may not be equivalent to private forage fees, the total forage value is the same, regardless whether the forage is sold privately (where the full value equilibrium price is paid) or publicly (where some part of that value is paid and the rest of the value up to the private grazing price is transferred unpaid). CDFG indicates that this is a plausible value, though it may be a lower bound of potential forage values. Personal communication with Bob Smith, California Department of Fish and Game, October 12, 2007.

### 3.2 PRE-DESIGNATION IMPACTS

98. Exhibit 3-4 provides the estimated pre-designation impacts for reduced grazing and fencing construction and maintenance costs.

99. Total undiscounted costs for the pre-designation period are $837,000. In present value terms, the total costs are $1.12 million assuming a three percent discount, rate and $1.58 million assuming a seven percent discount rate.

**EXHIBIT 3-4 PRE-DESIGNATION GRAZING IMPACTS**

| UNIT NUMBER | UNIT NAME | UNDISCOUNTED | PRESENT VALUE 3% | PRESENT VALUE 7% |
|---|---|---|---|---|
| DN-1 | Lake Earl/Lake Tolowa | $221,000 | $294,000 | $412,000 |
| HUM-1 | Stone Lagoon | $4,380 | $5,860 | $8,440 |
| HUM-3 | Humboldt Bay | $387,000 | $517,000 | $732,000 |
| HUM-4 | Eel River | $97,200 | $129,000 | $182,000 |
| MEN-1 | Ten Mile River | $7,900 | $10,600 | $15,100 |
| SON-1 | Salmon Creek | $20,800 | $27,800 | $39,600 |
| MAR-3 | Lagunitas (Papermill) Creek | $30,800 | $41,000 | $57,800 |
| SLO-2 | Oak Knoll Creek (Arroyo Laguna) | $1,870 | $2,500 | $3,590 |
| SLO-4 | San Simeon Creek | $20,200 | $26,900 | $38,200 |
| VEN-1 | Ventura River | $46,100 | $61,600 | $88,100 |
| **TOTAL** | | **$837,000** | **$1,120,000** | **$1,580,000** |
| Note: Totals may not sum due to rounding. | | | | |

### 3.3 POST-DESIGNATION IMPACTS

100. Exhibit 3-5 provides the estimated post-designation impacts for reduced grazing and fencing construction and maintenance costs. These impacts are what can be expected following designation, which is a continuation of the same policy that CDFG carried out before designation, projected 20 years into the future. Exhibit 3-5 uses the same cost information from the pre-designation period (Exhibit 3-4). Total undiscounted costs are $1.53 million. In present value terms, total costs are $1.29 million assuming a three percent discount rate and $1.08 million assuming a seven percent discount rate. The annualized cost to grazing ranges from $87,000 dollars assuming a three percent discount rate, and $102,000 assuming a seven percent discount rate.

**EXHIBIT 3-5 POST-DESIGNATION GRAZING IMPACTS**

| UNIT | UNIT NAME | UNDISCOUNTED | PRESENT VALUE 3% | PRESENT VALUE 7% | ANNUALIZED 3% | ANNUALIZED 7% |
|---|---|---|---|---|---|---|
| DN-1 | Lake Earl/Lake Tolowa | $397,000 | $332,000 | $273,000 | $22,300 | $25,700 |
| HUM-1 | Stone Lagoon | $8,420 | $7,270 | $6,190 | $489 | $584 |
| HUM-3 | Humboldt Bay | $715,000 | $606,000 | $505,000 | $40,700 | $47,700 |
| HUM-4 | Eel River | $175,000 | $147,000 | $121,000 | $9,890 | $11,400 |
| MEN-1 | Ten Mile River | $15,000 | $12,900 | $10,900 | $865 | $1,030 |
| SON-1 | Salmon Creek | $38,900 | $33,200 | $27,900 | $2,230 | $2,630 |
| MAR-3 | Lagunitas (Papermill) Creek | $56,000 | $47,200 | $39,100 | $3,170 | $3,690 |
| SLO-2 | Oak Knoll Creek (Arroyo Laguna) | $3,570 | $3,080 | $2,610 | $207 | $247 |
| SLO-4 | San Simeon Creek | $37,500 | $31,900 | $26,700 | $2,140 | $2,520 |
| VEN-1 | Ventura River | $87,000 | $74,600 | $63,000 | $5,020 | $5,950 |
| **TOTAL** | | **$1,530,000** | **$1,290,000** | **$1,080,000** | **$87,000** | **$102,000** |
| Note: Totals may not sum due to rounding. | | | | | | |

# CHAPTER 4 | POTENTIAL ECONOMIC IMPACTS TO TRANSPORTATION

101. This chapter estimates how conservation efforts of the tidewater goby may affect transportation projects. As such, this chapter addresses activities only.The Service lists road and bridge construction and maintenance as potential threats.[74] Road and bridge construction and maintenance activities are identified in the proposed rule as actions that "…substantially alter the channel morphology of the proposed critical habitat…" and/or "…cause atypical levels of sedimentation in coastal wetland habitats or remove vegetative cover that stabilizes stream banks."[75] Activities of concern relate to the effects of bridge and/or road construction and maintenance, specifically looking at construction activities that could cause harm by sediment loading, siltation, or contamination.

102. The first section of this chapter discusses how transportation related activities could threaten tidewater goby habitat, describes the research strategy for identifying pre-designation costs and cataloging post-designation activities, and identifies which units could be affected. The next section considers the section 7 consultations and conservation measures that took place between 1994 and 2006. The chapter concludes with cost estimates for planned road and bridge projects.

**Tidewater Goby Study Area for Transportation Related Activities**

Because most of the proposed critical habitat units are small and the units are primarily lagoons, estuaries, or backwater marshes, few economic activities take place within the habitat. As a result, transportation related activities that may threaten the tidewater goby and its habitat are likely to occur upstream or upgradient of the proposed critical habitat unit (it is generally shorter to cross a stream than a lagoon). As discussed in Chapter 1, for purposes of the economic analysis, the Service has determined that the appropriate study area for transpiration related activities includes an area 200 meters around the proposed critical habitat unit. [1]

[1] Email communications from Service, April 23 and April 25, 2007.

74 71 FR 68913.

75 71 FR 68937

## 4.1 ROAD AND BRIDGE CONSTRUCTION AND MAINTENANCE

103. State roads in California are regulated by the California Department of Transportation (Caltrans). County roads are the responsibility of the individual county. The Federal Highway Authority (FHWA) provides funding for several State and county road projects. When this funding is present and FHWA and a State or local governing agency collaborate on a maintenance or construction project, FHWA becomes the lead agency (with either the State or counties as seconds) and the process goes through a section 7 consultation.[76] Eleven road and bridge section 7 consultations occurred between 1994 and 2006. Most of these involved Caltrans and the US Army Corps of Engineers (USACE), though one involved a county department of public works.

104. Data on pre-designation road and bridge construction and maintenance projects were collected from examination of the section 7 consultation history and of publicly available Caltrans records. In addition, all of the county planning departments and public works/transportation departments were contacted to obtain information about pre-designation and planned post-designation projects.[77] Key stakeholders, such as the USACE and consultants and engineers involved with tidewater goby mitigation during construction activities were also interviewed for information about pre-designation and post-designation road and bridge projects within the study area.

105. The consultation history reveals that few road or bridge projects were undertaken at either the State or county level within the study area between 1994 and 2006. Two county projects were identified in Humboldt and Santa Barbara counties. Five State road/bridge projects were identified in that period in Mendocino, Santa Cruz, San Luis Obispo, and Santa Barbara counties. Several projects had more than one section 7 consultation.

106. Predicted occurrences of post-designation road and bridge projects are based on available information from current plans by State and county agencies. This approach is taken instead of forecasting trends from existing data because a substantial number of bridge improvement projects were recently completed as a result of the Seismic Retrofit Program described below, delaying the need for additional new improvements by several decades.

107. The Seismic Retrofit Program, initiated in 1989, was instituted to identify and strengthen California bridges to insure that they meet seismic safety standards. As part of this program, multiple bridges have recently undergone construction and maintenance activities. Several of these have prompted section 7 consultations with the Service, including the construction carried out on the Pajaro River and Watsonville Slough in units SC-5 (Pajaro River) and MEN-1 (Ten Mile River). Many of these retrofit programs have involved within-channel construction. Over 99 percent of the bridges that were identified by the Seismic Retrofit Program as needing work have already been

[76] Written communication from Senior Biologist, Service Ventura Office, April 18, 2007.

[77] Caltrans has promised to provide information on tidewater goby mitigation at the time of public comment. Written communication from Deborah McKee, Fisheries and Aquatic Resources, Caltrans Division of Environmental Analysis, May 15, 2007.

upgraded.[78] This recent spate of bridge upgrading indicates that most of the bridge construction that might otherwise have occurred over the next few decades has already been completed.

108. There are current plans for upcoming projects not related to the Seismic Retrofit Program, however. Some of these plans are for projects several years in the future.[79] Review of publicly available Caltrans road and bridge construction plans indicates that there are several planned road and bridge projects as well as planned railroad bridge rehabilitation projects for unit HUM-3 (Humboldt Bay).

109. Project modifications associated with road and bridge construction and maintenance activities are very similar to mitigation measures employed to protect the tidewater goby and its habitat during other activities. Many of these modifications are outlined in the 1997 programmatic section 7 consultation that the Service completed with USACE for flood control and water management. These measures are listed in Exhibit 2-4. Exhibit 2-6 presents average costs for project modifications performed to protect the tidewater goby during several types of activities.

110. A project modification that is often used with in-channel bridge construction is the erection of cofferdams to isolate work areas from tidewater gobies and their habitats. The average cost for this project modification is $15,000.[80] This project modification can be added to the other average costs in Exhibit 2-6 to generate a total average project cost of $50,200 for projects that employ cofferdams.

111. To the extent possible, economic impacts are estimated based upon costs reported by individuals involved with specific projects (which are then compared to average costs to assess their credibility). In most cases, however, there have been no direct communications from stakeholders with knowledge of specific projects. For detailed section 7 consultations, specific instances of the application of different mitigation measures were considered, and in conjunction with the data in Exhibit 2-6, used to generate project specific cost estimates.

112. For example, the section 7 consultation for the Ten Mile Bridge replacement involves several mitigation measures for several different components of the larger project. The plan approved in the section 7 consultation called for work to be performed over two years, and for the construction of three in-channel piers on which bridge supports are to be built. The average mitigation action has costs of $35,200, as shown in Exhibit 2-6. These costs are assumed to be incurred once in 2007 and again in 2008. In addition, the three piers require the construction of cofferdams to isolate construction activity, which is assumed to cause an additional 2 cofferdams to be built in 2007, and one in 2008. The

[78] California Department of Transportation, 2007, "Seismic Retrofit Program Fact Sheet," accessed at: http://www.dot.ca.gov/hq/paffairs/about/retrofit.htm, April 15, 2007.

[79] For example, Caltrans records include plans for road projects in 2009 and 2010 in Humboldt County and 2019 in Santa Barbara County. See Caltrans, Upcoming Central Region Construction Projects, Friday, March 16, 2007, p. 5 of 8.

[80] NRCS State Approved Cost Share List for Fiscal Year 2007.

consultation also specifics that six distinct implementations of surveying and monitoring are to be carried out. The sum of average costs for the specified mitigation measures is 3 cofferdams (3 x $15,000), 2 years of "average" mitigation intervention (2 x $35,200) and four additional surveying and monitoring efforts (in addition to those in the average mitigation actions) to be carried out in 2007 (4 x $1,200 + 4 x $1,200 + 4 x $3,000). There are no administrative costs added to the project modification sums in 2007 and 2008 because the section 7 consultation took place in 2006. Section 7 consultation cost estimates are derived in Exhibit 2-3. The information detailed in this example is described for each unit in the mitigation action and mitigation cost columns for Exhibits 4-1 and 4-2.

## 4.2 PRE-DESIGNATION IMPACTS

113. Exhibit 4-1 shows the estimated pre-designation costs per unit for conservation measures associated with road and bridge construction and maintenance activities and the estimated administrative costs for these projects. Project names and years are included for reference purposes. These projects were identified from the section 7 consultation history provided by the Service.

114. The unit with the highest pre-designation costs for transportation related activities was SB-6 (Gaviota Creek) where three road and bridge construction projects, with attendant administrative costs, were performed over successive years. Unit MEN-1 (Ten Mile River) incurred administrative costs for several successive section consultation costs, but will not incur actual construction costs until 2007. Other pre-designation consultations are described in the exhibit.

## 4.3 POST-DESIGNATION IMPACTS

115. Exhibit 4-2 provides estimated impacts per unit of post-designation administrative and conservation measures for ongoing and post-designation road and bridge construction and maintenance activities and the estimated administrative costs for these projects. Project names and years are included for reference purposes. The source for each project is also referenced.

116. Estimated economic impacts for planned road and bridge construction projects primarily consist of continuations of existing projects and planned Caltrans projects. The largest impacts are in the Humboldt Bay Area, which is to be expected given the size of the study area in that unit, and the fact that there are several municipal jurisdictions that overlap the study area there.

## 4.4 SOURCES OF UNCERTAINTY

117. There are two primary sources of uncertainty that may affect the estimates generated in this chapter. These uncertainties concern predictions of planned projects and potential variability in the cost estimates.

- The prediction of post-designation projects may under-predict the number of actual projects because the centralized sources analyzed may not contain information on all projects. Caltrans information on planned programs was available for Monterey, Santa Cruz, San Luis Obispo, and Santa Barbara counties in a comprehensive document; no documents that are as comprehensive were readily available for the other counties in the study area. Though the research concerning potential projects was thorough, omissions are possible. To the extent that any project(s) have been omitted, this estimate will understate the actual post-designation costs.[81]
- The costs of mitigation efforts are an average of the best available data. In reality, costs will vary with the location and time specific measures that must be undertaken in each individual project. The estimates provided are generated from an average of several data points, however these data points may not represent the complete range of possible conservation activities.

[81] Exhibits 4-1 and 4-2 include specific details about the road and bridge projects included in the expectation that during review of this chapter, stakeholders may be forthcoming with additional information and help improve the estimates.

**EXHIBIT 4-1 PRE-DESIGNATION ROAD AND BRIDGE PROJECT IMPACTS**

| UNIT | UNIT NAME | PROJECT NAME | YEARS | CONSULTATION COSTS | MITIGATION MEASURES | MITIGATION COSTS | ESTIMATED COSTS | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | UNDISCOUNTED | PRESENT VALUE (3%) | PRESENT VALUE (7%) |
| HUM-3 | Humboldt Bay | Arcata Road Project[1] | 2003-2006 | 1 Formal:<br>• $19,500 | Three sub-projects with average mitigation actions with cofferdams instead of relocations;<br>Three additional requirements for monitoring/surveying/ sampling.<br>Spread over 2003-2007[1] | Four of five years of $123,000:<br>• 3 x $35,700<br>• 3 x $1,200<br>• 3 x $1,200<br>• 3 x $3,000 | $118,000 | $130,000 | $147,000 |
| MEN-1 | Ten Mile River | Ten Mile River Bridge Consultations[2] | 2001, 2003, 2006 | 3 Formal:<br>• 3 x $19,500 | | | $59,000 | $70,000 | $91,000 |
| SC-5 | Pajaro River | Widening, upgrade of Pajaro River Bridge[3] | 1997 | 1 Formal:<br>• $19,500 | Average mitigation action with cofferdam[3] | • $35,200 + $15,000 | $70,000 | $91,000 | $129,000 |
| SLO-3 | Little Pico Creek | Little Pico Creek Bridge Replacement[4] | 1995-1997 | 1 Formal:<br>• $19,500 | Average mitigation action with 2 subsequent years of additional monitoring/ Surveying/sampling.[4] | • $35,200<br>• 2 x $1,200<br>• 2 x $1,200<br>• 2 x $3,000 | $65,500 | $88,300 | $131,000 |
| SLO-7 | Pismo Creek | Slope Enhancement, Pismo Creek Bridge[5] | 1997 | 1 Formal:<br>• $19,500 | Average mitigation action[5] | • $35,200 | $55,000 | $71,000 | $100,000 |
| SB-6 | Gaviota Creek | Road Stabilization, Bridge Enhancement, Bridge Replacement[6] | 1996, 2005-2006 | 3 Formal:<br>• 3 x $19,500 | 1 Average mitigation action without silt fences or relocation (1996);<br>1 Average mitigation action with 2 cofferdams (1996);<br>2 Average mitigation actions 2005-2006[6] | • $8,900<br>• $35,200 + 2 x $15,000<br>• 2 x $35,200 | $203,000 | $246,000 | $325,000 |

| UNIT | UNIT NAME | PROJECT NAME | YEARS | CONSULTATION COSTS | MITIGATION MEASURES | MITIGATION COSTS | ESTIMATED COSTS | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | UNDISCOUNTED | PRESENT VALUE (3%) | PRESENT VALUE (7%) |
| SB-7 | Winchester / Bell Canyon | New Bell Canyon Bridge[7] | 1997 | 1 Formal:<br>• $19,500 | Average mitigation action[7] | • $35,200 | $55,000 | $71,000 | $99,500 |
| **TOTAL** | | | | | | | **$624,000** | **$767,000** | **$1,020,000** |

Notes:

(1) U.S. Fish and Wildlife Service. "Old Arcata Road/Myrtle Avenue Widening and Rehabilitation Project." Formal Consultation # 1-14-2001-875.1, with the Federal Highway Administration. March 13, 2003.

(2) U.S. Fish and Wildlife Service. "Formal Consultation on Foundation Study for Ten Mile River Bridge Replacement Project," Formal Consultation # 1-14-1999-F-184, with the Federal Highway Administration. September 19, 2001.; U.S. Fish and Wildlife Service. "Reinitiation of Formal Consultation on Foundation Study for Ten Mile River Bridge Replacement Project," Consultation 1-14-1999-184.3, with the Federal Highway Administration. April 2, 2003.; U.S. Fish and Wildlife Service. "Proposed Replacement of the Ten Mile River Bridge." Formal Consultation # 1-14-1999-184.5, with the Federal Highway Administration. June 15, 2006.

(3) U.S. Fish and Wildlife Service. "Authorization of Roadway Rehabilitation, Widening, and Seismic Retrofitting on State Route 1 Bridge over the Pajaro River and the Watsonville Slough," Formal Consultation # 1-8-97-F-11, with the US Army Corps of Engineers. April 9, 1997.

(4) U.S. Fish and Wildlife Service. "Replacement of Pico Creek Bridge," Formal Consultation # 1-8-94-F-54, with the Federal Highway Administration. December 4, 1994.

(5) U.S. Fish and Wildlife Service. "Slope Repairs Beneath Three Pismo Creek Bridges," Formal Consultation # 1-8-97-F-9, with the Federal Highway Administration. March 5, 1997.

(6) U.S. Fish and Wildlife Service. "Protection of an Access Road at Gaviota State Park, Santa Barbara," Formal Consultations 1-8-96-F-14, with the US Army Corps of Engineers. April 15, 1996.; U.S. Fish and Wildlife Service. "Reinitiation of Formal Consultation - Biological Opinion for the Removal of a Summer Crossing in and Placement of a Bridge over Gaviota Creek," Formal Consultation # 1-8-96-F-47R, with the U.S. Army Corps of Engineers. September 5, 1996.; U.S. Fish and Wildlife Service. "Gaviota Beach Road and Gaviota Creek Bridge Replacement Project," Formal Consultation # 1-8-05-F-8, with the Federal Emergency Management Agency. June 9, 2005.

(7) U.S. Fish and Wildlife Service. "Temporary Dewatering of Bell Canyon and Tecolote Creeks for Construction of Two New Bridges," Formal Consultation # 1-8-97-F-18, with the US Army Corps of Engineers. May 8, 1997.

Note: Totals may not sum due to rounding.

**EXHIBIT 4-2 POST-DESIGNATION ROAD AND BRIDGE PROJECT IMPACTS**

| UNIT | UNIT NAME | PROJECT NAME | YEARS | CONSULTATION COSTS | MITIGATION MEASURES | MITIGATION COSTS | ESTIMATED COSTS | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | UNDISCOUNTED | PRESENT VALUE (3%) | PRESENT VALUE (7%) |
| HUM-3 | Humboldt Bay | Arcata Road Project[1] | 2007 | Consultation in 2003 | One Year of Old Arcata Road Project[1] | One of five years of $123,000[2] | $517,000 | $$491,000 | $$462,000 |
| | | Ryan Slough Bridge[3] | 2007 | 1 Formal:<br>• $19,500 | 1 Average mitigation action[3] | • $35,200 | | | |
| | | Arcata RR Bridges[4] | 2007 | 4 Formal<br>• 4 x $19,500 | 4 Average mitigation actions[4] | • 4 x $35,200 | | | |
| | | Eureka Slough Bridge[5] | 2009-2010 | 1 Formal:<br>• $19,500 | 1 Average mitigation action[5] | • $35,200 | | | |
| | | Eureka-Arcata Route 101 Improvements[6] | 2012 | 3 Formal<br>• 3 x $19,500 | 3 Average mitigation actions[6] | • 3 x $35,200 | | | |
| MEN-1 | Ten Mile River | Ongoing and future Ten-Mile River Bridge work[7] | 2007-2008 | Consultations in prior years | Implementation of actions as stipulated in consultation:<br>1 Average mitigation action with 2 cofferdams and 4 monitoring/surveying/ sampling actions (2007):<br>1 Average mitigation action with 1 cofferdam (2008)[7] | • $35,200 + 2 x $15,000<br>• 4 x $1,200<br>• 4 x $1,200<br>• 4 x $3,000<br>• $35,200 + $15,000 | $137,000 | $136,000 | $134,000 |
| MAR-3 | Lagunitas (Papermill) Creek | Lagunitas Creek Bridge8 | 2007 | No Consultation Cited | Dewatering, monitoring, relocating; erosion control labor and materials8 | • $45,000 | $45,000 | $45,000 | $45,000 |
| S M-1 | San Gregorio Creek | Pavement Restoration9 | 2007 | 1 Formal:<br>• $19,500 | 1 Monitoring/surveying/ sampling action9 | • 1 x $1,200<br>• 1 x $1,200<br>• 1 x $3,000 | $24,900 | $24,900 | $24,900 |
| SC-1 | Laguna Creek | Pajaro River: Thurwacker Bridge, Route 1 Bridge[10] | 2008, 2009 | 1 Formal:<br>• 2 x $19,500 | 1 Average mitigation action in 2008 and 2009[10] | • 2 x $35,200 | $164,000 | $155,000 | $144,000 |
| | | Pavement Restoration[11] | 2010 | 1 Formal:<br>• $19,500 | 1 Average mitigation action[11] | • $35,200 | | | |
| SB-6 | Gaviota Creek | Culvert Replacement12 | 2009 | 1 Formal:<br>• $19,500 | 1 Average mitigation action12 | • $35,200 | $54,700 | $51,600 | $47,800 |

| UNIT | UNIT NAME | PROJECT NAME | YEARS | CONSULTATION COSTS | MITIGATION MEASURES | MITIGATION COSTS | ESTIMATED COSTS | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | UNDISCOUNTED | PRESENT VALUE (3%) | PRESENT VALUE (7%) |
| SB-9 | Mission Creek-Laguna Channel | Cabrillo Street Bridge[13] | 2007 | 1 Formal:<br>• $19,500 | 1 Average mitigation action[13] | • $35,200 | $124,000 | $104,000 | $85,600 |
| | | Route 101 Widening[14] | 2019 | 1 Formal:<br>• $19,500 | 1 Average mitigation action with cofferdam[14] | • $35,200 + $15,000 | | | |
| **TOTAL** | | | | | | | **$1,070,000** | **$1,010,000** | **$943,000** |

(1) Consultation 1-14-2001-875.1, March 13, 2003.
(2) See Exhibit 4-1.
(3) Project description from Andrew Bundschuh, Humboldt County Dept of Public Works, written communication May 16, 2007. Assumed one average mitigation action.
(4) Caltrans 2006 State Improvement Plan: Humboldt County, page 22. Four distinct railroad bridges were identified with GIS; this estimate assumes project work at each one.
(5) Caltrans 2006 State Highway Operation and Protection Program Project List: Humboldt County, page 16. Assumed one average mitigation action.
(6) Caltrans District 1 Construction Projects, htttp://www.dot.ca.gov/dist1/d1projects/ Accessed on May 23, 2007. Assumed three average mitigation actions based on project description.
(7) Consultation 1-14-1999-184.5, June 15, 2006.
(8) Written Communication from Whitney Fiore, Marin County Roads consultant, May 10, 2007.
(9) Caltrans 2006 state Highway Operation and Protection Program: San Mateo County, page 71.
(10) Project information from personal communication from Don Hill, Santa Cruz County Department of Public Works, April 9, 2007. Assumed two average mitigation actions.
(11) Caltrans, Upcoming Central Region Construction Projects, Friday, March 16, 2007, p. 6 of 8. Assumed one average mitigation action.
(12) Caltrans, Upcoming Central Region Construction Projects, Friday, March 16, 2007, p. 4 of 8. Assumed one average mitigation action.
(13) Project information from personal communication from Jack Malone, US Army Corps of Engineers, April 30, 2007. Assumed one average mitigation action.
(14) Caltrans widening of Route 101 to 6 lanes. Source: Caltrans, Upcoming Central Region Construction Projects, Friday, March 16, 2007, p. 5 of 8. Assumed one average mitigation action.
Note: Totals may not sum due to rounding.

# CHAPTER 5 | POTENTIAL ECONOMIC IMPACTS TO NATURAL RESOURCES MANAGEMENT

118. This chapter estimates pre-designation and post-designation costs of natural resource management activities that may impact the tidewater goby and its habitat. This activity is not explicitly identified as a threat in the proposed rule, but is included in this analysis as an activity of concern based on the section 7 consultation history and discussions with the Service. Activities considered in this chapter include watershed and salmonid restoration programs, which have the potential to "…substantially alter the channel morphology of the proposed critical habitat…" and/or "…cause atypical levels of sedimentation in coastal wetland habitats or remove vegetative cover that stabilizes stream banks."[82] In the long-term, restoration programs may be helpful to tidewater gobies and may potentially improve their habitat. However, in the short-term, the actions required in order to implement watershed or salmonid restoration may require construction activities that could cause harm by sediment loading, siltation, or contamination. This chapter also discusses two habitat conservation plans (HCPs) and one Safe Harbor Agreement currently under development, and potential threats from sand and gravel mining.

119. Ecosystem management programs that may potentially threaten tidewater goby habitat are programs that seek to restore higher quality, pre-degradation conditions to those ecosystems. Because the tidewater goby lives in lagoons and estuaries, the ecosystems of concern are those that influence lagoons and estuaries. These programs tend to address watershed wide policy issues; many of these programs self-label as "watershed restoration programs." It is this breadth of scope that sets these programs apart from water management or flood control projects addressed in Chapter 2. Another type of ecosystem restoration is salmonid restoration, which is similar to a watershed restoration program, but is targeted toward one specific species.

120. This chapter proceeds with an overview discussion of restoration programs, conservation plans, and mining. The second section reviews the types of conservation efforts used during restoration programs and discusses the methodology employed to identify pre-designation and post-designation natural resource management activities. The next section describes pre-designation costs of watershed and salmonid restoration programs and the final section estimates post-designation impacts, concluding with a discussion of areas of uncertainty in the analysis.

[82] 71 FR 68937

**Tidewater Goby Study Area for Natural Resource Management Activities**

Because most of the proposed critical habitat units are small and the units are primarily lagoons, estuaries, or backwater marshes, few economic activities take place within the habitat. As a result, natural resource management activities that may threaten the tidewater goby and its habitat are likely to occur upstream or upgradient from the proposed critical habitat units. As discussed in chapter 1, for purposes of the economic analysis, the Service has determined that the appropriate study area includes the area within the proposed critical habitat unit and an area within a 50 meter buffer extending 100 meters upstream of the proposed critical habitat unit along the course of all tributaries. [1]

[1] Email communications from Service, April 23 and April 25, 2007.

## 5.1 OVERVIEW OF TYPES OF NATURAL RESOURCE MANAGEMENT IN THE STUDY AREA

### 5.1.1 ECOSYSTEM AND SALMON RESTORATION PLANS

121. In many parts of California, public and private programs are underway to restore streambed/riverbed conditions to earlier (pre-degradation) conditions. While these projects may have long term effects that are beneficial to the goby, their implementation may result in the alteration or destruction of habitat. For example, in-channel construction activities may cause erosion and sediment loading that will disrupt tidewater goby habitat. Many restoration projects have resulted in section 7 consultations in the past, and have involved Federal, State, county, and municipal agencies, as well as some private and not-for-profit groups. While many of the larger programs are conducted on State or Federal land, private lands around estuaries can also be recipients of public and private funding for streambed restoration programs. Prediction of post-designation restoration programs is difficult due to the numerous and varied types of programs that may be undertaken by a variety of organizations. The best guide to future programs are current programs, many of which are planned, but have not initiated work due to a lack of funding. Many of these will take multiple years to implement.

122. Coho and Chinook salmon have either endangered or threatened status along the California coast, and are listed as such at both the Federal and State levels. Several programs designed to restore salmon habitat and populations have been implemented and many more programs are planned. Some concern exists that salmonid restoration projects have the potential to disrupt tidewater goby habitat. While some parts of salmonid restoration measures may improve tidewater goby habitat, some measures, such as improving flow-through to allow easier access for salmon to migrate upstream could reduce the PCEs available for the tidewater goby. While this potential conflict is a possibility, no section 7 consultation specifically recognized the potential conflict, and most of the stakeholders contacted believed that salmonid restoration projects would be beneficial to the tidewater goby.

