



# FEDERAL REGISTER

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Vol. 78

Wednesday,

No. 25

February 6, 2013

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Part III

Department of the Interior

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Fish and Wildlife Service

50 CFR Part 17

Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Tidewater Goby; Final Rule

**DEPARTMENT OF THE INTERIOR****Fish and Wildlife Service****50 CFR Part 17**

[Docket No. FWS-R8-ES-2011-0085;  
4500030114]

RIN 1018-AX39

**Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Tidewater Goby**

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Final rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service, designate critical habitat for the tidewater goby (*Eucyclogobius newberryi*) under the Endangered Species Act of 1973, as amended (Act). In total, approximately 12,156 acres (4,920 hectares) in Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties, California, fall within the boundaries of the critical habitat designation.

**DATES:** This rule becomes effective on March 8, 2013.

**ADDRESSES:** This final rule and the associated final economic analysis are available on the Internet at <http://www.regulations.gov> at Docket No. FWS-R8-ES-2011-0085, and from the Ventura Fish and Wildlife Office Web site at <http://www.fws.gov/ventura/>. Comments and materials received, as well as supporting documentation used in preparing this final rule, are available for public inspection, by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, CA 93003; telephone 805-644-1766; facsimile 805-644-3958.

The coordinates or plot points or both from which the maps included in the regulation are generated are included in the administrative record for this critical habitat designation and are available at <http://www.fws.gov/ventura/>, at <http://www.regulations.gov> in Docket No. FWS-R8-ES-2011-0085, and at the Ventura Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**). Any additional tools or supporting information that has been developed for this critical habitat designation will also be available at the Fish and Wildlife Service Web site and Field Office set out above, and may also be included in the preamble and/or at <http://www.regulations.gov>.

**FOR FURTHER INFORMATION CONTACT:** For general information, and information about the final designation in Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles Counties, contact Diane K. Noda, Field Supervisor, U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, CA 93003; telephone 805-644-1766; facsimile 805-644-3958. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800-877-8339.

For information about the final designation in Del Norte, Humboldt, and Mendocino Counties, contact Nancy Finley, Field Supervisor, U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, 1655 Heindon Road, Arcata, CA 95521; telephone 707-822-7201; facsimile 707-822-8411.

For information about the final designation in Sonoma, Marin, and San Mateo Counties, contact Susan Moore, Field Supervisor, U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, 2800 Cottage Way, Suite W-2605, Sacramento, CA 95825; telephone 916-414-6600; facsimile 916-414-6712.

For information about the final designation in Orange and San Diego Counties, contact Jim Bartel, Field Supervisor, U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Service Office, 6010 Hidden Valley Road, Suite 101, Carlsbad, CA 92011; telephone 760-431-9440; facsimile 760-431-5901.

**SUPPLEMENTARY INFORMATION:**

**Executive Summary**

*Why we need to publish a rule.* This is a final rule to revise the designation of critical habitat for the endangered tidewater goby. Under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), any species that is determined to be an endangered or threatened species requires critical habitat to be designated, to the maximum extent prudent and determinable. Designations and revisions of critical habitat can only be completed by issuing a rule. In total, approximately 12,156 acres (ac) (4,920 hectares (ha)) of critical habitat for the tidewater goby in California fall within the boundaries of the critical habitat designation.

We designated critical habitat for this species in 2000 and again in 2008. As part of a settlement agreement, we agreed to reconsider the 2008 designation. A proposed rule to revise the 2008 critical habitat designation was published in the **Federal Register** on October 19, 2011 (76 FR 64996). This

constitutes our final revised designation for the tidewater goby.

*We are making the following changes to the critical habitat designation.* The 2008 final critical habitat designation (73 FR 5920) consisted of 44 units in Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles Counties, California, totaling 10,003 ac (4,050 ha). In this final critical habitat designation, we have designated 65 critical habitat units for the tidewater goby throughout its range, including the 44 units designated in the 2008 final rule. These units are essential for the recovery of the tidewater goby as described in the Recovery Plan for the Tidewater Goby (Service 2005a; Recovery Plan).

*The basis for our action.* Under the Act, we must determine critical habitat for any endangered or threatened species to the maximum extent prudent and determinable. We are required to base the designation on the best available scientific data 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. The Secretary of the Department of the Interior (Secretary) may exclude an area from critical habitat if the benefits of exclusion outweigh the benefits of designation, unless the exclusion will result in the extinction of the species.

*We prepared an economic analysis.* In order to consider economic impacts, we prepared a new analysis of the economic impacts of the proposed revised critical designation. We announced the availability of the draft economic analysis (DEA) in the **Federal Register** on July 24, 2012 (77 FR 43222), allowing the public to provide comments on our analysis. We considered all comments and information received from the public during the comment period, incorporated the comments as appropriate, and have completed the final economic analysis (FEA) concurrently with this final determination. The economic analysis did not identify any areas with disproportionate costs associated with the designation, and no areas were excluded from the final designation based on economic reasons.

*Peer review and public comment.* We sought comments and information from independent specialists to ensure that our critical habitat designation is based on scientifically sound data, assumptions, and analyses. We had invited these peer reviewers to comment on our specific assumptions and

conclusions in the proposed revision of the critical habitat designation. These peer reviewers generally concurred with our methods and conclusions and provided additional information, clarifications, and suggestions to improve this final rule. Information we received from peer review is incorporated in this final revised designation. We also considered all comments and information received from the public during the comment period.

### Previous Federal Actions

On April 15, 2009, the Natural Resources Defense Council (NRDC) filed a lawsuit in the U.S. District Court for the Northern District of California challenging a portion of the January 31, 2008, final rule that designated 44 critical habitat units in California (73 FR 5920, January 31, 2008). The lawsuit challenged the Service's failure to include any unoccupied habitat and the exclusion of some occupied habitat from critical habitat designation, and the failure to explain why unoccupied habitat previously included in the 2000 designation was not included in the 2008 designation. In a consent decree dated December 11, 2009, the U.S. District Court: (1) Stated that the 44 critical habitat units should remain in effect; (2) stated that the final rule designating critical habitat was remanded in its entirety for reconsideration; and (3) directed the Service to promulgate a revised critical habitat rule that considers the entire geographic range of the tidewater goby and any currently unoccupied tidewater goby habitat. The consent decree requires that the Service submit proposed and final revised rules to the **Federal Register** no later than October 7, 2011, and November 27, 2012, respectively. We published a proposed revised critical habitat in the **Federal Register** on October 19, 2011 (76 FR 64996). Information on the associated draft economic analysis for the revised proposed critical habitat was published in the **Federal Register** on July 24, 2012 (77 FR 43222). At the request of the Service on November 26, 2012, the U.S. District Court granted a 60-day extension to submit the final revised rule to the **Federal Register** no later than January 26, 2013. By publishing this final revised designation we are complying with the consent decree established by the Court. For additional information on previous Federal actions please refer to the 1994 listing rule (59 FR 5494; February 4, 1994), and previous critical habitat designation (73 FR 5920; January 31, 2008).

### Background

It is our intent to discuss in this final rule only those topics directly relevant to the development and designation of critical habitat for the tidewater goby under the Act (16 U.S.C. 1531 *et seq.*). For more information on the biology and ecology of the tidewater goby, refer to the final listing rule published in the **Federal Register** on February 4, 1994 (59 FR 5494). For information on tidewater goby critical habitat, refer to the proposed rules to designate critical habitat for the tidewater goby published in the **Federal Register** on August 3, 1999 (64 FR 42250), November 28, 2006 (71 FR 68914), and October 19, 2011 (76 FR 64996); and the subsequent final critical habitat designations published in the **Federal Register** on November 20, 2000 (65 FR 69693), and January 31, 2008 (73 FR 5920); and to our Recovery Plan (Service 2005a), which is available from the Ventura Fish and Wildlife Office (see **ADDRESSES** section or <http://ecos.fws.gov>). Information on the associated draft economic analysis for the proposed rule to revise critical habitat was published in the **Federal Register** on July 24, 2012 (77 FR 43222).

#### *Species Description and Genetic/Morphological Characteristics*

The tidewater goby is a small, elongate, gray-brown fish rarely exceeding 2 inches (in) (5 centimeters (cm)) in length. This species possesses large pectoral fins, with the pelvic or ventral fins joined to each other beginning below the chest and belly and from below the gill cover back to just anterior of the anus. Male tidewater gobies are nearly transparent with a mottled brown upper surface. Female tidewater gobies develop darker colors, often black, on the body and dorsal and anal fins. The tidewater goby is a short-lived species; the lifespan of most individuals appears to be about 1 year (Irwin and Soltz 1984, p. 26; Swift *et al.* 1989, p. 4; Hellmair 2011, p. 5).

Various genetic markers demonstrate that pronounced differences exist in the genetic structure of the tidewater goby, and that tidewater goby populations in some locations are genetically distinct. A study of mitochondrial DNA and cytochrome b (molecular material used in genetic studies) sequences from tidewater gobies that were collected at 31 locations throughout the species' geographic range has identified six major phylogeographic (historical processes that may be responsible for the current geographic distributions) units (Dawson *et al.* 2001, p. 1171). These six regional units are the basis for the recovery units in the Recovery Plan

(Service 2005a, p. 30), and include the following areas: (1) Tillas Slough (Smith River) in Del Norte County to Lagoon Creek in Mendocino County (North Coast (NC) Recovery Unit); (2) Salmon Creek in Sonoma County to Bennett's Slough in Monterey County (Greater Bay (GB) Recovery Unit); (3) Arroyo del Oso to Morro Bay in San Luis Obispo County (Central Coast (CC) Recovery Unit); (4) San Luis Obispo Creek in San Luis Obispo County to Rincon Creek in Santa Barbara County (Conception (CO) Recovery Unit); (5) Ventura River in Ventura County to Topanga Creek in Los Angeles County (Los Angeles-Ventura (LV) Recovery Unit); and (6) San Pedro Harbor in Los Angeles County to Los Peñasquitos Lagoon in San Diego County (South Coast (SC) Recovery Unit).

A more recent study to gather genetic distribution data for the tidewater goby used a panel of novel microsatellite loci (repeating sequences of DNA) assessed in a first-order (unbound strands of DNA) survey across its range (Earl *et al.* 2010, p. 104). More specifically, Earl *et al.* (2010, p. 103) described 19 taxon-specific microsatellite loci, and assessed genetic variation across the tidewater goby's range relative to genetic subdivision. The study concluded: (1) Populations of tidewater goby in northern San Diego County form a highly divergent clade (a genetically related group) with reduced genetic variation that appears to merit status as a separate species; (2) populations along the mid-coast of California are subdivided into regional groups, which are more similar to each other than different, contrary to conclusions from previous mitochondrial sequence-based studies (Dawson *et al.* 2001, p. 1176); and (3) that tidewater goby dispersal during the Pleistocene/Holocene sea level rise (approximately 7,000 years ago), followed by increased isolation during the Holocene, formed a star phylogeny (recent population formed from a common ancestor) with geographic separation in the northernmost populations and some local differentiation (Earl *et al.* 2010, p. 103). Genetic diversity among populations within a species may be important to long-term persistence because it represents the raw material for adapting to differing local conditions and environmental stochasticity (Frankham 2005, p. 754).

The conclusion that the populations of the tidewater goby in the North Coast Recovery Unit formed as a result of a single recent episode of colonization of newly formed habitats is supported by McCraney *et al.* (2010, p. 3325). They compared genetic variation of 13

naturally and artificially fragmented populations of the tidewater goby in northern California, including 8 Humboldt Bay populations and 5 coastal lagoon populations (Lake Earl, Stone Lagoon, Big Lagoon, Virgin Creek, and Pudding Creek), and reached similar conclusions to Earl *et al.* (2010, p. 113). McCraney *et al.* (2010, p. 3325) also concluded that natural and artificial habitat fragmentation caused marked divergence among the tidewater goby in the North Coast populations. Their study showed that Humboldt Bay populations, due to isolation by manmade barriers, exhibited very high levels of genetic differentiation between populations, extremely low levels of genetic diversity within populations, and no migration among populations. They concluded that this pattern makes the Humboldt Bay populations of tidewater goby vulnerable to extirpation because artificial fragmentation and its resulting genetic differentiation between subpopulations, extremely low levels of genetic diversity within subpopulations, and lack of migration among the subpopulations reduces fitness and adaptive potential of a subpopulation (McCraney *et al.* 2010, p. 3325). In contrast, the study found that, while coastal lagoon populations also exhibited very high levels of genetic differentiation between populations, these populations displayed substantial levels of genetic diversity within populations indicating occasional migration among lagoons (McCraney *et al.* 2010, p. 3325). Populations in all coastal lagoons, with the exception of Lake Earl in Del Norte County, appear to be stable and genetically healthy (McCraney *et al.* 2010, p. 3325). The Lake Earl population exhibited reduced levels of genetic diversity in comparison to similar coastal lagoon populations (McCraney *et al.* 2010, p. 3324). McCraney *et al.* (2010, p. 3324) suspects that the reduced genetic diversity detected within Lake Earl is likely due to repeated population bottlenecks (reduced genetic diversity due to reduced population size) resulting from regular artificial breaching of the sandbar at the lagoon mouth.

To summarize, the conclusions from these studies are:

(1) The species can be divided into six phylogeographic units based upon genetic similarities and differences.

(2) The tidewater goby to the south of the gap between Los Angeles and Orange Counties is probably a separate species from populations to the north based on its divergent genetic makeup.

(3) Natural and anthropogenic barriers have contributed to genetic differentiation among populations.

(4) Although genetic differences occur between populations north of the Los Angeles-Orange County line, they are not as divergent as those populations further south.

(5) Some north coast populations exhibit significantly reduced genetic diversity, reduced growth potential, and reduced duration of spawning period. These populations appear to be vulnerable to extirpation.

#### *Metapopulation Dynamics*

Local populations of tidewater goby are best characterized as metapopulations (Lafferty *et al.* 1999a, p. 1448; Smith, *in litt.* 2012). How a metapopulation functions through time is an important factor in the conservation of the tidewater goby and thus it is an important consideration in the designation of critical habitat. As such, using information primarily from Groom *et al.* (2006, pp. 216–219, 383–384, 424–428) and Primack (2006, pp. 285–287) and elsewhere as noted below, we present the general concept of metapopulation dynamics followed by a discussion of its application to the tidewater goby.

A metapopulation, in short, is a population of populations (often referred to as subpopulations). However, because of variations in the rates of birth, death, immigration, and emigration, each population is not static over time; as such, the interplay of a metapopulation's constituent populations results in a dynamic process of metapopulation maintenance. Thus, definitions of the term *metapopulation* within the scientific literature often incorporate the dynamic interaction of subpopulations, according to Groom *et al.* (2006, p. 706) a metapopulation consists of: "A network of semi-isolated populations with some level of regular or intermittent migration and gene flow among them, in which individual populations may go extinct [become extirpated] but can then be recolonized from other populations." The Recovery Plan also incorporates interpopulation interaction in its definition of metapopulation: "several to many subpopulations [of] tidewater goby that are close enough to one another that dispersing individuals could be exchanged" (Service 2005a, p. A-3).

Regarding this discussion, two points in particular are important to note in metapopulations: (1) Variability within subpopulations, and (2) connectivity between them through dispersing individuals. As mentioned above, subpopulations at different locations within a metapopulation vary over time. Because of intrinsic and extrinsic factors

(Soulé and Simberloff 1986, pp. 27–28), some populations at given locations have high rates of growth in some years and other populations decline or even become extirpated. Yet, because subpopulations within a metapopulation are biologically connected through dispersing individuals, high-productivity subpopulations (sources) may augment the population size in low-productivity subpopulations (sinks); moreover, dispersing individuals may even recolonize extirpated areas. In this way, a metapopulation as a whole maintains a greater level of stability over time than its constituent subpopulations—in effect, metapopulation dynamics dampen the effects of variability. In addition to bolstering subpopulations or recolonizing extirpated areas, dispersing individuals are also important for maintaining gene flow between subpopulations (genetic connectivity) and thereby reducing the risk that certain alleles may be lost as a result of the extirpation of a subpopulation.

Moreover, the greater the number of constituent subpopulations within a metapopulation, the greater the likelihood the effects of variability will be attenuated in that metapopulation. In short, because of metapopulation dynamics, extirpation of a subpopulation is not necessarily permanent. This results in a situation where constituent subpopulations "blink out" and "blink on" over time. A metapopulation persists through time because the rate of extirpation in subpopulations is balanced by the rate of recolonization. As a result, occupancy of an area may change over time.

The balance discussed above is in large part dependent upon dispersal of individuals. Ultimately, when the rate of recolonization is reduced or eliminated, the effects of the threats are no longer dampened by metapopulation dynamics. In such a case, each constituent subpopulation becomes increasingly or completely independent, and extirpation of such a subpopulation is likely to be permanent.

The pattern of extirpation and recolonization observed in the tidewater goby suggests that some tidewater goby populations exhibit a metapopulation dynamic where some populations survive or remain viable by continually exchanging individuals and recolonizing after occasional extirpations (Doak and Mills 1994, p. 619). Individual populations of tidewater goby occupy coastal lagoons and estuaries that are separated from each other by land and, in most cases, are separated from the open ocean by



sandbars, or other barriers. Very few tidewater gobies have ever been captured in the marine environment (Swift *et al.* 1989, p. 7), which suggests that this species rarely occurs in the open ocean. Studies of the tidewater goby suggest that some populations persist on a consistent basis, while other populations appear to experience intermittent extirpations (local extinctions) (Lafferty *et al.* 1999a, p. 1452). These extirpations may result from one or a series of factors, such as the drying up of the lagoon during prolonged droughts (Lafferty *et al.* 1999a, p. 1451). Some of the areas where the tidewater goby has been extirpated apparently have been recolonized by nearby populations (those within approximately 6 miles (mi) (10 kilometers (km))) (Lafferty *et al.* 1999a, p. 1451; Smith, *in litt.* 2012). However, genetic research has revealed tidewater gobies are capable of dispersing up to 30 mi (48 km) (Jacobs *et al.* 2005, p.52).

Lafferty *et al.* (1999b, p. 618) monitored the postflood persistence of several tidewater goby populations in Santa Barbara and Los Angeles Counties after the heavy winter floods of 1995. All of the monitored populations persisted after the floods, and no significant changes in population sizes were noted (Lafferty *et al.* 1999b, p. 621). However, tidewater goby apparently colonized Cañada Honda in Santa Barbara County after one flood event (Lafferty *et al.* 1999b, p. 621). This suggests that flooding—where the barrier between the lagoon and the open ocean is breached and tidewater goby individuals are washed out to sea—may sometimes have a positive effect, forcing the dispersal of individuals and thereby allowing for recolonization of habitats where a tidewater goby population has become extirpated or allowing for genetic exchange between extant populations.

Historical records and survey results for several areas occupied by the tidewater goby are available (Swift *et al.* 1989, pp. 18–19; Swift *et al.* 1994, pp. 8–16). These studies suggest that the persistence of tidewater goby populations is related to habitat size, configuration, location, and proximity to human development. In general, the most stable and persistent tidewater goby populations tend to occur in lagoons and estuaries that are more than 2.5 ac (1 ha) in size, and that have remained relatively unaffected by human activities (Lafferty *et al.* 1999a, pp. 1450–1453). Conversely, some habitats less than 2.5 ac (1 ha) in size have tidewater goby populations that persist on a regular basis, such as

Cañada del Agua Caliente in Santa Barbara County (Swift *et al.* 1997, p. 3). We also note that some systems that are affected or altered by human activities also have relatively large and stable populations; examples include Pismo Creek in San Luis Obispo County, the Santa Ynez River in Santa Barbara County, and the Santa Clara River in Ventura County. The best available information suggests that the lagoons and estuaries with persistent tidewater goby populations likely serve as source populations that provide individuals that colonize adjacent locations with intermittent populations (Lafferty *et al.* 1999a, p. 1452). However, a rangewide metapopulation viability analysis for the tidewater goby has not been conducted; data from such a study would help inform which tidewater goby populations are source populations and which are sinks, and allow for the development of metapopulation-based recovery objectives for the species. Until data on demography and dynamics of tidewater goby metapopulations are available, the Recovery Plan for the species calls for interim objectives that emphasize consistent occupancy of habitat capable of sustaining viable tidewater goby populations (Service 2005a, p. 39).