### 5.1.2 HABITAT CONSERVATION PLANS

123. Three HCPs currently under development may impact the study area. First, the Ventura River Multi-Species HCP, being developed by the Ventura River Watershed Council, is in preliminary stages. This plan will cover water use and management, flood control facilities, recreational facilities, and various planned projects in each of those areas. The plan covers four endangered species including the tidewater goby.[83] In addition, an HCP for San Luis Obispo State parks is being drafted by the California Department of Parks and Recreation. This HCP will provide habitat protection and management while reducing human related impacts in the parks.[84] Costs specific to tidewater goby habitat management within the HCP are included in the post-designation cost estimates, in Exhibit 5-2.[85] Finally, the Safe Harbor Agreement in unit VEN-3 (J Street Drain – Ormond Lagoon) between the Metropolitan Water District of Southern California and the Service underwent a section 7 consultation in 2005.[86] This plan will sell 276 acres to a non-profit conservation organization with conservation easements upon the property. Twenty acres in the vicinity would be retained by the Metropolitan Water District of Southern California for current farming and potential commercial or industrial use. While the consultation required no mitigation action, the costs of the consultation are included in the pre-designation costs reported in this analysis.

### 5.1.3 SAND AND GRAVEL MINING

124. This chapter also investigated the potential impact of habitat designation on sand and gravel mining. Mining is mentioned explicitly in the proposed rule.[87] The study area for mining is within the critical habitat unit and within a 50 meter buffer extending for 200 meters upstream along all tributaries. A GIS analysis found no mines within the relevant study area. Furthermore, no information about potential new mines is available, and several existing California regulations are likely to make new mining operations close to the California Coast unlikely. As a result, no impacts are estimated for this industry.

## 5.2 NATURAL RESOURCE MANAGEMENT PROJECTS

125. Within the study area, there have been nine section 7 consultations concerning natural resource management issues, including four formal consultations, one informal

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[83] Riegge, Laura, "Ventura River Multi-Species HCP," Presentation to the Ventura River Watershed Council, March 13, 2007. Requested cost information from draft HCP documents were judged by the City of Ventura to be too premature to publicize. Personal communication between Karen Wald, City of Ventura and Jane Israel, Industrial Economics, April 17, 2007.

[84] State of California Department of Parks and Recreation, Oceano Dunes District, Alternative Access Study: Oceano Dunes State Vehicular Recreation Area, November 15, 2006, pp. 13-14.

[85] Cost data were obtained in a personal communication with Ronnie Glick, California Department of Parks, May 22, 2007.

[86] U.S. Fish and Wildlife Service. "Safe Harbor Agreement with the Metropolitan Water District of Southern California, Los Angeles County, California," Formal Consultation # 1-8-05-FW-17, July 27, 2005, with the Metropolitan Water District of Southern California

[87] 71 FR 68937

consultation, and two technical assistances. Officials from multiple State, county, and Federal agencies, as well as from non-government agencies have also been contacted to provide information about pre-designation and post-designation restoration programs. While no central information on such programs exists, multiple public databases from organizations such as the California Coastal Conservancy have been researched. Researching the State programs provides information on publicly funded projects. Several non-governmental organizations have also concentrated on improving and restoring estuarine environments.

126. Pre-designation actions are not a good guide for predicting post-designation activity because areas where restoration programs have been completed are not likely to require more restoration work within the twenty year time span reviewed in this analysis. Present plans and guidance documents for watershed and salmonid restoration provide a valuable source of data. Watershed and salmonid restoration programs generally provide some overview of plans they intend to implement. Often, however, these plans lack funding and remain in hiatus until funding is available, at which point they are implemented. To the extent possible, this analysis has relied on records of planned programs, supplemented by information from various stakeholders.

127. Research on potential post-designation projects is complicated by the nature of the restoration programs, which are eco-system oriented and may involve several geographically dispersed activities. The defined study area for this activity is relatively small by contrast. Many identified restoration programs that appear to be relevant fall outside of the activity study area.

128. Measures to minimize negative effects due to construction activities occurring within habitat or upstream are essentially the same as for other construction or maintenance activities occurring within a study area. These project modifications include monitoring the tidewater goby population and transporting them if necessary, construction of silt fences, and educating workers about tidewater gobies and their habitat. These measures are listed in Exhibit 2-4 and have average cost estimates provided for them in Exhibit 2-6. Average cost estimates are applied to different projects depending on their magnitude and complexity, and the degree to which tidewater goby conservation efforts will be necessary. The estimates used to capture the impact of administrative consultation costs are presented in Exhibit 2-3.

## 5.3 PRE-DESIGNATION IMPACTS

129. Exhibit 5-1 provides estimates for pre-designation costs related to tidewater goby-specific project modifications undertaken during natural resource management activities. This exhibit lists the name of the project, years of operation, type of consultation (if any), project modifications, and costs. For some units, such as HUM-3 (Humboldt Bay), there were multiple restoration projects. These different projects are listed as separate rows within HUM-3 (Humboldt Bay) to clarify which cost estimates are from which action.

130. The greatest total impact from conservation efforts for restoration programs is in unit HUM-3 (Humboldt Bay). This critical habitat unit has multiple jurisdictions and spans the largest land area. There are multiple sub-ecosystems within this critical habitat unit, including Martin Slough, Gannon Slough, Salmon Creek, etc. There have been many different restoration programs in these different areas; HUM-3 (Humboldt Bay) had the largest number of restoration projects as well as the largest impacts.

## 5.4 POST-DESIGNATION IMPACTS

131. Exhibit 5-2 displays the predicted costs for current and planned restoration programs. Section 7 administrative consultation costs as well as project modification costs are predicted for these different programs. For the Salmon Creek Salmonid Restoration program in HUM-3 (Humboldt Bay), consultation took place prior to 2007, but project work is currently underway.

132. Like the pre-designation period, unit HUM-3 (Humboldt Bay) has the highest estimated costs for the post-designation period. Post-designation restoration program efforts include the Salmon Creek project (which spans the pre- and post-designation periods), and two additional ecosystems that were not previously addressed, McDaniel Slough and Rocky Gulch. The second largest impacts are in unit MAR-1 (Estero Americano), where the Gold Ridge Conservation District has generated a comprehensive watershed restoration program that spans the entire watershed. Two of the many projects within the plan address the estuary specifically and call for intensive study and implementation of six separate stream-bed/channel restoration activities.

## 5.5 SOURCES OF UNCERTAINTY

133. There are two primary sources of uncertainty that may affect the estimates generated in this chapter. These uncertainties concern predictions of planned projects and potential variability in the cost estimates.

- The prediction of post-designation projects may under-predict the number of actual projects due to the decentralized nature of restoration efforts. Major organizations involved in these types of projects were interviewed. However, smaller organizations may also undertake local restoration not considered in this analysis. While the research concerning potential projects was thorough, omissions are possible. To the extent that any project(s) have not been included, this estimate will understate the actual post-designation costs.[88]
- The costs of project modifications are an average of the best available data. In reality, costs will vary with the location and time specific measures that must be undertaken in each individual project. The estimates provided are generated from

[88] Exhibits 5-1 and 5-2 include extensive details about watershed and salmonid restoration projects in the expectation that during review of this chapter, stakeholders may be forthcoming with additional information and help improve the estimates.

an average of several data points, however these data points may not represent the complete range of possible conservation activities. Without better information regarding specific actions and costs, it is not possible to judge whether estimates will under or overstate true costs.

**EXHIBIT 5-1 PRE-DESIGNATION NATURAL RESOURCES MANAGEMENT ACTIVITY IMPACTS**

| UNIT | UNIT NAME | PROJECT NAME | YEARS | CONSULTATION COSTS | MITIGATION MEASURES | MITIGATION COSTS | ESTIMATED COSTS | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | UNDISCOUNTED | PRESENT VALUE (3%) | PRESENT VALUE (7%) |
| HUM-3 | Humboldt Bay | Martin Slough Urban Stream Restoration[1] | 2001 | 1 Formal:<br>• $19,500 | 1 Average mitigation action[1] | • $35,200 | $354,000 | $390,000 | $446,000 |
| | | Gannon Slough and Beith Creek[2] | 2005 | 1 Formal:<br>• $19,500<br>1 Informal:<br>• $9,500 | 5 Average mitigation actions with cofferdams[2] | • 5 x $35,200<br>• 5 x $15,000 | | | |
| | | Salmon Creek Salmonid Restoration[3] | 2006 | 1 Formal:<br>• $19,500 | Actions take place in 2007 | | | | |
| MAR-4 | Rodeo Lagoon | Rodeo Lagoon Tidewater Goby Sampling[4] | 1995-2000<br>2005-2006 | None | Tidewater goby study in 1995; monitoring/surveying/ Sampling 1995-2000, 2005; Tidewater Goby Study 2005-2006[4] | • $10,000 (1995)<br>• 7 x $5,400 (1995-2000, 2005)<br>• 2 x $20,000 (2005-2006) | $87,800 | $105,000 | $135,000 |
| MN-1 | Bennett Slough | Moss Landing Harbor Enhancement[5] | 2004 | 1 Formal:<br>• $19,500 | 1 Average mitigation action[5] | • $35,200 | $54,700 | $61,900 | $73,300 |
| SLO-6 | San Geronimo Creek | San Geronimo Creek Wetland Restoration[6] | 2005 | 1 Formal:<br>• $19,500 | 1 Average mitigation action[6] | • $35,200 | $54,700 | $60,800 | $70,500 |
| SB-1 | Santa Maria River | Guadalupe Oil Field Beach Project[7] | 2000 | 1 Formal:<br>• $19,500 | 1 Average mitigation action[7] | • $35,200 | $54,700 | $66,700 | $86,700 |
| SB-8 | Arroyo Burro | Arroyo Burro Estuary Improvement[8] | 2004<br>2005 | 2 Technical Assistances:<br>• 2 x $1,500 | Monitoring/surveying/ sampling in 2004; Monitoring/surveying/ sampling and relocation in 2005[8] | • 2 x $1,200<br>• 2 x $1,200<br>• 2 x $3,000<br>• 1 x $14,500 | $28,300 | $30,600 | $34,000 |
| SB-9 | Mission Creek-Laguna Channel | Santa Barbara Creeks Restoration[9] | 2004-2006 | None | Monitoring/surveying/ sampling each year[9] | • 3 x $1,200<br>• 3 x $1,200<br>• 3 x $3,000 | $16,200 | $17,200 | $18,600 |

| UNIT | UNIT NAME | PROJECT NAME | YEARS | CONSULTATION COSTS | MITIGATION MEASURES | MITIGATION COSTS | ESTIMATED COSTS | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | UNDISCOUNTED | PRESENT VALUE (3%) | PRESENT VALUE (7%) |
| VEN-1 | Ventura River | Ventura River Estuary Restoration[10] | 1995<br>2001 | None | Monitoring/surveying/ sampling in 1995;<br>Monitoring, sampling project costing $22,350 in 2001[10] | • $1,200<br>• $1,200<br>• $3,000<br>• $22,350 | $27,800 | $34,400 | $45,700 |
| VEN-2 | Santa Clara River | Urban Stream Restoration Project[11] | 1997 | None | Monitoring/surveying/ Sampling[11] | • $1,200<br>• $1,200<br>• $3,000 | $5,400 | $7,260 | $10,600 |
| VEN-3 | J Street Drain-Ormond Lagoon | Clean Oceans and Nourishment[12] | 2003 | 1 Formal:<br>• $19,500 | 1 Average mitigation action[12] | • $35,200 | $94,100 | $109,000 | $133,000 |
| | | Safe Harbor Agreement[13] | 2002, 2005 | 1 Formal:<br>• $19,500 | Transport of Gobies, 2003<br>Monitoring/surveying/ Sampling, 2005 [13] | • $14,500<br>• $1,200<br>• $1,200<br>• $3,000 | | | |
| LA-1 | Malibu Lagoon | Restoration of Malibu Lagoon[14] | 1995-1997 | None | Monitoring/surveying/ sampling, 1995-1997 [14] | • 3 x $1,200<br>• 3 x $1,200<br>• 3 x $3,000 | $21,600 | $29,900 | $45,500 |
| | | Malibu Creek[15] | 1995-1997 | None | Monitoring/surveying/ Sampling[15] | • $1,200<br>• $1,200<br>• $3,000 | | | |
| LA-2 | Topanga Creek | Topanga Creek Water Quality Study[16] | 1999-2001 | None | Monitoring/surveying/ sampling, 1999-2001[16] | • 3 x $1,200<br>• 3 x $1,200<br>• 3 x $3,000 | $16,200 | $19,900 | $26,100 |
| **TOTAL** | | | | | | | **$816,000** | **$932,000** | **$1,120,000** |

Notes:
Totals may not sum due to rounding.
(1) California Department of Water Resources, Urban Streams Restoration Program Finalist Projects Spring 2001 Grant Application Cycle, "$10 Million, Prop 13 funds, Fiscal Year 2001/2002." Accessed May 24, 2007 at http://www.watershedrestoration.water.ca.gov/urbanstreams/pastproj/spr01proj$10m.cfm Assumed one average mitigation based on project description.
(2) U.S. Fish and Wildlife Service. "Effects of the Gannon Slough and Beith Creek Channel Realignment and Enhancement Project," Formal Consultation # 1-14-2005-2693.1, with the US Army Corps of Engineers. September 26, 2005.
(3) U.S. Fish and Wildlife Service. "Effects of the Salmon Creek Anadromous Salmonid Access, Tide Water Habitat Enhancement, and Flood Control Maintenance Project," Formal Consultation # 1-14-2004-2556, with the Humboldt Bay National Wildlife Refuge Complex. July 20, 2006.
(4) Personal correspondence with Darren Fong, National Park Service, May 15, 2007; Written communication from Darren Fong, National Park Service, May 18, 2007; Fong, Darren, "Year 2005 Tidewater Goby Sampling in Rodeo Lagoon, Golden Gate National Recreation Area, Marin County" January, 2006 (monitoring/sampling/surveying costs); Fong, Darren, "Year 2005 Tidewater Goby Sampling in Rodeo Lagoon, Golden Gate National Recreation Area, Marin County"

| UNIT | UNIT NAME | PROJECT NAME | YEARS | CONSULTATION COSTS | MITIGATION MEASURES | MITIGATION COSTS | ESTIMATED COSTS | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | UNDISCOUNTED | PRESENT VALUE (3%) | PRESENT VALUE (7%) |
| (January, 2006); Written communication from Darren Fong, Golden Gate National Recreation Area, May 29, 2007.<br>(5) U.S. Fish and Wildlife Service. "Moss Landing Habitat Enhancement Project," Formal Consultation # 1-8-03-F-54, with the US Army Corps of Engineers. June 4, 2004.<br>(6) U.S. Fish and Wildlife Service. "Authorization to Conduct Stream and Wetland Restoration Activities, " Formal Consultation # 1-8-03-F-55, with the US Army Corps of Engineers. August 11, 2005.<br>(6) U.S. Fish and Wildlife Service. "Authorization to Conduct Stream and Wetland Restoration Activities, " Formal Consultation # 1-8-03-F-55, with the US Army Corps of Engineers. August 11, 2005.<br>(7) U.S. Fish and Wildlife Service. "Guadalupe Oil Field Beach Project" Formal Consultation # 1-8-00-F-10R, with the US Army Corps of Engineers. June 7, 2000.<br>(8) U.S. Fish and Wildlife Service. "Authorization of Biological Monitor for the Arroyo Burro Estuary Improvement Project," Technical Assistance # 1-8-04-F-12 with the City of Santa Barbara, California, May 17, 2004.; U.S. Fish and Wildlife Service. "Biologist Approval for the Arroyo Burro Estuary Restoration Project" Technical Assistance # 1-8-04-F-12, with the City of Santa Barbara, California. August 17, 2005.<br>(9) Written communication from George Johnson, Creeks Restoration Planner, City of Santa Barbara Parks and Recreation Department to Ventura Service Office, January 29,2007.<br>(10) Application of average onsite monitoring costs (conservation cost worksheet) to California Conservancy Wetland Profile, http://www.wrpinfo.scc.ca.gov/coast/dbs/profile.asp?SITEID=35 Accessed on May 24, 2007; Grant amount for surveying work on Ventura River, Southern California Wetlands Recovery Project, 2001 Summary of Small Grants Projects, www.scwrp.org/documents/SmallGrants/2001Summary.pdf Accessed on May 24, 2007.<br>(11) Application of sampling/monitoring/survey costs to program described in the California Department of Water Resources, Planning and Local Assistance: Urban Streams Restorations Project: Funded Projects: Natural Resource Projects Inventory, http://endeavor.des.ucdavis.edu/nrpi/ accessed May 24, 2007.<br>(12) U.S. Fish and Wildlife Service. " Beach Erosion Authority for Clean Oceans and Nourishment Project." Formal Consultation # 1-8-02-F-36 with the US Army Corps of Engineers, May 9, 2003.<br>(13) Memorandum from Assistant Field Supervisor, Service Ventura Office to Manager, Service California/Nevada Operations Office, July 27, 2005.<br>(14) Costs of actions described in California Department of Water Resources, Planning and Local Assistance: Urban Streams Restorations Project: Funded Projects: Natural Resource Projects Inventory, http://endeavor.des.ucdavis.edu/nrpi/ accessed May 24, 2007.<br>(15) Costs of actions described in California Department of Water Resources, Planning and Local Assistance: Urban Streams Restorations Project: Funded Projects: Natural Resource Projects Inventory, http://endeavor.des.ucdavis.edu/nrpi/ accessed May 24, 2007.<br>(16) Application of average sampling monitoring/survey cost (Conservation cost worksheet) for cost of action described in California Department of Water Resources, Planning and Local Assistance: Urban Streams Restorations Project: Funded Projects: Natural Resource Projects Inventory, http://endeavor.des.ucdavis.edu/nrpi/ accessed May 24, 2007. | | | | | | | | | |

**EXHIBIT 5-2 POST-DESIGNATION NATURAL RESOURCES MANAGEMENT PROJECT IMPACTS**

| UNIT | UNIT NAME | PROJECT NAME | YEARS | CONSULTATION COSTS | MITIGATION MEASURES | MITIGATION COSTS | ESTIMATED COSTS | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | UNDISCOUNTED | PRESENT VALUE (3%) | PRESENT VALUE (7%) |
| HUM-3 | Humboldt Bay | McDaniel Slough[1] | 2007-2026 | 1 Formal:<br>• $19,500 | 1 Average mitigation action; Monitoring to continue 2007 to 2026.[1] | • $35,200<br>• 20 x $1,000 | $380,000 | $375,000 | $371,000 |
| | | Rocky Gulch Salmon Restoration[2] | 2007-2010 | 1 Formal:<br>• $19,500 | 1 Average mitigation action; Monitoring to continue 2007 to 2010.[2] | • $35,200<br>• $2,750 x 3 | | | |
| | | Salmon Creek Salmonid Restoration[3] | 2007 | Consultation took place in 2006 | 3 Average mitigation actions and 5 additional cofferdams, 4 additional silt fences, 1 additional goby relocation[3] | • 3 x $35,200<br>• 5 x $15,000<br>• 4 x $11,800<br>• 1 x $14,500 | | | |
| HUM-4 | Eel River | Eel River Delta Restoration[4] | 2012 | 1 Formal:<br>• $19,500 | 1 Average mitigation action[4] | • $35,200 | $54,700 | $47,200 | $39,000 |
| MAR-1 | Estero Americano | Estero Americano Restoration[5] | 2007-2014<br>2008-2010 | 2 Formal:<br>• 2 x $19,500 | Monitoring/surveying/ Sampling[5] | • 8 x $5,400<br>• 6 x $35,200 over 3 years | $293,000 | $277,000 | $257,000 |
| MAR-3 | Lagunitas (Peppermill) Creek | Tomales Bay Goby Restoration[6] | 2007-2008 | 1 Formal:<br>• $19,500 | Specific Actions in Implementation Plan[6] | • 105,000 | $125,000 | $123,000 | $121,000 |
| MAR-4 | Rodeo Lagoon | Tidewater Goby Monitoring[7] | 2007-2012<br>2015,2018<br>2021,2024 | None | Monitoring yearly through 2012, then every 3 years[7] | • 6 x $2,000<br>• 4 x $2,000 | $20,000 | $16,700 | $13,700 |
| MN-1 | Bennett Slough | Moss Landing Harbor Dredging[8] | 2007 | None | 1 Average mitigation action without silt fences or goby relocation[8] | • $8,900 | $8,900 | $8,900 | $8,900 |
| SLO-7 | Pismo Creek | Habitat Conservation Plan[9] | 2010-2026 | 1 Formal:<br>• $19,500 | Apportioned costs of HCP for Tidewater Goby[9] | • 1 x $7,500<br>• 16 x $5,000 | $107,000 | $82,200 | $60,600 |
| LA-1 | Malibu Lagoon | Malibu Lagoon Restoration Project[10] | 2007-2008 | 1 Formal:<br>• $19,500 | 2 x Average Mitigation actions[10] | • 2 x $35,200 | $89,900 | $88,900 | $87,600 |
| **TOTAL** | | | | | | | **$1,080,000** | **$1,020,000** | **$959,000** |

Notes:

Totals may not sum due to rounding.

(1) Monitoring costs of $1,000 per year for 20 years were specified in a personal communication with Karen Kovacs, California Department of Fish and Game, April 12, 2007.

(2) Monitoring costs of $2,750 per year for three years were specified in a written communication from Michelle Gilroy, District Watershed Biologist, California Department of Fish and Game, May 15, 2007.

(3) U.S. Fish and Wildlife Service. "Effects of the Salmon Creek Anadromous Salmonid Access, Tide Water Habitat Enhancement, and Flood Control Maintenance Project," Formal Consultation # 1-14-2004-2556, with the Humboldt Bay National Wildlife Refuge Complex. July 20, 2006.

(4) Personal communication with Karen Kovacs, Senior Biologist Supervisor, California Department of Fish and Game Wildlife Programs Branch, April 12, 2007. Assumed one average mitigation action.

(5) Gold Ridge Conservation District, Estero Americano Watershed Management Plan, February, 2007.

(6) Fong, David, Michael K Saiki, and Lorraine Parsons, "Implementation Plan to Establish Endangered Tidewater Goby Population Within the Tomales Bay Watershed, Marin Co., CA, 2007.

(7) Written communications from Darren Fong, National Park Service, May 18, 200 and, May 29, 2007.

(8) Assumed cost of monitoring for actions in US Army Corps of Engineers, San Francisco District, "Revised Environmental Assessment for Operations and Maintenance Dredging of the Moss Landing Harbor Federal Channels, Moss Landing, Monterey County, California."

(9) Personal Communication with Ronnie Glick, California Department of Parks, May 22, 2007.

(10) Personal Communication with Jack Malone, US Army Corps of Engineers, Ventura Field Office, Regulatory Branch, April 30, 2007. Assumed two average mitigation actions based on description.

# CHAPTER 6 | POTENTIAL ECONOMIC IMPACTS TO OIL AND GAS PIPELINE CONSTRUCTION AND MAINTENANCE

134. This chapter estimates the impact of tidewater goby conservation efforts on oil and gas pipeline construction and maintenance activities. These activities may affect habitat by increasing sediment or contaminant flows into the critical habitat units. This activity is not explicitly identified as a threat in the proposed rule, but is included in this analysis as an activity of concern based on the section 7 consultation history and discussions with the Service.

135. The first section of this chapter discusses how pipeline-related activities could threaten tidewater goby habitat and identifies units that could be affected. The second section describes the methodology employed to identify pre-designation costs and predict post-designation activities. The third section considers the section 7 consultations and conservation measures that took place between 1994 and 2006. The chapter concludes with a discussion of post-designation pipeline projects.

**Tidewater Goby Study Area for Oil and Gas Pipeline Construction and Maintenance Activities**

Because most of the proposed critical habitat units are small and the units are primarily lagoons, estuaries, or backwater marshes, few economic activities take place within the habitat. Pipeline construction and maintenance activities that may threaten the tidewater goby and its habitat are likely to occur upstream or upgradient from the proposed critical habitat units (it is generally shorter to cross a stream than a lagoon). As discussed in chapter 1, for purposes of the economic analysis, the Service has determined that the appropriate study area for pipeline construction and maintenance activities includes an area 200 meters around the proposed critical habitat unit.[1]

[1] Email communications from Service, April 23 and April 25, 2007.

## 6.1 PIPELINE ACTIVITY THREATS AND POTENTIALLY AFFECTED LOCATIONS

136. Pipeline construction and maintenance activities are the focus of eight section 7 consultations and were also identified as a potentially habitat threatening activity through communication with the Service. Pipeline construction activities include the installation of new pipelines, removal of existing pipelines, or repair of pipelines. Threats that may result from these activities include the deposition of increased sediment levels or contamination within proposed critical habitat, which would degrade habitat quality.

137. The costs of tidewater goby conservation efforts during the construction of two municipal water pipelines are also included in this chapter. The conservation measures for work on water pipelines are identical to those taken when working with oil and gas pipelines. However, there are no centralized records of water pipeline systems in California, and it is not feasible to predict where new water pipelines may be built over the geographic scope of the study area (there were only two water pipeline consultations across 44 proposed critical habitat units over twelve years).

138. The California Fire Marshall has jurisdiction over oil and liquid gas pipelines in the State of California.[89] All existing pipelines are required to incorporate monitoring and maintenance procedures. The National Office of Pipeline Safety, within the US Department of Transportation Pipeline and Hazardous Material Safety Administration, regulates all pipelines that transport hazardous liquids or natural gas. The California Public Utilities Commission also records this information.

139. Exhibit 6-1 shows the units that contain oil, liquid gas, natural gas, and other hazardous liquid pipelines, as well as the names of the pipeline operating companies and some limited information about their characteristics. For security reasons, this information indicates inclusion in the study area, but not actual physical location. The California Fire Marshall's office was queried about the presence of oil and liquid gas pipelines in the study area and the Pipeline and Hazardous Material Safety Administration's National Pipeline Mapping System was used to locate natural gas and hazardous liquid pipelines. The California Fire Marshall provided more detailed information about the size and status of the crude oil and liquid gas pipelines than the National Pipeline Mapping System did about the natural gas and hazardous liquid pipelines. As a result, the size and status of the crude oil and liquid gas pipelines are provided for those pipelines in Exhibit 6-1.

[89] California Codes: Government Code Section 51010-51019.1. Accessed May 2, 2007 at: http://www.picosearch.com/cgi-bin/ts.pl

**EXHIBIT 6-1 PIPELINES BY TYPE AND LOCATION**

| UNIT | NAME | NATURAL GAS PIPELINE | HAZARDOUS LIQUID PIPELINE | CRUDE OIL PIPELINE | PIPELINE DETAILS |
|---|---|---|---|---|---|
| HUM-3 | Humboldt Bay | Pacific Gas and Electric Co. | | | |
| SC-1 | Laguna Creek | Pacific Gas and Electric Co. | | | |
| SC-2 | Baldwin Creek | Pacific Gas and Electric Co. | | | |
| SLO-7 | Pismo Creek | | | Conoco Philips | 8" Empty, inactive |
| | | | | Conoco Philips | 12" Inactive |
| SB-3 | Canada de Santa Anita | | Arguello, Inc | | |
| SB-4 | Canada de Alegria | | Arguello, Inc. | Arguello, Inc. | 24" Active |
| SB-5 | Canada de Agua Caliente | | Argeullo, Inc. | Arguello, Inc. | 24" Active |
| SB-7 | Winchester / Bell Canyon | Southern California Gas Company | Venoco, Inc. | Venoco, Inc. | 10" Active |
| | | | | Venoco, Inc | 6" Inactive |
| | | | | Venoco, Inc | 6" Active |
| | | | | Venoco, Inc. | 10" Active |
| VEN-1 | Ventura River | Southern California Gas Company | Venoco, Inc. | Venoco, Inc. | 22" Active |
| VEN-2 | Santa Clara River | Southern California Gas Company | Conoco Phillips | Conoco Phillips | 8" Active |
| VEN-3 | J Street Drain-Ormond Lagoon | | Southern California Edison Company | | |

Sources: Written communication from Lisa Dowdy, California State Fire Marshall Division of Pipelines. This communication listed all oil and liquid gas pipelines in the study area. This table also contains information on hazardous liquid and natural gas pipelines from the Pipeline and Hazardous Material Safety Administration's National Pipeline Mapping System: https://www.npms.phmsa.dot.gov/ accessed on May 8, 2007.

140. Pipeline construction activity includes the installation of new pipelines and the removal of existing pipelines. In some cases, existing pipelines have been purged and then filled with cement instead of being completely removed. This approach can minimize potential harms to environmentally sensitive areas and reduce conservation costs borne by pipeline operators.[90]

141. Pipeline maintenance consists of monitoring pipeline quality and responding to current or projected problems based on the gathered monitoring data. Pipeline structural monitoring is performed with an In-Line Inspection (ILI) tool, a machine that runs through the

[90] In 1995 and 1996 an eight inch pipeline and a twelve inch pipeline across Pismo Creek (SLO-7) were cut, capped, and filled with cement. Written communication from Nancy Brodbeck, Environmental Coordinator, Conoco Philips Pipeline Company. May 15, 2007.

interior of the pipeline to assess pipeline condition. The ILI tools must be accessed at certain intervals along the pipelines, but pipeline companies are very unlikely to seek pipeline access within the study area.[91] Any needed maintenance will have to be performed in such a way as to not affect the tidewater goby or its habitat.[92]

142. While accidental oil and gas pipeline breaching could harm tidewater gobies and their habitat, such events are very difficult to predict. Furthermore, in the event of a breach, State and local officials would respond to repair the pipeline and clean up any effects of the spill regardless of the presence of tidewater gobies. For these reasons this analysis does not consider accidental pipeline breaches.