#### Distribution

The known geographic range of the tidewater goby is limited to the coast of California (Eschmeyer *et al.* 1983, p. 262; Swift *et al.* 1989, p. 12). The species historically occurred from locations 3 mi (5 km) south of the California—Oregon border (Tillas Slough in Del Norte County) to 44 mi (71 km) north of the United States—Mexico border (Agua Hedionda Lagoon in San Diego County). The available documentation (Eschmeyer *et al.* 1983, p. 262; Swift *et al.* 1989, p. 12) suggests that the northernmost extent of the current geographic range has not changed over time. Tidewater goby historically occurred in Agua Hedionda Lagoon, but the site is currently considered to be unoccupied. The species' southernmost, known, currently occupied locality is the San Luis Rey River, 5 mi (8 km) north of Agua Hedionda Lagoon in San Diego County. Although the northernmost extent of the tidewater goby's range has not changed and the southernmost extent has retracted by only 5 mi (8 km), its overall distribution has become patchy and fragmented along the coast. However, as discussed above in the *Metapopulation Dynamics* section, the occupancy of an area may change overtime and, when determining occupancy of an area, we first look at the rangewide occupancy

for the species and then consider potential connectivity and source areas at the subpopulation or unit level.

The tidewater goby appears to be naturally absent from several long (50 to 135 mi (80 to 217 km)) stretches of coastline lacking lagoons or estuaries, where steep topography or swift currents may prevent the tidewater goby from dispersing between adjacent locations (Swift *et al.* 1989, p. 13; Earl *et al.* 2010, p. 104). One such gap occurs between the Eel River in Humboldt County and the Ten Mile River in Mendocino County. A second gap exists between Davis Lake in Mendocino County and Salmon Creek in Sonoma County. Another large natural gap exists between Monterey County and Arroyo del Oso in San Luis Obispo County. Habitat loss and other anthropogenic-related factors have resulted in the tidewater goby's absence from several locations where it historically occurred; the extirpation of tidewater goby from some of these locations has expanded gaps and created additional gaps in the species' geographic distribution (Capelli 1997, p. 7). Two examples of extirpations are San Francisco Bay in San Francisco and Alameda Counties, and Redwood Creek and Freshwater Lagoon in Humboldt County.

Swift *et al.* (1989, p. 13) reported that, as of 1984, tidewater goby occurred or had been known to occur at 87 locations, including those at the extreme northern and southern end of the species' historical geographic range. An assessment of the species' distribution in 1993, using records that were limited to the area between the Monterey Peninsula in Monterey County and the United States—Mexico border, found the tidewater goby occurring at four additional sites since 1984 (Swift *et al.* 1993, p. 129). Other locations have been identified since 1993, and to date the tidewater goby has been documented to have occurred at 135 locations. Of these 135 locations, 21 (16 percent) are no longer occupied by the tidewater goby.

#### Habitat

The lagoons, estuaries, backwater marshes, and freshwater tributaries that tidewater goby occupy are dynamic environments subject to considerable fluctuations on a seasonal and annual basis. Typically, a sandbar forms in the late spring as flow into a lagoon declines enough to allow the ocean surf to build up sand at the mouth of the lagoon. Winter rains and increased stream flows may bring in considerable sediment and dramatically affect the bottom profile and substrate composition of a lagoon or estuary. Fine mud and clay either move through the

lagoon or estuary, or settle out in the backwater marshes, while heavier sand is left behind. High flows associated with winter rains can scour out the lagoon bottom to a lower level, especially after breaching the mouth sandbar, with sand building up again after flows decline. These dynamic processes result in wetland habitats that, over time, move both up or down coast, and inland or coastward.

The horizontal extent of the lentic (pondlike) wetland habitat associated with a particular tidewater goby locality varies and is affected, in part, by local precipitation patterns and topography. In coastal areas where the topography is steep and precipitation relatively low, such as areas adjacent to the Santa Ynez Mountains in Santa Barbara County, the habitats occupied by tidewater goby may be a few acres in size and only extend a few hundred feet inland from the ocean, with backwater marshes small or absent. In other coastal settings where topography is less steep and precipitation is more abundant, surface streams are larger, and coastal lagoons or estuaries may be hundreds of acres in size and extend many miles inland and may include extensive backwater marshes (for example, Lake Earl in Del Norte County and Ten Mile River in Mendocino County). Some occupied locations, such as Bennett's Slough in Monterey County, receive water from upstream areas on a year-round basis. Such locations tend to possess wetland habitats that are larger and can extend inland for several miles. Other occupied locations do not possess stream channels or tributaries that provide a considerable amount of water throughout the summer or fall months. Such locations, such as Little Pico Creek in San Luis Obispo County, tend to possess wetland habitats that extend only a short distance inland.

#### Reproduction

The tidewater goby has been observed to spawn in every month of the year except December (Swenson 1999, p. 107). Reproduction tends to peak in late April or May to July, and can continue into November depending on seasonal temperature and rainfall. Hellmair's (2011) findings reveal year-round reproduction for some tidewater goby populations that have high genetic diversity and restricted spawning periods for other populations with low genetic diversity. Swenson (1995, p. 31) has documented the spawning activities of adult fish or the presence of egg clutches at water temperatures between 48 and 77 degrees Fahrenheit (°F) (9 and 25 degrees Celsius (°C)). Spawning tidewater gobies have been documented

to breed in water salinities between 1 and 30 parts per thousand (ppt) (Swenson 1995, p. 31, Smith, *in litt.* 2012). However, tidewater gobies prefer salinities less than 10 ppt (Moyle 2002, p. 431).

#### Threats

The final listing rule for the tidewater goby published in 1994 (59 FR 5494; February 4, 1994) and the 5-year review (Service 2007) state that this species is threatened, or potentially threatened, by: (1) Coastal development projects that result in the loss or alteration of coastal wetland habitat; (2) water diversions and alterations of water flows upstream of coastal lagoons and estuaries that negatively impact the species' breeding and foraging activities; (3) groundwater overdrafting; (4) channelization of the rivers where the species occurs; (5) discharge of agricultural and sewage effluents; (6) cattle grazing and feral pig activity that results in increased sedimentation of coastal lagoons and riparian habitats, removal of vegetative cover, increased ambient water temperatures, and elimination of plunge pools and undercut banks utilized by the tidewater goby; (7) introduced species that prey on the tidewater goby (e.g., bass (*Micropterus* spp.), rainwater killifish (*Lucania parva*), and crayfish (*Cambarus* spp.)); (8) the inadequacy of existing regulatory mechanisms; (9) drought conditions that result in the deterioration of coastal and riparian habitats; and (10) competition with introduced species, such as the yellowfin goby (*Acanthogobius flavimanus*) and chameleon goby (*Tridentiger trionocephalus*). Lastly, loss of genetic diversity has also been recently shown to threaten populations of tidewater goby (McCraney *et al.* 2010, Hellmair 2011).

#### Climate Change

Our analyses under the Endangered Species Act include consideration of ongoing and projected changes in climate. The terms "climate" and "climate change" are defined by the Intergovernmental Panel on Climate Change (IPCC). "Climate" refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2007, p. 78). The term "climate change" thus refers to a change in the mean or variability of one or more measures of climate (e.g., temperature or precipitation) that persists for an extended period, typically decades or longer, whether the change is due to

natural variability, human activity, or both (IPCC 2007, p. 78). Various types of changes in climate can have direct or indirect effects on species. These effects may be positive, neutral, or negative and they may change over time, depending on the species and other relevant considerations, such as the effects of interactions of climate with other variables (e.g., habitat fragmentation) (IPCC 2007, pp. 8–14, 18–19). In our analyses, we use our expert judgment to weigh relevant information, including uncertainty, in our consideration of various aspects of climate change.

In addition to the threats listed above, tidewater goby populations are threatened by global climate change. Sea level rise and hydrological changes associated with climate change are having and will continue to have significant effects on tidewater goby habitat over the next several decades.

Sea level rise is a result of two phenomena: thermal expansion (increased sea water temperatures) and global ice melt (Cayan *et al.* 2006, p. 5, National Research Council 2012, p. 33). Between 1897 and 2006, the observed sea level rise has been approximately 2 millimeters (0.08 in) per year, or a total of 20 cm (8 in) over that period (Heberger *et al.* 2009, p. 6). Older estimates projected that sea level rise along the California coast would follow a similar rate and reach 0.2–0.6 meters (m) (0.7–2 feet (ft)) by 2100 (IPCC 2007). Recent observations and models indicate that those projections were conservative and ignored some critical factors, such as melting of the Greenland and Antarctica ice sheets (Heberger *et al.* 2009, p. 6; Rahmstorf 2010, p. 44). Heberger *et al.* (2009, p. 8) have updated the sea level rise projections for California to 1.0–1.4 m (3.3–4.6 ft) by 2100, while Vermeer and Rahmstorf (2009, p. 21530) calculate the sea level rise globally at 0.57–1.9 m (2.4–6.2 ft); in both cases, recent estimates were more than twice earlier projections. Combined with California's normal dramatic tidal fluctuations and coincidental storms—the severity of the latter is projected to increase with more frequent El Niño Southern Oscillations due to increasing surface water temperature (Cayan *et al.* 2006, p. 17)—the effects of sea level rise are expected to result in greater coastal erosion (Scripps Institution of Oceanography 2012, p. 24) and reach farther inland than previously anticipated (Cayan *et al.* 2006, pp. 48–49; Cayan *et al.* 2009, p. 40).

Park *et al.* (1989, pp. 1–52) projected that, of the saltmarshes along the coast of the contiguous United States: 30 percent would be lost with a 0.5-m (1.6-

ft) sea level rise, 46 percent with a 1-m (3.3-ft) sea level rise, 52 percent with a 2-m (6.6-ft) sea level rise, and 65 percent with a 3-m (9.8-ft) sea level rise. While we cannot project directly to California from the estimates of Park *et al.* (1989, p. 1–52) who focused on the east coast and Gulf coast of the United States, we can anticipate that, with a projected global sea level rise of up to almost 2 m (6.6 ft), 46 to 65 percent of the remaining coastal saltmarshes in California would be lost by 2100. Applying Heberger *et al.*'s (2009, p. 8) more conservative estimates for California to Park *et al.*'s calculations, with a projected sea level rise of 1.0–1.4 m (3.3–4.6 ft) by 2100, somewhere between 46 and 52 percent of the coastal saltmarshes in California would be inundated.

For the tidewater goby, sea level rise estimates based on more recent projections, combined with the effects of storms and tidal fluctuations, have the potential to transform coastal lagoons into primarily saltwater bodies (Cayan *et al.* 2006, pp. 34, 48–49). More severe storms that are likely to result from climate change (Cayan *et al.* 2006, p. 17), especially along the northern coast of California (Cayan *et al.* 2009, p. 38), combined with the higher than normal sea levels, will breach lagoon mouths more frequently from the ocean side, allowing more saltwater intrusion, altering the physical conditions of the tidewater goby's habitat (increased salinity), and disrupting the tidewater goby's normal reproduction process that requires closed lagoons and a specific range of salinities. The conversion of coastal lagoons and estuaries from brackish to primarily saltwater bodies, in addition to the inundation and breaching of sandbars, would eliminate habitat for tidewater goby in many areas. For a species that exhibits metapopulation dynamics and was listed as endangered due to past habitat loss and fragmentation of metapopulations, the projection of further habitat loss due to sea level rise raises concerns for the tidewater goby's survival over the long term.

#### Summary of Changes From Previously Designated Critical Habitat and 2011 Proposed Revised Critical Habitat Designation

In this section we present the differences between what was designated in the January 31, 2008, final rule (73 FR 5920), what was included in the October 19, 2011, proposed rule (76 FR 64996), and what is included in this final designation.

The 2008 final critical habitat designation (73 FR 5920, January 31,

2008) consisted of 44 units in Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, and Los Angeles Counties, California, totaling 10,003 ac (4,050 ha). In this final critical habitat designation, we have designated 65 critical habitat units for the tidewater goby throughout its range, including the 44 units designated in the 2008 final rule. Of the 21 new units included in this designation, 5 units are within the geographical area occupied at the time of listing and 16 units are outside the geographical area occupied at the time of listing (Table 1). Of the 16 new units that are outside the geographical area occupied at the time of listing, 8 units are currently occupied (Table 1). These 16 units are essential for the conservation of the tidewater goby as described in the Recovery Plan (Service 2005a).

This final critical habitat designation for the tidewater goby also differs from our October 19, 2011 (76 FR 64996) proposed rule. We reviewed and considered comments from the public and peer reviewers on the proposed revised designation, and from the public on the draft economic analysis published on July 24, 2012 (77 FR 43222). As a result of comments received, our final designation differs from our proposed designation, as follows:

(1) Based on information we received in comments regarding our proposal to designate unoccupied units, we revised the language in the *Criteria Used To Identify Critical Habitat* section of this final rule to clarify our intent. In the proposed rule we stated that, "We also are proposing to designate specific areas outside the geographical area occupied by the species at the time of listing that were historically occupied, but are presently unoccupied, because such areas are essential for the conservation of the species" (p. 65004). However, we did not intend to limit the proposal to only specific areas outside the geographical area occupied by the species at the time of listing that were historically occupied. Our intent was to consider all areas that are essential for the conservation of the species and not only those that were known to be historically occupied; we were in error when we included "that were historically occupied, but are presently unoccupied" in the proposed rule. We proposed to designate six units that are outside the geographical area occupied by the species at the time of listing where the tidewater goby has not been detected historically. These units are: Pomponio Creek (SM–2), Bolinas Lagoon (MAR–5), Arroyo de la Cruz

(SLO–1), Oso Flaco Lake (SLO–12), Arroyo Sequit (LA–1), and Zuma Canyon (LA–2). Subsequent to the publication of the proposed rule, tidewater gobies have been detected in Pomponio Creek (SM–2) (Rischbieter, *in litt.* 2012). These units are essential for the conservation of the tidewater goby as described in the Recovery Plan (Service 2005a) and the unit descriptions below.

(2) We revised and expanded our discussion on tidewater goby metapopulation dynamics and provided a discussion on the effects of climate change on the tidewater goby and its habitat.

(3) Based on comments received from the County of Santa Barbara pertaining to unit SB–12, Arroyo Paredon Creek, we reassessed the topography of the unit as originally proposed and determined that the gradient of the upper portion of the unit was a barrier to tidewater gobies. The unit now includes approximately 3 ac (1 ha), a net decrease of approximately 1 ac (less than 1 ha) from the proposal.

#### Critical Habitat

##### Background

Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features.

(a) Essential to the conservation of the species and

(b) Which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Conservation, as defined under section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that Federal agencies ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the consultation requirements of section 7(a)(2) of the Act would apply, but even in the event of a destruction or adverse modification finding, the obligation of the Federal action agency and the landowner is not to restore or recover the species, but to implement reasonable and prudent alternatives to avoid destruction or adverse modification of critical habitat.

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features (1) which are essential to the conservation of the species and (2) which may require special management considerations or protection. For these areas, critical habitat designations identify, to the extent known using the best scientific and commercial data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat). In identifying those physical or biological features within an area, we focus on the principal biological or physical constituent elements (primary constituent elements that provide for a species' life-history processes, such as roost sites, nesting grounds, seasonal wetlands, water quality, tide, soil type) that, under the appropriate species-specific circumstances, are essential to the conservation of the species.

Under the second prong of the Act's definition of critical habitat, we designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. For example, we may determine that an area currently occupied by the

species but outside the geographical area occupied at the time of listing is essential for the conservation of the species and include it in the critical habitat designation. We designate critical habitat in areas outside the geographical area occupied by a species only when a designation limited to its range would be inadequate to ensure the conservation of the species.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific and commercial data available. Further, our Policy on Information Standards Under the Endangered Species Act (published in the **Federal Register** on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106-554; H.R. 5658)), and our associated Information Quality Guidelines provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

When we are determining which areas should be designated as critical habitat, our primary source of information is generally the information developed during the listing process for the species. Additional information sources may include the Recovery Plan for the species, articles in peer-reviewed journals, conservation plans developed by States and counties, scientific status surveys and studies, biological assessments, other unpublished materials, or experts' opinions or personal knowledge.

Habitat is dynamic, and species may move from one area to another over time. We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, will continue to be subject to: (1) Conservation actions implemented under section 7(a)(1) of the Act, (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to insure their actions are not likely to jeopardize the

continued existence of any endangered or threatened species, and (3) the prohibitions of section 9 of the Act if actions occurring in these areas may affect the species. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of this species. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species conservation planning efforts if new information available at the time of these planning efforts calls for a different outcome.

#### *Physical or Biological Features*

In accordance with section 3(5)(A)(i) and 4(b)(1)(A) of the Act and regulations at 50 CFR 424.12, in determining which areas within the geographical area occupied by the species at the time of listing to designate as critical habitat, we consider the physical or biological features essential to the conservation of the species and which may require special management considerations or protection. These include, but are not limited to:

- (1) Space for individual and population growth and for normal behavior;
- (2) Food, water, air, light, minerals, or other nutritional or physiological requirements;
- (3) Cover or shelter;
- (4) Sites for breeding, reproduction, or rearing (or development) of offspring; and
- (5) Habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species.

We derive the specific physical or biological features essential to tidewater goby conservation from studies of this species' habitat, ecology, and life history as described in the Critical Habitat section of the proposed rule to revise critical habitat published in the **Federal Register** on October 19, 2011 (76 FR 64996), and in the information presented below. Additional information can be found in the final listing rule published in the **Federal Register** on February 4, 1994 (59 FR 5494), and the Recovery Plan for the tidewater goby (Service 2005a). We have determined that the tidewater goby requires the following physical or biological features:

### *Space for Individual and Population Growth and for Normal Behavior*

#### Saline Aquatic Habitat

The tidewater goby occurs in lagoons, estuaries, and backwater marshes that are adjacent to the Pacific Ocean (Wang 1982, p. 14; Irwin and Soltz 1984, p. 27; Swift *et al.* 1989, p. 1; Swenson 1993, p. 3; Moyle 2002, p. 431). The tidewater goby is most commonly found in waters with relatively low salinities, that is, less than 10 to 12 parts per thousand (ppt) (Swift *et al.* 1989, p. 7) (see below for further details). This species can, however, tolerate a wide range of salinities and is frequently found in coastal habitats with higher salinity levels (Swift *et al.* 1989, p. 7; Worcester 1992, p. 106; Swift *et al.* 1997, pp. 15–22); the species has been collected in salinities as high as 42 ppt (Swift *et al.* 1989, p. 7). The species' tolerance of high salinities likely enables it to withstand some exposure to the marine environment, which has a salinity of about 35 ppt, allowing it to recolonize nearby lagoons and estuaries following flood events (Swift *et al.* 1989, p. 7). However, tidewater gobies have only rarely been captured in the marine environment (Swift *et al.* 1989, p. 7), and they appear to enter the ocean only when flushed out of lagoons, estuaries, and river mouths by storm events or human-caused breaches of sand bars. Salinity tolerance studies indicate that larval stages are largely intolerant of high salinities whereas adult tidewater gobies can tolerate higher salinities. These findings suggest spawning in saline conditions is unlikely to be productive and that migration among subpopulations is most likely the result of adult tidewater goby movement (Kinziger, *in litt.* 2012). The goal of the Recovery Plan is to preserve the diversity of habitats that occur within the range of the species, the metapopulation structure of the species, and genetic diversity (Service 2005a, p. 28).

#### Water Depth, Velocity, and Temperature

The tidewater goby is most commonly collected in water less than 6 ft (2 m) deep (Wang 1982, pp. 4–5; Worcester 1992, p. 53). However, recently tidewater gobies were collected in Big Lagoon in Humboldt County during the breeding season at a water depth of 15 ft (4.6 m) (Goldsmith, *in litt.* 2006a). Whether use of these deeper waters is confined to this locality or is more widespread will require additional sampling at various depths and locations. The tidewater goby tends to avoid currents and concentrate in slack-water areas; this suggests it is less likely

to occur in areas with a steep gradient or microhabitats that have a substantial current. At Pescadero Creek in San Mateo County, tidewater gobies were absent from portions of the flowing creek that had a surface velocity of 0.15 m per second (0.49 ft per second), and the species was instead more densely concentrated in nearby eddies with lower water velocities (Swenson 1993, p. 3). Backwater marshes may provide important refuges that reduce the likelihood that a substantial number of tidewater gobies will be flushed out of the lagoons or estuaries and into the marine environment during heavy winter floods (Lafferty *et al.* 1999b, p. 619). Evidence that increased flows can eliminate the tidewater goby from a locality is suggested by the elimination of the tidewater goby from Waddell Creek in Santa Cruz County following a flood event in the winter of 1972–73 (Nelson as cited in Swift 1990, p. 2); this creek had been channelized and no longer afforded protection from high flows during flood events. Likewise, the channelization and elimination of habitat lateral to the main stream channel upstream of San Onofre Lagoon in San Diego County probably led to the flushing and extirpation of the tidewater goby from this locality during a storm in 1993 (Swift *et al.* 1994, p. 22–23). The importance of backwater marshes is also highlighted by the fact that tidewater gobies in these habitats can achieve a greater size at maturity than in adjacent lagoons and creeks (Swenson 1993, pp. 6–7).

#### Freshwater Habitat

The tidewater goby also occurs in freshwater streams up-gradient and tributary to brackish habitats; the salinity of these freshwater streams is typically less than 0.5 ppt. The available documentation demonstrates that, in some areas, tidewater goby can occur 1.6 to 7.3 mi (2.6 to 11.7 km) upstream from the ocean environment (Irwin and Soltz 1984, p. 27; Swift *et al.* 1997, p. 20; Goldsmith, *in litt.* 2006b). Within a 2-hour period, hundreds of tidewater gobies have been observed to move upstream of a fixed location into areas in the Santa Ynez River 3.2 mi (5.1 km) from the ocean in Santa Barbara County (Swift *et al.* 1997, p. 20). The fact that this many individuals were observed to move through an area suggests that freshwater tributaries in some riverine systems provide important habitat for individual and population growth. We have reviewed a variety of documents to determine how far tidewater gobies have been detected upstream from the ocean. Goldsmith (*in litt.* 2006b) found tidewater gobies 1.6 to 2.0 mi (2.6 to 3.3

km) upstream from the ocean in the Ten Mile River in Mendocino County; Swift *et al.* (1997, p. 18) found tidewater gobies 4.6 mi (7.3 km) upstream from the ocean in the San Antonio River in Santa Barbara County; Swift *et al.* (1997, p. 20) found tidewater gobies at various distances from 3.9 to 7.3 mi (6.2 to 11.7 km) upstream from the ocean in the Santa Ynez River in Santa Barbara County; and Holland (1992, p. 9) found tidewater gobies 3 mi (5 km) upstream from the ocean in the Santa Margarita River in San Diego County. Collectively, these data suggest the average maximum distance tidewater gobies have been detected upstream from the ocean in medium to large rivers is approximately 4.0 mi (6.4 km). Other than high stream gradient, the reasons for the variation in upstream movement between one locality and another have not been determined; salinity could be an important factor. Upstream salinity levels may vary with time of year, tidal cycles, storm events, and topography. However, Swift *et al.* (1997, p. 26) indicate that gradient and lack of barriers (e.g., beaver dams, sills) are more important factors than salinity to upstream dispersal.

#### Sandbars

Many of the locations occupied by the tidewater goby closely correspond to stream drainages. Under natural conditions, these stream drainages and the marine environment collectively act to produce sandbars that form a barrier between the ocean and the lagoon, estuary, backwater marsh, and freshwater stream system (Habel and Armstrong 1977, p. 39). These sandbars tend to be present during the late spring, summer, and fall seasons. The presence of a sandbar can create a lower salinity level (5 to 10 ppt) in the area up gradient from the sandbar (Carpelan 1967, p. 324) than would otherwise exist if there were no sandbar. The tidewater goby is more commonly associated with these lower salinity levels than with the salinity levels that occur in the ocean or an estuary without a sandbar, that is, about 35 ppt (Swift *et al.* 1989, p. 7). The formation of a sandbar also creates more habitat for aquatic organisms because water becomes ponded behind the sandbar. Artificial breaching of a sandbar tends to result in a rapid decrease in water levels, unlike natural breaching, and increases the likelihood that adult tidewater gobies, their nests, and their fry could become stranded and die, or become concentrated and subject to greater levels of predation pressure by birds or other predators. Natural breaching events tend to occur during

the late winter and early spring when tidewater goby breeding is at a low point in the reproduction cycle. Furthermore, tidewater gobies are likely able to detect storm events due to the increased inflow of fresh water that may cause a natural breaching event and swim upstream or take refuge in side channels (Lafferty *et al.* 1999b, p. 619).

In Humboldt Bay and the Eel River estuary in Humboldt County, a large amount of salt and brackish marsh habitat was historically eliminated through the construction of levees and drainage channels. As a result, several of the locations occupied by the tidewater goby do not contain natural sandbars between the ocean and habitat where the species is present. Instead, manmade water control structures such as tidegates and culverts exist between tidal waters and the locations where tidewater goby occur. These tidegates have been in place for decades, and in some cases they provide habitat conditions similar to those created by the presence of a seasonal sandbar. In fact, most of the occupied tidewater goby habitats in the Humboldt Bay-Eel River estuaries are above tidegates. Other examples where large amounts of brackish marsh habitat have been lost due to construction of levees and drainage channels include the tributaries to the San Francisco Bay, Tomales Bay, Waddell Creek, Salinas River, Goleta Slough, Santa Clara River, and Mugu Lagoon.

#### Food

The tidewater goby feeds mainly on macroinvertebrates (for example shrimp and aquatic insects) (Irwin and Soltz 1984, p. 21–23; Swift *et al.* 1989, p. 6; Swenson 1995, p. 87). The diets of adult and juvenile tidewater gobies tend to include the same relative abundance of different invertebrate species (Swenson and McCray 1996, p. 962). The nonnative New Zealand mudsnails (NZMS; *Potamopyrgus antipodarum*) have been a seasonally important component of the diet of tidewater gobies in the northcoast region (Hellmair *et al.* 2011, p. 1).

#### Cover or Shelter

A variety of native and nonnative fish species and fish-eating bird species, such as egrets (*Egretta* spp.) and herons (e.g., great blue herons (*Ardea herodias*)), prey on tidewater gobies. Therefore, escape cover or shelter is necessary to reduce the likelihood that tidewater gobies will be preyed upon. A species' ability to persist when it is subject to predation pressure frequently depends on the presence of different features that provide a greater level of

structure, which makes it more likely a prey species will avoid predation (Crowder and Cooper 1982, p. 1802; Gilinsky 1984, p. 455). At locations where the tidewater goby occurs, submerged and emergent aquatic vegetation has the potential to provide cover from predators, and provide a greater degree of habitat heterogeneity or structure that would not otherwise exist if the aquatic vegetation was absent. Stable lagoons often possess dense aquatic vegetation that frequently consists of sago pondweed (*Potamogeton pectinatus*) or widgeon grass (e.g., *Ruppia maritima* and *R. cirrhosa*). At some locations, juvenile tidewater gobies are more prevalent in areas with at least some submergent vegetation as compared to other areas with no or little vegetation (Wang 1984, p. 16; Swenson 1994, p. 6; Trihey & Associates, Inc. 1996, p. 11). It is reasonable to assume that the presence of submerged or emergent vegetation reduces the likelihood that tidewater gobies will be preyed upon by native and nonnative species because this vegetation provides cover and increases the level of habitat heterogeneity in a way that makes it more likely that tidewater gobies will persist where they co-occur with predators.

Aquatic vegetation may provide some degree of shelter or refuge during flash flood events (Lafferty *et al.* 1999b, p. 621). These refuges presumably would result because the presence of vegetation would create lower water velocities than might otherwise occur in unvegetated areas. Such refuges would be especially important to fish species that are not strong swimmers, such as the tidewater goby.

#### Sites for Breeding, Reproduction, or Rearing (or Development) of Offspring

The eggs of the tidewater goby are laid in burrows that are excavated by male fish. The available literature suggests that burrows most commonly occur in areas with relatively unconsolidated, clean, coarse sand (Swift *et al.* 1989, p. 8), while other documents demonstrate that burrows may also occasionally occur in silt or mud (Wang 1982, p. 6). Swenson (1995, p. 148) demonstrated that tidewater gobies prefer a sandy substrate in the laboratory. Male tidewater gobies remain in the burrow to guard the eggs attached to the burrow ceiling and walls. Male tidewater gobies care for the embryos for approximately 9 to 11 days until they hatch, rarely if ever emerging from the burrow to feed (Swift *et al.* 1989, p. 4). The tidewater goby larvae occupy the water column after the eggs hatch (Wang 1982, p. 15). As they mature, they occupy the bottom

substrate. Worcester (1992, pp. 77–79) found that larval tidewater gobies in Pico Creek Lagoon in San Luis Obispo County tended to use the deeper portion of the lagoon, that is, depths of 29 inches (in) (73 centimeters (cm)) versus 17 in (42 cm).

#### Habitats Protected from Disturbance or Representative of the Historical, Geographical, and Ecological Distributions of the Species

The majority of lagoons and estuaries that currently support the tidewater goby have experienced some level of disturbance. The lagoons and estuaries that support the tidewater goby range in size from approximately 3.5 square yards (3 m<sup>2</sup>) of surface area to about 2,000 ac (800 ha). Most lagoons and estuaries that support the tidewater goby range from about 1.25 to 12.5 ac (0.5 to 5 ha). Surveys of tidewater goby locations and historical records indicate that size, configuration, location, and access by humans are all factors in the persistence of populations of this species (Swift *et al.* 1989, p. 15, 1994, p. 26–27). Lagoons and estuaries smaller than about 5 ac (2 ha) generally have histories of extirpation or population reduction to very low levels. These small locations are also often within a mile or so of another locality from which recolonization could occur following natural episodic catastrophic events. The most stable or largest populations today are in locations of intermediate sizes, which range from 5 to 125 ac (2 to 50 ha). In many cases these intermediate-sized locations likely serve as source populations for the smaller ephemeral sites (Lafferty *et al.* 1999b, p. 1452).

#### Primary Constituent Elements for Tidewater Goby

Under the Act and its implementing regulations, we are required to identify the physical or biological features essential to the conservation of the tidewater goby within the geographical area occupied at the time of listing, focusing on the features' primary constituent elements. We consider primary constituent elements to be the elements of physical or biological features that provide for a species' life-history processes that are essential to the conservation of the species.

Based on our current knowledge of the physical or biological features and habitat characteristics required to sustain the species' life-history processes, we determine that the primary constituent element (PCE) specific to the tidewater goby is:

(1) Persistent, shallow (in the range of approximately 0.3 to 6.6 ft (0.1 to 2 m)),

still-to-slow-moving lagoons, estuaries, and coastal streams with salinity up to 12 ppt, which provide adequate space for normal behavior and individual and population growth that contain one or more of the following:

(a) Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;

(b) Submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus*, *Ruppia maritima*, *Typha latifolia*, and *Scirpus* spp., that provides protection from predators and high flow events; or

(c) Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

#### *Special Management Considerations or Protection*

When designating critical habitat, we assess whether the specific areas within the geographical area occupied by the species at the time of listing contain features that are essential to the conservation of the species and which may require special management considerations or protection. Special management considerations or protection may be necessary to eliminate or reduce the magnitude of threats that affect the physical or biological features essential to the conservation of the tidewater goby. Threats identified in the final listing rule for the tidewater goby include:

(1) Coastal development projects, including proposed restoration projects that involve elimination of backwaters and loss or alteration of coastal wetland habitat, which may be crucial for flood refuge for the tidewater goby;

(2) water diversions and alterations of water flows upstream of coastal lagoons and estuaries that negatively impact the species' breeding and foraging habitat and activities;

(3) groundwater overdrafting that results in reduction of flows and negatively impacts the species' breeding and foraging habitat and activities;

(4) channelization of habitats where the species occurs that removes or reduces quality of habitat;

(5) discharge of agricultural and sewage effluents;

(6) cattle grazing and feral pig activity that result in increased sedimentation of coastal lagoons and riparian habitats, remove vegetative cover, increase ambient water temperatures, and eliminate plunge pools and collapsed undercut banks utilized by the tidewater goby;

(7) introduced species that prey on the tidewater goby (such as bass, rainwater killifish, African clawed frogs);

(8) the inadequacy of existing regulatory mechanisms;

(9) drought conditions that result in the deterioration of coastal and riparian habitats; and

(10) competition with introduced species, such as the yellowfin goby and chameleon goby.

For the purposes of this final rule, we have combined the "water diversions and alterations of water flows upstream of coastal lagoons and estuaries that negatively impact the species' breeding and foraging activities" threats category with "drought conditions" and "groundwater overdrafting," along with the addition of artificial breaching of sandbars, into one threat category. The combined category is referred to as "water diversions, alterations of water flows, artificial sandbar breaching, and groundwater overdrafting that negatively impact the species' breeding and foraging activities." Similarly, we have combined the two threat categories of "introduced species that prey on the tidewater goby (e.g., bass, African clawed frogs)" and "competition with introduced species such as the yellowfin goby and chameleon goby" into one category called, "introduced species that prey on, or compete with, the tidewater goby (for example, yellowfin goby, and bass)." We also recognize that where special management may be necessary, regulatory mechanisms may need to be added or amended by local, State, or Federal governmental entities if sufficient management is not achievable through voluntary mechanisms.

The tidewater goby's distribution reflects a pattern of occupancy and extirpation. The species requires refugia under drought conditions and places to recolonize under wetter conditions; otherwise, the tidewater goby would be relegated to existing only within those few lagoons and estuaries large enough to support it during periods of drought. If the suitable localities that are occupied during periods of normal precipitation cease to function as tidewater goby habitat due to modification or destruction while the localities are unoccupied, the metapopulation dynamics may be disrupted and the species may not be able to respond by recolonizing unoccupied localities under favorable conditions. The tidewater goby is facing numerous threats, including habitat loss from multiple sources, habitat fragmentation due to the loss of "stepping stone" localities between

subpopulations, predation and nonnative competitors, alterations to hydrology (sandbar breaching, channelization, for example), changes in water quality, stochastic events such as drought, and the growing and inevitable impact of sea level rise. While some of these threats can singly have a substantial impact on individual tidewater goby subpopulations, in most cases it is the combined impact that is a threat to the species, especially in light of global climate change. A more detailed discussion of threats to the tidewater goby can be found in the final listing rule (59 FR 5494, February 4, 1994), and the final Recovery Plan (Service 2005a, pp. 16–19).

We find that the components of the PCE present within all the areas we are designating as critical habitat may require special management considerations or protection due to threats to the tidewater goby or its habitat. Using current information provided in the Recovery Plan (Service 2005a, Appendix E) and other information in our files, we have identified the components of the PCE that may require special management considerations or protection from known threats within each of the critical habitat units (see Critical Habitat Designation and Table 2 below for a unit-by-unit description). Some of the special management actions that may be needed for essential features of tidewater goby habitat are briefly summarized below.

(1) Implement measures to avoid, minimize or mitigate direct and indirect loss and modification of tidewater goby habitat due to dredging, draining, and filling of lagoons and estuaries.

Additional management actions should be taken to restore historical tidewater goby locations and potential habitats as opportunities become available to eliminate, minimize, or mitigate the effects of existing structures and past activities that have destroyed or degraded tidewater goby habitat.

(2) Develop and implement measures to minimize the adverse effects due to channelization that can eliminate crucial backwater habitats or other flood refuges.

(3) Implement measures, such as best management practices, for managing excessive sedimentation in tidewater goby habitat. Measures should be implemented to control sedimentation in tidewater goby habitat due to cattle grazing, development, channel modification, recreational activity, and agricultural practices.

(4) Implement measures to prevent further decrease in freshwater inflow, water depth, and surface area within



tidewater goby habitat due to dams, water diversions, and groundwater pumping.

(5) Implement measures to avoid anthropogenic breaching of lagoons and use of pumping and other water control structures to regulate water levels, to maintain suitable habitat conditions during the summer and fall when tidewater goby reproduction is at its highest and freshwater inflow is at its lowest.

(6) Implement measures to improve water quality degraded as a result of agricultural runoff and effluent, municipal runoff, golf course runoff, sewage treatment effluent, cattle grazing, development, oil spills, oil field runoff, toxic waste, and gray-water dumping. Also, measures should be implemented to prevent further degradation of the water quality due to dikes, tidal gates, and other impedances to the natural freshwater/saltwater interface that alter the salinity regime in some of the tidewater goby habitats.

(7) Implement measures to control the abundance and distribution of nonnative species.

(8) Implement measures to restore genetic diversity within populations where the natural metapopulation dynamic will be unable to do so.

#### *Criteria Used To Identify Critical Habitat*

As required by section 4(b)(2) of the Act, we used the best scientific and commercial data available to designate critical habitat. We reviewed available information pertaining to the habitat requirements of this species. In accordance with the Act and its implementing regulation at 50 CFR 424.12(e), we considered whether designating areas outside those currently occupied as well as those occupied at the time of listing are essential to ensure the conservation of the species. We are designating critical habitat in areas within the geographical area occupied by the species at the time of listing in 1994. We also are designating specific areas outside the geographical area occupied by the species at the time of listing because such areas are essential for the conservation of the species.

In revising critical habitat for the tidewater goby, we made extensive use of the information in the Recovery Plan (Service 2005a), and incorporated the recovery goals and strategy identified in the Recovery Plan for the development of our revised designation. We also reviewed other relevant information, including peer-reviewed journal articles, unpublished reports and materials (for example, survey results

and expert opinions), the final listing rule (59 FR 5494; February 4, 1994), the 2000 final critical habitat rule (65 FR 69693; November 20, 2000), the 2006 proposed critical habitat rule (71 FR 68914; November 28, 2006), the 2008 final critical habitat rule (73 FR 5920; January 31, 2008), the 2011 proposed critical habitat rule (76 FR 64996; October 19, 2011), the 5-year review for the tidewater goby (Service 2007), and regional databases and GIS coverages, for example, the California Natural Diversity Database, and National Wetlands Inventory maps. We analyzed this information to identify: (1) Specific areas within the geographical area occupied at the time of listing that contain the physical or biological features essential to the conservation of the tidewater goby and which may require special management considerations or protection, and (2) criteria for specific areas outside the geographical area occupied at the time of listing that are essential for the conservation of the tidewater goby.

The Recovery Plan focuses on preserving the diversity of tidewater goby habitats throughout the range of the species, preserving the natural processes of recolonization and population exchange (metapopulation dynamics) that enable recovery following natural episodic catastrophic events, and preserving genetic diversity (Service 2005a, p. 28). The conservation of the environmental, morphological, and genetic diversity across the range of the species is an important consideration in determining specific areas on which are found the physical or biological features essential to the conservation of the species and other specific areas that are essential for the conservation of the tidewater goby. For example, a population's ability to successfully adapt to changing environmental conditions is a function of the population size and genetic variation of the individuals at a given location (Reed and Frankham 2003, p. 233).

Local adaptations to different environmental conditions and morphological differences are likely linked to genetic variations among populations. These features may in turn be best protected by: (1) Identifying areas that represent the range of environmental, genetic, and morphological diversity; and (2) maximizing within these areas the protection of contiguous environmental gradients across which selection and migration can interact to maintain population viability and (adaptive) genetic diversity (Moritz 2002, p. 238). The Recovery Plan subdivides the

geographical distribution of the tidewater goby into 6 recovery units, encompassing a total of 26 subunits defined according to genetic differentiation and geomorphology. We considered the conservation of the tidewater goby in each of the recovery units and subunits, as well as the species as a whole, in our analysis.

Based on the information and recommendations in the Recovery Plan, we developed a conservation framework and criteria to identify the specific circumstances under which the presence of the components of the PCE within the geographical area occupied by the species at the time of listing provides the physical or biological features essential to the conservation of the tidewater goby, and additionally what areas outside the geographical area occupied at the time of listing are essential for the conservation of the species.

#### *Areas Within the Geographical Area Occupied at the Time of Listing*

Within the geographical area occupied at the time of listing, the specific areas meeting the criteria below are designated as critical habitat in this final rule because they provide the physical or biological features essential to the conservation of the tidewater goby.

(1) Areas that support source populations (populations where local reproductive success is greater than local mortality (Meffe and Carroll 1994, p. 187)). For the purposes of this designation, we identified areas supporting source populations as those that are currently occupied and have been consistently occupied for 3 or more consecutive years based on survey data and published reports. Source populations are more likely to be capable of maintaining populations over many years and are, therefore, capable of providing individuals to recruit into surrounding subpopulations.

(2) Areas that support subpopulations within each metapopulation in addition to source populations in the event that the source population is extirpated due to a natural episodic catastrophic event such as a major flood or drought.

(3) Areas that provide connectivity between metapopulations. These areas are likely to act as "stepping stones" between more isolated populations, and thereby contribute to metapopulation persistence and genetic exchange. For the purposes of this designation, we generally identified locations that provide connectivity as those within approximately 6 mi (10 km) of another location. However, we included a few locations that exceeded 6 mi but were



within the maximum dispersal distance as determined through genetic research (Jacobs *et al.* 2005, p. 52) where there were no other locations with suitable habitat in that portion of the coast.