## 6.2 ANALYTIC APPROACH

143. Any pipeline maintenance or construction operations in the study area must comply with mitigation and conservation measures to protect the tidewater goby and its habitat. The section 7 consultation history consists of a total of eight consultations for projects within the study area. Two of these were water pipeline consultations in units HUM-3 (Humboldt Bay) and SC-5 (Pajaro River). Three consultations (two formal and one technical assistance) concerned the same project in unit SB-5 (Canada de Agua Caliente), the removal of a Chevron-Texaco pipeline. There was one consultation in SB-6 (Gaviota Creek) and two distinct consultations on different phases of the Guadalupe Oil Field remediation in SB-1 (Santa Maria River).

144. The small number of consultation histories precludes forecasting post-designation activities based on that data; the history of actions is insufficient to generate a robust estimate. Instead, many different agencies and companies were contacted and asked about their pre-designation and post-designation pipeline maintenance or construction projects.

145. After the pipeline operators were identified through the processes discussed in Section 6.1, all pipeline operators were contacted, as well as county departments of public works. In addition, parties to the section 7 consultations at the U.S. Army Corps of Engineers and at the Service were contacted. These parties provided some additional sources of information to contact, including engineers and biologists that had performed tidewater goby conservation actions in the presence of pipeline work. These sources were also contacted.

146. The consultation history does not include pipeline projects that occurred in what is being proposed as critical habitat in unit SLO-7, in 1995, 1996, and 1997. In 1995 and 1996, two existing pipelines were purged, capped, and filled. In 1997 a new pipeline, crossing

[91] Personal communication with Tim Mahoney, Southern California Gas Company, May 9, 2007.

[92] Information about projected pipeline maintenance within the proposed critical habitat has been requested from all the pipeline operators identified in Exhibit 6-1. To date, only Conoco-Phillips has responded; the records from their ILI analyses predict no upcoming work within the study area. Written communication from Ken Fuller, Conoco Phillips Company, May 10, 2007.

Pismo Creek was built.[93] No known tidewater goby conservation actions were carried out during these projects.

## 6.3 PRE-DESIGNATION IMPACTS

147. Exhibit 6-2 shows the estimated pre-designation costs per unit for pipeline construction and maintenance activities and the estimated administrative costs associated with these projects.

**EXHIBIT 6-2 PRE-DESIGNATION CONSERVATION COSTS FOR OIL AND GAS PIPELINE CONSTRUCTION AND MAINTENANCE**

| UNIT | NAME | TOTAL COSTS | | |
|---|---|---|---|---|
| | | UNDISCOUNTED | PRESENT VALUE (3%) | PRESENT VALUE (7%) |
| HUM-3[1] | Humboldt Bay | $54,700 | $63,000 | $76,400 |
| SC-5[2] | Pajaro River | $54,700 | $61,900 | $73,300 |
| SB-1[3] | Santa Maria River | $109,000 | $129,000 | $161,000 |
| SB-5[4] | Canada de Agua Caliente | $42,500 | $50,800 | $65,000 |
| SB-6[5] | Gaviota Creek | $94,500 | $118,000 | $159,000 |
| **TOTAL** | | **$356,000** | **$423,000** | **$535,000** |

Note: totals may not sum due to rounding
Sources:
(1) U.S. Fish and Wildlife Service. "Effects of Installing a Water Pipeline in Former Tidal Lands, Humboldt Bay, Eureka, California." Formal Consultation # 1-14-03-1650, with the US Army Corps of Engineers. April 28, 2003. One formal consultation and one average mitigation action.
(2) U.S. Fish and Wildlife Service. "Pajaro Valley Water Management Agency's Revised Basin Management Plan" Formal Consultation # 1-8-03-F-44, with the Bureau of Reclamation. March 19, 2004. One formal consultation and one average mitigation action.
(3) U.S. Fish and Wildlife Service. "Concurrence for Use of the Programmatic Biological Opinion for Coastal Listed Species for the Guadalupe Oil Field Beach Project," Formal Consultation # 1-8-99-F/C-99, with the US Army Corps of Engineers. November 3, 1999. and U.S. Fish and Wildlife Service. "Site-Wide Guadalupe Oil Field Remediation and Restoration Project," Formal Consultation # 1-8-03-FC-57, with the US Army Corps of Engineers. August 18, 2005. Two formal consultation and two average mitigation actions.
(4) Monitoring costs of $2,000, personal communication with Brian Dugas, Padre Associates, May 3, 2007. Two formal consultations and one technical assistance: U.S. Fish and Wildlife Service. "Chevron-Texaco Pipeline Removal and Abandonment Project," Formal Consultation # 1-8-04-F-24, with the US Army Corps of Engineers. August 18, 2004; U.S. Fish and Wildlife Service. "Authorization of Biological Monitor for the Chevron-Texaco Pipeline Abandonment and Removal Project," Technical Assistance # 1-8-04-F-25 with Padre Associates, Inc., September 20, 2004; U.S. Fish and Wildlife Service. "Remove and Abandon the Chevron-Texaco Pipeline on Hollister Ranch," Formal Consultation # 1-8-04-F-44, with the US Army Corps of Engineers. February 18, 2005.
(5) Estimated mitigation costs of $75,000. Written Communication from John Storrer, Storrer Environmental Services, May 17, 2007. U.S. Fish and Wildlife Service. "Proposed Relocation of All American Pipeline Company's Crude Oil Pipeline," Formal Consultation # 1-8-99-F-20, with the US Army Corps of Engineers. January 15, 1999.

[93] Written communication from Nancy Brodbeck, Environmental Engineer, Conoco Phillips Company, May 15, 2007.

148. The economic impacts of these activities include the costs for required measures as well as the administrative costs of consultations. Administrative cost estimates are presented in Exhibit 2-3. These cost estimates are used in this chapter to capture the administrative portion of pre-designation pipeline projects.

149. Project modifications associated with pipeline construction and maintenance activities are very similar to mitigation measures employed to protect tidewater gobies during other activities, such as work on flood control structures or roads and bridges. Several mitigation measures were specified in the 1997 programmatic section 7 consultation that the Service completed with USACE for flood control and water management. These measures are listed in Exhibit 2-4. Exhibit 2-6 presents average costs for project modifications performed to protect the tidewater goby during several types of activities.

150. To the extent possible, economic impacts for pipeline construction and maintenance are estimated based upon costs reported by individuals involved with specific projects. In most cases, however, there have been no direct communications from stakeholders with specific knowledge of project costs. Most pipeline construction and maintenance activities that have taken place or are planned within the study area are very similar and well represented by the measures listed in Exhibit 2-6, therefore the estimated average costs for those actions are used to estimate costs in this chapter.

151. The two municipal water supply pipelines actions occurred in HUM-3 (Humboldt Bay) in 2003 and SC-5 (Pajaro River) in 2004 and required formal consultations and active implementation of the measures described in Exhibit 2-6. Total conservation costs for these projects in 2003 (HUM-3, Humboldt Bay) and 2004 (SC-5, Pajaro River) are unknown, but can be approximated as $54,700 for each project, including average mitigation action costs and the cost of the formal consultation.[94]

152. The consultations reveal that the two oil and gas pipeline projects in SB-1 (Santa Maria) employed measures similar to the average mitigation actions. The impacts for these procedures are estimated at $35,200 each.[95] Two formal and one informal section 7 consultations in 2004 and 2005 concerned the removal and abandonment of petroleum pipelines along the coast by Chevron and Texaco. This excavation impacted proposed critical habitat in the Canada de Agua Caliente unit (SB-5, Canada de Agua Caliente).[96]

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[94] These projects are described in U.S. Fish and Wildlife Service. "Effects of Installing a Water Pipeline in Former Tidal Lands, Humboldt Bay, Eureka, California." Formal Consultation # 1-14-03-1650, with the US Army Corps of Engineers. April 28, 2003 and U.S. Fish and Wildlife Service. Pajaro Valley Water Management Agency's Revised Basin Management Plan" Formal Consultation # 1-8-03-F-44, with the Bureau of Reclamation. March 19, 2004.. Costs were estimated according to the methodology presented in Exhibit 2-5.

[95] These projects are described in U.S. Fish and Wildlife Service. Concurrence for Use of the Programmatic Biological Opinion for Coastal Listed Species for the Guadalupe Oil Field Beach Project," Formal Consultation # 1-8-99-F/C-99, with the US Army Corps of Engineers. November 3, 1999 and U.S. Fish and Wildlife Service. "Site-Wide Guadalupe Oil Field Remediation and Restoration Project," Formal Consultation # 1-8-03-FC-57, with the US Army Corps of Engineers. August 18, 2005..

[96] Written communication from Biologist, Service South California Coast Division, May 3, 2007.

Initial surveys in 2005 found no tidewater gobies present. In the absence of designated critical habitat, the finding of no present tidewater gobies was sufficient to not pursue tidewater goby (or tidewater goby habitat) protective measures. Monitoring costs paid by Chevron-Texaco totaled approximately $2,000 ($1,000 for the biologist they hired to perform the tidewater goby survey and $1,000 for the biologist representing Santa Barbara County to monitor the survey).[97] The total mitigation cost specific to the work in SB-6 (Gaviota Creek) was $75,000; this action was also accompanied by a section 7 consultation.[98]

## 6.4 POST-DESIGNATION IMPACTS

153. There are very few planned projects to build new pipelines or remove existing pipelines.[99] Queries to the California Fire Marshall's office indicate that there are no known post-designation plans for pipeline construction or pipeline removal in the critical habitat influence areas.[100]

154. There are two known planned pipeline activities that may affect unit SB-7 (Winchester / Bell Canyon). Venoco is in the process of remediation of the Ellwood Field oil well facilities in Santa Barbara County. Part of this process that is anticipated to begin soon, is the Dos Pueblos pipeline route abandonment.[101] This project is expected to remove two individual six-inch pipelines that are about 200 feet apart.[102] Because these two pipeline crossings are sufficiently far apart and may be removed at different times, the impact estimate for mitigation of both pipeline removals is the calculated average mitigation cost, applied twice (2 x $35,200 = $70,400). No time-line is given for the removal of these pipelines, but the permitting process has been approved. Therefore, the removal project is assumed to occur immediately.

155. Venoco is also in the process of expanding their offshore facilities in the Ellwood Field region. Part of this project includes construction of a new 10 mile onshore pipeline that would pass through the SB-7 (Winchester / Bell Canyon) critical habitat area.[103] This project will require a full conservation effort. Because the timing on this project is unknown and not all regulatory approvals have been obtained, the analysis assumes that the project occurs in 2012 at an average cost of $35,200.

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[97] Personal communication with Brian Dugas, Padre Associates, Inc., May 3, 2007.

[98] This project is described in U.S. Fish and Wildlife Service. Proposed Relocation of All American Pipeline Company's Crude Oil Pipeline," Formal Consultation # 1-8-99-F-20, with the US Army Corps of Engineers. January 15, 1999.. These project-specific cost estimates are from a written communication from John Storrer, Storrer Environmental Services, May 17, 2007.

[99] Some query responses from pipeline operators are expected, but have not yet been provided.

[100] Personal communication with Kathy Battles, Office of the California State Fire Marshall, May 3, 2007.

[101] Written communication from John Storrer, Storrer Environmental Services, May 17, 2007.

[102] http://www.countyofsb.org/energy/projects/Arco-DP.asp accessed May 18, 2007.

[103] http://www.countyofsb.org/energy/projects/venocoFullField.asp accessed May 18, 2007

156. Total predicted post-designation costs for oil and gas pipeline construction and maintenance for the planned activities in SB-7 (Winchester / Bell Canyon) are $145,000, undiscounted. When three percent and seven percent discount rates are applied, these estimates are $137,000, and $129,000, respectively. These costs include estimates for anticipated conservation measures as well as estimated administrative costs.

## 6.5 SOURCES OF UNCERTAINTY

157. There are three primary sources of uncertainty that may affect the estimates generated in this chapter. These uncertainties concern predictions of planned projects and potential variability in the cost estimates.

- The prediction of post-designation projects may understate the actual number of post-designation projects because there is no centralized source where such post-designation plans are registered. Though the research concerning potential projects was thorough, omissions are possible. To the extent that any project(s) have been omitted, this estimate will understate the actual post-designation costs.
- The costs of mitigation efforts are an average of the best available data. In reality, costs will vary with the location and time specific measures that must be undertaken in each individual project. The estimates provided are generated from an average of several data points, however these data points may not represent the complete range of possible conservation activities.
- If the post-designation pipeline projects occur later than this analysis anticipates, or if the pipeline installation project by Venoco in SB-7 is not approved, then the estimates of post-designation costs will overstate the true costs.

# CHAPTER 7 | POTENTIAL ECONOMIC IMPACTS TO DEVELOPMENT

158. This chapter describes how conservation efforts to protect the tidewater goby and its habitat may affect land, housing, and commercial development in the study area. The tidewater goby recovery plan states "coastal development projects that modify or destroy coastal brackish-water habitat are the major factor adversely affecting the Tidewater goby."[104] Owners of parcels containing a federally-listed species, or designated as critical habitat for a listed species, may face certain land use restrictions that preclude, restrict, delay, or increase the cost of development on some or all of the parcel. Such outcomes may reduce the value of the property. Specifically, this chapter focuses on the economic impacts resulting from tidewater goby conservation efforts and any coextensive land use regulations affecting residential and commercial real estate within the study area. For example, if development were to be restricted due to limitations on the area available for development, protections related to potential non-point source pollution from construction efforts, or restrictions on the use of groundwater limiting the amount of development allowed in an area, economic impacts could result.

159. The 44 proposed critical habitat units are located along the coast of California from Los Angeles up to the Oregon border. As the actual critical habitat units comprise primarily lagoons and estuaries, it is unlikely that development exists, or will be proposed or permitted directly within these areas. Accordingly, this analysis focuses on potential development projects adjacent to the proposed critical habitat, within the defined study area of 200 meters around each unit. The level of existing development and development pressure in the study area varies greatly depending on location. Some of the proposed critical habitat units are in remote rural areas of the California coast already set aside from development (i.e., San Luis Obispo County units SLO-1 through SLO-6) while others overlap densely developed cities (i.e., SLO-9 in the City of Santa Barbara).

160. There have been no pre-designation consultations or impacts to private development due to the tidewater goby or its habitat. In fact, the U.S. Army Corps of Engineers (USACE) has a history of permitting flood control projects within/adjacent to tidewater goby habitat with the goal of protecting development (e.g., Lake Earl sandbar breaching 10-year permit). As such, no measurable reduction in new development is expected due to tidewater goby conservation efforts. Based on discussions with county planners and personnel with the California Coastal Commission (CCC), expected future development in these areas is limited.

[104] U.S. Fish and Wildlife Service. 2005. Recovery Plan for the Tidewater Goby (*Eucyclogobius newberryi*). U.S. Fish and Wildlife Service, Portland, Oregon. vi + 199 pp. Also, U.S. Fish and Wildlife Service, Revised Critical Habitat Designation for the Tidewater Goby Proposed Rule, November 28, 2006. 71 FR 68925.

**Tidewater Goby Study Area for Development Activity**

Because most of the proposed critical habitat units are small and the units are primarily lagoons, estuaries, or backwater marshes, few economic activities take place within the habitat. As a result, development activities that may threaten the tidewater goby and its habitat are likely to occur upstream or upgradient from the proposed critical habitat units. As discussed in Chapter 1, for purposes of the economic analysis, the Service has determined the appropriate study area for development activity includes an area 200 meters around the proposed critical habitat unit.[1]

[1] Email communications from Service, April 23 and April 25, 2007.

161. The first section of this chapter provides baseline information on development in the study area, including an overview of State and local laws regulating development. Next, the chapter provides a discussion of the potential impacts to development resulting from tidewater goby conservation efforts. The third section describes the methodology utilized to project the potential for future development activity. Fourth, this chapter provides a qualitative discussion of the likelihood of development activity in the study area, Finally, the chapter provides a discussion of the sources of uncertainty underlying the analysis.

## 7.1 OVERVIEW OF DEVELOPMENT ACTIVITY

162. The study area falls primarily within the coastal zone defined under the California Coastal Act (the Coastal Act), as discussed below. In general, development in the coastal zone must meet stringent regulatory requirements defined under the California Environmental Quality Act (CEQA) and the Coastal Act. These two laws are discussed in greater detail below.

163. CEQA is a California State statute requiring State and local agencies ("lead agencies") to identify potentially significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. The lead agencies must prepare an Environmental Impact Report (EIR) if the project may produce certain types of environmental and ecological impacts, including habitat degradation, or impacts to wildlife populations. Projects without a mandatory finding of significance and in which the lead agency finds no significant impacts may be approved by a lead agency through a "negative declaration." Alternatively, a lead agency may offer project plans redesigned to account for significant impacts in what is known as a "mitigated negative declaration."[105]

164. Minor development projects, including alterations or replacements of existing facilities and structures, and developments smaller than 2,500 square feet are eligible for a categorical CEQA exemption. Potential CEQA-associated impacts are therefore limited to large development projects. It is possible that large development projects potentially affecting the tidewater goby or its habitat may experience additional requirements in the

[105] California Natural Resources Code, Section 15065(a).

preparation of an EIR due to the consideration of sensitive species and habitat. This analysis did not identify any large developments expected to occur within the study area in the 20-year timeframe of the analysis.

165. The Coastal Act established the California Coastal Commission (CCC), which oversees development in the coastal zone.[106] In addition, the Coastal Act requires that each of the counties and cities in the coastal zone develop a Local Coastal Program (LCP), which, once approved by the CCC, regulates all development in the coastal regions of the State. LCPs establish a standard of review. A county or city with an LCP is responsible for reviewing most development permits for proposed coastal projects; counties or cities without LCPs defer applications directly to the CCC. Projects that require Federal permitting (e.g., a USACE 404 permit) are permitted directly though the CCC, as opposed to a local government. Finally, the CCC has primary authority over any development on tidelands, submerged lands, or public trust lands.[107]

**Coastal Commission Standards**

The Commission carries out Coast Act policies, which seek to:

- Protect and expand public shoreline access and recreational opportunities
- Protect and restore sensitive habitats and habitat for rare and endangered species
- Protect farmlands, natural landforms, commercial fisheries, and archeological resources
- Protect scenic landscapes and views of the sea
- Establish stable urban-rural boundaries and guide new development into areas with adequate service.

Source: California Coastal Commission, "California Coastal Commission: Why it Exists and What it Does," at http://www.coastal.ca.gov/publiced/Comm_Brochure.pdf accessed on May 28, 2007.

166. According to the Coastal Act, any development that involves the placement of any solid material or structure, a change in land use density or intensity (including subdivision), a change in the intensity of water use or access to water, or the removal of major vegetation requires a coastal permit from either the county or city government with an approved LCP, or from the CCC. Development projects exempt from permit review include repairs and improvements to single-family homes, replacement of structures destroyed by natural disasters, and certain temporary events in the coastal zone.[108] The CCC may place

[106] According to the CCC, the coastal zone varies from a few blocks in urban areas to several miles in less developed regions. See http://www.coasta.ca.gov/whoweare.html for further information. Also, See brochure titled "California Coastal Commission: Why it Exists and What it Does," accessed at http://www.coastal.ca.gov/publiced/Comm_Brochure.pdf on May 28, 2007.

[107] Ibid.

[108] Ibid.

"conditions on concurrence" for approval of a project. That is, it may agree that a project may proceed with certain stipulations, for example implementation of tidewater goby conservation efforts.

## 7.2 DISCUSSION OF POTENTIAL IMPACTS TO DEVELOPMENT ACTIVITY

167. While there has been no section 7 consultation or habitat conservation planning activity related to development projects, development was identified as a threat in the tidewater goby recovery plan. New development activities have the potential to impact the tidewater goby and its habitat in several ways:

- Increased pressure to artificially breach sandbars and undertake additional flood control efforts (e.g., channelization);
- Runoff/sedimentation from new construction activities;
- Water flow alterations from increased groundwater withdrawals for water supply; and,
- Increased risk of sewage/septic system issues.

Note that three of these threats, flood control efforts, groundwater withdrawals, and sewage systems, are addressed in Chapter 2.

168. Discussion with CCC and county planning departments indicates that the designation of tidewater goby critical habitat has the potential to raise awareness about the sensitive nature of these areas, but that the current regulations already require certain actions which effectively protect the tidewater goby and its habitat; thus, additional tidewater goby conservation efforts are unlikely.[109] While some of the required actions, such as protecting water quality, are coextensive with tidewater goby conservation efforts, some of the potential factors limiting development in these areas are unrelated to tidewater goby, such as:[110]

- Steep slopes;
- Protection of viewsheds; and,
- The necessity for development to occur where services are available.

### 7.2.1 PRE-DESIGNATION IMPACTS

169. In the study area for one of the proposed critical habitat units, DN-1 (Lake Earl/Lake Tolowa), the Pacific Shores Homeowners Association has proposed residential development. Pacific Shores is a 1,535 lot subdivision, consisting largely of dunes and wetlands, which was subdivided and sold to individual buyers in the 1960s but never

[109] Personal communication with Steve Monowicz, California Coastal Commission, May 8, 2007; Kristin Drumm, Marin County Planning Department, May 9, 2007; Tom Hofweber, Humboldt County Planning Division, May 8, 2007; Rick Miller, Mendocino County Planning Department, May 4, 2007.

[110] Ibid.

developed. According to the CCC, the regulatory agency with permitting authority in this area, development is not likely to be approved for multiple reasons unrelated to the tidewater goby. The primary reason is that, due to the low elevation and high groundwater conditions, onsite sewage treatment would not be allowed, and to implement a centralized system is not economically feasible.[111]

### 7.2.2 EXPECTED POST-DESIGNATION IMPACTS TO DEVELOPMENT ACTIVITY

170. In the absence of historical impacts on development projects or guidance from the Service as to the likelihood of impacts to development activity or expected tidewater goby conservation efforts that might be required, the analysis does not quantify post-designation impacts to development. Rather, the analysis provides information regarding the potential likelihood of development of each proposed critical habitat unit.

## 7.3 METHODOLOGY

171. The evaluation of the potential for development in the tidewater goby study area follows these steps:

1. ***Identify developable lands.*** Based on available GIS information, calculate the acreage of vacant land included in the study area that is zoned for development.[112] This was done by identifying the acreage of dry land under private or unknown ownership within the study area, and refining this estimated acreage based on available information regarding zoning and vacant parcels.
2. ***Describe the regulation of development in the coastal areas of California included in the study area.*** This involved contacting State and local agencies and reviewing relevant regulations.
3. ***Contact each county or city containing potential critical habitat and consult relevant zoning information to determine:***
   - How counties permit development of coastal areas;
   - The current status of development in the study area; and,
   - The likelihood and type of future development in these areas.
4. ***Classify each proposed critical habitat unit study area as having low, medium, or high development potential according to the following characteristics:***
   - ***High:*** Areas of high development potential are subject to existing development plans which could facilitate development. Specific proposals exist for

[111] Personal communication with Jim Baskin, California Coastal Commission, May 2, 2007.

[112] The calculation of developable lands acreage is subject to a variety of limitations. For areas where county parcel data indicating vacant lands and zoning were not available, lands identified as private or unknown ownership were included in the estimated developable acreage for the study area. Where possible, these estimates were refined based on personal communications with planning departments.

development projects within or adjacent to these areas that will likely require consideration of tidewater goby or its habitat.

- ***Medium:*** Medium development potential describes areas in which zoning and geography are conducive to future development, but for which no specific development plans or proposals currently exist. While development of these areas may be affected by tidewater goby conservation efforts in the future, information is not available to determine whether and how projects may be affected.
- ***Low***: Areas characterized as having low development potential are not amenable to development (e.g., area geology may not support construction of infrastructure); are protected in some way from development (e.g., as part of a State park or National Wildlife Refuge); are already built out; or are otherwise not attractive to developers according to county or city planning departments.

## 7.4 POST-DESIGNATION IMPACTS TO DEVELOPMENT ACTIVITY

172. As noted above, the analysis does not quantify post-designation impacts to development. Rather, Exhibit 7-1 discusses the development potential of the study area associated with each proposed critical habitat unit, including reference to discussions with local and county planners. While a number of these units are classified as medium potential for development, there are no large scale planned developments expected within the study area. Many of the units are primarily or entirely State park lands or beaches.

## EXHIBIT 7-1 LIKELIHOOD OF FUTURE DEVELOPMENT WITHIN STUDY AREA

| COUNTY | UNIT | NAME | LIKELIHOOD OF FUTURE DEVELOPMENT | ACRES OF POTENTIALLY DEVELOPABLE LAND IN STUDY AREA (1) | NOTES |
|---|---|---|---|---|---|
| Del Norte | DN-1 | Lake Earl/Lake Tolowa | Low | 274.3 | Much of the area around Lake Earl has been purchased by CDFG with the for the purpose of setting it aside for wildlife habitat. Most private land in the study area is zoned for agricultural use or already developed. The county is highly unlikely to approve zoning changes. Also, development is unlikely due to sewage treatment and potable water issues. A few small areas set back from the lake, in the Crescent City planning area, could be proposed for development in the next 20 years.[2] |
| Humboldt | HUM-1 | Stone Lagoon | Low | 0.3 | All zoned open space or agriculture - no development is anticipated.[3] |
| | HUM-2 | Big Lagoon | Medium | - | This area is primarily zoned for open space; however, Big Lagoon Rancheria has a planned development of a tribal casino in this study area (outside of the actual proposed critical habitat unit).[4] There is a proposal to allow the tribe to develop the casino off-reservation at an alternative location (in Barstow) in order to protect this ecologically sensitive area. The future of this project is highly uncertain.[5] |
| | HUM-3 | Humboldt Bay | Medium | 4.7 | This area could see some additional small scale residential development; however, there are no current plans for development. [4] |
| | HUM-4 | Eel River | Low | - | This area is zoned agriculture; no development is anticipated. [3] |
| Mendocino | MEN-1 | Ten Mile River | Low | - | This area is zoned rangeland or forestland, which requires a 160 acre minimum lot size for development and subdividing is not allowed. Thus, the likelihood of development is low.[6] |
| | MEN-2 | Virgin Creek | Medium | 7.2 | There is some potential for residential development east of Highway 1, outside of the coastal zone, in an area zoned rural residential development. Nothing is currently planned. [6] |
| | MEN-3 | Pudding Creek | Medium | 71.1 | There is some potential for residential development east of Highway 1, outside of the coastal zone, in an area zoned rural residential development. Nothing is currently planned. [6] |
| | MEN-4 | Davis Lake and Manchester State Park | Low | - | This area is all State park lands – no development anticipated. [6] |
| Sonoma | SON-1 | Salmon Creek | Low | 14.7 | This area includes an existing residential neighborhood on the south side of the creek near its mouth onto the Pacific ocean. It is possible there may be a few 'still to be developed' single family residential lots in that development.[7] |

| COUNTY | UNIT | NAME | LIKELIHOOD OF FUTURE DEVELOPMENT | ACRES OF POTENTIALLY DEVELOPABLE LAND IN STUDY AREA [(1)] | NOTES |
|---|---|---|---|---|---|
| Marin | MAR-1 | Estero Americano | Low | - | This area is zoned for agricultural production (e.g., zoning where only agricultural uses are encouraged); thus, development potential is limited.[8] |
| | MAR-2 | Estero de San Antonio | Low | - | This area is zoned for agricultural production (e.g., zoning where only agricultural uses are encouraged); thus, development potential is limited.[8] |
| | MAR-3 | Lagunitas (Papermill) Creek | Low | 363.0 | This area has some potential for additional development, especially along the west side of Tomales Bay (Inverness Park) and along the southern part towards Point Reyes Station. However, most of these vacant parcels likely have not been already built because of other development constraints including: steep slope, septic systems not being appropriate (in this area septic systems are required), and potable water issues. Based on these factors and the general plan focus on developing areas where services already exist, development likelihood is low.[8] |
| | MAR-4 | Rodeo Lagoon | Low | - | This area is in the Golden Gate National Recreation Area, owned by the National Park Service. Thus, no development is anticipated. [9] |
| San Mateo | SM-1 | San Gregorio Creek | Low | 102.4 | Most of this unit is within San Gregorio State Beach. There are no planned projects on the periphery, and any development would likely be limited to single family homes or agricultural uses (i.e., barns). Thus, development potential is limited.[10] |
| | SM-2 | Pescadero-Butano Creek | Low | 35.7 | Most of this unit is within Pescadero State Beach. There are no planned projects on the periphery, and any development would likely be limited to single family homes or agricultural uses (i.e., barns). Thus, development potential is limited. [10] |
| | SM-3 | Bean Hollow Creek (Arroyo de Los Frijoles) | Medium | 42.6 | Portions of this unit are within Bean Hollow State Beach. Most of the private lands in this area have been developed since the 1970s/80s. There are no planned projects in this area, and any development would likely be limited to single family homes or agricultural uses (i.e., barns).[10] |
| Santa Cruz | SC-1 | Laguna Creek | Low | 31.9 | Study area is primarily zoned conservation and agriculture lands.[1] |
| | SC-2 | Baldwin Creek | Low | 9.7 | Study area is entirely zoned as park land. [1] |
| | SC-3 | Corcoran Lagoon | Medium | 120.7 | Study area includes lands zoned for residential and commercial development, but may be already largely developed.[11] |