#### *Areas Outside the Geographical Area Occupied at the Time of Listing*

We have determined that the specific areas within the geographical area occupied at the time of listing alone are not sufficient to meet the recovery goals for the species because:

(1) The Recovery Plan recommends a targeted program of introduction and reintroduction of tidewater gobies into suitable habitat to minimize the chance of local extirpations resulting in extinction of a broader metapopulation (see the *Metapopulation Dynamics* section, above, for details) and resultant loss of its unique genetic traits (Service 2005a, p. 29);

(2) There has been loss and degradation (see the *Threats* section, above, for details) of habitat throughout the species' range since the time of listing;

(3) We anticipate a further loss of habitat in the future due to sea-level rise resulting from climate change (see the *Climate Change* section, above, for details); and

(4) The species needs habitat areas that are arranged spatially in a way that will maintain connectivity and allow dispersal within and between units (see the *Metapopulation Dynamics* section, above, for details).

One example of the need to designate areas outside the geographical area occupied at the time of listing is where distances between areas occupied at the time of listing may make it difficult for tidewater goby to disperse from one area to the next. Another example is to help prevent the extirpation of a metapopulation in which only one or two occupied sites remain. These areas that are outside the geographical area occupied at the time of listing include locations that are currently occupied and, in a few cases, ones that were historically occupied. In some unoccupied areas, the habitat would require some management: For example, restoration of a natural breaching regime, exotic predator management, or freshwater inflow enhancement.

Therefore, for areas outside the geographical area occupied at the time of listing, those meeting the criteria below are designated as critical habitat in this final rule because they are essential for the conservation of the species.

(1) Areas of aquatic habitat in coastal lagoons and estuaries with still-to-slow-moving water that allow for the

conservation of viable metapopulations under varying environmental conditions, such as, for example, drought.

(2) Areas that provide connectivity between source populations or may provide connectivity in the future. These areas are likely to act as "stepping stones" between more isolated populations, and thereby contribute to metapopulation persistence and genetic exchange. For the purposes of this designation, we generally identified locations that provide connectivity as those within approximately 6 mi (10 km) of another location.

(3) Additional areas that may be more isolated but may represent unique adaptations to local features (habitat variability, hydrology, microclimate). For example, the Eel River (HUM-4) is essential for the conservation of tidewater goby because it possesses ecological characteristics that are important in maintaining the species' ability to adapt to changing environments, including the ability to disperse into higher channels and marsh habitat during severe flood events.

By applying the two sets of criteria to the 26 recovery subunits described in the Recovery Plan, we have identified 45 critical habitat units within the geographical area occupied by the species at the time of listing that we have determined contain the physical or biological features essential to the conservation of the tidewater goby and which may require special management considerations or protection, and 20 critical habitat units outside the geographical area occupied by the species at the time of listing that we have determined are essential for the conservation of the species. Please see Table 1, below, for the occupancy status of each of the 65 critical habitat units.

As emphasized throughout this rule and the Recovery Plan, the conservation of the tidewater goby is dependent on maintaining the metapopulation dynamics of the species, and we have therefore designated all those locations that we determined are essential for achieving that goal. In order to maintain metapopulation dynamics, we have determined that some locations where tidewater gobies have never been found or have not been found in recent years are essential for the conservation of the species. It should be noted, however, that some subpopulations within a metapopulation tend to decline or disappear periodically due to events such as drought and severe flooding, but then reappear or increase in abundance during more optimal conditions. However, surveys to determine the presence or absence of tidewater gobies

are not usually conducted every year, and therefore the presence of tidewater gobies may have been missed. For example, tidewater gobies were known to occur in the San Luis Rey River in 1958. However, the river has only been surveyed five times in the last 65 years since 1958, and tidewater gobies were found in 2010.

As discussed previously, a metapopulation is generally considered to consist of several distinct but related subpopulations that are within dispersal distance of each other. Although the individual subpopulations may sometimes disappear, the metapopulation as a whole is often stable because immigrants from one population (which may, for example, be experiencing a population boom) are likely to re-colonize habitat which has been left open by the extirpation of another population as long as the habitat still remains. They may also emigrate to a small population and rescue that population from extirpation. In a metapopulation dynamic, connectivity of source populations is crucial, and locations considered unoccupied may serve this purpose. Although no single tidewater goby subpopulation may be able to guarantee the long-term survival of this species, the combined effect of many sporadically connected subpopulations may. Therefore, although a particular location may not be occupied at one point in time, or even for long periods of time, that location may be important for maintaining the connectivity between subpopulations, and hence contribute to the species' overall survival and conservation. For example, although tidewater gobies have not been detected in Arroyo del la Cruz, it is within dispersal distance of Arroyo del Corral, which is considered currently to be occupied in critical habitat. Arroyo de la Cruz is located approximately 2.0 mi (3.2 km) north of the Arroyo de Corral. Arroyo de la Cruz provides habitat for tidewater gobies that disperse from Arroyo del Corral, which may serve to decrease the risk of extirpation of this metapopulation through stochastic events. Arroyo de la Cruz is one of two locations with suitable habitat within the Central Coast Recovery Subunit (CC 1), as described in the Recovery Plan. Therefore, although tidewater gobies have not been detected at Arroyo de la Cruz, we consider this area to be essential to the conservation of the species because it contributes to ensuring the viability of the metapopulation because if the subpopulation within the Arroyo de

Corral unit (SLO-2) is extirpated, the entire metapopulation would be lost.

The process of making exclusions under Section 4(b)(2) considers the extent to which habitat restoration would be necessary to support the species in areas currently unoccupied. Where restoration is not likely due to cost or other factors, the benefits in terms of conservation value may not be as strong. Restoration activities would benefit all of the critical habitat units in this designation, and some form of restoration will be necessary to support the successful reintroduction or recolonization of the tidewater goby in the units that are unoccupied. For example, some of the unoccupied locations need improvements to water quality, barrier removal, exotic species management (e.g., Walker Creek, Salinas River, Arroyo de la Cruz, Oso Flaco Lake, etc.). However, designation of critical habitat does not mandate restoration or management of any areas. However, we determined it is feasible to restore all of the unoccupied habitat designated in this rule to the point where it can support gobies and we avoided designating unoccupied areas that are highly degraded or fragmented and not likely restorable (e.g., Los Angeles River, Mugu Lagoon). Such areas provide little or no long-term conservation value, and are not essential for the conservation of the species.

#### Mapping

After determining the lagoons and estuaries necessary for the conservation of the tidewater goby by applying criteria outlined above, the boundaries of each critical habitat unit were mapped. Unit boundaries were based on several factors, including species occurrence data that demonstrated where tidewater gobies have been observed, the presence of barriers and stream gradients that limit tidewater goby movements, and the presence and extent of the essential physical or biological features.

The geographic extent of each critical habitat unit was delineated, in part, using existing digital data. To determine the lateral boundaries of each critical habitat unit, we most frequently relied on the Pacific Institute global climate change model and National Wetland Inventory (NWI) maps that were prepared by the Service in 2006. The NWI maps are based on the Cowardin classification system (Cowardin *et al.* 1979, pp. 1–103). The Service has adopted this classification system as its official standard to describe wetland and deepwater habitats. Specifically, the following wetland types based on Cowardin (1979, p. 5) were used to

delineate unit boundaries: Lake, Estuarine and Marine Deepwater, Estuarine and Marine Wetland, Freshwater Pond, Freshwater Emergent Wetland, Freshwater Forested/Shrub Wetland, and Riverine. These wetland types have, or are likely to have, components of the PCE at various times throughout the year, depending on the season and environmental factors such as storm or drought events. In some cases, we used existing anthropogenic structures, such as concrete or riprap channel linings that occur within wetland habitat types, to delineate the lateral boundaries of units. To a lesser extent, we also used aerial imagery from the National Agricultural Imagery Program (NAIP) to delineate the lateral boundaries of a critical habitat unit where insufficient NWI data were available.

The precise location of tidewater goby habitat at a particular locality may vary on a daily, seasonal, and annual basis; the habitats occupied by tidewater goby exist in a dynamic environment that varies over time. For example, the size and lateral extent of a coastal lagoon or estuary varies with daily tide cycles. Flood events may also change the precise location where surface water exists within a given lagoon, estuary, backwater marsh, or freshwater tributary. Therefore, it is appropriate to delineate each critical habitat unit to encompass the entire area that may be occupied by tidewater goby on a daily, seasonal, or annual basis. This was accomplished by using the boundaries delineated on the NWI maps to determine the lateral extent of each unit.

The delineation of the farthest upstream extent of a particular critical habitat unit was determined using one of four features that include:

- (1) The average distance that tidewater gobies are known to move upstream from the ocean (4.0 mi (6.4 km)),
- (2) the presence of barriers, such as culverts that may prevent tidewater gobies from moving upstream,
- (3) the presence of a vertical drop, for example more than 4 to 8 in (10 to 20 cm) high, or steep gradient that precludes tidewater gobies from swimming upstream or can act as a barrier that makes it less likely tidewater gobies will be able to swim upstream (Swift *et al.* 1997, p. 20), or
- (4) limited surface water in the tributary up-gradient from the lagoon or estuary.

Each of the above features describes a barrier to upstream movement; therefore, the upstream extent of a particular unit was determined by whichever barrier was identified first

through the mapping process regardless of whether or not components of the PCE were still present above it.

When determining critical habitat boundaries within this final rule, we made every effort to avoid including developed areas such as lands covered by bridges, docks, and other structures because such lands cannot provide habitat for the tidewater goby. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of such developed lands. Any such lands inadvertently left inside critical habitat boundaries shown on the maps of this final rule have been excluded by text in the rule and are not designated as critical habitat. Therefore, a Federal action involving these lands will not trigger section 7 consultation with respect to critical habitat and the requirement of no adverse modification unless the specific action may affect adjacent critical habitat.

The critical habitat designation is defined by the map or maps, as modified by any accompanying regulatory text, presented at the end of this document in the rule portion. We include more detailed information on the boundaries of the critical habitat designation in the preamble of this document. We will make the coordinates or plot points or both on which each map is based available to the public on <http://www.regulations.gov> at Docket No. FWS-R8-ES-2011-0085, on our Internet sites at <http://www.fws.gov/ventura/>, and at the field office responsible for the designation (see **FOR FURTHER INFORMATION CONTACT** above).

We are designating as critical habitat lands that we have determined are within the geographical area occupied at the time of listing and contain sufficient physical or biological features to support life-history processes essential to the conservation of the species, and lands outside of the geographical area occupied at the time of listing that we have determined are essential for the conservation of tidewater goby.

Units within the geographical area occupied at the time of listing are designated based on sufficient elements of physical or biological features being present to support tidewater goby life processes. Some units contain all of the identified elements of physical or biological features and support multiple life processes. Some units contain only some elements of the physical or biological features necessary to support the tidewater goby's particular use of that habitat.

**Final Critical Habitat Designation**

We are designating 65 units as critical habitat for tidewater goby (see Table 1

below). The critical habitat areas described below constitute our best

assessment at this time of areas that meet the definition of critical habitat.

TABLE 1—OCCUPANCY OF TIDEWATER GOBY BY DESIGNATED CRITICAL HABITAT UNITS

Unit	Name	Within the geographical area occupied at time of listing?	Currently occupied <sup>1</sup>
DN-1	Tillas Slough (Smith River)	Yes	Yes.
DN-2	Lake Earl/Lake Tolowa	Yes	Yes.
HUM-1	Stone Lagoon	Yes	Yes.
HUM-2	Big Lagoon	Yes	Yes.
HUM-3	Humboldt Bay	Yes	Yes.
HUM-4	Eel River	No	Yes.
MEN-1	Ten Mile River	Yes	Yes.
MEN-2	Virgin Creek	Yes	Yes.
MEN-3	Pudding Creek	Yes	Yes.
MEN-4	Davis Lake and Manchester State Park Ponds.	Yes	Yes.
SON-1	Salmon Creek	Yes	Yes.
MAR-1	Estero Americano	Yes	Yes.
MAR-2	Estero de San Antonio	Yes	Yes.
MAR-3	Walker Creek	No	No.
MAR-4	Lagunitas (Papermill) Creek	No	Yes.
MAR-5	Bolinas Lagoon <sup>2</sup>	No	No.
MAR-6	Rodeo Lagoon	Yes	Yes.
SM-1	San Gregorio Creek	Yes	Yes.
SM-2	Pomponio Creek	No	Yes.
SM-3	Pescadero-Butano Creek	Yes	Yes.
SM-4	Bean Hollow Creek (Arroyo de Los Frijoles).	Yes	Yes.
SC-1	Waddell Creek	Yes	Yes.
SC-2	Scott Creek	No	Yes.
SC-3	Laguna Creek	Yes	Yes.
SC-4	Baldwin Creek	Yes	Yes.
SC-5	Moore Creek	Yes	Yes.
SC-6	Corcoran Lagoon	Yes	Yes.
SC-7	Aptos Creek	Yes	Yes.
SC-8	Pajaro River	Yes	Yes.
MN-1	Bennett Slough	Yes	Yes.
MN-2	Salinas River	No	No.
SLO-1	Arroyo de la Cruz <sup>2</sup>	No	No.
SLO-2	Arroyo del Corral	Yes	Yes.
SLO-3	Oak Knoll Creek (Arroyo Laguna).	Yes	Yes.
SLO-4	Little Pico Creek	Yes	Yes.
SLO-5	San Simeon Creek	Yes	Yes.
SLO-6	Villa Creek	Yes	Yes.
SLO-7	San Geronimo Creek	Yes	Yes.
SLO-8	Toro Creek	Yes	Yes.
SLO-9	Los Osos Creek	No	Yes.
SLO-10	San Luis Obispo Creek	Yes	Yes.
SLO-11	Pismo Creek	Yes	Yes.
SLO-12	Oso Flaco Lake <sup>2</sup>	No	No.
SB-1	Santa Maria River	Yes	Yes.
SB-2	Cañada de las Agujas	Yes	Yes.
SB-3	Cañada de Santa Anita	Yes	Yes.
SB-4	Cañada de Alegria	Yes	Yes.
SB-5	Cañada de Agua Caliente	Yes	Yes.
SB-6	Gaviota Creek	Yes	Yes.
SB-7	Arroyo Hondo	No	Yes.
SB-8	Winchester-Bell Canyon	Yes	Yes.
SB-9	Goleta Slough	No	Yes.
SB-10	Arroyo Burro	No	Yes.
SB-11	Mission Creek-Laguna Channel.	Yes	Yes.
SB-12	Arroyo Paredon	No	Yes.
VEN-1	Ventura River	Yes	Yes.
VEN-2	Santa Clara River	Yes	Yes.
VEN-3	J Street Drain-Ormond Lagoon.	Yes	Yes.
VEN-4	Big Sycamore Canyon	No	Yes.
LA-1	Arroyo Sequit <sup>2</sup>	No	No.
LA-2	Zuma Creek <sup>2</sup>	No	No.
LA-3	Malibu Lagoon	Yes	Yes.

TABLE 1—OCCUPANCY OF TIDEWATER GOBY BY DESIGNATED CRITICAL HABITAT UNITS—Continued

Unit	Name	Within the geographical area occupied at time of listing?	Currently occupied <sup>1</sup>
LA-4 .....	Topanga Creek .....	No .....	Yes.
OR-1 .....	Aliso Creek .....	No .....	No.
SAN-1 .....	San Luis Rey River .....	No .....	Yes.

<sup>1</sup> Based on the Recovery Plan and subsequent survey information where available.

<sup>2</sup> Tidewater gobies have never been recorded from this location; however, regularly scheduled monitoring of these subpopulations has not been conducted.

The approximate area of each critical habitat unit is shown in Table 2.

TABLE 2—CRITICAL HABITAT UNITS DESIGNATED FOR THE TIDEWATER GOBY AND KNOWN THREATS THAT MAY REQUIRE SPECIAL MANAGEMENT CONSIDERATIONS OR PROTECTION OF THE ESSENTIAL PHYSICAL OR BIOLOGICAL FEATURES FOR UNITS WITHIN THE GEOGRAPHICAL AREA OCCUPIED BY THE SPECIES AT THE TIME OF LISTING

Unit name	Federal ac (ha)	State ac (ha)	Local ac (ha)	Private ac (ha)	Total <sup>1</sup> ac (ha)	Known threats that may require special management considerations or protection of the essential features <sup>2</sup>
DN-1: Tillas Slough (Smith River) .....	0 (0)	0 (0)	0 (0)	21 (8)	21 (8)	2, 3, 5
DN-2: Lake Earl/Lake Tolowa .....	0 (0)	2,335 (945)	0 (0)	348 (141)	2,683 (1,086)	1, 2, 4
HUM-1: Stone Lagoon .....	0 (0)	653 (264)	0 (0)	0 (0)	653 (264)	4
HUM-2: Big Lagoon .....	0 (0)	1,527 (618)	0 (0)	2 (1)	1,529 (619)	2, 4
HUM-3: Humboldt Bay .....	652 (264)	61 (24)	45 (18)	81 (33)	839 (339)	1, 3, 4, 5
HUM-4: Eel River .....	0 (0)	5 (2)	0 (0)	34 (13)	39 (15)	N/A
MEN-1: Ten Mile River .....	0 (0)	17 (7)	0 (0)	56 (23)	73 (30)	4
MEN-2: Virgin Creek .....	0 (0)	2 (1)	0 (0)	2 (1)	4 (2)	1, 4
MEN-3: Pudding Creek .....	0 (0)	10 (4)	1 (1)	6 (2)	17 (7)	1, 2, 4
MEN-4: Davis Lake and Manchester State Park Ponds .....	0 (0)	29 (12)	0 (0)	0 (0)	29 (12)	4
SON-1: Salmon Creek .....	0 (0)	47 (19)	14 (6)	47 (19)	108 (44)	1, 2, 4, 5
MAR-1: Estero Americano .....	0 (0)	0 (0)	0 (0)	465 (188)	465 (188)	1, 4, 5
MAR-2: Estero De San Antonio .....	0 (0)	0 (0)	0 (0)	285 (115)	285 (115)	1, 2, 4, 5
MAR-3: Walker Creek .....	0 (0)	9 (4)	0 (0)	109 (44)	118 (48)	N/A
MAR-4: Lagunitas (Papermill) Creek .....	318 (129)	459 (186)	0 (0)	221 (90)	998 (405)	N/A
MAR-5: Bolinas Lagoon .....	29 (12)	0 (0)	1,048 (424)	37 (15)	1,114 (451)	N/A
MAR-6: Rodeo Lagoon .....	40 (16)	0 (0)	0 (0)	0 (0)	40 (16)	1
SM-1: San Gregorio Creek .....	0 (0)	33 (13)	0 (0)	12 (5)	45 (18)	1, 3
SM-2: Pomponio Creek .....	0 (0)	1 (1)	0 (0)	6 (2)	7 (3)	N/A
SM-3: Pescadero-Butano Creek .....	0 (0)	241 (97)	0 (0)	4 (2)	245 (99)	1, 3, 4
SM-4: Bean Hollow Creek (Arroyo de Los Frijoles) .....	0 (0)	3 (1)	0 (0)	7 (3)	10 (4)	1, 2
SC-1: Waddell Creek .....	0 (0)	39 (16)	0 (0)	36 (14)	75 (30)	2, 3, 4
SC-2: Scott Creek .....	0 (0)	66 (27)	6 (2)	2 (1)	74 (30)	N/A
SC-3: Laguna Creek .....	0 (0)	26 (11)	0 (0)	0 (0)	26 (11)	2, 4
SC-4: Baldwin Creek .....	0 (0)	27 (11)	0 (0)	0 (0)	27 (11)	2, 4
SC-5: Moore Creek .....	15 (6)	0 (0)	0 (0)	0 (0)	15 (6)	2, 4
SC-6: Corcoran Lagoon .....	0 (0)	1 (1)	6 (2)	21 (8)	28 (11)	1, 4
SC-7: Aptos Creek .....	0 (0)	9 (4)	0 (0)	0 (0)	9 (4)	1, 3, 4
SC-8: Pajaro River .....	0 (0)	158 (64)	11 (4)	46 (19)	215 (87)	1, 3, 4
MN-1: Bennett Slough .....	0 (0)	108 (44)	5 (2)	54 (22)	167 (68)	1, 2, 3, 4
MN-2: Salinas River .....	195 (79)	33 (13)	1 (1)	237 (96)	466 (189)	N/A
SLO-1: Arroyo de la Cruz .....	0 (0)	25 (10)	0 (0)	8 (3)	33 (13)	N/A
SLO-2: Arroyo del Corral .....	0 (0)	4 (2)	0 (0)	1 (1)	5 (3)	1, 5
SLO-3: Oak Knoll Creek (Arroyo Laguna) .....	0 (0)	4 (2)	0 (0)	1 (1)	5 (3)	1, 3
SLO-4: Little Pico Creek .....	0 (0)	2 (1)	0 (0)	7 (3)	9 (4)	5
SLO-5: San Simeon Creek .....	0 (0)	17 (7)	0 (0)	0 (0)	17 (7)	2, 4, 5
SLO-6: Villa Creek .....	0 (0)	14 (6)	0 (0)	1 (1)	15 (7)	1, 2, 4, 5
SLO-7: San Geronimo Creek .....	0 (0)	1 (1)	0 (0)	0 (0)	1 (1)	5
SLO-8: Toro Creek .....	0 (0)	1 (1)	0 (0)	8 (3)	9 (4)	2, 3, 4
SLO-9: Los Osos Creek .....	0 (0)	62 (25)	1 (1)	10 (4)	73 (30)	N/A
SLO-10: San Luis Obispo Creek .....	0 (0)	0 (0)	3 (1)	28 (11)	31 (12)	1, 2, 3, 4
SLO-11: Pismo Creek .....	0 (0)	14 (6)	1 (1)	5 (2)	20 (9)	1, 3, 4
SLO-12: Oso Flaco Lake .....	0 (0)	165 (67)	0 (0)	6 (2)	171 (69)	N/A
SB-1: Santa Maria River .....	0 (0)	0 (0)	42 (17)	432 (174)	474 (192)	1, 2, 4, 5

TABLE 2—CRITICAL HABITAT UNITS DESIGNATED FOR THE TIDEWATER GOBY AND KNOWN THREATS THAT MAY REQUIRE SPECIAL MANAGEMENT CONSIDERATIONS OR PROTECTION OF THE ESSENTIAL PHYSICAL OR BIOLOGICAL FEATURES FOR UNITS WITHIN THE GEOGRAPHICAL AREA OCCUPIED BY THE SPECIES AT THE TIME OF LISTING—Continued

Unit name	Federal ac (ha)	State ac (ha)	Local ac (ha)	Private ac (ha)	Total <sup>1</sup> ac (ha)	Known threats that may require special management considerations or protection of the essential features <sup>2</sup>
SB-2: Cañada de las Agujas .....	0 (0)	0 (0)	0 (0)	1 (1)	1 (1)	1, 4
SB-3: Cañada de Santa Anita .....	0 (0)	0 (0)	0 (0)	3 (1)	3 (1)	4
SB-4: Cañada de Alegria .....	0 (0)	0 (0)	0 (0)	2 (1)	2 (1)	1, 2, 4, 5
SB-5: Cañada de Agua Caliente .....	0 (0)	0 (0)	0 (0)	1 (1)	1 (1)	1, 4
SB-6: Gaviota Creek .....	0 (0)	10 (4)	0 (0)	1 (1)	11 (5)	1, 3, 4, 5
SB-7: Arroyo Hondo .....	0 (0)	0 (0)	0 (0)	1 (1)	1 (1)	N/A
SB-8: Winchester-Bell Canyon .....	0 (0)	0 (0)	1 (1)	5 (2)	6 (3)	2, 4
SB-9: Goleta Slough .....	0 (0)	0 (0)	164 (66)	26 (10)	190 (76)	N/A
SB-10: Arroyo Burro .....	0 (0)	0 (0)	3 (1)	0 (0)	3 (1)	N/A
SB-11: Mission Creek-Laguna Channel .....	0 (0)	3 (1)	4 (2)	0 (0)	7 (3)	1, 3, 4
SB-12: Arroyo Paredon .....	0 (0)	1 (1)	1 (1)	1 (1)	3 (3)	N/A
VEN-1: Ventura River .....	0 (0)	25 (10)	16 (7)	9 (4)	50 (20)	1, 2, 3, 4
VEN-2: Santa Clara River .....	0 (0)	199 (80)	14 (6)	110 (44)	323 (130)	1, 2, 3, 4
VEN-3: J Street Drain-Ormond Lagoon ..	0 (0)	5 (2)	49 (20)	67 (27)	121 (49)	1, 2, 3, 4
VEN-4: Big Sycamore Canyon .....	0 (0)	1 (1)	0 (0)	0 (0)	1 (1)	N/A
LA-1: Arroyo Sequit .....	0 (0)	1 (1)	0 (0)	0 (0)	1 (1)	N/A
LA-2: Zuma Canyon .....	0 (0)	0 (0)	5 (2)	0 (0)	5 (2)	N/A
LA-3: Malibu Lagoon .....	0 (0)	41 (17)	1 (1)	22 (9)	64 (27)	1, 2, 3, 4
LA-4: Topanga Creek .....	0 (0)	4 (1)	0 (0)	2 (1)	6 (2)	N/A
OR-1: Aliso Creek .....	0 (0)	0 (0)	8 (3)	6 (2)	14 (5)	N/A
SAN-1: San Luis Rey River .....	0 (0)	3 (1)	49 (20)	4 (2)	56 (23)	N/A
Total <sup>1</sup> .....	1,249 (506)	6,501 (2,636)	1,501 (611)	2,905 (1,177)	12,156 (4,920)	.....

**Note:** Area sizes may not sum due to rounding.

<sup>1</sup> Area estimates in ac (ha) reflect the entire area within the critical habitat unit boundaries. Area estimates are rounded to the nearest whole integer that is equal to or greater than 1.

<sup>2</sup> Codes of known threats that may require special management considerations or protection of the essential physical or biological features are as follows:

1. Coastal development projects that result in the loss or alteration of coastal wetland habitat affecting the PCE components 1a, 1b, or 1c.
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 the PCE components 1a or 1b.
3. Channelization of habitats where the species occurs affecting the PCE components 1a, 1b, or 1c.
4. Nonpoint- 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 the PCE.
5. Cattle grazing 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 goby affecting the PCE.

N/A—Not applicable because location is outside the geographical area occupied by the species at the time of listing.

We present brief descriptions of all units, and reasons why they meet the definition of critical habitat for tidewater goby, below. The first two or three letters in the code for each critical habitat unit description reflect the county where the unit occurs: DN = Del Norte, HUM = Humboldt, MEN = Mendocino, SON = Sonoma, MAR = Marin, SM = San Mateo, SC = Santa Cruz, MN = Monterey, SLO = San Luis Obispo, SB = Santa Barbara, VEN = Ventura, LA = Los Angeles, OR = Orange, and SAN = San Diego. In Tables 1 and 2 above, these units are listed in sequential order from north to south. For the purposes of this document, the term "local ownership" refers to land owned or managed by a city, county, or municipal government entity.

#### DN-1: Tillas Slough

DN-1 consists of 21 ac (8 ha) of private lands. This unit is located in Del Norte County, approximately 3.0 mi (4.8 km) west of the community of Smith River and 8.0 mi (12.8 km) north of Lake Earl/Lake Tolowa (DN-2), which is also the next nearest extant subpopulation.

DN-1 was occupied at the time of listing. This unit supports the northernmost tidewater goby subpopulation. DN-1 will support the recovery of the tidewater goby subpopulation within the North Coast Recovery Unit. This unit is important for maintaining the tidewater goby metapopulation in the region, and plays an important role in dispersal of the tidewater goby, which could prove vital if certain factors, such as climate change, adversely impact the tidewater goby habitat locally or to the south. A

culvert that serves as a grade control structure, which mutes the tide cycle, provides relatively stable water levels in this unit (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

*DN-2: Lake Earl/Lake Tolowa*

DN-2 consists of 2,683 ac (1,086 ha). This unit is located in Del Norte County, approximately 3 mi (4.8 km) north of the town of Crescent City. The unit consists of 2,335 ac (945 ha) of State lands and 348 ac (140 ha) of private lands. This unit includes two contiguous lagoons (Lake Tolowa and Lake Earl), referred to collectively as Lake Earl. DN-2 is located 8.0 mi (12.8 km) south of (DN-1), which is also the nearest extant subpopulation.

DN-2 was occupied at the time of listing. The tidewater goby subpopulation in DN-2 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the North Coast Recovery Unit.

DN-2 is representative of extensive coastal lagoons and bays north of Cape Mendocino formed over uplifting Holocene sediments on broad flat coastal benches. These coastal benches include an intricate network of estuaries and other channels that are features essential to the conservation of the tidewater goby because they provide refugia during seasonal floods and breeding habitat through the full range of drought cycles. The water level and salinity within the lagoon varies seasonally and annually in response to: (a) Periods of high precipitation or drought within its watershed; (b) the timing, duration, and frequency of breaching events; (c) the water level in the lagoon at the time of breaching; and (d) ocean tidal cycles during and immediately following a breach. As a result of natural and human-induced environmental changes, including artificial breaching, maximum water depth within Lake Earl/Lake Tolowa varies during an annual cycle from less than 5 ft (1.5 m) deep to more than 10 ft (3 m) deep. The distribution of tidewater goby and the PCE within Lake Earl/Lake Tolowa changes in response to these dynamic short-term habitat conditions; over a multiyear cycle, tidewater goby may persist and breed anywhere within the lagoon. McCraney *et al.* (2010) indicate that artificial breaching activities may be reducing genetic diversity in this subpopulation by repeated bottlenecks.

On an intermittent basis, DN-2 possesses a sandbar across the mouth of the lagoon or estuary during the majority of the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions during those times (PCE 1c). PCE 1a and 1b occur throughout the unit, although their

precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

*HUM-1: Stone Lagoon*

HUM-1 consists of 653 ac (264 ha). This unit is located in Humboldt County, approximately 11 mi (18 km) north of the City of Trinidad. The unit consists entirely of State lands. HUM-1 is located 3.1 mi (5.0 km) north of Big Lagoon (HUM-2), which is also the nearest extant subpopulation.

HUM-1 was occupied at the time of listing. The tidewater goby subpopulation in HUM-1 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the North Coast Recovery Unit.

On an intermittent basis, HUM-1 possesses a sandbar across the mouth of the lagoon or estuary during the majority of the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

*HUM-2: Big Lagoon*

HUM-2 consists of 1,529 ac (619 ha). This unit is located in Humboldt County, approximately 7 mi (11 km) north of the City of Trinidad. The unit consists of 1,527 ac (618 ha) of State lands and 2 ac (1 ha) of private lands. HUM-2 is located 3.1 mi (5.0 km) south of Stone Lagoon (HUM-1), which is also the nearest extant subpopulation.

HUM-2 was occupied at the time of listing. The tidewater goby subpopulation in HUM-2 is likely a

source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the North Coast Recovery Unit.

Mark and recapture surveys for tidewater goby were conducted by Humboldt State University in a large cove near the State Park boat ramp in Big Lagoon during the fall of 2008, 2009, and 2010, to estimate the minimum tidewater goby subpopulation for each year (Hellmair 2011, p. 47). Results indicate that, in 2008, the tidewater goby subpopulation was approximately 21,000 individuals. In 2009, the subpopulation was approximately 1.7 to 3.4 million individuals in the cove. In 2010, the subpopulation was approximately 30,000 individuals in the same cove. Based on the results of this research, which estimated that the subpopulation fluctuated between 21,000 and 1.7–3.4 million individuals, and the relatively large size of the lagoon, Big Lagoon likely has the largest and most robust tidewater goby subpopulation in northern California. The results of the study also reflect how variable tidewater goby subpopulation numbers can be from year to year in a given location.

On an intermittent basis, HUM-2 possesses a sandbar across the mouth of the lagoon or estuary during the majority of the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions during those times (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

*HUM-3: Humboldt Bay*

HUM-3 consists of 839 ac (339 ha). This unit is located in Humboldt County, within an approximate 8-mi (13-km) radius to the north, south, and west of the City of Eureka. The unit consists of 652 ac (264 ha) of Federal lands, 61 ac (24 ha) of State lands, 45 ac (18 ha) of local lands, and 81 ac (33 ha) of private lands. HUM-3 is located 18.4 mi (29.7 km) north of the Eel River (HUM-4), which is also the nearest extant subpopulation. HUM-3 was

occupied at the time of listing. The tidewater goby subpopulation in HUM-3 is likely a source population, which is important in maintaining the metapopulation dynamics, and hence the long-term viability, of the North Coast Recovery Unit. This subpopulation may provide essential demographic and genetic support to HUM-4, especially after periods of extreme floods, for example, after the 1964 "Christmas Flood," when the subpopulation of tidewater goby at the Eel River estuary may have been extirpated.

Humboldt Bay and its adjacent marshes and estuaries are a complex mixture of natural and human-made aquatic features that have experienced many decades of human-induced changes. These changes include the construction of levees, tidegates, culverts, and other water control structures, and extensive dredging of sandbars. Surrounding the Bay itself is a generally broad bench historically dominated by mudflats, tidal marshes, estuarine channels, and brackish marshes. Substantial portions of these habitats were converted to agricultural, urban, and industrial uses in recent history, resulting in the loss of as much as 10,000 ac (4,047 ha) of potentially suitable tidewater goby habitat. This critical habitat unit consists of a complex of interconnected estuary channels and tidegates along the eastern edge of Humboldt Bay, which collectively mimic, on a much-reduced scale, suitable habitat for tidewater goby. Many of these channels and marshes are themselves the result of changes to historical habitats, and depend on specific, yet generally undocumented, management activities, such as dredging or sandbar breaches, for their continued function.

To address the dynamic variability of these habitats resulting from seasonal and inter-annual precipitation differences, we have included both the actual known locations where the tidewater goby has been documented, as well as portions of those channels contiguous to, and upchannel or downchannel from, occupied habitat. We have not designated Humboldt Bay proper as critical habitat, nor have we proposed major channels subject to substantial daily tidal fluctuations, as tidewater gobies are not known to breed there. Similarly, we have not designated channels that are discontinuous with occupied habitat, nor have we included intervening marsh or agricultural lands that may occasionally be flooded during severe winter storm events.

Based on several recent surveys, we have found that the precise locations of

tidewater goby use within the channel complex during any particular year may change in response to variations in precipitation and channel hydrology. We anticipate that the persistence of the tidewater goby source population within this unit may require protection of lagoons and estuaries that are not occupied every year, but collectively support a source population through an interconnected complex of channels and shallow water habitats. That is, any of the several known occupied locations within a channel complex may be used by tidewater goby during various years in response to dynamic habitat conditions during seasonal, annual, and longer term climatic cycles, such as drought.

PCE 1c (a sandbar(s) across the mouth of a lagoon or estuary) is not likely to occur within this unit because a navigable, dredged channel with a permanent open connection to the ocean is maintained on a regular basis. PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *HUM-4: Eel River*

This unit is located in Humboldt County, approximately 4.0 mi (6.5 ha) northwest of the City of Ferndale. The unit consists of two subunits, totaling 5 ac (2 ha) of State lands and 34 ac (13 ha) of private lands.

Both subunits are outside the geographical area occupied by the species at the time of listing but are now occupied. The Eel River estuary is similar to Humboldt Bay (HUM-3) in that tidewater goby subpopulations have been found in isolated populations in severely and artificially fragmented habitats, which are often found behind tidegates, culverts, and other manmade structures. In Humboldt Bay (HUM-3), McCraney *et al.* (2010, p. 3315) found that artificial fragmentation reduced dispersal and gene flow in these subpopulations. The same may be true for the Eel River estuary subpopulations with isolated populations that are genetically distinct from each other. Therefore, until additional information is available regarding population

genetics, distribution, and other parameters, we consider these two areas, the Eel River North Area (Subunit-4a) and the Eel River South Area (Subunit-4b), to be distinct from each other. Artificially fragmented habitats in the Eel River estuary may have genetically isolated or weakened populations of tidewater goby, as has been identified in Humboldt Bay (HUM-3) (McCraney *et al.* 2010, p. 3315). Current and proposed estuarine restoration projects in the Eel River estuary may improve dispersal of tidewater goby, increase genetic diversity, and aid in recovery of the species in these locations as well.

#### *Subunit-4a (Eel River North Area)*

Subunit-4a encompasses approximately 16 ac (6 ha), and consists of 5 ac (2 ha) of State lands and 11 ac (4 ha) of private lands. Subunit-4a is located 3.3 mi (5.3 km) north of Subunit-4b, which is also the nearest extant subpopulation. This subunit is essential for the conservation of the species because it possesses ecological characteristics that are important in maintaining the species' ability to adapt to changing environments, including the ability to disperse into higher channels and marsh habitat during severe flood events. The Eel River delta includes a large, complex estuary with a network of diked and natural slough channels with suitable tidewater goby habitat. The Eel River delta contains many small unsurveyed slough channels and other backwater areas that provide suitable habitat for tidewater goby, but it also contains larger channels open to direct tidal influence that do not provide suitable habitat and are not included in this subunit. This subunit consists of backwater channels and immediately adjacent marsh contiguous to the known-occupied habitat.

This unit is subject to infrequent, yet severe, flooding from the nearby Eel River proper. The major flood event of 1964 ("Christmas Flood"), and other major floods during the past century, may have severely altered habitat in most channels, including those currently occupied. Tidewater goby may have survived the flood and resulting loss of habitat in the refugia provided in upper channels and swales. Alternatively, the species may have been extirpated at the Eel River delta during those severe events, and become reestablished through recolonization by individuals from Humboldt Bay populations (HUM-3). Of particular importance, the Eel River location is at the north end of one of the largest natural geographic gaps in the tidewater goby's geographic range. The gap

extends to the Ten Mile River (Mendocino County) to the south, representing a coastline distance in excess of 135 mi (217 km).

This unit is outside the geographical area occupied by the species at the time of listing, but is considered to be currently occupied. Although Subunit-4a is outside the geographical area occupied at the time of listing, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, Subunit-4a possesses a sandbar across the mouth of the lagoon or estuary during the majority of the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### *Subunit-4b (Eel River South Area)*

Subunit-4b encompasses approximately 23 ac (9 ha), and consists entirely of private lands. Subunit-4b is located 3.3 mi (5.3 km) south of Subunit-4a, which is also the nearest extant subpopulation. This subunit is essential for the conservation of the species because it possesses ecological characteristics that are important in maintaining the species' ability to adapt to changing environments, including the ability to disperse into higher channels and marsh habitat during severe flood events. The Southern Eel River delta includes a large complex estuary with a network of diked and natural slough channels, and other backwater areas that provide suitable habitat for tidewater goby. It also contains larger channels open to direct tidal influence that do not provide suitable habitat and are not included in this unit. This unit consists of backwater channels and immediately adjacent marsh contiguous to the known-occupied habitat.

This unit is subject to infrequent, yet severe, flooding from the nearby Eel River proper. The major flood event of 1964 ("Christmas Flood"), and other major floods during the past century, may have severely altered habitat in most channels, including those currently occupied. Tidewater goby may have survived the flood and resulting loss of habitat in the refugia provided in upper channels and swales.

Alternatively, the species may have been extirpated at the Eel River delta during those severe events, and become reestablished through recolonization by individuals from Humboldt Bay populations (HUM-3). Of particular importance, the Eel River location is at

the north end of one of the largest natural geographic gaps in the tidewater goby's geographic range. The gap extends to the Ten Mile River (Mendocino County) to the south, representing a coastline distance in excess of 135 mi (217 km).

This unit is outside the geographical area occupied by the species at the time of listing, but is considered to be currently occupied. Although Subunit-4b was outside the geographical area occupied at the time of listing, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, Subunit-4b possesses a sandbar across the mouth of the lagoon or estuary during the majority of the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### *MEN-1: Ten Mile River*

MEN-1 consists of 73 ac (30 ha). This unit is located in Mendocino County, approximately 9.0 mi (14.5 km) north of the Town of Fort Bragg. The unit consists of 17 ac (7 ha) of State lands and 56 ac (23 ha) of private lands. MEN-1 is located 5.6 mi (8.9 km) north of the Virgin Creek (MEN-2), which is also the nearest extant subpopulation. MEN-1 was occupied by tidewater goby at the time of listing. The tidewater goby subpopulation in MEN-1 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the North Coast Recovery Unit. Furthermore, this unit is the largest block of habitat along the coast of Mendocino County, and is the first location on the southern end of one of the longest stretches of unsuitable habitat in the species' range (previously described under HUM-4). Thus, this unit is important to connect subpopulations within Mendocino County. South of Ten Mile River, only three other small isolated locations (MEN-2, 3, 4) occupied by the tidewater goby are known to exist across the more than 100 miles of rugged coastline between MEN-1 and SON-1 in south coastal Sonoma County.

On an intermittent basis, MEN-1 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although

their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *MEN-2: Virgin Creek*

MEN-2 consists of 4 ac (2 ha). This unit is located in Mendocino County, approximately 3.5 mi (5.6 km) north of the Town of Fort Bragg. The unit consists of 2 ac (1 ha) of State lands and 2 ac (1 ha) of private lands. MEN-2 is located 1.2 mi (2.0 km) north of Pudding Creek (MEN-3), which is also the nearest extant subpopulation.

MEN-2 was occupied by tidewater goby at the time of listing. The tidewater goby subpopulation in MEN-2 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the North Coast Recovery Unit.