| COUNTY | UNIT | NAME | LIKELIHOOD OF FUTURE DEVELOPMENT | ACRES OF POTENTIALLY DEVELOPABLE LAND IN STUDY AREA (1) | NOTES |
|---|---|---|---|---|---|
| | SC-4 | Aptos Creek | Medium | 39.0 | Study area includes lands zoned for residential and commercial development, but may be already largely developed. [11] |
| | SC-5 | Pajaro River | Low | 187.7 | Study area includes primarily agriculture and conservation zoned lands, with only very small areas zoned for rural or residential development. [1] |
| Monterey | MN-1 | Bennett Slough | Low | - | All of this land is zoned for public, recreational or agricultural use. Thus, no development is anticipated.[1] |
| San Luis Obispo | SLO-1 | Arroyo del Corral | Low | - | These units are all State park lands used solely for passive recreational use. Thus, no development is anticipated.[12] In the last 10 years, all coastal lands in the northern portions of SLO county have been purchased by the State Parks departments or donated by the Hearst corporation; these lands have been converted into open public space.[13] |
| | SLO-2 | Oak Knoll Creek (Arroyo Laguna) | Low | - | |
| | SLO-3 | Little Pico Creek | Low | - | |
| | SLO-4 | San Simeon Creek | Low | - | |
| | SLO-5 | Villa Creek | Low | - | |
| | SLO-6 | San Geronimo Creek | Low | - | |
| | SLO-7 | Pismo Creek | Medium | 74.9 | This unit falls in the city of Pismo Beach. There may be some limited potential for development of single family homes in the study area.[14] |
| Santa Barbara | SB-1 | Santa Maria River | Low | - | This river forms the border between San Luis Obispo County and Santa Barbara County. This area is entirely zoned for agriculture and beach/sand dunes/public use. Thus, development potential is assumed to be low.[1, 15] |
| | SB-2 | Canada de las Agujas | Low | 28.7 | This unit falls in the Hollister Ranch subdivision, where each parcel is a minimum of 100 acres and the land is all zoned Agriculture-2. The proposed critical habitat units all fall south of the railroad, which is owned by the ranch in common. Potential development could occur on privately owned lots north of the railroad, but this zoning designation limits potential development to three units per parcel.[16] Only very small portions of two parcels are included in the study area.[1] |

| COUNTY | UNIT | NAME | LIKELIHOOD OF FUTURE DEVELOPMENT | ACRES OF POTENTIALLY DEVELOPABLE LAND IN STUDY AREA (1) | NOTES |
|---|---|---|---|---|---|
| | SB-3 | Canada de Santa Anita | Low | 43.9 | This unit falls in the Hollister Ranch subdivision, where each parcel is a minimum of 100 acres and the land is all zoned Agriculture-2. The proposed critical habitat units all fall south of the railroad, which is owned by the ranch in common. Potential development could occur on privately owned lots north of the railroad, but this zoning designation limits potential development to three units per parcel. [16] Only very small portions of two parcels are included in the study area. [1] |
| | SB-4 | Canada de Alegria | Low | 40.1 | This unit falls in the Hollister Ranch subdivision, where each parcel is a minimum of 100 acres and the land is all zoned Agriculture-2. The proposed critical habitat units all fall south of the railroad, which is owned by the ranch in common. Potential development could occur on privately owned lots north of the railroad within the study area, but this zoning designation limits potential development to three units per parcel. [16] Portions of two parcels are included in the study area. [1] |
| | SB-5 | Canada de Agua Caliente | Low | 37.1 | This unit falls in the Hollister Ranch subdivision, where each parcel is a minimum of 100 acres and the land is all zoned Agriculture-2. The proposed critical habitat units all fall south of the railroad, which is owned by the ranch in common. Potential development could occur on privately owned lots north of the railroad, but this zoning designation limits potential development to three units per parcel. [16] Portions of two parcels are included in the study area; information on whether those parcels are vacant is unavailable. [1] |
| | SB-6 | Gaviota Creek | Low | - | This unit falls entirely within Gaviota State Park. Thus, development is not anticipated. [1] |
| | SB-7 | Winchester/ Bell Canyon | Medium | 61.2 | Some land to the east of the proposed critical habitat, within the study area, is zoned for commercial development. [1] |
| | SB-8 | Arroyo Burro | Medium | 53.1 | Some land to the east of the proposed critical habitat, within the study area, is zoned for residential development. [1] |
| | SB-9 | Mission Creek— Laguna Channel | Medium | 25.7 | Some land within the study area is zoned for residential development. [1] |
| Ventura | VEN-1 | Ventura River | Low | 56.2 | The portion of the study area south of the highway is all public land. The portion of the study area north of Highway 101 consists of an existing RV park and other lands in the floodway, which therefore have limited development potential.[17] |

| COUNTY | UNIT | NAME | LIKELIHOOD OF FUTURE DEVELOPMENT | ACRES OF POTENTIALLY DEVELOPABLE LAND IN STUDY AREA (1) | NOTES |
|---|---|---|---|---|---|
| | VEN-2 | Santa Clara River | Medium | 142.4 | Portions of the study area are privately owned and portions are part of McGrath State Beach.[18] Portions of the study area are zoned as 'Urban' under the Ventura general plan classifications.[1] The Nature Conservancy is planning to purchase lands in this area over the next seven years. In Ventura County there is the SOAR initiative (expires in 2023) which requires a vote of the people to change zoning from agricultural zoning, making it more difficult to develop the portions of the study area that are zoned for agriculture.[19] |
| | VEN-3 | J Street Drain—Ormond Lagoon | Low | 93.9 | Portions of the study area contain the HALACO superfund site, lands owned by the Nature Conservancy, and lands owned by the State.[20] |
| Los Angeles | LA-1 | Malibu Lagoon | Low | - | This area is essentially already built out. While there are a few parcels still undeveloped and zoned for single family residences, development potential for the vacant parcels is low because the specific parcels have access problems.[21] |
| | LA-2 | Topanga Creek | Low | - | Most of this unit falls in Topanga State Beach. Any private land in this unit is likely already developed.[21] |

Notes:
(1) Based on IEc GIS analysis of available zoning data. For areas where county parcel data indicating vacant lands and zoning were not available, lands identified as private or unknown ownership were included in the estimated developable acreage for the study area. Where possible, these estimates have been refined based on personal communications with planning departments.
(2) Personal communication with Ernie Perry and Heidi Kunstal, Del Norte County Planning Division, April 9 &12, 2007.
(3) IEc GIS analysis of county zoning, confirmed by Tom Hofweber, Humboldt County Planning Division, May 8, 2007.
(4) Personal communication with Tom Hofweber, Humboldt County Planning Division, May 8, 2007.
(5) Email communication from Deputy Field Supervisor, Service Arcata Field Office, May 10, 2007.
(6) Personal communication with Rick Miller, Mendocino County Planning Division, May 4, 2007.
(7) Email communication from Ken Ellison, Supervising Planner, County of Sonoma, May 5, 2007.
(8) Personal communication with Kristen Drumm, Marin County Planning Division, May 9, 2007.
(9) Personal communication with Darren Fong, National Park Service, May 15, 2007.
(10) Personal communication with Dave Holbrook, Supervising Planner, San Mateo County, May 9, 2007, and email communication from Dave Holbrook May 15, 2007.
(11) IEc GIS analysis of county level zoning data and satellite imagery.

| COUNTY | UNIT | NAME | LIKELIHOOD OF FUTURE DEVELOPMENT | ACRES OF POTENTIALLY DEVELOPABLE LAND IN STUDY AREA [1] | NOTES |
|---|---|---|---|---|---|

(12) Personal communication with Nick Franco, Superintendent San Luis Obispo Coast District, California Department of State Parks and Recreation, May 10, 2007.
(13) Personal communication with Mark Hutchinson, Environmental Director, San Luis Obispo County, April 27, 2007.
(14) Personal communication with Mike Gruver, City of Pismo Beach Planning Department, May 2, 2007.
(15) Personal communication from Matt Janssen, San Luis Obispo County Planning Department, May 11, 2007
(16) Personal communication with Anne Coates, Hollister Ranch Homeowners Association, May 1, 2007.
(17) Personal communication with Marc Landgraf, Trust for Public Land, May 25, 2007.
(18) Proposed Rule 71 FR 68935.
(19) Personal communication with E.J. Remson, TNC, May 21, 2007.
(20) Email communication from Sandi Matsumoto, TNC, May 29, 2007.
(21) Personal communication with Dave Crawford, City of Malibu Planning Department, May 7, 2007 also review of information on City of Malibu interactive GIS website at http://maps.digitalmapcentral.com/CommView/Malibu_cv/index.html, accessed on May 7, 2007.

## 7.5 SOURCES OF UNCERTAINTY

173. There are several important caveats to the analysis of development impacts. These include:

- This analysis forecasts development potential of the critical habitat area based on current zoning. It therefore does not account for possible re-zoning within the region to accommodate greater levels of development. However, discussion with CCC and various planning departments indicate that it may be difficult to change zoning designations in much of the study area.
- This analysis defines "developable" land as currently undeveloped lands that are amenable to future development as determined by available zoning or land use planning information. The analysis uses the best readily available GIS information to calculate the acreage of developable land which was then refined based on other available information. These estimates may over- or understate the actual lands available for development. For example, the estimated acreage of developable lands may be overstated because these areas may be less suited to development due to specific characteristics of individual parcels that have not been considered for purposes of this analysis (i.e., steep slope, access issues).

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# APPENDIX A | INCREMENTAL ANALYSIS OF CRITICAL HABITAT FOR THE TIDEWATER GOBY

1. This appendix estimates the potential incremental impacts of critical habitat designation for the tidewater goby. It does so by attempting to isolate those direct and indirect impacts discussed in this report that are expected to be triggered specifically by the critical habitat designation. That is, this appendix addresses those incremental conservation efforts and associated impacts that would not be expected to occur absent the designation of critical habitat for the species.

2. As described in detail in Section A.3, the incremental impacts of critical habitat designation for the tidewater goby are forecast to be $206,000 (present value at a three percent discount rate). These incremental impacts are associated with additional administrative costs of consultation associated with the designation. While this analysis projects additional administrative costs, no additional project modification costs are expected to result from this designation. All impacts quantified in Chapters 2 through 6 of this report, other than the incremental portion of administrative costs, are forecast to occur regardless of critical habitat designation for the tidewater goby.

## A.1 BACKGROUND

3. The U.S. Office of Management and Budget's (OMB) guidelines for conducting economic analysis of regulations direct Federal agencies to measure the costs of a regulatory action against a baseline, which it defines as the "best assessment of the way the world would look absent the proposed action."[113] In other words, the baseline includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat. Impacts that are incremental to that baseline (i.e., occurring over and above existing constraints) are attributable to the proposed regulation. Significant debate has occurred regarding whether assessing the impacts of the Service's proposed regulations using this baseline approach is appropriate in the context of critical habitat designations.

4. In 2001, the U.S. Tenth Circuit Court of Appeals instructed the Service to conduct a full analysis of all of the economic impacts of proposed critical habitat designation (CHD), regardless of whether those impacts are attributable coextensively to other causes.[114] Specifically, the court stated:

[113] OMB, "Circular A-4," September 17, 2003.

[114] *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

> "The statutory language is plain in requiring some kind of consideration of economic impact in the CHD phase. Although 50 C.F.R. 402.02 is not at issue here, the regulation's definition of the jeopardy standard as fully encompassing the adverse modification standard renders any purported economic analysis done utilizing the baseline approach virtually meaningless. We are compelled by the canons of statutory interpretation to give some effect to the congressional directive that economic impacts be considered at the time of critical habitat designation…. Because economic analysis done using the FWS's baseline model is rendered essentially without meaning by 50 C.F.R. § 402.02, we conclude Congress intended that the FWS conduct a full analysis of all of the economic impacts of a critical habitat designation, regardless of whether those impacts are attributable co-extensively to other causes. Thus, we hold the baseline approach to economic analysis is not in accord with the language or intent of the ESA."[115]

5. Since that decision, however, courts in other cases have held that an incremental analysis of impacts stemming solely from the critical habitat rulemaking is proper.[116] For example, In the March 2006 court order ruling that the August 2004 critical habitat rule for the Peirson's milk-vetch was arbitrary and capricious, the United States District Court for the Northern District of California stated,

> "The Court is not persuaded by the reasoning of *New Mexico Cattle Growers*, and instead agrees with the reasoning and holding of *Cape Hatteras Access Preservation Alliance v. U.S. Dep't of the Interior*, 344 F. Supp 2d 108 (D.D.C. 2004). That case also involved a challenge to the Service's baseline approach and the court held that the baseline approach was both consistent with the language and purpose of the ESA and that it was a reasonable method for assessing the actual costs of a particular critical habitat designation *Id* at 130. 'To find the true cost of a designation, the world with the designation must be compared to the world without it.'"[117]

6. In order to address the divergent opinions of the courts and provide the most complete information to decision-makers, this economic analysis reports both: a) the fully co-extensive impacts associated with the proposed critical habitat designation (in Chapters 2 through 6 of the report); and b) the subset of these impacts that are identified as incremental to the rulemaking, precipitated specifically by the designation of critical habitat for the species (in this appendix).

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[115] *New Mexico Cattle Growers Assn v. United States Fish and Wildlife Service*, 248 F.3d 1277 (10th Cir. 2001).

[116] *Cape Hatteras Access Preservation Alliance v. Department of Interior*, 344 F. Supp. 2d 108 (D.D.C.); CBD v. BLM, 422 F. Supp/. 2d 1115 (N.D. Cal. 2006).

[117] Center for Biological Diversity et al., Plaintiffs, v. Bureau of Land Management et al., Defendants and American Sand Association, et al., Defendant Intervenors. Order re: Cross Motions for Summary Judgment. Case 3:03-cv-02509 Document 174 Filed 03/14/2006. Pages 44-45.

7. Until a new regulation is adopted to define "destruction or adverse modification," incremental effects of critical habitat designation are determined using the Service's December 9, 2004 interim guidance on "Application of the 'Destruction or Adverse Modification' Standard Under Section 7(a)(2) of the Endangered Species Act" and information from the Service regarding what potential consultations and project modifications would be imposed as a result of critical habitat designation over and above those associated with the listing.[118] The following section describes the methods employed to identify incremental impacts anticipated to result from the designation of critical habitat.

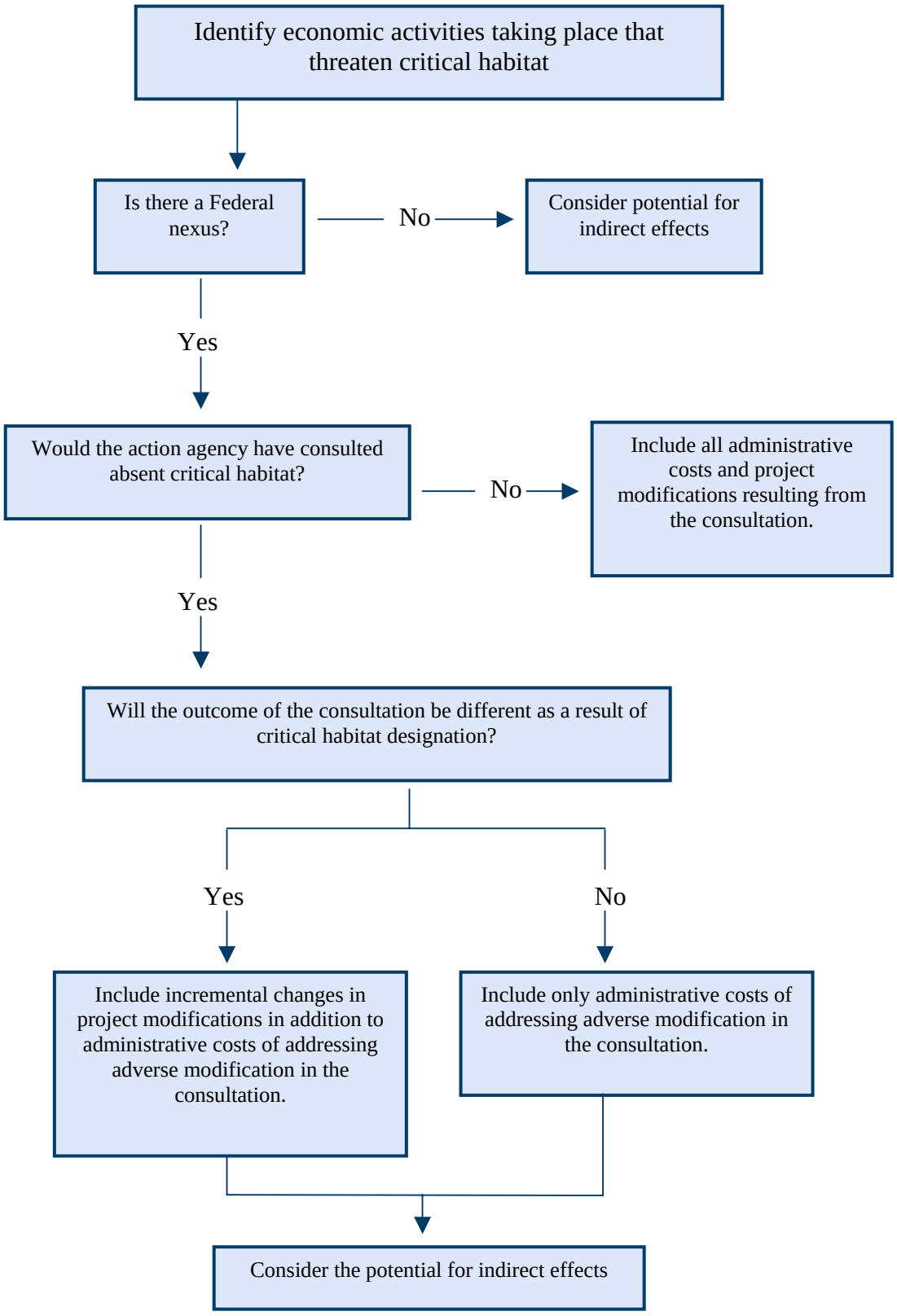
## A.2 FRAMEWORK FOR THE INCREMENTAL ANALYSIS

8. This section provides a description of the methodology used to determine potential economic impacts stemming from the proposed designation of critical habitat for the tidewater goby. The analysis evaluates impacts in a "with critical habitat designation" versus a "without critical habitat designation" framework, measuring the net change in economic activity. The "without critical habitat designation" scenario, which represents the baseline for this incremental analysis, includes all protection already afforded the species under State, local, and Federal laws, existing conservation plans, and the listing of the species under the Act. The focus of this incremental analysis is to determine the impacts on land uses and activities from the designation of critical habitat that are above and beyond those impacts due to existing required or voluntary conservation efforts being undertaken due to other Federal, State, and local regulations or guidelines.

9. Exhibit A-1 depicts the decision analysis regarding whether an impact should be considered incremental. The following sections describe this decision tree in detail.

[118] Director, U.S. Fish and Wildlife Service, Memorandum to Regional Directors and Manager of the California-Nevada Operations Office, Subject: Application of the "Destruction or Adverse Modification" Standard under Section 7(a)(2) of the Endangered Species Act, dated December 9, 2004.

**EXHIBIT A-1 IDENTIFYING INCREMENTAL IMPACTS OF CRITICAL HABITAT DESIGNATION**



### A.2.1 DEFINING THE BASELINE

10. The baseline for this incremental analysis is the existing state of regulation, prior to the designation of critical habitat, which provides protection to the species under the Act, as well as under other Federal, State and local laws. 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. The administrative costs of consultations under the jeopardy standard, along with the impacts of project modifications resulting from these consultations, are considered baseline impacts.

11. In addition to impacts associated with section 7 of the Act, the baseline includes impacts of compliance with other sections of the Act, as well as other Federal, State, and local laws that protect the species in the absence of critical habitat designation. If the Clean Water Act, for example, protects wetland habitat for the species, relevant impacts of Clean Water Act compliance are considered part of the baseline.

12. The baseline represents the best estimate of the "world without critical habitat," and therefore considers a wide range of additional factors beyond the compliance costs of regulations that provide protection to the listed species. As recommended by OMB, the baseline incorporates, as appropriate, trends in market conditions, implementation of other regulations and policies by the Service and other government entities, and trends in other factors that have the potential to affect economic costs and benefits, such as the rate of regional economic growth in potentially affected industries.

13. When critical habitat is designated, section 7 requires Federal agencies to ensure that their actions will not result in the destruction or adverse modification of critical habitat (in addition to considering whether the actions are likely to jeopardize the continued existence of the species). The added administrative costs of including consideration of critical habitat in section 7 consultations, and the additional impacts of implementing project modifications resulting from the protection of critical habitat are the direct compliance costs of designating critical habitat. These costs are not in the baseline, and are considered incremental impacts of the rulemaking.

### A.2.2 QUANTIFYING INCREMENTAL ECONOMIC IMPACTS

14. The incremental impacts of the proposed critical habitat designation are a subset of the co-extensive economic impacts quantified in Chapters 2 through 6 on this analysis. Incremental impacts may be the direct compliance costs associated with additional effort for forecast consultations, reinitiated consultations, new consultations occurring specifically because of the designation, and additional project modifications that would not have been required under the jeopardy standard. Additionally, incremental impacts may include indirect impacts resulting from reaction to the potential designation of critical habitat (e.g., developing habitat conservation plans (HCPs) specifically to avoid designation of critical habitat), triggering of additional requirements under State or local

laws intended to protect sensitive habitat, and uncertainty and perceptional effects on markets.

### Direct Impacts

15. The direct, incremental impacts of critical habitat designation stem from the consideration of the potential for destruction or adverse modification of critical habitat during section 7 consultations. The two categories of direct, incremental impacts of critical habitat designation are: 1) the administrative costs of conducting section 7 consultation; and 2) implementation of any project modifications requested by the Service through section 7 consultation to avoid, compensate for, or mitigate potential destruction or adverse modification of critical habitat.

Administrative Section 7 Consultation Costs

16. Parties involved in section 7 consultations include the Service, a Federal "action agency," and in some cases, a private entity involved in the project or land use activity. The action agency (i.e., the Federal nexus necessitating the consultation) serves as the liaison with the Service. While consultations are required for activities that involve a Federal nexus and may jeopardize the continued existence of the species regardless of whether critical habitat is designated, the designation may increase the effort for consultations in the case that the project or activity in question may adversely modify critical habitat.

17. In general, three different scenarios associated with the designation of critical habitat may trigger incremental administrative consultation costs:

    1. **Additional effort to address adverse modification in a new consultation -** New consultations taking place after critical habitat designation may require additional effort to address critical habitat issues above and beyond the listing issues. In this case, only the additional administrative effort required to consider critical habitat is considered an incremental impact of the designation.

    2. **Re-initiation of consultation to address adverse modification -** Consultations that have already been completed on a project or activity may require re-initiation to address critical habitat. In this case, the costs of re-initiating the consultation, including all associated administrative and project modification costs are considered incremental impacts of the designation.

    3. **Incremental consultation resulting entirely from critical habitat designation -** Critical habitat designation may trigger additional consultations that may not occur absent the designation (e.g., for an activity for which adverse modification may be an issue, while jeopardy is not, or consultations resulting from the new information about the potential presence of the species provided by the designation). Such consultations may, for example, be triggered in critical habitat areas that are not occupied by the species. All associated administrative and project modification costs

of incremental consultations are considered incremental impacts of the designation.

18. Typical administrative costs of consultations were estimated based on a review of consultation records and discussions with Service field offices, as illustrated in Exhibit A-2.

**EXHIBIT A-2 TYPICAL ADMINISTRATIVE CONSULTATION COSTS, 2006$**

| CONSULTATION TYPE | SERVICE | ACTION AGENCY | THIRD PARTY | BIOLOGICAL ASSESSMENT | TOTAL COST |
|---|---|---|---|---|---|
| Informal | $2,250 | $2,900 | $2,050 | $2,000 | **$9,500** |
| Formal | $5,050 | $5,750 | $3,500 | $4,800 | **$19,500** |
| Programmatic | $15,250 | $12,750 | n/a | $5,600 | **$33,600** |

Source: IEc analysis based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2006, and review of consultation records from several Service field offices across the country. Estimates reflect average hourly time required by staff. Confirmed by local Action Agencies (personal communication with Jane Hicks, USACE, March 27, 2007).
Note: Totals may not sum due to rounding.

19. The above ranges in consultation costs represent effort required for all types of consultation, including those that considered both adverse modification and jeopardy, and are therefore not representative of the incremental administrative costs of consultation triggered specifically by critical habitat designation. To estimate the fraction of the administrative costs associated with consultation the following assumptions were applied.

- The costs of an incremental consultation (one only occurring because of the designation of critical habitat) are the greatest, as all costs associated with this consultation are included.
- Re-initiation of a consultation is assumed to require approximately half the level of effort of the incremental consultation. This assumes that re-initiations are less time-consuming as the groundwork for the project has already been considered in terms of its effect on the species.
- Efficiencies exist with considering both jeopardy and adverse modification at the same time (e.g., in staff time saved for project review and report writing), and therefore incremental administrative costs of considering adverse modification in consultations that will already be required to consider jeopardy result in the least incremental effort of these three consultation categories, roughly half that of a re-initiation.

20. The cost model in Exhibit A-3 presents the estimated incremental costs of consultation for each of the three categories of consultation described above. The estimated costs

represent the midpoint of the ranges in Exhibit A-2 to account for variability regarding levels of effect of specific consultation.[119]

**EXHIBIT A-3 ESTIMATED ADMINISTRATIVE COSTS OF CONSULTATION (PER EFFORT), 2006$**

| CONSULTATION TYPE | SERVICE | FEDERAL AGENCY | THIRD PARTY | BIOLOGICAL ASSESSMENT | TOTAL WITH BIOLOGICAL ASSESSMENT |
|---|---|---|---|---|---|
| **INCREMENTAL CONSULTATION RESULTING ENTIRELY FROM CRITICAL HABITAT DESGINATION** | | | | | |
| Informal | $2,250 | $2,900 | $2,050 | $2,000 | $9,500 |
| Formal | $5,050 | $5,750 | $3,500 | $4,800 | $19,500 |
| Programmatic | $15,250 | $12,750 | n/a | $5,600 | $33,600 |
| **RE-INITIATION OF CONSULTATION TO ADDRESS ADVERSE MODIFICATION** | | | | | |
| Informal | $1,130 | $1,450 | $1,030 | $1,000 | $4,750 |
| Formal | $2,530 | $2,880 | $1,750 | $2,400 | $9,750 |
| Programmatic | $7,630 | $6,380 | n/a | $2,800 | $16,800 |
| **ADDITIONAL EFFORT TO ADDRESS ADVERSE MODIFICATION IN A NEW CONSULTATION** | | | | | |
| Informal | $563 | $725 | $513 | $500 | $2,380 |
| Formal | $1,260 | $1,440 | $875 | $1,200 | $4,880 |
| Programmatic | $3,810 | $3,190 | n/a | $1,400 | $8,400 |

Source: IEc analysis of full administrative costs is based on data from the Federal Government Schedule Rates, Office of Personnel Management, 2006, and a review of consultation records from several Service field offices across the country conducted in 2002.
Notes:
1. Estimates reflect average hourly time required by staff.

Section 7 Project Modification Impacts

21. Section 7 consultation considering critical habitat may also result in additional project modification recommendations specifically addressing potential destruction or adverse modification of critical habitat. For forecast consultations considering jeopardy and adverse modification, and for re-initiations of past consultations to consider critical habitat, economic impacts of project modifications undertaken to avoid, compensate for, or mitigate adverse modification are considered incremental impacts of critical habitat designation. For consultations that are forecast to occur specifically because of the designation (incremental consultations), impacts of all associated project modifications are assumed to be incremental impacts of the designation. This is summarized below.

[119] Absent specific information on the probability that a consultation will be closer to the low or high end of the range, presenting the midpoint effectively assumes there is an even distribution of the consultation falling at any given point on the spectrum between the low-end cost and high-end cost.

1. **Additional effort to address adverse modification in a new consultation -** Only project modifications associated solely with avoiding, compensating for, or mitigating adverse modification are considered incremental.
2. **Re-initiation of consultation to address adverse modification -** Only project modifications associated solely with avoiding, compensating for, or mitigating adverse modification are considered incremental.
3. **Incremental consultation resulting entirely from critical habitat designation -** Impacts of all project modifications are considered incremental.

### Indirect Impacts

22. The designation of critical habitat may, under certain circumstances, affect actions that do not have a Federal nexus and thus are not subject to the provisions of section 7 under the Act. Indirect impacts are those unintended changes in economic behavior that may occur outside of the Act, through other Federal, State, or local actions that are caused by the designation of critical habitat. This section identifies common types of indirect impacts that may be associated with the designation of critical habitat. This analysis does not expect any of these impacts to be associated with the critical habitat designation for the tidewater goby.

Habitat Conservation Plans

23. Under section 10(a)(1)(B) of the Act, a non-Federal entity (i.e., a landowner or local government) may develop an HCP for an endangered 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. The HCP intends to counterbalance potential harmful effects that a proposed activity may have on a species, while allowing the otherwise lawful activity to proceed. As such, the purpose of the habitat conservation planning process is to ensure that the effects of incidental take are adequately minimized and mitigated. Thus, HCPs are developed to ensure compliance with section 9 of the Act and to meet the requirements of section 10 of the Act.

24. HCPs are not required or necessarily recommended by a critical habitat designation. Some landowners, however, may voluntarily complete a HCP in response to the prospect of having their land designated as critical habitat. In this case, the effort involved in creating the HCP and undertaking associated conservation actions are considered an incremental effect of designation.

Other State and Local Laws

25. Under certain circumstances, critical habitat designation may provide new information to a community about the sensitive ecological nature of a geographic region, potentially triggering additional economic impacts under other State or local laws. In cases where these impacts would not have been triggered absent critical habitat designation, they are considered indirect, incremental impacts of the designation.

26. The California Environmental Quality Act (CEQA), for example, requires that lead agencies, public agencies responsible for project approval, consider the environmental effects of proposed projects that are considered discretionary in nature and not categorically or statutorily exempt. In some instances, critical habitat designation may trigger CEQA-related requirements. This is most likely to occur in areas where the critical habitat designation provides clearer information on the importance of particular areas as habitat for a listed species. In addition, applicants who were "categorically exempt" from preparing an Environmental Impact Report under CEQA may no longer be exempt once critical habitat is designated. In cases where the designation triggers the CEQA significance test or results in a reduction of categorically exempt activities, associated impacts are considered to be an indirect, incremental effect of the designation.

27. Similarly, under the California Coastal Act, critical habitat designation may trigger additional requirements ("conditions on concurrence") for approval of a project within the coastal zone. These would also be considered indirect, incremental effects of the designation.

Additional Indirect Impacts

28. In addition to the indirect effects of compliance with other laws or triggered by the designation, project proponents, land managers and landowners may face additional indirect impacts, including the following:

- **Time Delays -** Both public and private entities may experience incremental time delays for projects and other activities due to requirements associated with the need to reinitiate the Section 7 consultation process and/or compliance with other laws triggered by the designation. To the extent that delays result from the designation, they are considered indirect, incremental impacts of the designation.
- **Regulatory Uncertainty -** The Service conducts each section 7 consultation on a case-by-case basis and issues a biological opinion on formal consultations based on species-specific and site-specific information. As a result, government agencies and affiliated private parties who consult with the Service under section 7 may face uncertainty concerning whether project modifications will be recommended by the Service and what the nature of these modifications will be. This uncertainty may diminish as consultations are completed and additional information becomes available on the effects of critical habitat on specific activities. Where information suggests that this type of regulatory uncertainty stemming from the designation may affect a project or economic behavior, associated impacts are considered indirect, incremental impacts of the designation.
- **Stigma -** In some cases, the public may perceive that critical habitat designation may result in limitations on private property uses above and beyond those associated with anticipated project modifications and regulatory uncertainty described above. Public attitudes about the limits or restrictions that critical habitat may impose can cause real economic effects to property owners, regardless of whether such limits are actually imposed. All else equal, a property that is designated as critical habitat may have a lower market value than an identical

property that is not within the boundaries of critical habitat due to perceived limitations or restrictions. As the public becomes aware of the true regulatory burden imposed by critical habitat, the impact of the designation on property markets may decrease. To the extent that potential stigma effects on markets are probable and identifiable, these impacts are considered indirect, incremental impacts of the designation.

## A.3 INCREMENTAL ANALYSIS OF CRITICAL HABITAT FOR THE TIDEWATER GOBY

29. Exhibit A-4 summarizes the co-extensive impacts quantified in Chapters 2 through 6 of this analysis, and details whether, according to the framework described above, each impact is considered to be a baseline or incremental impact. Total baseline impacts of tidewater goby conservation are forecast to be $22.0 million (present value at a three percent discount rate), not including $32.0 million - $82.4 million in potential cost savings (present value at three percent discount rate) related to permit modifications for a wastewater treatment facility in unit VEN-2, Santa Clara River. These baseline impacts are not expected to be affected by decisions made regarding the final critical habitat designation for the tidewater goby; they are expected occur absent any critical habitat designation for the species. Total incremental impacts of critical habitat designation are forecast to be $206,000 (present value at a three percent discount rate).

30. Exhibit A-4 highlights that, aside from a subset of administrative costs of section 7 consultation, all of the economic impacts quantified in Chapters 2 through 6 of this analysis are expected to be baseline costs of the tidewater goby species associated with their listing status. In other words, although critical habitat designation for the tidewater goby is not expected to require modifications to land uses and activities above and beyond modifications that are already required under the listing, direct costs of critical habitat exist associated with the value of time and effort of conducting section 7 consultations beyond those associated with the listing of the tidewater goby. Specifically, additional administrative efforts resulting from the designation of critical habitat relate to the additional time spent in meetings, preparing letters, and developing biological opinions, as needed.

31. Exhibit A-5 distributes the estimated incremental impacts across the proposed critical habitat units for the tidewater goby. Designation of 15 of the 44 units proposed for critical habitat are expected to generate incremental impacts above and beyond those associated with the listing of the species. The designation of critical habitat Unit HUM-3, Humboldt Bay is expected to trigger the greatest incremental impacts, approximately 25 percent of total forecast incremental impacts.

## EXHIBIT A-4 INCREMENTAL IMPACTS OF CRITICAL HABITAT DESIGNATION FOR THE TIDEWATER GOBY

| DESCRIPTION OF IMPACT QUANTIFIED IN CO-EXTENSIVE ANALYSIS (CHAPTERS 2 THROUGH 6) | BASELINE IMPACT (PV, 3%) | INCREMENTAL IMPACT (PV, 3%) | REASON |
|---|---|---|---|
| **WATER MANAGEMENT (CHAPTER 2)** | | | |
| Acquisition of lands within the study area around Lake Earl by California Department of Fish and Game (CDFG). | $18.5 million | $0 | CDFG is undertaking these acquisitions in order to avoid breaching the sandbar during tidewater goby breeding periods as specified in the section 7 consultation, regardless of critical habitat designation. |
| Acquisition of lands by the Nature Conservancy and Trust for Public Lands in Ventura County. | | | The purpose of these actions is to prevent structured flood control (e.g., channelization), which threatens tidewater goby habitat. As these costs are related to ongoing land acquisitions that are already planned, these costs would be incurred regardless of critical habitat designation. |
| Modifications to flood control and sandbar breaching projects within the study area including surveying and monitoring and potential relocation of gobies. | | | Based on discussions with implementing agencies and the Service, these project modifications, derived from the section 7 consultation history for projects permitted by the U.S. Army Corps of Engineers, are not expected to change as a result of critical habitat designation. |
| Administrative costs of consultation. | $219,000 | $85,600 | Incremental administrative consultation costs are associated with two forecast re-initiations and 18 forecast new consultations (4 informal, 13 formal and one programmatic) for water management projects. |
| **Wastewater Treatment (Section 2.3)** Impacts of potentially beneficial modifications to a proposed permit for operating a wastewater treatment facility in Ventura County (Unit VEN-2). | Potential Cost Savings of $32.0 million - $82.4 million | $0 | The Service submitted comments regarding the City of Ventura's National Pollutant Discharge Elimination System (NPDES) permit asserting that the discharge simulates a more natural environment by maintaining water levels. It recommends that the discharge be continued to protect sensitive species, including tidewater goby. The Service has indicated that its comment letter would have been the same regardless of critical habitat designation.* |
| **GRAZING (CHAPTER 3)** | | | |
| Modifications to grazing practices on State lands managed by CDFG resulting in lost grazing value and costs associated with fencing. | $1.29 million | $0 | Based on discussion with CDFG, current practices undertaken to protect tidewater goby are likely to continue unchanged. As there is no federal nexus for the grazing activity occurring in the study area, incremental impacts are not expected. |
| **TRANSPORTATION (CHAPTER 4)** | | | |
| Modifications to road and bridge construction projects. | $714,000 | $0 | Surveying and monitoring were recommended in section 7 consultations in consideration of jeopardy, and are expected to be recommended even absent critical habitat designation. |

| DESCRIPTION OF IMPACT QUANTIFIED IN CO-EXTENSIVE ANALYSIS (CHAPTERS 2 THROUGH 6) | BASELINE IMPACT (PV, 3%) | INCREMENTAL IMPACT (PV, 3%) | REASON |
|---|---|---|---|
| Administrative costs of consultation. | $219,000 | $73,200 | Incremental administrative consultation costs are associated with 16 forecast new consultations are expected to require additional effort for consideration of potential impacts to critical habitat. |
| **NATURAL RESOURCE MANAGEMENT (CHAPTER 5)** | | | |
| Modifications to watershed restoration construction projects. | $804,000 | $0 | These project modifications were recommended in section 7 consultations in consideration of jeopardy, and are not expected to change as a result of critical habitat designation. |
| Development of portion of Habitat Conservation Plan (HCP) related to tidewater goby conservation by California State Parks and Recreation in SLO-7 Pismo Creek unit. | $64,300 | $0 | Based on communication from the Service, the HCP would have been undertaken regardless of the critical habitat designation.** |
| Administrative costs of consultation. | $113,000 | $37,800 | Incremental administrative consultation costs are associated with eight forecast new consultations for future watershed restorations. |
| **OIL AND GAS PIPELINES (CHAPTER 6)** | | | |
| Modifications to pipeline installation and removal projects. | $101,000 | $0 | Based on discussions with implementing agencies and the Service, these project modifications, derived from the section 7 consultation history for projects permitted by the U.S. Army Corps of Engineers, are not expected to change as a result of critical habitat designation. |
| Administrative costs of consultation. | $27,200 | $9,090 | Incremental administrative consultation costs are associated with two forecast new consultations for pipeline construction projects within the proposed critical habitat. |
| **Total Costs** | **$22.1 million** | **$206,000** | |
| Potential Cost Savings related to VEN-2 | ($32,000,000) – ($82,400,000) | **$0** | |
| **Total Costs (Potential Cost Savings)** | **($9,980,000) - ($60,300,000)** | **$206,000** | |

Notes:
* Email communication from Ventura, California, U.S. Fish and Wildlife Service Field Office, August 29, 2007. Letter from Steve Henry, Assistant Field Supervisor, Ventura Field Office, U.S. Fish and Wildlife Service to Blythe Ponek-Bacharowski, Los Angeles Regional Water Quality Control Board, dated May 30, 2007 re: Comments on the Issuance of National Pollutant Discharge Elimination System (NYPDES) Permit No. CA 0053651 Ventura Water Reclamation Facility. Available at: http://www.waterboards.ca.gov/losangeles/html/permits/tentative_order/Individual/Ventura/Ventura.html, accessed on July 16, 2007. The Regional Water Quality Board will decide on this permit on December 6, 2007 board meeting. The Board delayed its decision from an October meeting to allow additional time needed to convene a panel of experts to study endangered species issues.
** Email communication from Ventura, California, U.S. Fish and Wildlife Service Field Office, September 17, 2007.

## EXHIBIT A-5 INCREMENTAL IMPACTS OF CRITICAL HABITAT BY UNIT (PRESENT VALUE 3%)

| UNIT | NAME | WATER MANAGEMENT | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| DN-1 | Lake Earl/Lake Tolowa | $13,000 | $0 | $0 | $0 | $13,000 |
| HUM-3 | Humboldt Bay | $0 | $41,600 | $9,760 | $0 | $51,400 |
| HUM-4 | Eel River | $0 | $0 | $4,210 | $0 | $4,210 |
| MAR-1 | Estero Americano | $0 | $0 | $9,620 | $0 | $9,620 |
| MAR-3 | Lagunitas (Peppermill) Creek | $0 | $0 | $4,880 | $0 | $4,880 |
| SM-1 | San Gregario Creek | $0 | $4,880 | $0 | $0 | $4,880 |
| SC-5 | Pajaro River | $18,200 | $13,800 | $0 | $0 | $32,000 |
| SLO-7 | Pismo Creek | $4,880 | $0 | $4,470 | $0 | $9,350 |
| SB-6 | Gaviota Creek | $19,000 | $4,600 | $0 | $0 | $23,600 |
| SB-7 | Winchester/Bell Canyon | $0 | $0 | $0 | $9,090 | $9,090 |
| SB-9 | Mission Creek—Laguna Channel | $13,900 | $8,300 | $0 | $0 | $22,200 |
| VEN-1 | Ventura River | $1,720 | $0 | $0 | $0 | $1,720 |
| VEN-2 | Santa Clara River | $4,740 | $0 | $0 | $0 | $4,740 |
| VEN-3 | J Street Drain—Ormond Lagoon | $10,200 | $0 | $0 | $0 | $10,200 |
| LA-1 | Malibu Lagoon | $0 | $0 | $4,880 | $0 | $4,880 |
| **Total** | | **$85,600** | **$73,200** | **$37,800** | **$9,090** | **$206,000** |

# APPENDIX B | SMALL BUSINESS ANALYSIS AND ENERGY IMPACT ANALYSIS

1. This appendix considers the extent to which incremental impacts discussed in Appendix A could be borne by small entities and the energy industry. The analysis presented in Section B.1 is conducted pursuant to the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996. Information for this analysis was gathered from the Small Business Administration (SBA) and the U.S. Department of Agriculture (USDA) National Agricultural Statistics Service (NASS). The energy analysis in Section B.2 is conducted pursuant to Executive Order 13211.

2. The analyses of impacts to small entities and the energy industry rely on the estimated incremental impacts associated with the proposed critical habitat designation as described in Appendix A, and not the total co-extensive impacts of tidewater goby conservation quantified in Chapters 2 through 6 of this report. The incremental impacts of the rulemaking are considered most relevant for the small business and energy impacts analyses as they are expected to stem from the critical habitat designation, and are therefore not expected to occur in the case that critical habitat is not designated for the tidewater goby. The majority of the co-extensive impacts quantified in Chapters 2 through 6, however, are expected to occur regardless of the outcome of this rulemaking, and are therefore not considered in terms of their impacts on small businesses and the energy industry.

## B.1 IMPACTS TO SMALL ENTITIES

3. When a Federal agency proposes regulations, the RFA requires the agency to prepare and make available for public comment an analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small government jurisdictions).[120] No initial regulatory flexibility analysis (IRFA) is required if the head of an agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the RFA to require Federal agencies to provide a statement of the factual basis for certifying a rule. To assist in this process, this appendix provides a screening level analysis of the potential for the tidewater goby critical habitat designation to affect small entities.

[120] 5 U.S.C. 601 et seq.

### B.1.1 SCREENING ANALYSIS OF IMPACTS TO SMALL ENTITIES

4. This screening analysis is based on the estimated incremental impacts associated with the proposed rulemaking as described in Appendix A. As discussed in Appendix A, these incremental impacts are associated with additional administrative costs of section 7 consultation resulting from the designation. No additional project modification costs are expected to result from this designation. All impacts quantified in Chapters 2 through 6 of this report, other than the incremental portion of administrative costs, are forecast to occur regardless of critical habitat designation for the tidewater goby.

5. Additional administrative costs resulting from this designation are expected to be borne various agencies, including the Service, the U.S. Army Corps of Engineers, California State departments, and various California city and county governments; however, none of these qualify as small entities.[121] Del Norte County, which is the only county containing proposed critical habitat that qualifies as a small entity, is not expected to bear any incremental impacts of goby conservation from the critical habitat designation. Therefore, this analysis does not anticipate any impacts to small entities.

## B.2 POTENTIAL IMPACTS TO THE ENERGY INDUSTRY

6. 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 the supply, distribution, and use of energy."[122]

7. The Office of Management and Budget provides guidance for implementing this Executive Order, outlining nine outcomes that may constitute "a significant adverse effect" when compared with 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;

[121] Section 601(5) of the RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with a population of less than 50,000.

[122] 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.

- 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.[123]

8. The estimated incremental impacts of this designation are related solely to additional administrative efforts; as such, energy-related impacts associated with the tidewater goby critical habitat designation are not expected.

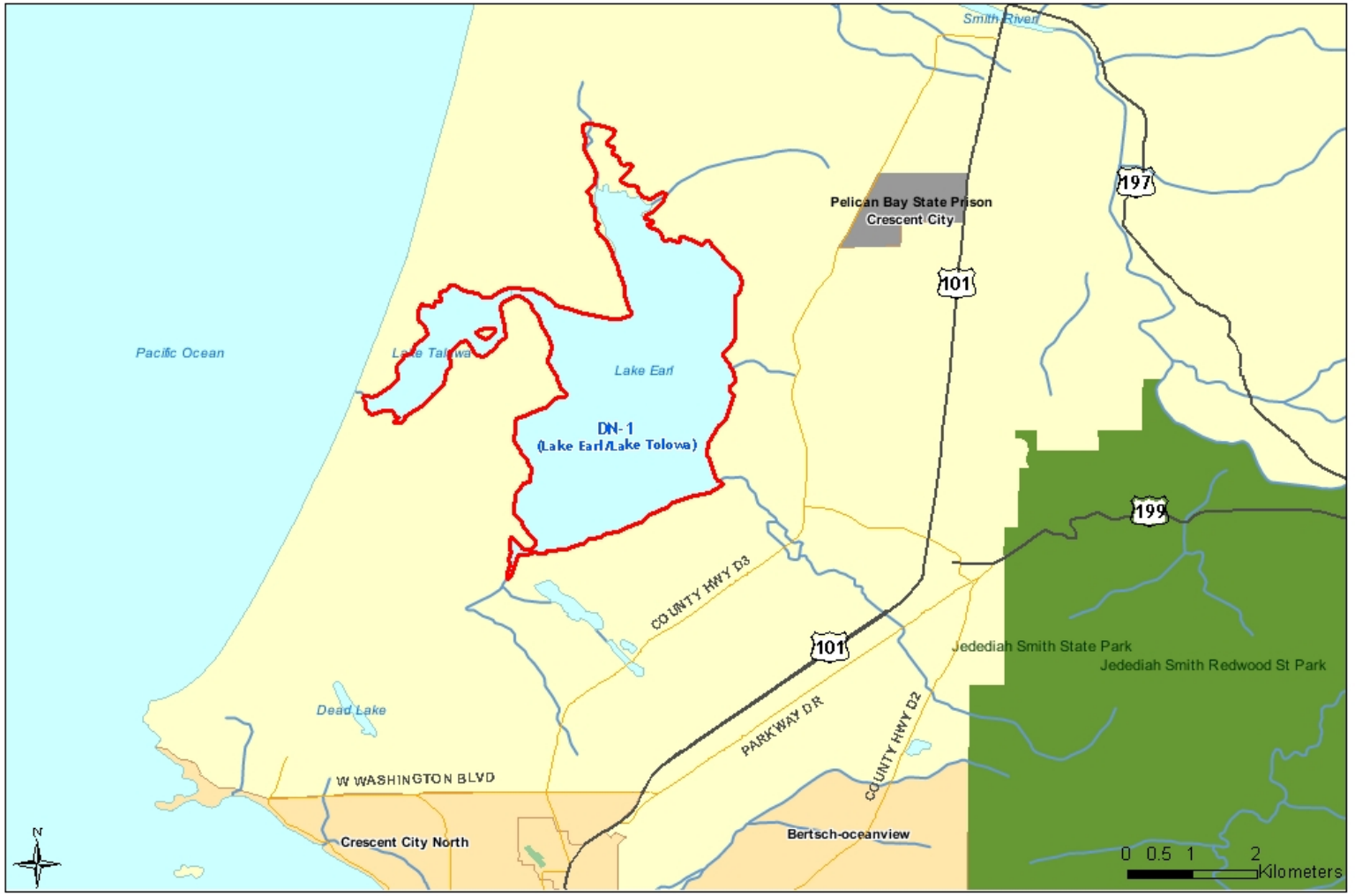
[123] Ibid.

# APPENDIX C
# PROPOSED CRITICAL HABITAT MAPS

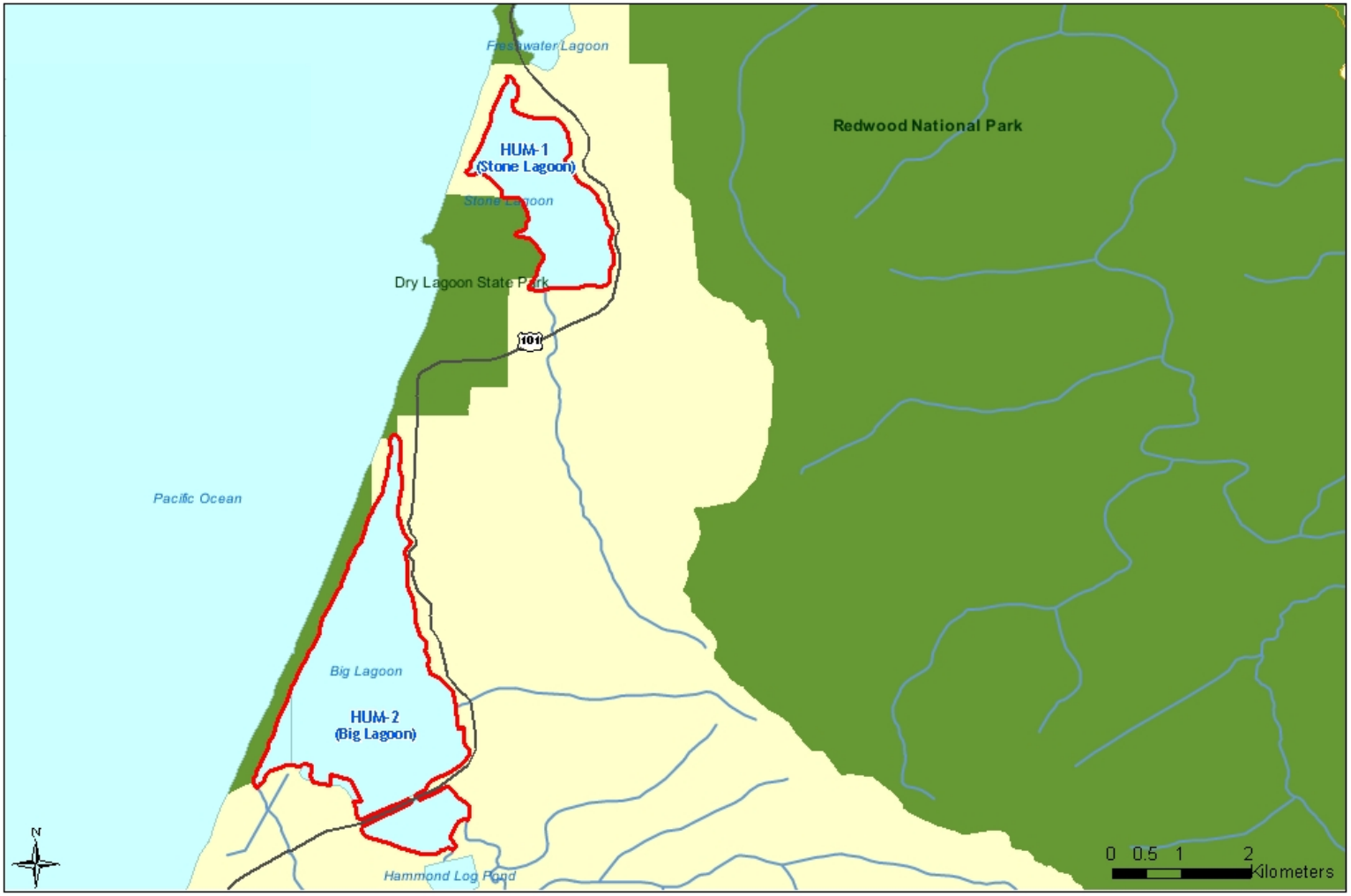
## STUDY AREAS DEFINED FOR PURPOSES OF THE ECONOMIC ANALYSIS

| ECONOMIC ACTIVITY | STUDY AREA |
|---|---|
| Flood control - channelization | Within proposed critical habitat and 1,000 meters upstream of unit |
| Flood control – tide gate maintenance or removal | Within proposed critical habitat only |
| Flood control – land/easement acquisition | Within proposed critical habitat and 200 meters around unit (including upstream) |
| Sandbar breaching | Within proposed critical habitat only |
| Dam operations, maintenance and removals | Within proposed critical habitat and 1,000 meters upstream of unit |
| Wastewater treatment | Within proposed critical habitat and 200 meters around unit |
| Groundwater withdrawals | Within proposed critical habitat and 100 meters around unit |
| Watershed and salmonid restoration | Within proposed critical habitat and 100 meters around unit |
| Cattle grazing | Within proposed critical habitat and 100 meters upstream |
| Crop farming | Within proposed critical habitat and 100 meters around unit |
| Transportation – new construction and retrofitting | Within proposed critical habitat and 200 meters around unit |
| Oil and gas pipeline construction | Within proposed critical habitat and 200 meters around unit |
| Sand and gravel mining | Within proposed critical habitat and 200 meters upstream of unit |
| New commercial and residential development | Within proposed critical habitat and 200 meters around unit |
| Source: Email communications from Service, April 23, April 25 and May 31, 2007. | |

TIDEWATER GOBY PROPOSED CRITICAL HABITAT
DN-1: Lake Earl/Lake Tolowa

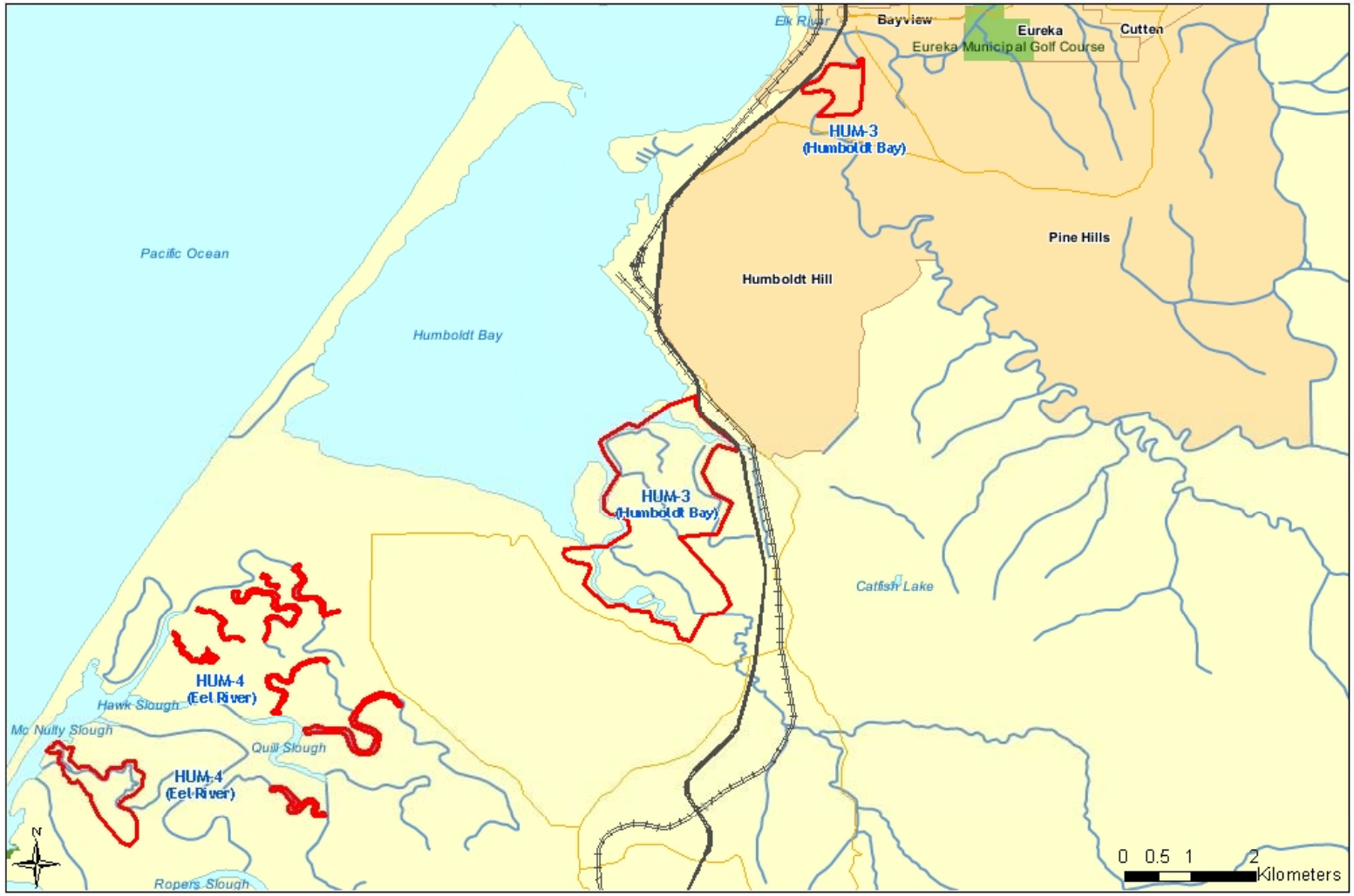


TIDEWATER GOBY PROPOSED CRITICAL HABITAT
HUM-1: Stone Lagoon & HUM-2: Big Lagoon



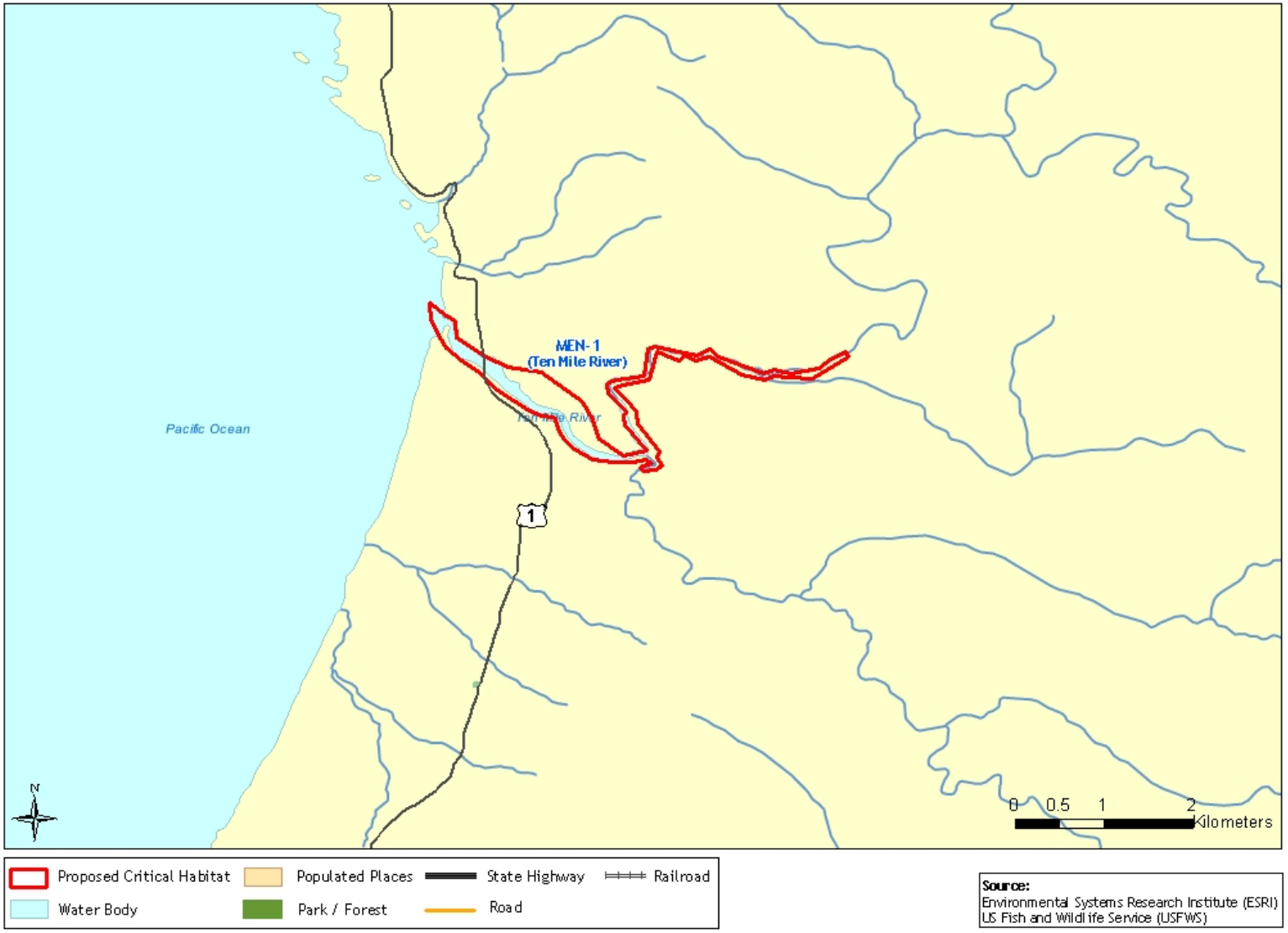
TIDEWATER GOBY PROPOSED CRITICAL HABITAT
HUM-3: Humboldt Bay