On an intermittent basis, MEN-2 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *MEN-3: Pudding Creek*

MEN-3 consists of 17 ac (7 ha). This unit is located in Mendocino County, approximately 2.5 mi (4.0 km) north of the town of Fort Bragg. The unit consists of 10 ac (4 ha) of State lands, 1 ac (less than 1 ha) of local lands, and 6 ac (2 ha) of private lands. MEN-3 is located 1.2 mi (2.0 km) south of Virgin Creek (MEN-2), which is also the nearest extant subpopulation.

MEN-3 was occupied by the tidewater goby at the time of listing.



This unit allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics within the North Recovery Unit.

On an intermittent basis, MEN-3 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *MEN-4: Davis Lake and Manchester State Park Ponds*

MEN-4 consists of 29 ac (12 ha). This unit is located in Mendocino County, approximately 1.2 mi (1.9 ha) west of the community of Manchester. The unit consists entirely of State lands. MEN-4 is located 32.4 mi (52.2 km) south of Pudding Creek (MEN-3), which is also the nearest extant subpopulation.

MEN-4 was occupied by tidewater goby at the time of listing. The tidewater goby subpopulation in MEN-4 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the North Coast Recovery Unit.

On an intermittent basis, MEN-4 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SON-1: Salmon Creek*

SON-1 consists of 108 ac (44 ha). This unit is located in Sonoma County, approximately 7 mi (11.3 km) south of the community of Jenner. The unit consists of 47 ac (19 ha) of State lands, 14 ac (6 ha) local lands, and 47 ac (19 ha) of private lands. SON-1 is located 5.3 mi (8.5 km) north of the Estero Americano unit (MAR-1), which is also the nearest extant subpopulation.

SON-1 was occupied by tidewater goby at the time of listing. The geological feature known as Bodega Head separates Salmon Creek and Estero Americano, and could reduce the exchange of tidewater goby between these two locations. The tidewater goby population in this unit is likely a source population, and is therefore important for maintaining metapopulation dynamics. This critical habitat unit provides habitat for a tidewater goby subpopulation that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). Maintaining this unit will reduce the chance of losing the tidewater goby within the Greater Bay Area Recovery Unit, and help conserve genetic diversity within the species.

On an intermittent basis, SON-1 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *MAR-1: Estero Americano*

MAR-1 consists of 465 ac (188 ha). This unit is located in Marin County, approximately 3.5 mi (5.7 km) south of Bodega Bay. The unit consists entirely of private lands. MAR-1 is located 2.2 mi (3.5 km) north of the Estero de San Antonio (MAR-2), which is also the nearest extant subpopulation.

MAR-1 was occupied by tidewater goby at the time of listing. The tidewater goby subpopulation in MAR-1 is likely a source population, which is important

in maintaining metapopulation dynamics, and hence the long-term viability, of the Greater Bay Area Recovery Unit.

On an intermittent basis, MAR-1 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *MAR-2: Estero de San Antonio*

MAR-2 consists of 285 ac (115 ha). This unit is located in Marin County, approximately 5.6 mi (9 km) south of Bodega Bay. The unit consists entirely of private lands. MAR-2 is located 2.2 mi (3.5 km) south of the Estero Americano (MAR-1), which is also the nearest extant subpopulation.

MAR-2 was occupied by tidewater goby at the time of listing. This critical habitat unit supports a source population of tidewater goby that likely provides individuals that are recruited into surrounding subpopulations. Given the close proximity of the MAR-1 and MAR-2 units and the dispersal capabilities of tidewater goby, it is likely that the two subpopulations have exchanged individuals in the past and will continue to exchange individuals in the future. Exchange between these subpopulations would bolster the continued sustainable existence of the two subpopulations, which would, together with unit SON-1, provide for natural colonization of available, but is considered to be currently unoccupied, estuaries within the region south of the Russian River and north of Point Reyes. This critical habitat unit provides habitat for a tidewater goby population that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). Maintaining this unit will reduce the chance of losing the tidewater goby within the Greater Bay Area Recovery Unit, and help conserve genetic diversity within the species.

On an intermittent basis, MAR-2 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### MAR-3: Walker Creek

MAR-3 consists of 118 ac (48 ha). This unit is located in Marin County, approximately 2.5 mi (4 km) southwest of the Town of Tomales. The unit consists of 9 ac (4 ha) of State lands and 109 ac (44 ha) of private lands. MAR-3 is located 4.6 mi (7.4 km) southeast of the Estero de San Antonio unit (MAR-2), which is also the nearest extant subpopulation.

This unit is outside the geographical area occupied by the species at the time of listing and is not considered to be currently occupied. However, tidewater gobies were collected at Walker Creek in 1897, but were not found in sampling efforts conducted in 1996 or 1999 (Service 2005a, p. C-8). This unit is identified in the Recovery Plan as a potential reintroduction site, and could provide habitat for maintaining the tidewater goby metapopulation in the region. MAR-3 is essential for the conservation of the species because establishing a tidewater goby population in this unit will support the recovery of the tidewater goby population within the Greater Bay Area Recovery Unit and help facilitate additional colonization of currently unoccupied locations.

Although MAR-3 is outside the geographical area occupied at the time of listing and is not currently occupied, it does possess the PCE that is needed to support tidewater goby. PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### MAR-4: Lagunitas (Papermill) Creek

MAR-4 consists of 998 ac (405 ha). This unit is located in Marin County, approximately 20.5 mi (33 km) south of

Bodega Bay. The unit consists of 318 ac (129 ha) of Federal lands, 459 ac (186 ha) of State lands, and 221 ac (90 ha) of private lands. MAR-4 is located 15.5 mi (25.0 km) south of the Estero de San Antonio unit (MAR-2), which is also the nearest extant subpopulation. Records indicate tidewater goby occurred at this location historically.

This unit is outside the geographical area occupied by the species at the time of listing, but recent surveys have confirmed that the unit is currently occupied. This unit is essential for the conservation of the species because it is the only known location of the tidewater goby to remain within the greater Tomales Bay area. Without this subpopulation, there would be no source population within dispersal distance of Tomales Bay to maintain the metapopulation dynamics of subpopulations within the area. Tomales Bay is designated as “wetlands of significant importance” under the International Convention on Wetlands (<http://sanctuariesimon.org/farallones/sections/estuaries/overview.php>).

Although MAR-4 is outside the geographical area occupied at the time of listing, it does possess the PCE that is needed to support tidewater goby. We do not have information that confirms that PCE 1c (a sandbar(s) across the mouth of the lagoon or estuary) is present within this unit on at least an intermittent basis. However, PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### MAR-5: Bolinas Lagoon

MAR-5 consists of 1,114 ac (451 ha). This unit is located in Marin County, approximately 0.5 mi (0.81 km) east of the community of Bolinas. The unit consists of 29 ac (12 ha) of Federal Lands, 1,048 ac (424 ha) of local lands, and 37 ac (15 ha) of private lands. MAR-5 is located 9.4 mi (15.1 km) northwest of the Rodeo Lagoon unit (MAR-6), which is also the nearest extant subpopulation.

This unit is outside the geographical area occupied by the species at the time of listing and is not known to be currently occupied, and there are no historical tidewater goby records for this location. However, this unit is essential for the conservation of the species because it provides suitable habitat within potential dispersal distance of nearby occupied units, is identified in the Recovery Plan as a potential introduction site, and could help maintain tidewater goby metapopulations in the region. Bolinas

Lagoon is designated as “wetlands of significant importance” under the International Convention on Wetlands (<http://sanctuariesimon.org/farallones/sections/estuaries/overview.php>). If a tidewater goby subpopulation is established in this unit, MAR-5 unit will support the recovery of the tidewater goby population within the Greater Bay Recovery Unit and help facilitate colonization of currently unoccupied locations.

Although MAR-5 is outside the geographical area occupied at the time of listing and is not currently occupied, it does possess the PCE that is needed to support tidewater goby. We do not have information that confirms that PCE 1c (a sandbar(s) across the mouth of the lagoon or estuary) is present within this unit on at least an intermittent basis. However, PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### MAR-6: Rodeo Lagoon

MAR-6 consists of 40 ac (16 ha). This unit is located in Marin County, approximately 3.8 mi (6 km) north of San Francisco. The unit consists entirely of Federal lands. MAR-6 is located 9.4 mi (15.1 km) south of Bolinas Lagoon (MAR-5), and is separated from the nearest extant subpopulation to the south, San Gregorio Creek (SM-1), by 36 mi (58 km).

MAR-6 was occupied by tidewater goby at the time of listing. MAR-6 is the only known location where the tidewater goby remains within the greater San Francisco Bay Area. This critical habitat unit provides habitat for a tidewater goby subpopulation that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). It also provides habitat for a subpopulation of tidewater goby that could disperse to other adjoining habitats. Maintaining this unit will reduce the chance of losing the tidewater goby in the Greater Bay Recovery Unit and help conserve genetic diversity within the species.

On an intermittent basis, MAR-6 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in

precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SM-1: San Gregorio Creek*

SM-1 consists of 45 ac (18 ha). This unit is located in San Mateo County, approximately 28 mi (45 km) south of the San Francisco–San Mateo County line. The unit consists of 33 ac (13 ha) of State lands and 12 ac (5 ha) of private lands. SM-1 is located 1.5 mi (2.4 km) north of Pomponio Creek (SM-2), and is separated from the nearest extant subpopulation to the south, Pescadero–Butano Creek (SM-3), by 3.8 mi (6.1 km).

SM-1 was occupied by tidewater goby at the time of listing. The tidewater goby subpopulation in this unit is likely a source population and is, therefore, important for maintaining metapopulation dynamics. This critical habitat unit provides habitat for a tidewater goby subpopulation that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). This unit is noted for high densities of tidewater goby (Swenson 1993, p. 3).

On an intermittent basis, SM-1 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SM-2: Pomponio Creek*

SM-2 consists of 7 ac (3 ha). This unit is located in San Mateo County, approximately 3.5 mi (5.6 km) north of the community of Pescadero. The unit consists of 1 ac (less than 1 ha) of State lands and 6 ac (2 ha) of private lands.

SM-2 is located 1.5 mi (2.4 km) south of the San Gregorio Creek unit (SM-1), which is also the nearest extant subpopulation.

This unit is outside the geographical area occupied by the species at the time of listing, but is considered to be currently occupied. This unit is essential for the conservation of the species because it provides habitat for the species, allows for connectivity between tidewater goby source populations from nearby units, supports gene flow, and provides for metapopulation dynamics in the region.

Although SM-2 is outside the geographical area occupied at the time of listing, it does possess the PCE that supports tidewater goby. On an intermittent basis, SM-2 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### *SM-3: Pescadero–Butano Creek*

SM-3 consists of 245 ac (99 ha). This unit is located in San Mateo County, approximately 32.0 mi (51.0 km) south of the San Francisco–San Mateo County line. This unit consists of 241 ac (97 ha) of State lands and 4 ac (2 ha) of private lands. SM-3 is located 2.2 mi (3.5 km) south of Pomponio Creek (SM-2), and is separated from the nearest extant subpopulation to the south, in Bean Hollow Creek (SM-4), by 3.0 mi (4.8 km).

SM-3 was occupied by tidewater goby at the time of listing. This unit allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics within the Greater Bay Area Recovery Unit.

On an intermittent basis, SM-3 possesses a sandbar across the mouth of the lagoon or estuary during the late spring and early fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see

*Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SM-4: Bean Hollow Creek (Arroyo de Los Frijoles)*

SM-4 consists of 10 ac (4 ha). This unit is located in San Mateo County, approximately 34.8 mi (56.0 km) south of the San Francisco–San Mateo County line. The unit consists of 3 ac (1 ha) of State lands and 7 ac (3 ha) of private lands. SM-4 is located approximately 3.0 mi (4.8 km) south of the Pescadero–Butano Creek (SM-3), which is also the nearest extant subpopulation.

SM-4 was occupied by tidewater goby at the time of listing. Maintaining this unit, together with the two units to the north, will reduce the chance of losing the tidewater goby along this important coastal range and allow for connectivity between tidewater goby source populations, thereby supporting gene flow and metapopulation dynamics within the Greater Bay Recovery Unit.

On an intermittent basis, SM-4 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SC-1: Waddell Creek*

SC-1 consists of 75 ac (30 ha). This unit is located in Santa Cruz County, approximately 18 mi (29 km) northwest of the city of Santa Cruz. The unit consists of 39 ac (16 ha) of State lands and 36 ac (14 ha) of private lands. SC-1 is located approximately 5.0 mi (8.0 km) north of the Scott Creek (SC-2), which is also the nearest extant subpopulation. This unit is at the northern extent of this metapopulation as described in the Recovery Plan. Tidewater gobies were present in low numbers in 1991 through 1996, but were not detected during surveys from 1997 to 2000 (Service 2005a, p. C-12). Tidewater gobies were again detected

during surveys in August 2012 (Rischbieter, *in litt.* 2012).

SC-1 was occupied by tidewater goby at the time of listing. This unit provides habitat for tidewater gobies dispersing from Scott Creek (SC-2), which may serve to decrease the risk of extirpation of this metapopulation through stochastic events. This unit allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics within the Greater Bay Area Recovery Unit.

On an intermittent basis, SC-1 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### SC-2: Scott Creek

SC-2 consists of 74 ac (30 ha). This unit is located in Santa Cruz County, approximately 11.8 mi (19.0 km) northwest of the City of Santa Cruz. The unit consists of 66 ac (27 ha) of State lands, 6 ac (2 ha) of local lands, and 2 ac (1 ha) of private lands. SC-2 is located 5.0 mi (8.0 km) south of Waddell Creek (SC-1), and is separated from the nearest extant subpopulation to the south, in Laguna Creek (SC-3), by 6.0 mi (9.6 km).

SC-2 is outside the geographical area occupied by the species at the time of listing, but is considered to be currently occupied. This unit is essential for the conservation of the species because it provides habitat for the species, allows for connectivity between tidewater goby source populations from nearby units, supports gene flow, and provides for metapopulation dynamics within the Greater Bay Area Recovery Unit.

Although SC-2 is outside the geographical area occupied at the time of listing, it does possess the PCE that supports tidewater goby. On an intermittent basis, SC-2 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially

closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### SC-3: Laguna Creek

SC-3 consists of 26 ac (11 ha). This unit is located in Santa Cruz County, approximately 7.5 mi (12.0 km) west of the City of Santa Cruz. The unit consists entirely of State lands. SC-3 is located 6.0 mi (9.6 km) south of Scott Creek (SC-2), the nearest extant population to the north, and is separated from the nearest extant subpopulation to the south, in Baldwin Creek (SC-4), by 2.0 mi (3.2 km).

SC-3 was occupied by tidewater goby at the time of listing. The tidewater goby subpopulation in this unit is likely a source population and is, therefore, important for maintaining metapopulation dynamics. This critical habitat unit provides habitat for a tidewater goby population that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). Together with Baldwin Creek (SC-4) to the south, this unit helps conserve the genetic diversity of the species.

On an intermittent basis, SC-3 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### SC-4: Baldwin Creek

SC-4 consists of 27 ac (11 ha). This unit is located in Santa Cruz County, approximately 6 mi (9.7 km) west of the City of Santa Cruz. The unit consists entirely of State lands. SC-4 is located 2.0 mi (3.2 km) south of Laguna Creek (SC-3), and is separated from the nearest extant subpopulation to the

south, Lombardi Creek (not designated as critical habitat), by 0.7 mi (1.2 km).

SC-4 was occupied by tidewater goby at the time of listing. The tidewater goby population in this unit is likely a source population and is, therefore, important for maintaining metapopulation dynamics. This critical habitat unit provides habitat for a tidewater goby population that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172) and, together with Laguna Creek (SC-3) to the north, helps conserve genetic diversity within the species.

On an intermittent basis, SC-4 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### SC-5: Moore Creek

SC-5 consists of 15 ac (6 ha). This unit is located in Santa Cruz County, approximately 2.0 mi (3.2 km) west of the City of Santa Cruz. The unit consists entirely of Federal lands. SC-5 is located 4.0 mi (6.4) south of Baldwin Creek. SC-5 is separated from the nearest extant subpopulation to the north, Younger Lagoon (not designated as critical habitat), by 0.5 mi (0.8 km).

SC-5 was occupied by tidewater goby at the time of listing. Maintaining this unit will reduce the chance of losing the tidewater goby within the Greater Bay Area Recovery Unit, and help conserve genetic diversity within the species.

On an intermittent basis, SC-5 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The

physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### SC-6: Corcoran Lagoon

SC-6 consists of 28 ac (11 ha). This unit is located in Santa Cruz County, approximately 3 mi (4.8 km) east of the City of Santa Cruz. This unit consists of 1 ac (less than 1 ha) of State lands, 6 ac (2 ha) of local lands, and 21 ac (8 ha) of private lands. SC-6 is located 4.0 mi (6.4 km) south of Moore Creek (SC-5), and the unit is separated from the nearest extant subpopulation to the south, in Moran Lake (not designated as critical habitat), by 0.7 mi (1.1 km).

SC-6 was occupied by tidewater goby at the time of listing. The tidewater goby subpopulation in this unit is likely a source population and is, therefore, important for maintaining metapopulation dynamics. This critical habitat unit provides habitat for a tidewater goby population that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). Maintaining this unit will reduce the chance of losing the tidewater goby within the Greater Bay Area Recovery Unit, and help conserve genetic diversity within the species.

On an intermittent basis, SC-6 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### SC-7: Aptos Creek

SC-7 consists of 9 ac (4 ha). This unit is located in Santa Cruz County, approximately 0.5 mi (0.8 km) southwest of the City of Aptos. The unit consists entirely of State lands. SC-7 is

located 4.1 mi (6.6 km) east of Corcoran Lagoon (SC-6), and is separated from the nearest extant subpopulation to the north, Moran Lake (not designated as critical habitat), by 4.2 mi (6.75 km).

SC-7 was occupied by tidewater goby at the time of listing. The tidewater goby population in SC-7 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the Greater Bay Area Recovery Unit.

On an intermittent basis, SC-7 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### SC-8: Pajaro River

SC-8 consists of 215 ac (87 ha). This unit is located in Santa Cruz County, approximately 5 mi (8 km) southwest of the City of Watsonville. The unit consists of 158 ac (64 ha) of State lands, 11 ac (4 ha) of local lands, and 46 ac (19 ha) of private lands. SC-8 is located 9.7 mi (15.6 km) south of Aptos Creek (SC-7), and is separated from the nearest extant subpopulation to the south, in Bennett Slough (MN-1), by 3.0 mi (4.7 km).

SC-8 was occupied by tidewater goby at the time of listing. Maintaining this unit will reduce the chance of losing the tidewater goby within the Greater Bay Area Recovery Unit, and help conserve genetic diversity within the species.

On an intermittent basis, SC-8 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management

considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### MN-1: Bennett Slough

MN-1 consists of 167 ac (68 ha). This unit is located in Monterey County, approximately 3.7 mi (6 km) northwest of the Town of Castroville. This unit consists of 108 ac (44 ha) of State lands, 5 ac (2 ha) of local lands, and 54 ac (22 ha) of private lands. MN-1 is located 4.1 mi (6.6 km) south of the Pajaro River (SC-8), and is separated from the nearest extant subpopulation to the south, Moro Cojo Slough (not designated as critical habitat), by 1.3 mi (2.1 km).

MN-1 was occupied by tidewater goby at the time of listing. The tidewater goby population in this unit is likely a source population and is, therefore, important for maintaining metapopulation dynamics. This critical habitat unit provides habitat for a tidewater goby population that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172), and maintaining it will reduce the chance of losing the tidewater goby within the Greater Bay Area Recovery Unit, and help conserve genetic diversity within the species.

PCE 1c (a sandbar(s) across the mouth of lagoon or estuary) is not likely to occur within this unit because it has a navigable, dredged channel with a permanent open connection to the ocean that is maintained on a regular basis. However, PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### MN-2: Salinas River

MN-2 consists of 466 ac (189 ha). This unit is located in Monterey County, approximately 7.5 mi (12 km) north of the City of Seaside. The unit consists of 195 ac (79 ha) of Federal lands, 33 ac (13 ha) of State lands, 1 ac (less than 1 ha) of local lands, and 237 ac (96 ha) of

private lands. Unit MN-2 is located 4.0 mi (8.0 km) south of the Bennett Slough unit (MN-1).