TIDEWATER GOBY PROPOSED CRITICAL HABITAT
HUM-3: Humboldt Bay & HUM-4: Eel River

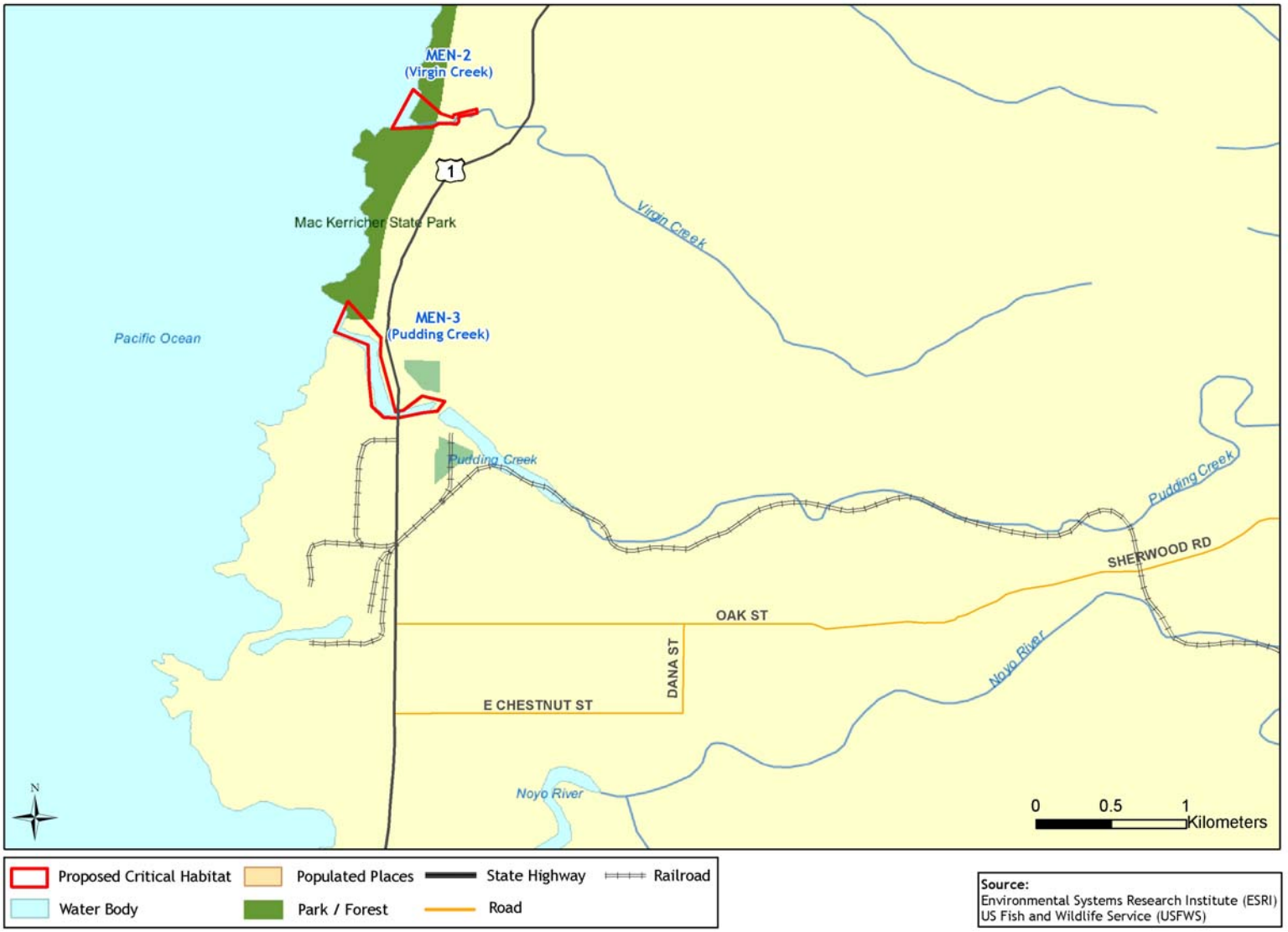



**Source:**
Environmental Systems Research Institute (ESRI)
US Fish and Wildlife Service (USFWS)

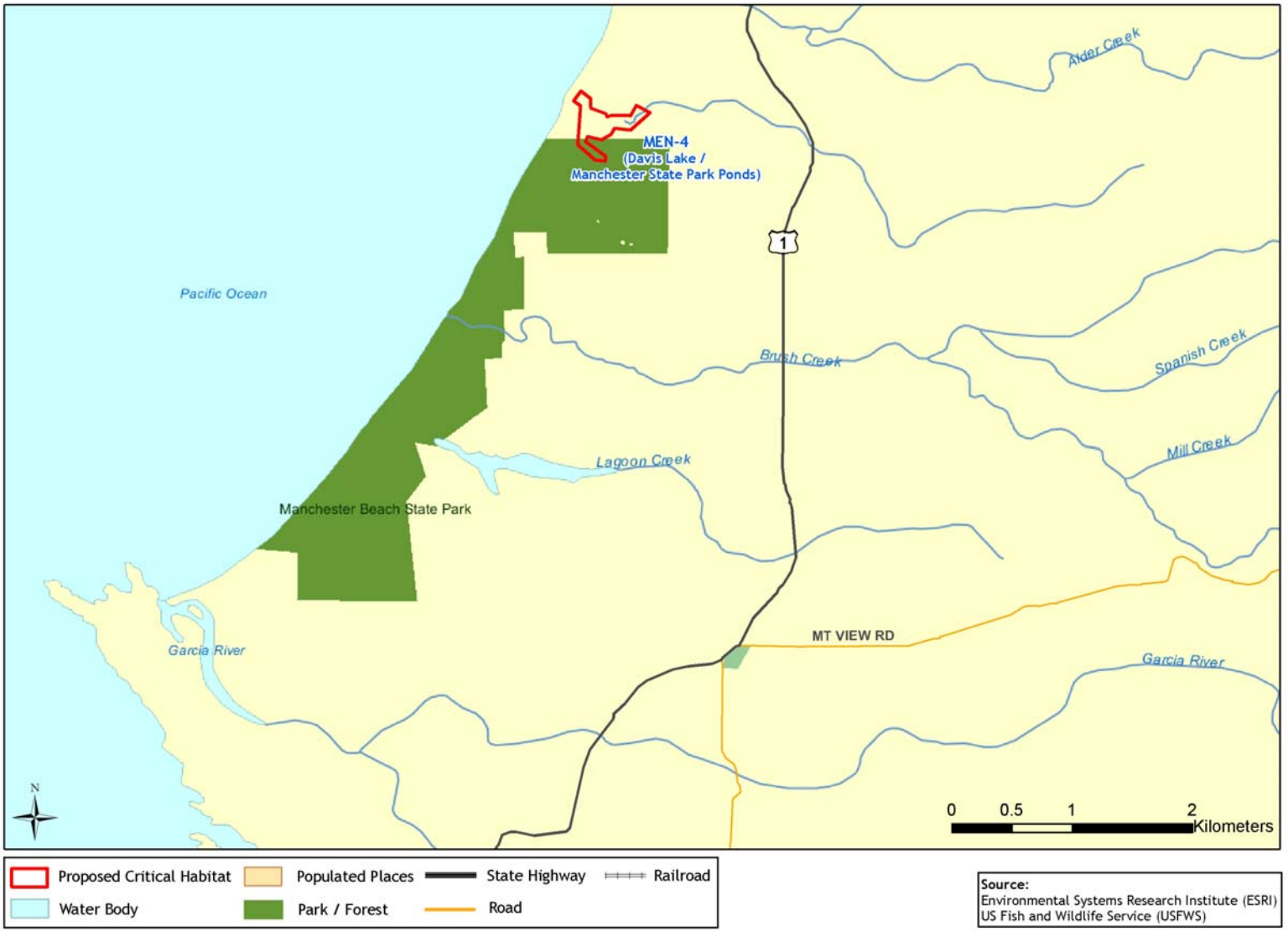
TIDEWATER GOBY PROPOSED CRITICAL HABITAT
MEN-1: Ten Mile River



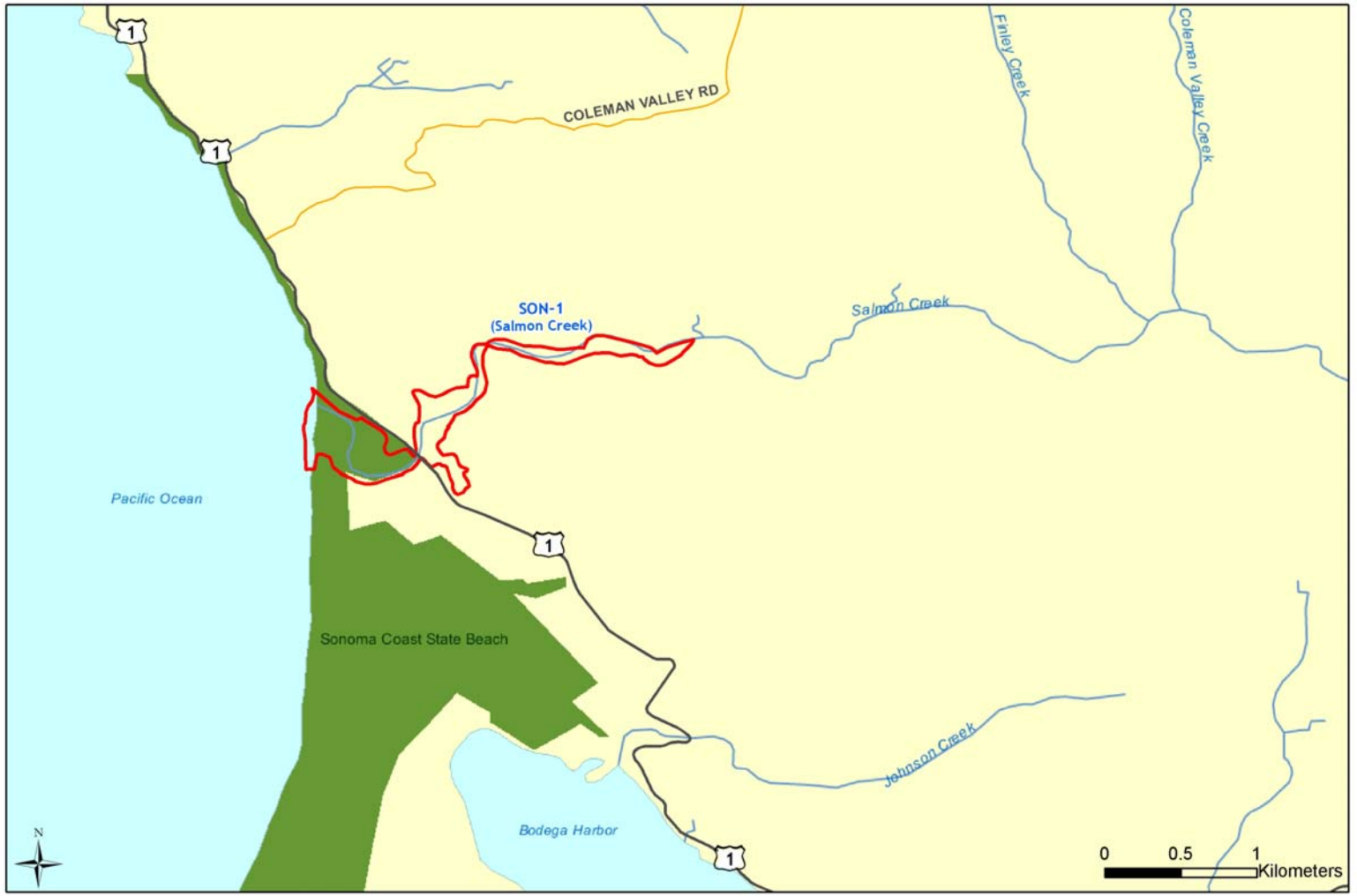
TIDEWATER GOBY PROPOSED CRITICAL HABITAT
MEN-2: Virgin Creek & MEN-3: Pudding Creek



TIDEWATER GOBY PROPOSED CRITICAL HABITAT
MEN-4: Davis Lake/Manchester State Park Ponds



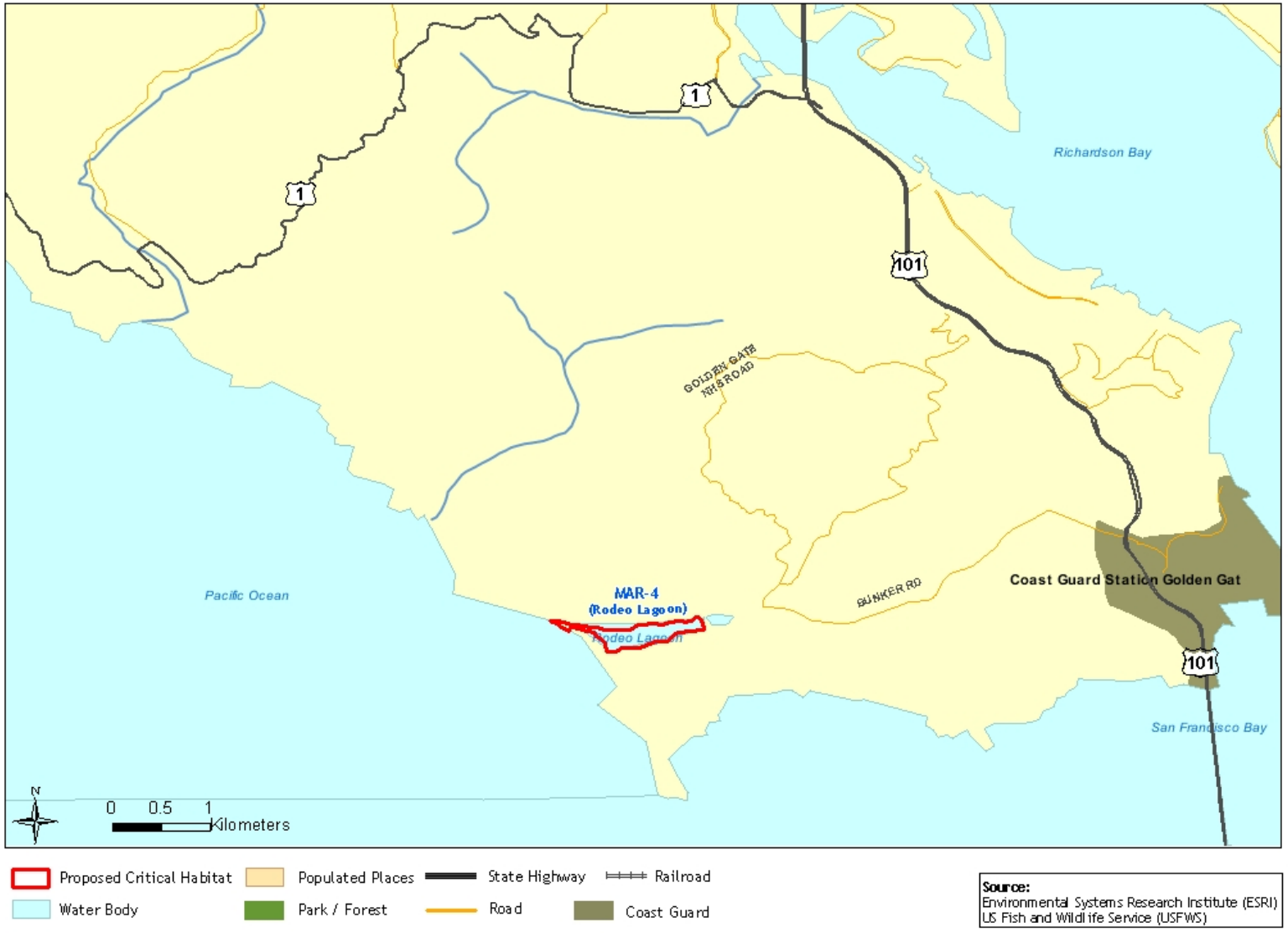
TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SON-1: Salmon Creek



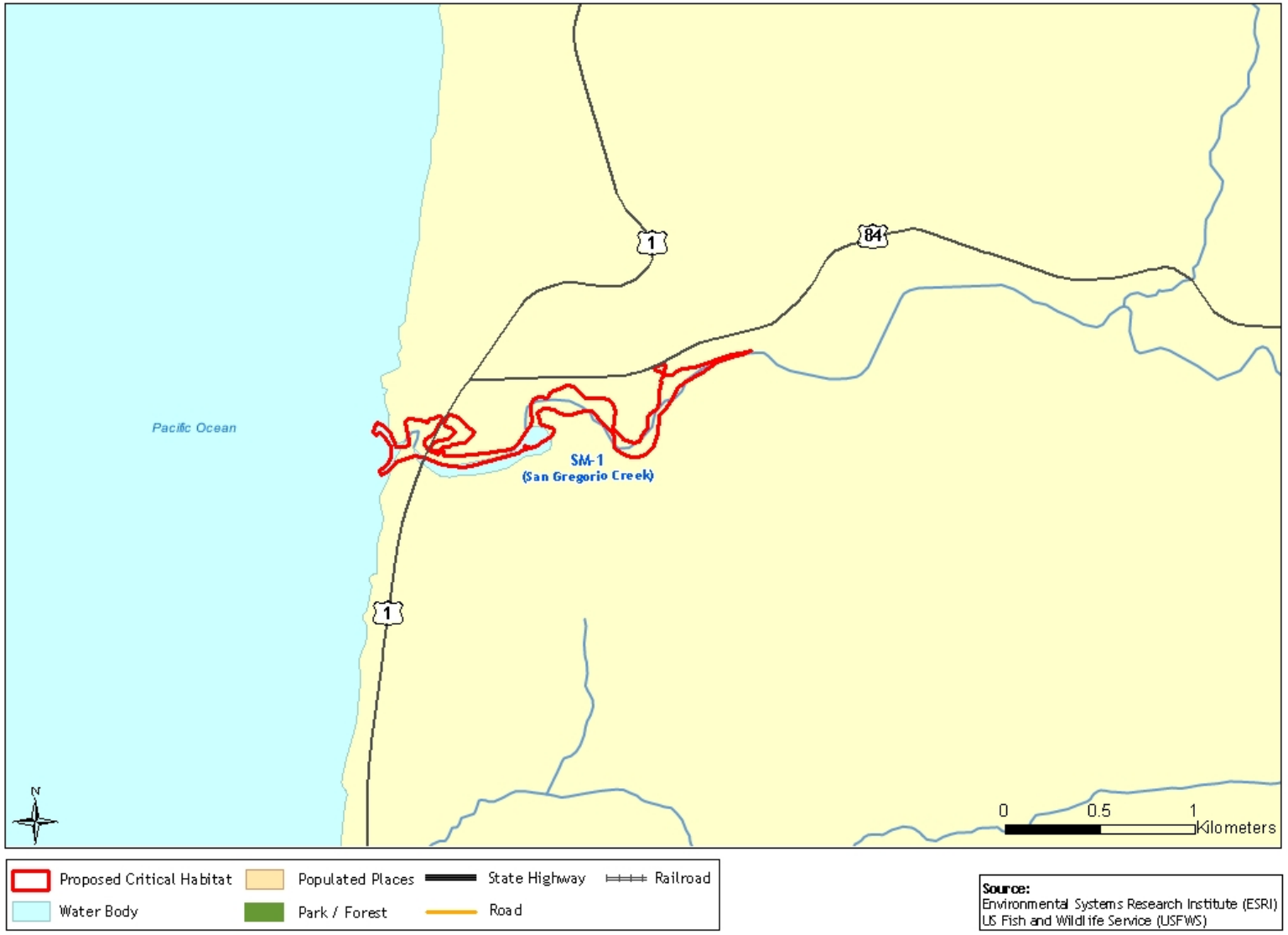
TIDEWATER GOBY PROPOSED CRITICAL HABITAT
MAR-1: Estero Americano & MAR-2: Estero de San Antonio

TIDEWATER GOBY PROPOSED CRITICAL HABITAT
MAR-3: Lagunitas - Tomasini Creeks

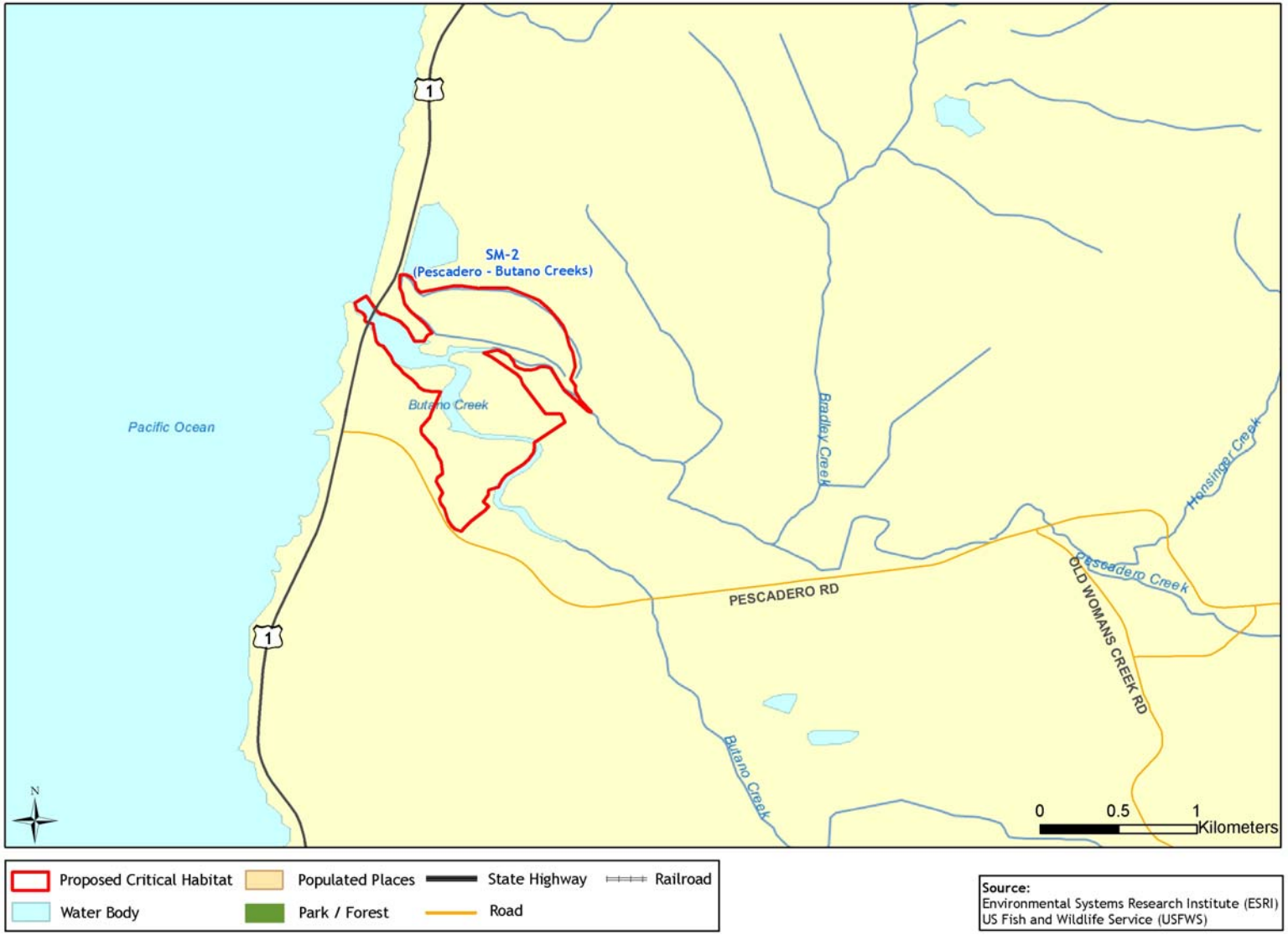
TIDEWATER GOBY PROPOSED CRITICAL HABITAT
MAR-4: Rodeo Lagoon



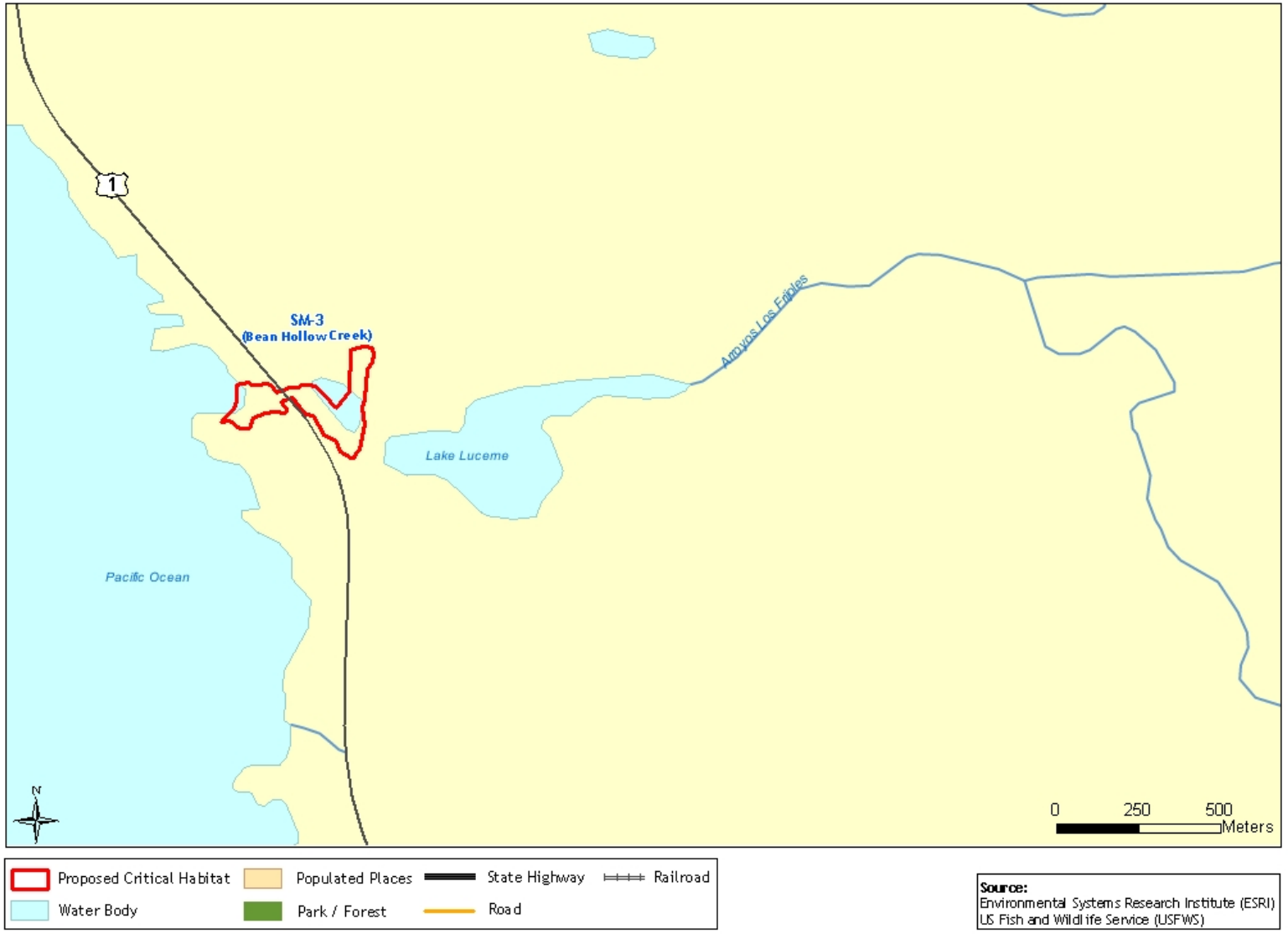
TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SM-1: San Gregorio Creek



TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SM-2: Pescadero - Butano Creeks



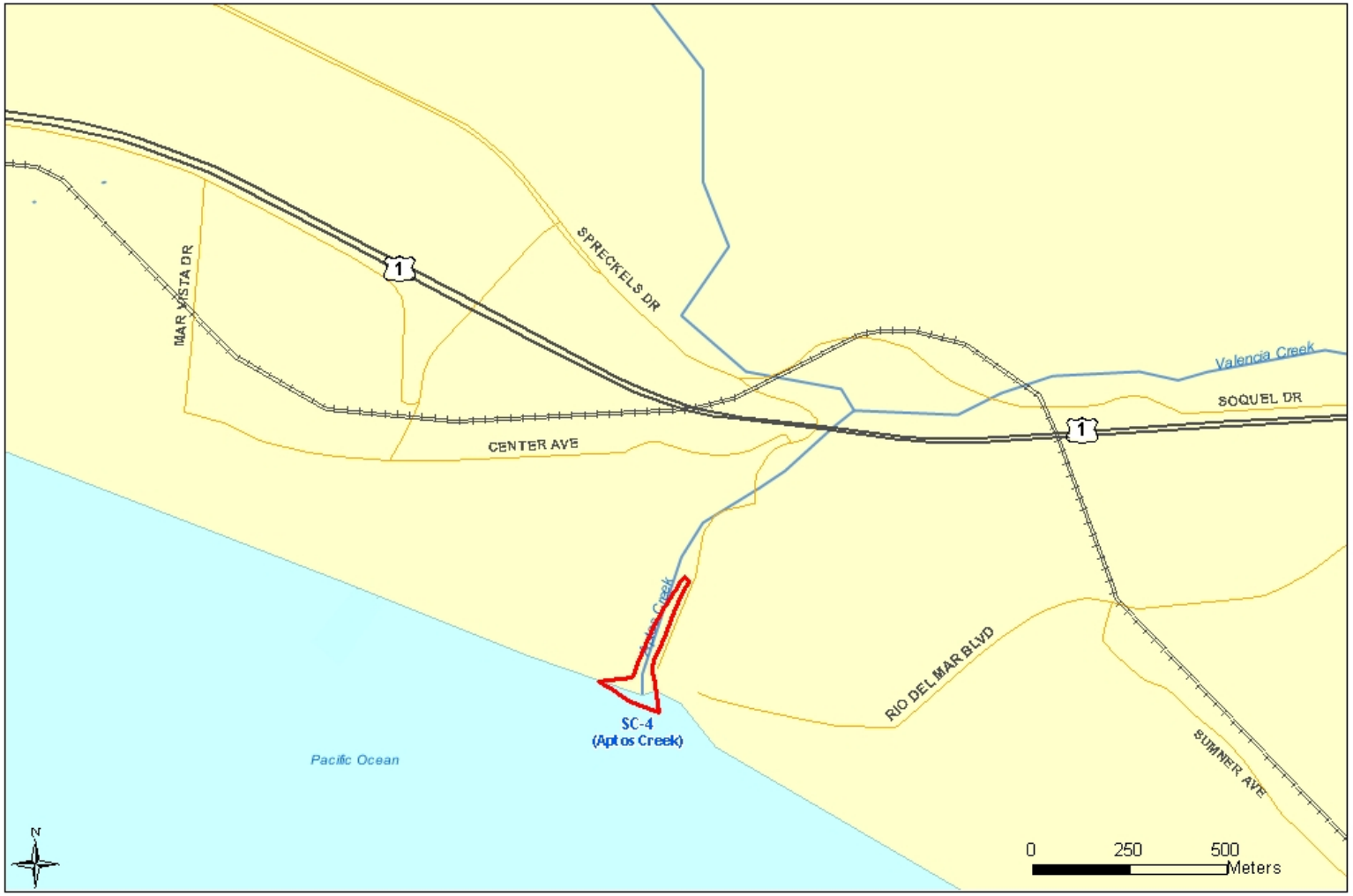
TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SM-3: Bean Hollow Creek (Arroyo de las Frijoles)



TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SC-1: Laguna Creek & SC-2: Baldwin Creek

TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SC-3: Corcoran Lagoon

TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SC-4: Aptos Creek

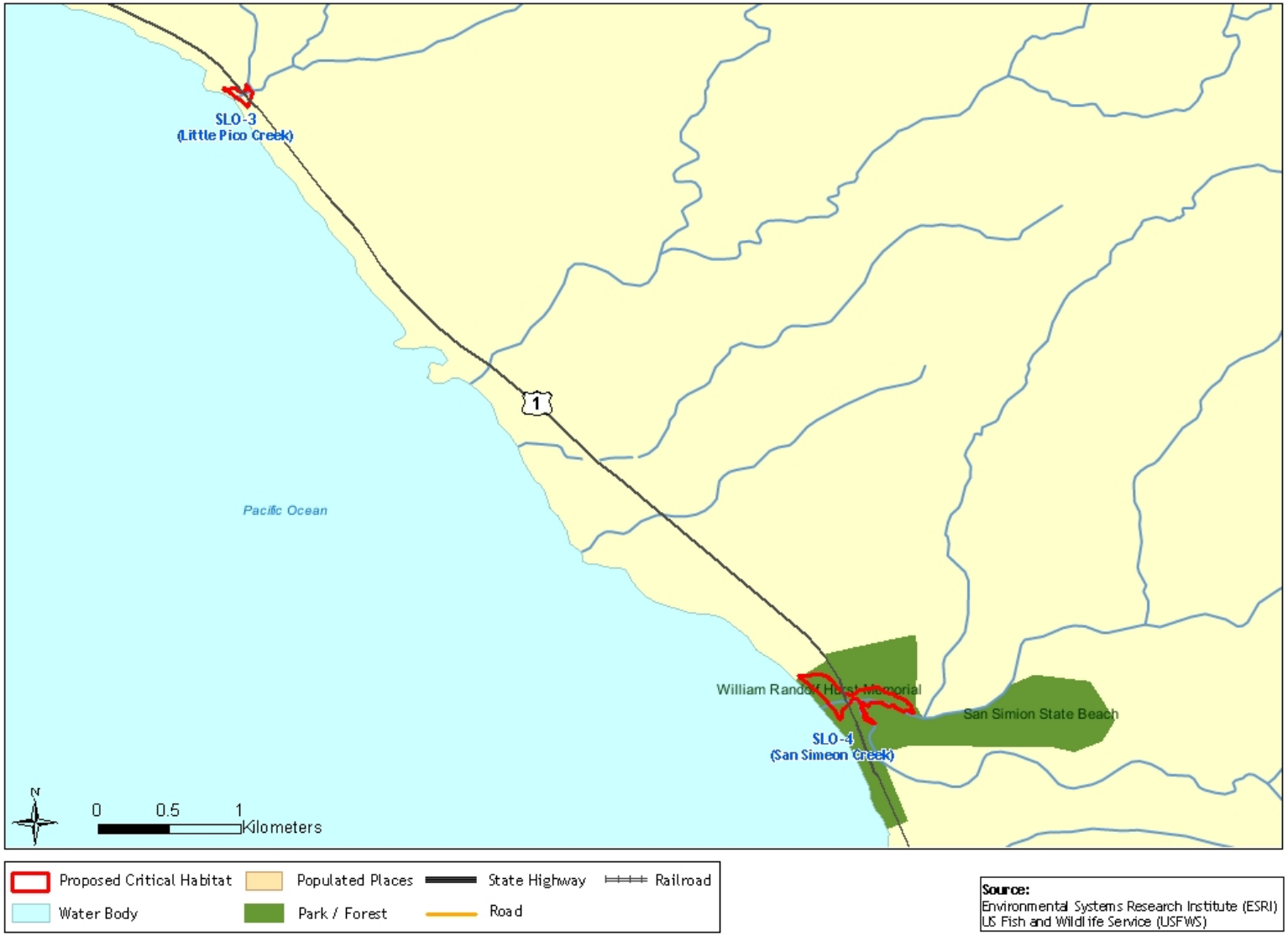


TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SC-5: Pajaro River

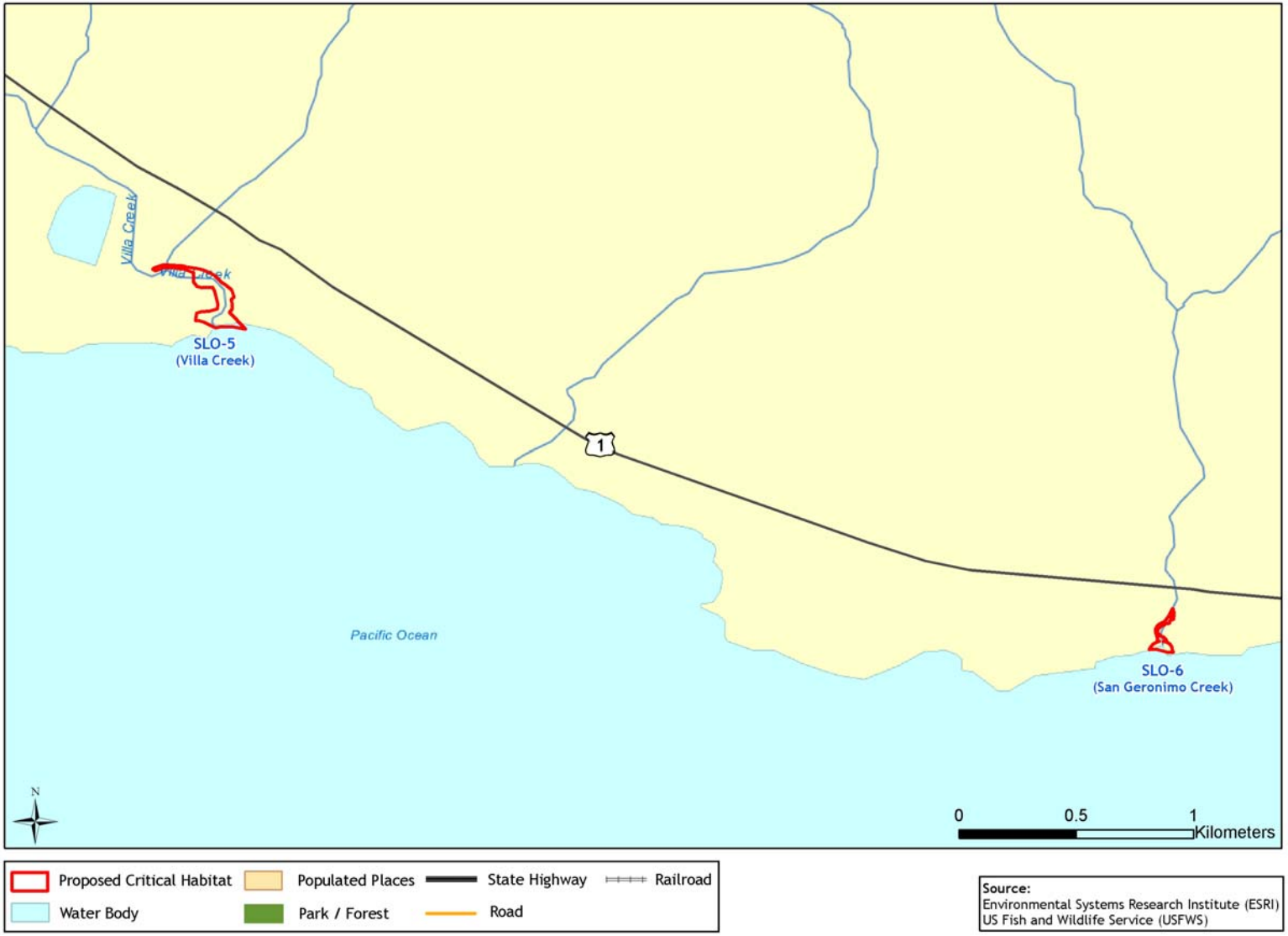
TIDEWATER GOBY PROPOSED CRITICAL HABITAT
MN-1: Bennett Slough

TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SLO-1: Arroyo Del Corral & SLO-2: Oak Knoll Creek

TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SLO-3: Little Pico Creek & SLO-4: San Simeon Creek

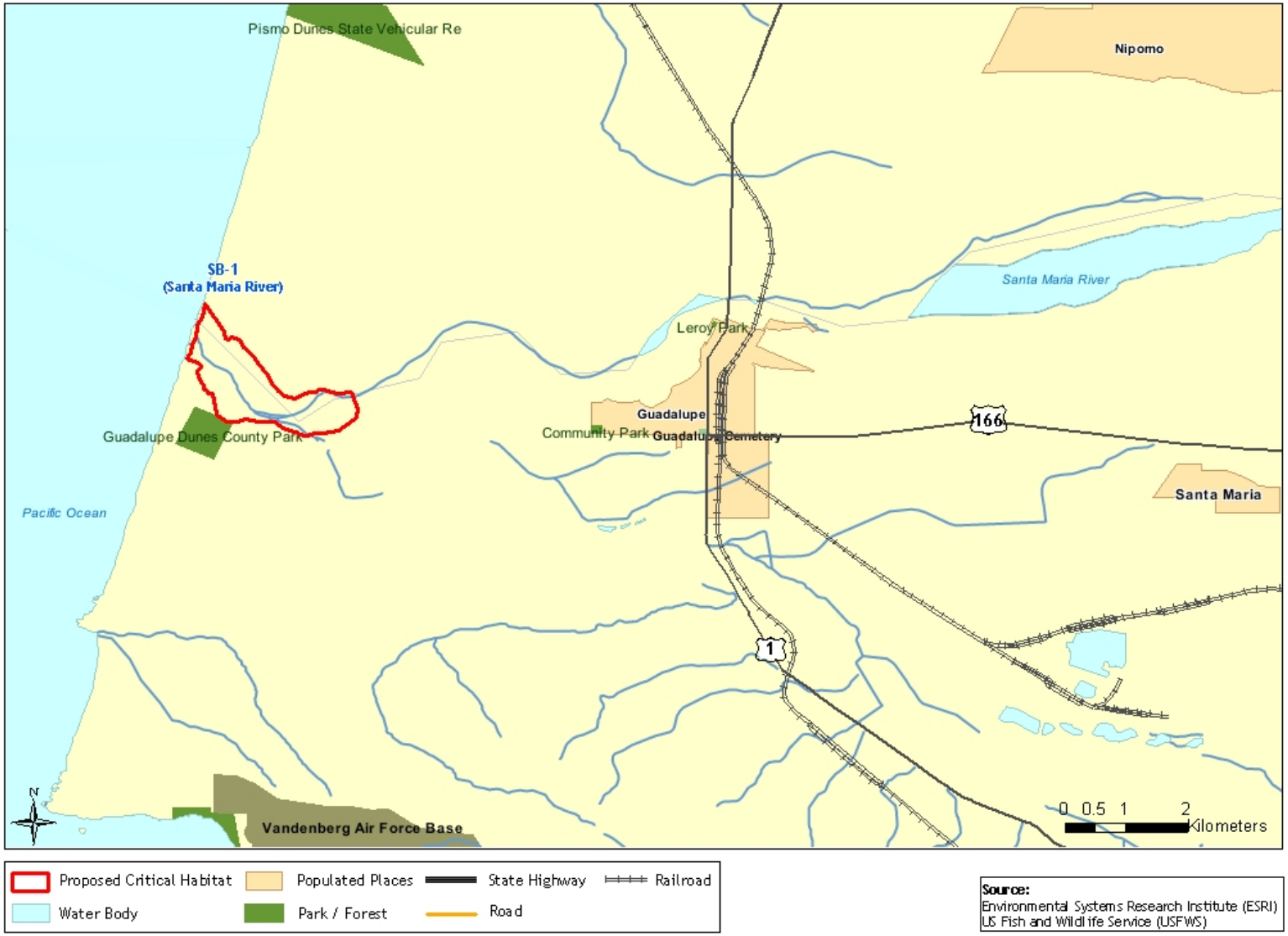


TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SLO-5: Villa Creek & SLO-6: San Geronimo Creek

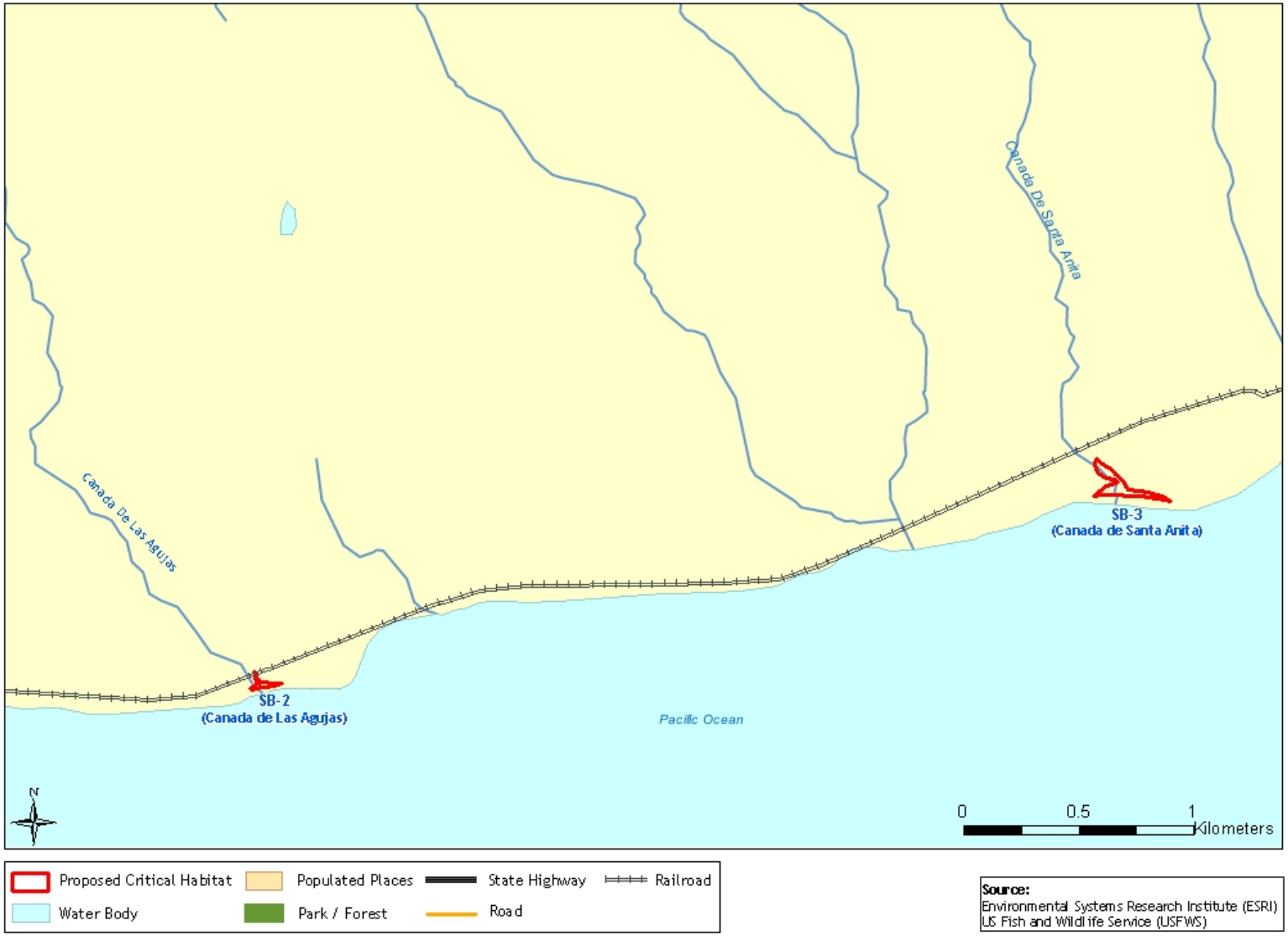


TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SLO-7: Pismo Creek

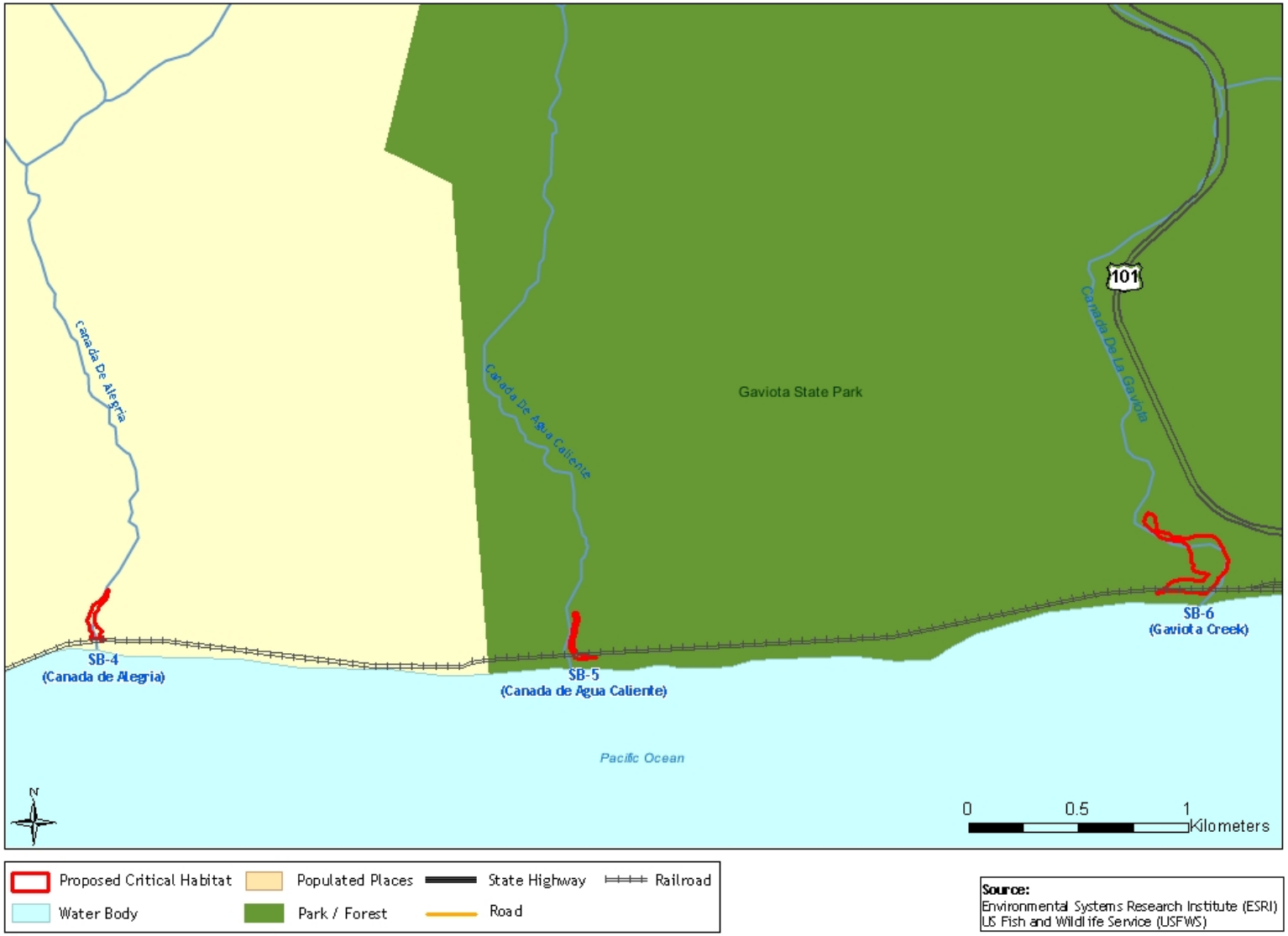
TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SB-1: Santa Maria River



TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SB-2: Canada de Las Agujas & SB-3: Canada de Santa Anita



TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SB-4: Canada de Alegria, SB-5: Canada de Agua Caliente & SB-6: Gaviota Creek



TIDEWATER GOBY PROPOSED CRITICAL HABITAT
SB-7: Winchester-Bell Canyons

## TIDEWATER GOBY PROPOSED CRITICAL HABITAT
### SB-8: Arroyo Burro

## TIDEWATER GOBY PROPOSED CRITICAL HABITAT
### SB-9: Mission Creek - Laguna Channel


Source:
Environmental Systems Research Institute (ESRI)
US Fish and Wildlife Service (USFWS)

TIDEWATER GOBY PROPOSED CRITICAL HABITAT
VEN-1: Ventura River

## TIDEWATER GOBY PROPOSED CRITICAL HABITAT
## VEN-2: Santa Clara River

TIDEWATER GOBY PROPOSED CRITICAL HABITAT
VEN-3: J Street Drain - Ormond Lagoon

TIDEWATER GOBY PROPOSED CRITICAL HABITAT
LA-1: Malibu Creek

TIDEWATER GOBY PROPOSED CRITICAL HABITAT
LA-2: Topanga Creek

# APPENDIX D
# DETAILED UNIT BY UNIT IMPACTS

# APPENDIX D | PRE-DESIGNATION COSTS

## EXHIBIT D-1 SUMMARY OF PRE-DESIGNATION IMPACTS (2007-2026): UNDISCOUNTED

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| DN-1 | $5,020,000 | $221,000 | $0 | $0 | $0 | $5,240,000 |
| HUM-1 | $0 | $4,380 | $0 | $0 | $0 | $4,380 |
| HUM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| HUM-3 | $0 | $387,000 | $118,000 | $354,000 | $54,700 | $914,000 |
| HUM-4 | $0 | $97,200 | $0 | $0 | $0 | $97,200 |
| MEN-1 | $0 | $7,900 | $58,500 | $0 | $0 | $66,400 |
| MEN-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SON-1 | $0 | $20,800 | $0 | $0 | $0 | $20,800 |
| MAR-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| MAR-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MAR-3 | $0 | $30,800 | $0 | $0 | $0 | $30,800 |
| MAR-4 | $11,400 | $0 | $0 | $87,800 | $0 | $99,200 |
| SM-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SM-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-1 | $1,340 | $0 | $0 | $0 | $0 | $1,340 |
| SC-2 | $1,340 | $0 | $0 | $0 | $0 | $1,340 |
| SC-3 | $1,340 | $0 | $0 | $0 | $0 | $1,340 |
| SC-4 | $1,340 | $0 | $0 | $0 | $0 | $1,340 |
| SC-5 | $300,000 | $0 | $69,700 | $0 | $54,700 | $424,000 |
| MN-1 | $1,340 | $0 | $0 | $54,700 | $0 | $56,000 |
| SLO-1 | $1,340 | $0 | $0 | $0 | $0 | $1,340 |

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| SLO-2 | $1,340 | $1,870 | $0 | $0 | $0 | $3,210 |
| SLO-3 | $1,340 | $0 | $65,500 | $0 | $0 | $66,800 |
| SLO-4 | $1,340 | $20,200 | $0 | $0 | $0 | $21,500 |
| SLO-5 | $1,340 | $0 | $0 | $0 | $0 | $1,340 |
| SLO-6 | $1,340 | $0 | $0 | $54,700 | $0 | $56,000 |
| SLO-7 | $56,000 | $0 | $54,700 | $0 | $0 | $111,000 |
| SB-1 | $1,340 | $0 | $0 | $54,700 | $109,000 | $165,000 |
| SB-2 | $1,340 | $0 | $0 | $0 | $0 | $1,340 |
| SB-3 | $1,340 | $0 | $0 | $0 | $0 | $1,340 |
| SB-4 | $1,340 | $0 | $0 | $0 | $0 | $1,340 |
| SB-5 | $1,340 | $0 | $0 | $0 | $42,500 | $43,800 |
| SB-6 | $165,000 | $0 | $203,000 | $0 | $94,500 | $463,000 |
| SB-7 | $1,340 | $0 | $54,700 | $0 | $0 | $56,000 |
| SB-8 | $1,340 | $0 | $0 | $28,300 | $0 | $29,600 |
| SB-9 | $121,000 | $0 | $0 | $16,200 | $0 | $137,000 |
| VEN-1 | $1,340 | $46,100 | $0 | $27,800 | $0 | $75,200 |
| VEN-2 | $889,000 | $0 | $0 | $5,400 | $0 | $894,000 |
| VEN-3 | $2,890,000 | $0 | $0 | $94,100 | $0 | $2,984,000 |
| LA-1 | $0 | $0 | $0 | $21,600 | $0 | $21,600 |
| LA-2 | $0 | $0 | $0 | $16,200 | $0 | $16,200 |
| **TOTAL** | **$9,470,000** | **$837,250** | **$624,000** | **$816,000** | **$356,000** | **$12,100,000** |

Note: Totals may not sum due to rounding.