This unit is outside the geographical area occupied by the species at the time of listing and is not considered to be currently occupied; however, this unit is essential for the conservation of the species. Tidewater gobies were last collected here in 1951, but were not present during surveys in 1991, 1992, and 2004 (Service 2005a, p. C-16). This unit is identified in the Recovery Plan as a potential reintroduction site. This unit would provide habitat for tidewater goby that disperse from Bennett Slough and Moro Cojo Slough, either through natural means or by reintroduction, which may serve to decrease the risk of extirpation of this metapopulation through stochastic events. This unit will also allow for connectivity between tidewater goby source populations, and thereby support gene flow and metapopulation dynamics within the Greater Bay Area Recovery Unit. Lastly, this unit is one of only three locations in Monterey County that have harbored tidewater goby and is one of the two subpopulations in the metapopulation as described in the Recovery Plan. Therefore, this unit is especially important for ensuring the viability of the metapopulation.

Although MN-2 is outside the geographical area occupied at the time of listing, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, MN-2 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### *SLO-1: Arroyo de la Cruz*

SLO-1 consists of 33 ac (13 ha). This unit is located in San Luis Obispo County, approximately 8.0 mi (13.0 km) northwest of San Simeon. The unit consists of 25 ac (10 ha) of State lands and 8 ac (3 ha) of private lands. SLO-1 is located approximately 2.0 mi (3.2 km) north of the Arroyo de Corral unit (SLO-2), which is also the nearest extant subpopulation.

This unit is outside the geographical area occupied by the species at the time of listing and is not known to be currently occupied, and there are no historical tidewater goby records for this location. However, this unit is essential for the conservation of the species

because it provides habitat to nearby units and is identified in the Recovery Plan as a potential introduction site, and could provide habitat for maintaining the tidewater goby metapopulation in the region.

This unit will provide habitat for tidewater goby that disperse from Arroyo del Corral through introduction of the species, which may serve to decrease the risk of extirpation of this metapopulation through stochastic events. This unit is one of two locations with suitable habitat within the Central Coast Recovery Subunit (CC 1), as described in the Recovery Plan. Therefore, this unit is especially important for ensuring the viability of the metapopulation because if the subpopulation within the Arroyo de Corral unit (SLO-2) is extirpated, the entire metapopulation would be lost.

Although SLO-1 is outside the geographical area occupied at the time of listing and is not currently occupied, it does possess the PCE that is needed to support tidewater goby. SLO-1 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### *SLO-2: Arroyo del Corral*

SLO-2 consists of 5 ac (3 ha). This unit is located in San Luis Obispo County, approximately 6 mi (9.7 km) northwest of San Simeon. The unit consists of 4 ac (2 ha) of State lands and 1 ac (less than 1 ha) of private lands. SLO-2 is located 2 mi (3.2 km) south of Arroyo de la Cruz (SLO-1) and is separated from the nearest extant subpopulation to the south, Oak Knoll Creek (SLO-3), by 4.3 mi (6.9 km).

SLO-2 was occupied at the time of listing. The tidewater goby subpopulation in this unit is likely a source population and is, therefore, important for maintaining metapopulation dynamics. This critical habitat unit provides habitat for a tidewater goby subpopulation that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). Maintaining this unit will reduce the chance of losing the tidewater goby within the Central Coast Recovery Unit, and help conserve genetic diversity within the species.

On an intermittent basis, SLO-2 possesses a sandbar across the mouth of

the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SLO-3: Oak Knoll Creek (Arroyo Laguna)*

SLO-3 consists of 5 ac (3 ha). This unit is located in San Luis Obispo County, approximately 2 mi (3.2 km) northwest of San Simeon. The unit consists of 4 ac (2 ha) of State lands and 1 ac (less than 1 ha) of private lands. SLO-3 is located 4.3 mi (6.9 km) south of Arroyo del Corral (SLO-2) and is separated from the nearest extant subpopulation to the south, in Arroyo de Tortuga (not designated as critical habitat), by 0.5 mi (0.8 km).

SLO-3 was occupied at the time of listing. This unit allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics within the Central Coast Recovery Unit.

On an intermittent basis, SLO-3 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SLO-4: Little Pico Creek*

SLO-4 consists of 9 ac (4 ha). This unit is located in San Luis Obispo County, approximately 6.7 mi (10.8 km) northwest of the Town of Cambria. The

unit consists of 2 ac (1 ha) of State lands and 7 ac (3 ha) of private lands. SLO-4 is located 3.7 mi (5.9 km) south of Oak Knoll Creek (SLO-3). The unit is separated from the nearest extant subpopulation to the north, in Broken Bridge Creek (not designated as critical habitat), by 1.4 mi (2.2 km).

SLO-4 was occupied at the time of listing. The tidewater goby subpopulation in SLO-4 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the Central Coast Recovery Unit.

On an intermittent basis, SLO-4 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SLO-5: San Simeon Creek*

SLO-5 consists of 17 ac (7 ha). This unit is located in San Luis Obispo County, approximately 3.3 mi (5.3 km) northwest of the Town of Cambria. The unit consists entirely of State lands. SLO-5 is located 3.8 mi (6.1 km) south of Little Pico Creek (SLO-4), and is separated from the nearest extant subpopulation to the south, in Santa Rosa Creek (not designated as critical habitat), by 2.6 mi (4.2 km).

SLO-5 was occupied at the time of listing. The tidewater goby subpopulation in SLO-5 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the Central Coast Recovery Unit.

On an intermittent basis, SLO-5 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in

response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SLO-6: Villa Creek*

SLO-6 consists of 15 ac (7 ha). This unit is located in San Luis Obispo County, approximately 9.6 mi (15.4 km) southeast of Cambria. The unit consists of 14 ac (6 ha) of State lands and 1 ac (less than 1 ha) of private lands. SLO-6 is located 12.3 mi (19.8 km) south of San Simeon Creek (SLO-5), and is separated from the nearest extant subpopulation to the south, in San Geronimo Creek (SLO-7), by 2.3 mi (3.7 km).

SLO-6 was occupied at the time of listing. The tidewater goby subpopulation in this unit is likely a source population and is, therefore, important for maintaining metapopulation dynamics. This critical habitat unit provides habitat for a tidewater goby subpopulation that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). Maintaining this unit will reduce the chance of losing the tidewater goby within the Central Coast Recovery Unit, and help conserve genetic diversity within the species.

On an intermittent basis, SLO-6 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SLO-7: San Geronimo Creek*

SLO-7 consists of 1 ac (less than 1 ha). This unit is located in San Luis Obispo County, approximately 7.6 mi

(12.2 km) northwest of the Town of Morro Bay, and approximately 1.4 mi (2.5 km) west of the Town of Cayucos. The unit consists entirely of State lands. SLO-7 is located 2.3 mi (3.7 km) south of Villa Creek (SLO-6), and is separated from the nearest extant subpopulation to the south, in Cayucos Creek (not designated as critical habitat), by 1.5 mi (2.4 km).

SLO-7 was occupied at the time of listing. The tidewater goby subpopulation in SLO-7 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the Central Coast Recovery Unit.

On an intermittent basis, SLO-7 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SLO-8: Toro Creek*

SLO-8 consists of 9 ac (4 ha). This unit is located in San Luis Obispo County, approximately 2.3 mi (3.7 km) south of the Town of Cayucos. The unit consists of 1 ac (less than 1 ha) of State lands and 8 ac (3 ha) of private lands. SLO-8 is located 5 mi (8.0 km) south of San Geronimo Creek (SLO-7), and is separated from the nearest extant subpopulation to the north, in Old Creek (not designated as critical habitat), by 1.8 mi (2.9 km).

SLO-8 was occupied at the time of listing. Maintaining this unit will reduce the chance of losing the tidewater goby within the Central Coast Recovery Unit, and help conserve genetic diversity within the species. On an intermittent basis, SLO-8 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular



time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

*SLO-9: Los Osos Creek*

SLO-9 consists of 73 ac (30 ha). This unit is located in San Luis Obispo County, within the Town of Baywood. The unit consists of 62 ac (25 ha) of State lands, 1 ac (less than 1 ha) of local lands, and 10 ac (4 ha) of private lands. The unit is separated from the nearest extant subpopulation to the north, in Toro Creek (SLO-8), by 8.0 mi (12.8 km). Tidewater gobies were present during surveys in 2001 (Service 2005a, p. C-21). Prior to the observations in 2001, tidewater goby had not been seen here since 1981 (Service 2005a, p. C-21).

Therefore, SLO-9 is outside the geographical area occupied by the species at the time of listing but is currently occupied. This unit is essential for the conservation of the species because it provides habitat to nearby units and is identified in the Recovery Plan as a potential introduction site, and could provide habitat for maintaining the tidewater goby metapopulation in the region. Maintaining this unit will also reduce the chance of losing the tidewater goby within the Central Coast Recovery Unit.

Although SLO-9 is outside the geographical area occupied at the time of listing, it does possess the PCE that is needed to support tidewater goby. PCE 1c (a sandbar(s) across the mouth of lagoon or estuary) is not likely to occur within this unit because it has a navigable channel with an open connection to Morro Bay, which is dredged on a regular basis. However, PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

*SLO-10: San Luis Obispo Creek*

SLO-10 consists of 31 ac (12 ha). This unit is located in San Luis Obispo County, within the Town of Avila Beach. The unit consists of 3 ac (1 ha) of local lands, and 28 ac (11 ha) of private lands. The unit is separated from the nearest extant subpopulation to the

south, in Pismo Creek (SLO-11), by 7.0 mi (11.2 km).

SLO-10 was occupied at the time of listing. The tidewater goby subpopulation in this unit is likely a source population and is, therefore, important for maintaining metapopulation dynamics. This critical habitat unit provides habitat for a tidewater goby subpopulation that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). On an intermittent basis, SLO-10 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

*SLO-11: Pismo Creek*

SLO-11 consists of 20 ac (9 ha). This unit is located in San Luis Obispo County, within the Town of Pismo Beach. The unit consists of 14 ac (6 ha) of State lands, 1 ac (less than 1 ha) of local lands, and 5 ac (2 ha) of private lands. SLO-11 is located 7 mi (11.2 km) south of San Luis Obispo Creek (SLO-10). The unit is separated from the nearest extant subpopulation to the south, in Arroyo Grande Creek (not designated as critical habitat), by 2.6 mi (4.2 km).

SLO-11 was occupied at the time of listing. The tidewater goby subpopulation in SLO-11 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the Conception Recovery Unit. On an intermittent basis, SLO-11 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in

precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

*SLO-12: Oso Flaco Lake*

SLO-12 consists of 171 ac (69 ha). This unit is located in San Luis Obispo County, approximately 5 mi (8.0 km) northwest of the City of Santa Maria. The unit consists of 165 ac (67 ha) of State lands and 6 ac (2 ha) of private lands. The unit is separated from the nearest extant subpopulation to the south, the Santa Maria River (SB-1), by 4 mi (6.4 km).

This unit is outside the geographical area occupied by the species at the time of listing and is not known to be currently occupied, and there are no historical tidewater goby records for this location. However, this unit is essential for the conservation of the species because it provides habitat to nearby units and is identified in the Recovery Plan as a potential introduction site, and could provide habitat for maintaining the tidewater goby metapopulation in the region. This unit will provide habitat for tidewater goby that disperse from Arroyo Grande Creek and the Santa Maria River, either through natural means or by introduction, which may serve to decrease the risk of extirpation of this metapopulation through stochastic events. This unit would also allow for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics in this region. Although tidewater goby may be presently precluded from this location due to water quality impairments, the California Regional Water Control Board is currently working with the Service to remedy these impairments. Therefore, we anticipate the habitat at this location will be suitable for tidewater goby in the future and have determined that this unit is essential for the conservation of the species as described above.

Although SLO-12 is outside the geographical area occupied at the time of listing and is not currently occupied, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, SLO-12 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby



provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### *SB-1: Santa Maria River*

SB-1 consists of 474 ac (192 ha). This unit is located in Santa Barbara County, approximately 13 mi (21 km) west of the City of Santa Maria. The unit consists of 42 ac (17 ha) of local lands and 432 ac (175 ha) of private lands. SB-1 is located 4 mi (6.4 km) south of Oso Flaco Lake (SLO-12), and is separated from the nearest extant subpopulation to the south, in Shuman Canyon (not designated as critical habitat; see *Application of Section 4(a)(3) of the Act*—Vandenberg Air Force Base section below), by 8.6 mi (13.9 km).

SB-1 was occupied at the time of listing. The tidewater goby subpopulation in this unit is likely a source population and is, therefore, important for maintaining metapopulation dynamics. This critical habitat unit provides habitat for a tidewater goby subpopulation that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). Maintaining this unit will reduce the chance of losing the tidewater goby within the Conception Recovery Unit, and help conserve genetic diversity within the species.

On an intermittent basis, SB-1 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SB-2: Cañada de las Agujas*

SB-2 consists of 1 ac (less than 1 ha). This unit is located in Santa Barbara County, approximately 7.2 mi (11.6 km) west of Gaviota. The unit consists entirely of private lands. SB-2 is located 38.8 mi (62.5 km) south of the Santa

Maria River (SB-1), and is separated from the nearest extant subpopulation to the south, in Arroyo El Bulito (not designated as critical habitat), by 0.4 mi (0.7 km).

SB-2 was occupied at the time of listing. This unit allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics within Conception Recovery Unit. Furthermore, this unit, and units SB-3, SB-4, SB-5, and SB-6, likely act as a metapopulation as defined in the Background section. These units are no more than 2.0 mi (3.3 km) from each other, which facilitates higher dispersal rates between sites. Because these units are of relatively small size in area (1 to 9 ac (less than 1 to 4 ha)), they are more susceptible to drying or shrinking due to drought conditions, which increases the likelihood of local extirpation. Lastly, because these units are small, they are likely to be dependent upon some degree of periodic exchange of tidewater goby between units for any one unit to persist over time. Therefore, designation of critical habitat at these five locations is necessary for the conservation of the tidewater goby along the Gaviota Coast in Santa Barbara County.

On an intermittent basis, SB-2 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SB-3: Cañada de Santa Anita*

SB-3 consists of 3 ac (1 ha). This unit is located in Santa Barbara County, approximately 5.2 mi (8.4 km) west of Gaviota. The unit consists entirely of private lands. SB-3 is located 2.0 mi (3.2 km) south of Cañada de las Agujas (SB-2), and is separated from the nearest extant subpopulation to the north, in Cañada del Agua (not designated as critical habitat), by 0.4 mi (0.7 km).

SB-3 was occupied at the time of listing. This unit is important to the

conservation of the species because it allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics within the Conception Recovery Unit.

Furthermore, as described above in SB-2, this unit, and units SB-2, SB-4, SB-5, and SB-6, likely act as a metapopulation as defined in the Background section, and designation of critical habitat at these five locations is necessary for the conservation of the tidewater goby along the Gaviota Coast in Santa Barbara County.

On an intermittent basis, SB-3 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SB-4: Cañada de Alegria*

SB-4 consists of 2 ac (1 ha). This unit is located in Santa Barbara County, approximately 3.2 mi (5.1 km) west of Gaviota. The unit consists entirely of private lands. SB-4 is located 2.0 mi (3.3 km) south of Cañada de Santa Anita (SB-3), and is separated from the nearest extant subpopulation to the south, in Cañada del Agua Caliente (SB-5), by 1.1 mi (1.8 km).

SB-4 was occupied at the time of listing. This unit is important to the conservation of the species because it allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics in this region. Furthermore, as described above in SB-2, this unit, and units SB-2, SB-3, SB-5, and SB-6, likely act as a metapopulation as defined in the Background section, and designation of critical habitat at these five locations is necessary for the conservation of the tidewater goby along the Gaviota Coast in Santa Barbara County.

On an intermittent basis, SB-4 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or

partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

*SB-5: Cañada del Agua Caliente*

SB-5 consists of 1 ac (less than 1 ha). This unit is located in Santa Barbara County, approximately 2.1 mi (3.4 km) west of Gaviota. This unit consists entirely of private lands. SB-5 is located 1.1 mi (1.8 km) south of Cañada de Alegria (SB-4), which is also the nearest extant subpopulation.

SB-5 was occupied at the time of listing. This critical habitat unit provides habitat for a tidewater goby subpopulation that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). This unit helps conserve genetic diversity within the species. This unit also allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics in this region. Furthermore, as described above in SB-2, this unit, and units SB-2, SB-3, SB-4, and SB-6, likely act as a metapopulation as defined in the Background section, and designation of critical habitat at these five locations is necessary for the conservation of the tidewater goby along the Gaviota Coast in Santa Barbara County.

On an intermittent basis, SB-5 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a

discussion of the threats to tidewater goby habitat and potential management considerations.

*SB-6: Gaviota Creek*

SB-6 consists of 11 ac (5 ha). This unit is located in Santa Barbara County, approximately 0.8 mi (1.3 km) west of Gaviota. This unit consists of 10 ac (4 ha) of State lands and 1 ac (less than 1 ha) of private lands. SB-6 is located 1.5 mi (2.4 km) south of Cañada del Agua Caliente (SB-5), which is also the nearest extant subpopulation.

SB-6 was occupied at the time of listing. This unit is important to the conservation of the species because maintaining it will reduce the chance of losing the tidewater goby within the Conception Recovery Unit. It also allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics in this region. Furthermore, as described above in SB-2, this unit, and units SB-2, SB-3, SB-4, and SB-5, likely act as a metapopulation as defined in the Background section, and designation of critical habitat at these five locations is necessary for the conservation of the tidewater goby along the Gaviota Coast in Santa Barbara County.

On an intermittent basis, SB-6 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

*SB-7: Arroyo Hondo*

SB-7 consists of 1 ac (less than 1 ha). This unit is located in Santa Barbara County, approximately 5.0 mi (8.0 km) east of Gaviota. This unit consists entirely of private lands. SB-7 is located 5.0 mi (8.0 km) south of Gaviota Creek (SB-6), and is separated from the nearest extant subpopulation to the south, in Arroyo Quemado (not designated as critical habitat), by 1.3 mi (2.0 km).

This unit is outside the geographical area occupied by the species at the time of listing, but is considered to be currently occupied. This unit is essential for the conservation of the species because it provides habitat to nearby units and could provide habitat for maintaining the tidewater goby metapopulation within the Conception Recovery Unit. Maintaining this unit will reduce the chance of losing the tidewater goby within the Conception Recovery Unit, and help conserve genetic diversity within the species.

Although SB-7 is outside the geographical area occupied at the time of listing, it does possess the PCE that supports tidewater goby. On an intermittent basis, SB-7 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

*SB-8: Winchester/Bell Canyon*

SB-8 consists of 6 ac (3 ha). This unit is located in Santa Barbara County, approximately 2.2 mi (3.5 km) west of the community of El Encanto Heights. The unit consists of 1 ac (less than 1 ha) of local lands and 5 ac (2 ha) of private lands. SB-8 is located 6.0 mi (9.6 km) north of Goleta Slough (SB-9), and is separated from the nearest extant subpopulation to the north, Tecolote Canyon (not designated as critical habitat), by 0.3 mi (0.4 km).

SB-8 was occupied at the time of listing. This unit is important to the conservation of the species because it allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics in this region. On an intermittent basis, SB-8 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or*

*Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SB-9: Goleta Slough*

SB-9 consists of 190 ac (76 ha). This unit is located in Santa Barbara County, within the City of Goleta. The unit consists of 164 ac (66 ha) of local lands and 26 ac (10 ha) of private lands. SB-9 is located 6.0 mi (9.6 km) south of Winchester/Bell Canyon (SB-8), and is separated from the nearest extant subpopulation to the north, Devereux Slough (not designated as critical habitat), by 4.0 mi (6.4 km).

This unit is outside the geographical area occupied by the species at the time of listing, but is currently occupied. This unit is essential for the conservation of the species because it provides habitat for the species, allows for connectivity between tidewater goby source populations from nearby units, supports gene flow, and provides for metapopulation dynamics within the Conception Recovery Unit.

Although SB-9 is outside the geographical area occupied at the time of listing, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, SB-9 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### *SB-10: Arroyo Burro*

SB-10 consists of 3 ac (1 ha). This unit is located in Santa Barbara County, approximately 3.6 mi (5.8 km) west of the City of Santa Barbara. The unit consists entirely of local lands. SB-10 is located 4.0 mi (6.4 km) north of Mission Creek-Laguna Channel (SB-11), which is also the nearest extant subpopulation.

This unit is outside the geographical area occupied by the species at the time of listing, but is considered to be currently occupied. This unit is essential for the conservation of the species because it provides habitat for the species, allows for connectivity between tidewater goby source populations from nearby units, supports gene flow, and provides for metapopulation dynamics within the Conception Recovery Unit.