## EXHIBIT D-2 SUMMARY OF PRE-DESIGNATION IMPACTS (2007-2026): DISCOUNTED AT 3%

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| DN-1 | $6,080,000 | $294,000 | $0 | $0 | $0 | $6,370,000 |
| HUM-1 | $0 | $5,860 | $0 | $0 | $0 | $5,860 |
| HUM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| HUM-3 | $0 | $517,000 | $130,000 | $390,000 | $63,000 | $1,100,000 |
| HUM-4 | $0 | $129,000 | $0 | $0 | $0 | $129,000 |
| MEN-1 | $0 | $10,600 | $70,300 | $0 | $0 | $80,800 |
| MEN-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SON-1 | $0 | $27,800 | $0 | $0 | $0 | $27,800 |
| MAR-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| MAR-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MAR-3 | $0 | $41,000 | $0 | $0 | $0 | $41,000 |
| MAR-4 | $15,200 | $0 | $0 | $105,000 | $0 | $120,000 |
| SM-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SM-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-1 | $1,610 | $0 | $0 | $0 | $0 | $1,610 |
| SC-2 | $1,610 | $0 | $0 | $0 | $0 | $1,610 |
| SC-3 | $1,610 | $0 | $0 | $0 | $0 | $1,610 |
| SC-4 | $1,610 | $0 | $0 | $0 | $0 | $1,610 |
| SC-5 | $370,000 | $0 | $90,900 | $0 | $61,900 | $523,000 |
| MN-1 | $1,610 | $0 | $0 | $61,900 | $0 | $63,500 |
| SLO-1 | $1,610 | $0 | $0 | $0 | $0 | $1,610 |
| SLO-2 | $1,610 | $2,500 | $0 | $0 | $0 | $4,120 |
| SLO-3 | $1,610 | $0 | $88,300 | $0 | $0 | $90,000 |
| SLO-4 | $1,610 | $26,900 | $0 | $0 | $0 | $28,500 |
| SLO-5 | $1,610 | $0 | $0 | $0 | $0 | $1,610 |

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| SLO-6 | $1,610 | $0 | $0 | $60,800 | $0 | $62,400 |
| SLO-7 | $75,200 | $0 | $70,700 | $0 | $0 | $146,000 |
| SB-1 | $1,610 | $0 | $0 | $66,700 | $129,000 | $197,000 |
| SB-2 | $1,610 | $0 | $0 | $0 | $0 | $1,610 |
| SB-3 | $1,610 | $0 | $0 | $0 | $0 | $1,610 |
| SB-4 | $1,610 | $0 | $0 | $0 | $0 | $1,610 |
| SB-5 | $1,610 | $0 | $0 | $0 | $50,800 | $52,400 |
| SB-6 | $212,000 | $0 | $246,000 | $0 | $118,000 | $576,000 |
| SB-7 | $1,610 | $0 | $70,700 | $0 | $0 | $72,300 |
| SB-8 | $1,610 | $0 | $0 | $30,600 | $0 | $32,200 |
| SB-9 | $131,000 | $0 | $0 | $17,200 | $0 | $148,000 |
| VEN-1 | $1,610 | $61,600 | $0 | $34,400 | $0 | $97,600 |
| VEN-2 | $1,010,000 | $0 | $0 | $7,260 | $0 | $1,020,000 |
| VEN-3 | $3,100,000 | $0 | $0 | $109,000 | $0 | $3,200,000 |
| LA-1 | $0 | $0 | $0 | $29,900 | $0 | $29,900 |
| LA-2 | $0 | $0 | $0 | $19,900 | $0 | $19,900 |
| **TOTAL** | **$11,000,000** | **$1,120,000** | **$767,000** | **$932,000** | **$423,000** | **$14,300,000** |

Note: Totals may not sum due to rounding.

**EXHIBIT D-3 SUMMARY OF PRE-DESIGNATION IMPACTS (2007-2026): DISCOUNTED AT 7%**

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| DN-1 | $7,910,000 | $412,000 | $0 | $0 | $0 | $8,320,000 |
| HUM-1 | $0 | $8,440 | $0 | $0 | $0 | $8,440 |
| HUM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| HUM-3 | $0 | $732,000 | $147,000 | $446,000 | $76,400 | $1,400,000 |
| HUM-4 | $0 | $182,000 | $0 | $0 | $0 | $182,000 |
| MEN-1 | $0 | $15,100 | $90,600 | $0 | $0 | $106,000 |
| MEN-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SON-1 | $0 | $39,600 | $0 | $0 | $0 | $39,600 |
| MAR-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| MAR-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MAR-3 | $0 | $57,800 | $0 | $0 | $0 | $57,800 |
| MAR-4 | $22,300 | $0 | $0 | $135,000 | $0 | $157,000 |
| SM-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SM-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-1 | $2,080 | $0 | $0 | $0 | $0 | $2,080 |
| SC-2 | $2,080 | $0 | $0 | $0 | $0 | $2,080 |
| SC-3 | $2,080 | $0 | $0 | $0 | $0 | $2,080 |
| SC-4 | $2,080 | $0 | $0 | $0 | $0 | $2,080 |
| SC-5 | $494,000 | $0 | $129,000 | $0 | $73,300 | $696,000 |
| MN-1 | $2,080 | $0 | $0 | $73,300 | $0 | $75,400 |
| SLO-1 | $2,080 | $0 | $0 | $0 | $0 | $2,080 |
| SLO-2 | $2,080 | $3,590 | $0 | $0 | $0 | $5,680 |
| SLO-3 | $2,080 | $0 | $131,000 | $0 | $0 | $134,000 |

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| SLO-4 | $2,080 | $38,200 | $0 | $0 | $0 | $40,300 |
| SLO-5 | $2,080 | $0 | $0 | $0 | $0 | $2,080 |
| SLO-6 | $2,080 | $0 | $0 | $70,500 | $0 | $72,600 |
| SLO-7 | $112,000 | $0 | $99,500 | $0 | $0 | $211,000 |
| SB-1 | $2,080 | $0 | $0 | $86,700 | $161,000 | $250,000 |
| SB-2 | $2,080 | $0 | $0 | $0 | $0 | $2,080 |
| SB-3 | $2,080 | $0 | $0 | $0 | $0 | $2,080 |
| SB-4 | $2,080 | $0 | $0 | $0 | $0 | $2,080 |
| SB-5 | $2,080 | $0 | $0 | $0 | $65,000 | $67,100 |
| SB-6 | $295,000 | $0 | $325,000 | $0 | $159,000 | $779,000 |
| SB-7 | $2,080 | $0 | $99,500 | $0 | $0 | $102,000 |
| SB-8 | $2,080 | $0 | $0 | $34,000 | $0 | $36,100 |
| SB-9 | $147,000 | $0 | $0 | $18,600 | $0 | $165,000 |
| VEN-1 | $2,080 | $88,100 | $0 | $45,700 | $0 | $136,000 |
| VEN-2 | $1,200,000 | $0 | $0 | $10,600 | $0 | $1,210,000 |
| VEN-3 | $3,390,000 | $0 | $0 | $133,000 | $0 | $3,520,000 |
| LA-1 | $0 | $0 | $0 | $45,500 | $0 | $45,500 |
| LA-2 | $0 | $0 | $0 | $26,100 | $0 | $26,100 |
| **TOTAL** | **$13,600,000** | **$1,580,000** | **$1,020,000** | **$1,120,000** | **$535,000** | **$17,900,000** |

Note: Totals may not sum due to rounding.

## APPENDIX D | POST-DESIGNATION COSTS

### EXHIBIT D-4 SUMMARY OF POST-DESIGNATION IMPACTS (2007-2026): UNDISCOUNTED

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| DN-1 | $2,830,000 | $397,000 | $0 | $0 | $0 | $3,230,000 |
| HUM-1 | $0 | $8,420 | $0 | $0 | $0 | $8,420 |
| HUM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| HUM-3 | $0 | $715,000 | $517,000 | $380,000 | $0 | $1,610,000 |
| HUM-4 | $0 | $175,000 | $0 | $54,700 | $0 | $230,000 |
| MEN-1 | $0 | $15,000 | $137,000 | $0 | $0 | $152,000 |
| MEN-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SON-1 | $0 | $38,900 | $0 | $0 | $0 | $38,900 |
| MAR-1 | $0 | $0 | $0 | $293,000 | $0 | $293,000 |
| MAR-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MAR-3 | $0 | $56,000 | $45,000 | $125,000 | $0 | $226,000 |
| MAR-4 | $0 | $0 | $0 | $20,000 | $0 | $20,000 |
| SM-1 | $0 | $0 | $24,900 | $0 | $0 | $24,900 |
| SM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SM-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-5 | $573,000 | $0 | $164,000 | $0 | $0 | $737,000 |
| MN-1 | $0 | $0 | $0 | $8,900 | $0 | $8,900 |
| SLO-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SLO-2 | $0 | $3,570 | $0 | $0 | $0 | $3,570 |

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| SLO-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SLO-4 | $0 | $37,500 | $0 | $0 | $0 | $37,500 |
| SLO-5 | $0 | $0 | $0 | $0 | $0 | $0 |
| SLO-6 | $0 | $0 | $0 | $0 | $0 | $0 |
| SLO-7 | $19,500 | $0 | $0 | $107,000 | $0 | $127,000 |
| SB-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-5 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-6 | $274,000 | $0 | $54,700 | $0 | $0 | $328,000 |
| SB-7 | $0 | $0 | $0 | $0 | $145,000 | $145,000 |
| SB-8 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-9 | $5,830,000 | $0 | $124,000 | $0 | $0 | $5,960,000 |
| VEN-1 | $1,150,000 | $87,000 | $0 | $0 | $0 | $1,240,000 |
| VEN-2 | $10,000,000 | $0 | $0 | $0 | $0 | $10,000,000 |
| VEN-3 | $339,000 | $0 | $0 | $0 | $0 | $339,000 |
| LA-1 | $0 | $0 | $0 | $89,900 | $0 | $89,900 |
| LA-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| **TOTAL** | **$21,000,000** | **$1,530,000** | **$1,070,000** | **$1,080,000** | **$145,000** | **$24,900,000** |

Note: Totals may not sum due to rounding.

**EXHIBIT D-5 SUMMARY OF POST-DESIGNATION IMPACTS (2007-2026): DISCOUNTED AT 3%**

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| DN-1 | $2,620,000 | $332,000 | $0 | $0 | $0 | $2,950,000 |
| HUM-1 | $0 | $7,270 | $0 | $0 | $0 | $7,270 |
| HUM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| HUM-3 | $0 | $606,000 | $491,000 | $375,000 | $0 | $1,470,000 |
| HUM-4 | $0 | $147,000 | $0 | $47,200 | $0 | $194,000 |
| MEN-1 | $0 | $12,900 | $136,000 | $0 | $0 | $148,000 |
| MEN-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SON-1 | $0 | $33,200 | $0 | $0 | $0 | $33,200 |
| MAR-1 | $0 | $0 | $0 | $277,000 | $0 | $277,000 |
| MAR-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MAR-3 | $0 | $47,200 | $45,000 | $123,000 | $0 | $215,000 |
| MAR-4 | $0 | $0 | $0 | $16,700 | $0 | $16,700 |
| SM-1 | $0 | $0 | $24,900 | $0 | $0 | $24,900 |
| SM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SM-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-5 | $460,000 | $0 | $155,000 | $0 | $0 | $615,000 |
| MN-1 | $0 | $0 | $0 | $8,900 | $0 | $8,900 |
| SLO-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SLO-2 | $0 | $3,080 | $0 | $0 | $0 | $3,080 |
| SLO-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SLO-4 | $0 | $31,900 | $0 | $0 | $0 | $31,900 |
| SLO-5 | $0 | $0 | $0 | $0 | $0 | $0 |

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| SLO-6 | $0 | $0 | $0 | $0 | $0 | $0 |
| SLO-7 | $19,500 | $0 | $0 | $82,200 | $0 | $102,000 |
| SB-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-5 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-6 | $213,000 | $0 | $51,600 | $0 | $0 | $264,000 |
| SB-7 | $0 | $0 | $0 | $0 | $137,000 | $137,000 |
| SB-8 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-9 | $5,340,000 | $0 | $104,000 | $0 | $0 | $5,440,000 |
| VEN-1 | $974,000 | $74,600 | $0 | $0 | $0 | $1,050,000 |
| VEN-2 | $8,920,000 | $0 | $0 | $0 | $0 | $8,920,000 |
| VEN-3 | $260,000 | $0 | $0 | $0 | $0 | $260,000 |
| LA-1 | $0 | $0 | $0 | $88,900 | $0 | $88,900 |
| LA-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| **TOTAL** | **$18,800,000** | **$1,290,000** | **$1,010,000** | **$1,020,000** | **$137,000** | **$22,300,000** |
| Note: Totals may not sum due to rounding. | | | | | | |

**EXHIBIT D-6 SUMMARY OF POST-DESIGNATION IMPACTS (2007-2026): DISCOUNTED AT 7%**

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| DN-1 | $2,390,000 | $273,000 | $0 | $0 | $0 | $2,660,000 |
| HUM-1 | $0 | $6,190 | $0 | $0 | $0 | $6,190 |
| HUM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| HUM-3 | $0 | $505,000 | $462,000 | $371,000 | $0 | $1,340,000 |
| HUM-4 | $0 | $121,000 | $0 | $39,000 | $0 | $160,000 |
| MEN-1 | $0 | $10,900 | $134,000 | $0 | $0 | $145,000 |
| MEN-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| MEN-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SON-1 | $0 | $27,900 | $0 | $0 | $0 | $27,900 |
| MAR-1 | $0 | $0 | $0 | $257,000 | $0 | $257,000 |
| MAR-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| MAR-3 | $0 | $39,100 | $45,000 | $121,000 | $0 | $205,000 |
| MAR-4 | $0 | $0 | $0 | $13,700 | $0 | $13,700 |
| SM-1 | $0 | $0 | $24,900 | $0 | $0 | $24,900 |
| SM-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SM-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SC-5 | $363,000 | $0 | $144,000 | $0 | $0 | $507,000 |
| MN-1 | $0 | $0 | $0 | $8,900 | $0 | $8,900 |
| SLO-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SLO-2 | $0 | $2,610 | $0 | $0 | $0 | $2,610 |
| SLO-3 | $0 | $0 | $0 | $0 | $0 | $0 |

| UNIT | WATER MANAGEMENT | GRAZING | TRANSPORTATION | NATURAL RESOURCE MANAGEMENT | OIL & GAS PIPELINES | TOTAL |
|---|---|---|---|---|---|---|
| SLO-4 | $0 | $26,700 | $0 | $0 | $0 | $26,700 |
| SLO-5 | $0 | $0 | $0 | $0 | $0 | $0 |
| SLO-6 | $0 | $0 | $0 | $0 | $0 | $0 |
| SLO-7 | $19,500 | $0 | $0 | $60,600 | $0 | $80,100 |
| SB-1 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-3 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-4 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-5 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-6 | $160,000 | $0 | $47,800 | $0 | $0 | $208,000 |
| SB-7 | $0 | $0 | $0 | $0 | $129,000 | $129,000 |
| SB-8 | $0 | $0 | $0 | $0 | $0 | $0 |
| SB-9 | $4,770,000 | $0 | $85,600 | $0 | $0 | $4,850,000 |
| VEN-1 | $796,000 | $63,000 | $0 | $0 | $0 | $859,000 |
| VEN-2 | $7,720,000 | $0 | $0 | $0 | $0 | $7,720,000 |
| VEN-3 | $184,000 | $0 | $0 | $0 | $0 | $184,000 |
| LA-1 | $0 | $0 | $0 | $87,600 | $0 | $87,600 |
| LA-2 | $0 | $0 | $0 | $0 | $0 | $0 |
| **TOTAL** | **$16,400,000** | **$1,080,000** | **$943,000** | **$959,000** | **$129,000** | **$19,500,000** |

Note: Totals may not sum due to rounding.

# APPENDIX E | FLOOD CONTROL PROJECT DETAILS

## EXHIBIT E-1 SUMMARY OF RESEARCH ON WATER MANAGEMENT ACTIVITIES

| COUNTY | UNIT | NAME | DESCRIPTION OF FUTURE WATER MANAGEMENT ACTIVITIES |
|---|---|---|---|
| Del Norte | DN-1 | Lake Earl/Lake Tolowa | No flood control projects (sandbar breaching only).[1]<br><br>California Department of Fish and Game (CDFG) has been acquiring lands/flood easements around Lake Earl for the purpose of allowing the area to flood naturally (to reduce pressure to breach the sandbar more frequently and later in the season). CDFG spent approximately $4.50 million from 1995 – 2006.[2] Future purchases of lands/easements will total about $2.50 million; these purchases will likely occur in the next five years.[3] |
| Humboldt | HUM-1 | Stone Lagoon | None.[1] |
| | HUM-2 | Big Lagoon | None.[1] |
| | HUM-3 | Humboldt Bay | Only expected work in this area is restoration work, no flood control projects.[1, 4]<br><br>The Service is currently participating in an effort to identify and catalog all of the water control structures in this area, but results will not be available in time for this analysis.[5] |
| | HUM-4 | Eel River | Potential removal of dams on the Eel River – outside of study area. Primary reason for removing this dam is for salmonid restoration.[6] |
| Mendocino | MEN-1 | Ten Mile River | None.[7] |
| | MEN-2 | Virgin Creek | |
| | MEN-3 | Pudding Creek | Small creek dam for municipal water take for City of Fort Bragg. Threat of diversion of water for residential use.[5] |
| | MEN-4 | Davis Lake and Manchester State Park | None expected - All in State park.[8] |
| Sonoma | SON-1 | Salmon Creek | Potential issues from water district pumping groundwater. The National Marine Fisheries Service had a case against the district, concerns that the groundwater withdrawal would impact the creek.[31]<br><br>CDFG Restoration project on various ranches in the area. No water management activities identified in this plan.[14] |
| Marin | MAR-1 | Estero Americano | None.[9] |
| | MAR-2 | Estero de San Antonio | None.[9] |
| | MAR-3 | Lagunitas (Papermill) Creek | None.[9] |
| | MAR-4 | Rodeo Lagoon | None.[10] |
| San Mateo | SM-1 | San Gregorio Creek | State property or near State beach so none expected.[9] |
| | SM-2 | Pescadero-Butano Creek | Restoration project – no flood control.[9] |

| COUNTY | UNIT | NAME | DESCRIPTION OF FUTURE WATER MANAGEMENT ACTIVITIES |
|---|---|---|---|
| | SM-3 | Bean Hollow Creek (Arroyo de Los Frijoles) | State property or near State beach so none expected. [9] |
| Santa Cruz | SC-1 | Laguna Creek | None. [9] |
| | SC-2 | Baldwin Creek | |
| | SC-3 | Corcoran Lagoon | |
| | SC-4 | Aptos Creek | |
| | SC-5 | Pajaro River | Sandbar breaching annually, involves goby monitoring/surveying by contractor. Also, County did an analysis regarding alternatives to breaching the sandbar. [11]<br><br>Pajaro River U.S. Army Corps of Engineers (USACE) flood control project is in early planning phases; USACE estimated goby mitigation measures and costs. Routine flood control maintenance performed by counties under 5-year USACE permit, but maintenance not in the channel, so goby is not an issue – no mitigation required.[12]<br><br>Potential for groundwater overdrafting upstream.[13] |
| Monterey | MN-1 | Bennett Slough | Mostly agricultural land upstream, not developed, therefore not much likelihood of flood control efforts. [15] |
| San Luis Obispo | SLO-1 | Arroyo del Corral | None- All State park lands.[16] |
| | SLO-2 | Oak Knoll Creek (Arroyo Laguna) | |
| | SLO-3 | Little Pico Creek | |
| | SLO-4 | San Simeon Creek | |
| | SLO-5 | Villa Creek | |
| | SLO-6 | San Geronimo Creek | |
| | SLO-7 | Pismo Creek | No flood control maintenance expected; Wastewater treatment plant discharge section 7 consultation was recently initiated by USACE.[17] |
| Santa Barbara | SB-1 | Santa Maria River | No flood control issues for Santa Barbara County, no USACE flood control projects. [18] |
| | SB-2 | Canada de las Agujas | |
| | SB-3 | Canada de Santa Anita | |
| | SB-4 | Canada de Alegria | |
| | SB-5 | Canada de Agua Caliente | |
| | SB-6 | Gaviota Creek | |
| | SB-7 | Winchester/Bell Canyon | |
| | SB-8 | Arroyo Burro | Restoration - no flood control. [18] |

| COUNTY | UNIT | NAME | DESCRIPTION OF FUTURE WATER MANAGEMENT ACTIVITIES |
|---|---|---|---|
| | SB-9 | Mission Creek—Laguna Channel | Mission Creek flood control project – USACE project was consulted on in 2001, but due to funding issues construction will not begin until at least 2010. Tidewater goby management plan completed in 2006. Project includes substantial mitigation measures for tidewater goby. USACE provided information regarding estimated mitigation measures and costs. [19]<br><br>The City of Santa Barbara Waterfront Department performs some maintenance activities that may benefit tidewater goby. In particular, the Waterfront Department constructs a berm each year to keep the Mission Creek and Laguna Channel lagoons combined into one large lagoon consistent with recommendations in the Tidewater Goby Management Plan for Mission Creek. All sand berm work is conducted outside of the lagoon when the mouth of Mission Creek is closed; thus there are no impacts to this project in terms of project modifications. In addition, the Waterfront Department and USACE conduct dredging activities to remove recently deposited sand in the Santa Barbara Harbor to maintain navigability. USACE is responsible for placing the discharge pipe and conducts any necessary surveys for Tidewater Gobies and other sensitive species. The Waterfront dept. does not incur any direct costs for tidewater goby conservation efforts because all Waterfront Department activities occur outside the lagoon.[32]<br><br>Santa Barbara County conducts routine maintenance on Mission Creek, which is performed on average every 2 years. The County conducts pre-project surveys several months before and then right before the project to determine if any sensitive species are present. In the past, they have not conducted any other mitigation for tidewater goby because the goby is not present in the area where they are conducting activities. For this reason, while some of this routine maintenance work may be occurring within the 1000 meter study area upstream of the critical habitat, no impacts are forecast for this activity. [20] |
| Ventura | VEN-1 | Ventura River | There is a habitat conservation plan (HCP) under development to cover activities in this area (see discussion in Chapter 5). This HCP is expected to cover activities by eight local agencies, including the City of Ventura, Casitas water district, and several smaller water districts. [21]<br><br>There has been some illegal sandbar breaching at this location, but no current plans to mitigate this activity. [22]<br><br>The Trust for Public Land (TPL) is currently in the planning stages for a project focused on acquiring lands to protect the lower six miles of the Ventura River. TPL has recently received a grant from the California Coastal Conservancy for planning purchases; and acquisitions could begin as early as 2008. Conservation purposes include: [23]<br>• Facilitate natural flood management and avoid channelization<br>• Maintain natural river flow<br>• Protect habitat for sensitive species<br>• Provide water quality benefits<br>California Coastal Conservancy grant for planning purposes of $100,000 in 2007. TPL will look to purchase approximately 60 acres within study area at an estimated cost of $1.04 million (undiscounted) over 12 years (2008 – 2019) |
| | VEN-2 | Santa Clara River | City of Ventura could experience significant benefits from tidewater goby conservation efforts if Ventura Water Reclamation Facility is allowed to continue effluent releases. If NPDES permit to continue effluent releases into the estuary is not approved, the City may have to build an ocean outfall, which would cost an additional $35 million – $90 million.[24]<br><br>Newhall Ranch development upstream may present groundwater withdrawal issues. [21]<br><br>The Nature Conservancy (TNC) has been actively purchasing lands in the Santa Clara River since 2001, with a focus on high quality riparian areas. TNC is currently updating their plan for this area, which will be completed in October 2007. TNC is looking at several acquisitions in the river mouth and estuary area. Expect to spend approximately $10.0 million over the next 7 years (2008 – 2014. Future goals include purchasing lands in the floodplain to help mitigate impacts of potential flooding, and to prevent structured flood control (channelization). [25] |

| COUNTY | UNIT | NAME | DESCRIPTION OF FUTURE WATER MANAGEMENT ACTIVITIES |
|---|---|---|---|
| | VEN-3 | J Street Drain—Ormond Lagoon | Flood control efforts by Ventura Watershed Protection District - two projects, one in J-Street Drain and another in Oxnard Drain. Timing uncertain but assume they both occur in 2016). [26]<br><br>Illegal sandbar breaching has occurred here, but no expected enforcement. [27]<br><br>The California Coastal Conservancy and TNC have acquired lands in this area, although mostly not in the study area. TNC and the California Coastal Conservancy were primarily focused on wetlands preservation around Ormond lagoon with their pre-designation property purchases in this area, but were also are also interested in avoiding flood control efforts that would be required if these lands are developed. Benefits to tidewater goby were also expected to occur as a result of these pre-designation purchases and any post-designation purchases. Estimate $2.60 million spent in 2005 for portion of TNC purchases that fall within study area. Future acquisitions will likely be outside of the study area, with the exception of the Halaco superfund site; however, that purchase is not likely to occur in the next 20 years.[28] |
| Los Angeles | LA-1 | Malibu Lagoon | Dam upstream. Proposed notching the dam and letting sediment move in batches, but it was recognized that this wouldn't be good for the tidewater goby. So, goby may preclude this method, and may require them to take a more expensive route. Corps has done some research, but there is no local sponsor for this project yet. This dam removal is several miles upstream of study area and is unlikely to occur in the next 20 years.[18]<br><br>The State used to be permitted to breach this lagoon but then it got harder to get the permit, so no longer perform this activity. The reason for breaching this sandbar is because as the water stands and gathers it smells and looks bad because of eutrification (i.e., algae buildup, increased oxygen, rotting). Unauthorized breaching of Malibu Lagoon occurs occasionally (local residents manually breach it to avoid odors). [29] |
| | LA-2 | Topanga Creek | Potential for future beach nourishment projects (Restoration projects discussed in Chapter 5). [30] |

| COUNTY | UNIT | NAME | DESCRIPTION OF FUTURE WATER MANAGEMENT ACTIVITIES |
|---|---|---|---|

Notes:
(1) Personal communication with USACE Eureka Field Office, March 22, 2007.
(2) Personal communications with Karen Kovacs, CDFG, April 12, 2007.
(3) Email and personal communication from Patty McCleary, Smith River Alliance, June 4, 2007.
(4) Personal communication with Jim Baskin CCC, May 2, 2007.
(5) Personal communication with Biologist, Service Arcata Field Office, February 15, 2007.
(6) Center for Environmental Economic Development (CEED). 2002. A River in the Balance: Benefits and Costs of Restoring Natural Water Flows to the Eel River, Prepared for Friends of the Eel River. Summer 2002.
(7) Personal communication with Rick Miller, Mendocino Planning Department, May 4, 2007.
(8) Based on IEc GIS analysis.
(9) Personal communication with Peter LaCivita, USCACE, April 9, 2007.
(10) Personal communication with Darren Fong, NPS, Golden Gate National Recreation Area, May 15, 2007.
(11) Personal communication with Don Hill, County of Santa Cruz Department of Public Works, April 9, 2007.
(12) Personal communication with Christopher Eng, USACE, May 4, 2007 & email May 15, 2007.
(13) Pajaro Valley Water Management Agency, Revised Basin Management Plan, 2002. Available at: http://www.pvwma.dst.ca.us/basin_management_plan/bmp_documents.shtml, accessed on July 17, 2007.
(14) Gold Ridge Resource Conservation District and Prunuske Chatham, Inc. 2007. Salmon Creek Watershed Assessment and Restoration Report, Version 1, 2007. Available at: http://www.goldridgercd.org/pdf/DFG_Assessment_Report_Draft.pdf, accessed on July 17, 2007.
(15) Personal communication with Jane Hicks, USACE, March 27, 2007.
(16) Personal communication with Nick Franco, California State Parks and Recreation, San Luis Obispo Coast District, May 10, 2007.
(17) Personal communication with Lisa Mangione, USACE, March 29, 2007.
(18) Personal communication with Jack Malone, USACE, April 30, 2007.
(19) Email from Gail Campos, USACE, May 15, 2007.
(20) Personal communication with Maureen Spencer, Santa Barbara Flood Control District, May 4, 2007.
(21) Personal communication with Karen Waln, City of Ventura, April 10, 2007.
(22) Personal communication with Biologist, Service Ventura Field Office, April 10, 2007.
(23) Personal communication with Marc Landgraf, TPL, May 25, 2007.
(24) Personal communication with Dan Pfeifer, City of Ventura, Utilities Division, Public Works Department, May 23, 2007.
(25) Personal communication with E.J. Remson, The Nature Conservancy, May 21, 2007. Also, see California Coastal Conservancy's Santa Clara River Parkway website http://www.santaclarariverparkway.org/parkwayplanning accessed on July 17, 2007.
(26) Personal communication with Theresa Stevens, Ventura Watershed Protection District, May 21, 2007.
(27) Personal communication with Antal Szijj, USACE, March 28, 2007.
(28) Personal communication with Sandi Matsumoto, TNC, May 25, 2007, and subsequent email communication from Sandi Matsumoto on May 29, 2007. Pre-designation purchases in the area include purchase of 265 acres by TNC for $13 m in 2005 (of which 20% falls in study area based on map provided by TNC, and IEc GIS analysis) (personal communication with Sandi Matsumoto, TNC, May 25, 2007). Also, 276 acres purchased by Coastal Conservancy $10.6 m in 2006 fell outside study area (California Coastal Conservancy. Southern California Wetlands Recovery Project 2006 Work Plan Update. Downloaded from http://www.scwrp.org/work_plan.htm).
(29) Personal communication with Dave Crawford, City of Malibu, May 7, 2007.
(30) Personal communication with Aaron Allen, USACE, March 27, 2007.
(31) Personal communication with Biologist, Service Sacramento Field Office, February 14, 2007.
(32) Email communication from Theresa Lawler, Waterfront Department, City of Santa Barbara, June 28, 2007.