Although SB-10 is outside the geographical area occupied at the time of listing, it does possess the PCE that

is needed to support tidewater goby. On an intermittent basis, SB-10 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### *SB-11: Mission Creek-Laguna Channel*

SB-11 consists of 7 ac (3 ha). This unit is located in Santa Barbara County, within the City of Santa Barbara. The unit consists of 3 ac (1 ha) of State lands and 4 ac (2 ha) of local lands. SB-11 is located 4.0 mi (6.4 km) south of Arroyo Burro (SB-10), and is separated from the nearest extant subpopulation to the south, in Sycamore Creek (not designated as critical habitat), by 1.0 mi (1.5 km).

SB-11 was occupied at the time of listing. The tidewater goby subpopulation in SB-11 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the Conception Recovery Unit.

On an intermittent basis, SB-11 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *SB-12: Arroyo Paredon*

SB-12 consists of 3 ac (1 ha). This unit is located in Santa Barbara County, within the City of Santa Barbara. The unit consists of 1 ac (less than 1 ha) of State lands, 1 ac (less than 1 ha) of local lands, and 1 ac (less than 1 ha) of private lands. SB-12 is located 8.0 mi (12.8 km) south of Mission Creek-Laguna Channel (SB-11), and is separated from the nearest extant subpopulation to the south, in

Carpinteria Creek (not designated as critical habitat), by 2.7 mi (4.3 km).

This unit is outside the geographical area occupied by the species at the time of listing, but is considered to be currently occupied. This unit is essential for the conservation of the species because it provides habitat for the species, allows for connectivity between tidewater goby source populations from nearby units, supports gene flow, and provides for metapopulation dynamics within the Conception Recovery Unit.

Although SB-12 is outside the geographical area occupied at the time of listing, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, SB-12 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### *VEN-1: Ventura River*

VEN-1 consists of 50 ac (21 ha). This unit is located in Ventura County, within the City of Ventura. The unit consists of 25 ac (10 ha) of State lands, 16 ac (7 ha) of local lands, and 9 ac (4 ha) of private lands. VEN-1 is located 4.3 mi (7.0 km) north of the Santa Clara River (VEN-2), which is also the nearest extant subpopulation.

VEN-1 was occupied at the time of listing. The tidewater goby population in this unit is likely a source population and is, therefore, important for maintaining metapopulation dynamics. This critical habitat unit provides habitat for a tidewater goby subpopulation that is important to the conservation of one of the genetically distinct recovery units as described in the Recovery Plan (Dawson *et al.* 2001, p. 1172). Maintaining this unit will reduce the chance of losing the tidewater goby within the LA/Ventura Recovery Unit, and help conserve genetic diversity within the species.

On an intermittent basis, VEN-1 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The

physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *VEN-2: Santa Clara River*

VEN-2 consists of 323 ac (130 ha). This unit is located in Ventura County, approximately 4 mi (6.4 km) southeast of the City of Ventura. This unit consists of 199 ac (80 ha) of State lands, 14 ac (6 ha) of local lands, and 110 ac (44 ha) of private lands. VEN-2 is located 4.3 mi (7.0 km) south of the Ventura River unit (VEN-1), which is also the nearest extant subpopulation.

VEN-2 was occupied by tidewater goby at the time of listing. The tidewater goby subpopulation in VEN-2 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the LA/Ventura Recovery Unit Recovery Unit. This unit is known to have tens of thousands of tidewater goby during certain times of the year (Dellith, pers. comm. 2010), and is considered one of the largest tidewater goby populations in southern California.

On an intermittent basis, VEN-2 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *VEN-3: J Street Drain-Ormond Lagoon*

VEN-3 consists of 121 ac (49 ha). This unit is located in Ventura County, approximately 1 mi (1.6 km) east of Port Hueneme. This unit consists of 5 ac (2 ha) of State lands, 49 ac (20 ha) of local lands, and 67 ac (27 ha) of private lands. VEN-3 is located 4.3 mi (6.9 km) south of the Santa Clara River (VEN-2), which is also the nearest extant subpopulation.

VEN-3 was occupied at the time of listing. This unit allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics within the LA/Ventura Recovery Unit. On an intermittent basis, VEN-3 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### *VEN-4: Big Sycamore Canyon [Note that the Recovery Plan refers to this location as "Sycamore Canyon"]*

VEN-4 consists of 1 ac (less than 1 ha). This unit is located in Ventura County, approximately 12.0 mi (19.3 km) northwest of the City of Malibu. The unit consists entirely of State lands. VEN-4 is located 5.0 mi (8.0 km) north of Arroyo Sequit (LA-1), and is separated from the nearest extant subpopulation to the north, in the Calleguas Creek (not designated as critical habitat), by 5.0 mi (8.0 km).

This unit is outside the geographical area occupied by the species at the time of listing, but is considered to be currently occupied. This unit is essential for the conservation of the species because it provides habitat for the species, allows for connectivity between tidewater goby source populations from nearby units, supports gene flow, and provides for metapopulation dynamics within the LA/Ventura Recovery Unit.

Although VEN-4 is outside the geographical area occupied at the time of listing, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, VEN-4 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to

seasonal fluctuations in precipitation and tidal inundation.

#### *LA-1: Arroyo Sequit*

LA-1 consists of 1 ac (less than 1 ha). This unit is located in Los Angeles County, approximately 7.5 mi (12.0 km) northwest of the City of Malibu. The unit consists entirely of State lands. LA-1 is located 5.0 mi (8 km) south of Big Sycamore Canyon (VEN-4), which is the nearest extant subpopulation.

This unit is outside the geographical area occupied by the species at the time of listing, is not known to be currently occupied, and there are no historical tidewater goby records for this location. However, this unit is essential for the conservation of the species because it is identified in the Recovery Plan as a potential introduction site, and could provide habitat for maintaining the tidewater goby metapopulation in the region. This unit will provide habitat for tidewater goby that may be introduced, which may serve to decrease the risk of extirpation of this metapopulation through stochastic events. This unit would also allow for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics within the LA/Ventura Recovery Unit.

Although LA-1 is outside the geographical area occupied at the time of listing and is not currently occupied, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, LA-1 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### *LA-2: Zuma Canyon*

LA-2 consists of 5 ac (2 ha). This unit is located in Los Angeles County, approximately 7.5 mi (12.0 km) northwest of the City of Malibu. The unit consists entirely of local lands administered by Los Angeles County. LA-2 is located 6.8 mi (11 km) south of Arroyo Sequit (LA-1), and is separated from the nearest extant subpopulation to the south, in the Malibu Lagoon (LA-3), by 10.0 mi (16.0 km).

LA-2 is outside the geographical area occupied by the species at the time of listing, is not known to be currently occupied, and there are no historical tidewater goby records for this location. However, this unit is essential for the

conservation of the species because it could provide habitat to nearby occupied units and is identified in the Recovery Plan as a potential introduction site, and it could provide habitat for maintaining the tidewater goby metapopulation within the LA/Ventura Recovery Unit. This unit will provide habitat for tidewater goby that are introduced, which may serve to decrease the risk of extirpation of this metapopulation through stochastic events. This unit would also allow for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics within the LA/Ventura Recovery Unit.

Although LA-2 is outside the geographical area occupied at the time of listing and is not currently occupied, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, LA-2 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### LA-3: Malibu Lagoon

LA-3 consists of 64 ac (27 ha). This unit is located in Los Angeles County, approximately 0.6 mi (1 km) east of Malibu Beach. The unit consists of 41 ac (27 ha) of State lands, 1 ac (less than 1 ha) of local lands, and 22 ac (9 ha) of private lands. LA-3 is located 6.0 mi (9.6 km) north of Topanga Canyon (LA-4), which is also the nearest extant subpopulation.

LA-3 was occupied at the time of listing. The tidewater goby subpopulation in LA-3 is likely a source population, which is important in maintaining metapopulation dynamics, and hence the long-term viability, of the LA/Ventura Recovery Unit. LA-3 supports one of the two remaining extant populations of tidewater goby within Los Angeles County.

On an intermittent basis, LA-3 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation. The

physical or biological features essential to the conservation of the species in this unit may require special management considerations or protection to address threats described in Table 2. Please see *Special Management Considerations or Protection* section of this rule for a discussion of the threats to tidewater goby habitat and potential management considerations.

#### LA-4: Topanga Creek

LA-4 consists of 6 ac (2 ha). This unit is located in Los Angeles County, approximately 5.5 mi (8.9 km) northwest of the City of Santa Monica. The unit consists of 4 ac (1 ha) of State lands and 2 ac (1 ha) of private lands. LA-4 is located 6.0 mi (9.6 km) south of Malibu Lagoon (LA-3), which is also the nearest extant subpopulation.

This unit is outside the geographical area occupied by the species at the time of listing, but is currently occupied. Tidewater gobies were first detected at this locality in 2001 (Service 2005a, p. C-30). Tidewater goby in Topanga Creek are probably derived from fish that dispersed from Malibu Creek. This unit is essential for the conservation of the species because it allows for connectivity between tidewater goby source populations, and thereby supports gene flow and metapopulation dynamics within the LA/Ventura Recovery Unit. This location is one of the two remaining locations in Los Angeles County known to be occupied by tidewater goby.

Although LA-4 is outside the geographical area occupied at the time of listing, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, LA-4 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### OR-1: Aliso Creek

OR-1 consists of 14 ac (5 ha). This unit is located in Orange County, within the City of Laguna Beach. The unit consists of 8 ac (3 ha) of local lands and 6 ac (2 ha) of private lands. OR-1 is located 13.5 mi (21.7 km) north of the San Mateo Creek (not designated as critical habitat, see *Application of Section 4(a)(3) of the Act—Marine Corps Base Camp Pendleton* section below), which supports the nearest extant subpopulation.

This unit is outside the geographical area occupied by the species at the time of listing, and is not known to be currently occupied. OR-1 was last known to be occupied in 1977 (Swift *et al.* 1989, p. 1). The reason for the extirpation of the historical subpopulation at this site is unknown. However, this unit is essential for the conservation of the species because it would aid recovery of the tidewater goby in the genetically unique South Coast Recovery Unit. The Recovery Plan notes that the species should be reintroduced into as many localities as possible to the north and south of MCB Camp Pendleton (Service 2005a, p. G-16). Aliso Creek is identified in the Recovery Plan as a potential reintroduction site (Service 2005a, p. G-20). If tidewater goby become established at this location, this unit's primary function would be to help maintain the genetic diversity of the Southern Coast Recovery Unit (especially Recovery Subunit SC1). Moreover, a level of population redundancy would help prevent the extirpation of a metapopulation in which only one or two occupied sites remain, which is the case for Recovery Subunit SC1.

Although OR-1 is outside the geographical area occupied at the time of listing and is not currently occupied, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, OR-1 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

#### SAN-1: San Luis Rey River

SAN-1 consists of 56 ac (23 ha). This unit is located in San Diego County, within the City of Oceanside. The unit consists of 3 ac (1 ha) of State lands, 49 ac (20 ha) of local lands, and 4 ac (2 ha) of private lands. SAN-1 is located approximately 2.5 mi (4.0 km) south of the Santa Margarita River (not designated as critical habitat; see *Application of Section 4(a)(3) of the Act—Marine Corps Base Camp Pendleton* section below), which supports the nearest known extant subpopulation.

This unit is outside the geographical area occupied by the species at the time of listing, but tidewater gobies were detected at this location in 2010

(Lafferty 2010, not paginated), which indicates that this location is one of the suite of occupied and intermittently occupied locations that contributes to tidewater goby metapopulation on MCB Camp Pendleton. This unit is essential for the conservation of the species because it serves as one of a limited number of locations that contribute toward metapopulation dynamics of the genetically unique South Coast Recovery Unit. As discussed in the *Metapopulation Dynamics* section, the number of subpopulations is important to the long-term stability of a metapopulation. As such, SAN-1 will help the species to survive and support the recovery of the tidewater goby population within the South Coast Recovery Unit, even potentially facilitating natural recolonization of currently unoccupied locations to the south. The Recovery Plan notes that the species should be reintroduced into as many localities as possible to the north and south of MCB Camp Pendleton (Service 2005a, p. G-16). The San Luis Rey River was identified in the Recovery Plan as a potential reintroduction site (Service 2005a, p. G-20). Prior to 2010, tidewater gobies were last detected in this unit in 1958 (Lafferty, pers. comm. 2010). This unit now represents the southernmost occupied area of the species' distribution, and is important for maintaining the tidewater goby metapopulation in the region.

Although SAN-1 is outside the geographical area occupied at the time of listing, it does possess the PCE that is needed to support tidewater goby. On an intermittent basis, SAN-1 possesses a sandbar across the mouth of the lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, and thereby provides relatively stable conditions (PCE 1c). PCE 1a and 1b occur throughout the unit, although their precise location during any particular time period may change in response to seasonal fluctuations in precipitation and tidal inundation.

## Effects of Critical Habitat Designation

### Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they fund, authorize, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. In addition, section 7(a)(4) of the Act requires Federal agencies to confer with

the Service on any agency action that is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of proposed critical habitat.

Decisions by the 5th and 9th Circuit Courts of Appeals have invalidated our regulatory definition of "destruction or adverse modification" (50 CFR 402.02) (see *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service*, 378 F. 3d 1059 (9th Cir. 2004) and *Sierra Club v. U.S. Fish and Wildlife Service et al.*, 245 F.3d 434, 442 (5th Cir. 2001)), and we do not rely on this regulatory definition when analyzing whether an action is likely to destroy or adversely modify critical habitat. Under the statutory provisions of the Act, we determine destruction or adverse modification on the basis of whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species.

If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. Examples of actions that are subject to the section 7 consultation process are actions on State, tribal, local, or private lands that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from the Service under section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat, and actions on State, tribal, local, or private lands that are not federally funded or authorized, do not require section 7 consultation.

As a result of this consultation, we document compliance with the requirements of section 7(a)(2) through our issuance of:

(1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, listed species or critical habitat; or

(2) A biological opinion for Federal actions that may affect, or are likely to adversely affect, listed species or critical habitat.

When we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species and/or destroy or adversely modify critical habitat, we provide reasonable and prudent alternatives to the project, if any are

identifiable, that would avoid the likelihood of jeopardy and/or destruction or adverse modification of critical habitat. We define "reasonable and prudent alternatives" (at 50 CFR 402.02) as alternative actions identified during consultation that:

(1) Can be implemented in a manner consistent with the intended purpose of the action,

(2) Can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction,

(3) Are economically and technologically feasible, and

(4) Would, in the Director's opinion, avoid the likelihood of jeopardizing the continued existence of the listed species and/or avoid the likelihood of destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Regulations at 50 CFR 402.16 require Federal agencies to reinitiate consultation on previously reviewed actions in instances where we have listed a new species or subsequently designated critical habitat that may be affected and the Federal agency has retained discretionary involvement or control over the action (or the agency's discretionary involvement or control is authorized by law). Consequently, Federal agencies sometimes may need to request reinitiation of consultation with us on actions for which formal consultation has been completed, if those actions with discretionary involvement or control may affect subsequently listed species or designated critical habitat.

### Application of the "Adverse Modification" Standard

The key factor related to the adverse modification determination is whether, with implementation of the proposed Federal action, the affected critical habitat would continue to serve its intended conservation role for the species. Activities that may destroy or adversely modify critical habitat are those that alter the physical or biological features to an extent that appreciably reduces the conservation value of critical habitat for tidewater goby. As discussed above, the role of critical habitat is to support life-history needs of the species and provide for the conservation of the species.

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that

designates critical habitat, activities involving a Federal action that may destroy or adversely modify such habitat, or that may be affected by such designation.

Activities that may affect critical habitat, when carried out, funded, or authorized by a Federal agency, should result in consultation for the tidewater goby. These activities include, but are not limited to:

(1) Actions that would channelize or divert water reducing the amount of space that is available for individual and population growth and normal behavior, and reduce or eliminate sites for breeding, reproduction, and rearing (or development) of offspring.

(2) Actions that would substantially alter the natural hydrologic regime upstream of the designated critical habitat units. Such activities could include, but are not limited to, ground water pumping or surface water diversion activities, construction of impoundments or flood control structures, or the release of water in excess of levels that historically occurred. These activities could result in atypical reduction or increases in the amount of water that is present in the aquatic habitats that tidewater goby occupy, and alter salinity conditions that support this species.

(3) Actions that would substantially alter the channel morphology of the designated critical habitat units, or the areas up-gradient from these units. Such activities could include, but are not limited to, channelization projects, road and bridge projects, removal of substrates, destruction and alteration of riparian vegetation, reduction of available floodplain, and removal of gravel or floodplain terrace materials. These activities could result in increased water velocities and flush large numbers of tidewater goby into the ocean especially during flood events.

(4) Actions that would result in the discharge of agricultural and sewage effluents, or chemical or biological pollutants into the aquatic habitats where tidewater goby occur. Such activities could include, but are not limited to, grazing, fertilizer application, sewage treatment, pesticide application, and herbicide application. These activities could degrade the water quality where tidewater goby live, introduce toxic substances that can poison individual fish, adversely affect fish immune systems, and decrease the amount of oxygen in aquatic habitats where the species occurs.

(5) Actions that would cause atypical levels of sedimentation in coastal wetland habitats or remove vegetative cover that stabilizes stream banks. Such

activities could include, but are not limited to, grazing or mining activities, road construction projects, off-road vehicle use, and other watershed and floodplain-disturbance activities. These activities could have the potential to alter the amount and composition of the substrate in the habitats where tidewater goby occur, and thereby affect the species' ability to construct breeding burrows.

(6) Actions that would result in the artificial breaching of lagoon habitats. Such activities could include, but are not limited to, lagoon breaching for mosquito control, flood management, and recreational opportunities such as creating surf breaks. These activities could reduce the amount of space that is available for individual and population growth; strand and desiccate tidewater goby adults, fry, or eggs; and increase the risk they will be preyed upon by native or nonnative predators as they become concentrated and exposed as water levels drop.

(7) Actions that would create barriers that prevent tidewater goby from accessing areas they would normally be able to access. These activities, which may include, but are not limited to, water diversions, road crossings, and sills. These activities could reduce the amount of space that is available for individual and population growth, and reduce the number and extent of sites for breeding, reproduction, and rearing (or development) of offspring.

#### Exemptions

##### *Application of Section 4(a)(3) of the Act*

The Sikes Act Improvement Act of 1997 (Sikes Act) (16 U.S.C. 670a) required each military installation that includes land and water suitable for the conservation and management of natural resources to complete an integrated natural resources management plan (INRMP) by November 17, 2001. An INRMP integrates implementation of the military mission of the installation with stewardship of the natural resources found on the base. Each INRMP includes:

- (1) An assessment of the ecological needs on the installation, including the need to provide for the conservation of listed species;
- (2) A statement of goals and priorities;
- (3) A detailed description of management actions to be implemented to provide for these ecological needs; and
- (4) A monitoring and adaptive management plan.

Among other things, each INRMP must, to the extent appropriate and

applicable, provide for fish and wildlife management; fish and wildlife habitat enhancement or modification; wetland protection, enhancement, and restoration where necessary to support fish and wildlife; and enforcement of applicable natural resource laws.

The National Defense Authorization Act for Fiscal Year 2004 (Pub. L. 108-136) amended the Act to limit areas eligible for designation as critical habitat. Specifically, section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) now provides: "The Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation."

We consulted with the military on the development and implementation of INRMPs for installations with listed species. We analyzed INRMPs developed by military installations located within the range of the critical habitat designation for tidewater goby to determine if they are exempt under section 4(a)(3) of the Act. The following areas are Department of Defense lands with completed, Service-approved INRMPs within the areas identified as meeting the definition of critical habitat.

#### Approved INRMPs

Vandenberg Air Force Base (VAFB) and Marine Corps Base (MCB) Camp Pendleton have approved INRMPs. The U.S. Air Force and Marine Corps (on VAFB and MCB Camp Pendleton, respectively) have committed to working closely with us, and the State (California Department of Fish and Game (CDFG) and California Department of Parks and Recreation (CDPR)) with regard to lands leased by MCB Camp Pendleton, to continually refine the existing INRMPs as part of the Sikes Act's INRMP review process. Based on our review of the INRMPs for these military installations, and in accordance with section 4(a)(3)(B)(i) of the Act, we have determined that the lands within these installations identified as meeting the definition of critical habitat are subject to the INRMPs, and that conservation efforts identified in these INRMPs will provide a benefit to the tidewater goby (see the following sections that detail this determination for each installation). Therefore, lands within these installations are exempt from critical habitat designation under section



4(a)(3)(B) of the Act. We are not including approximately 727 ac (294 ha) of habitat on VAFB, and approximately 1,156 ac (468 ha) of habitat on MCB

Camp Pendleton, in this critical habitat designation because of this exemption. Table 3 below provides approximate areas (ac, ha) of lands that meet the

definition of critical habitat, but are exempt from designation under section 4(a)(3)(B) of the Act.

TABLE 3—EXEMPTIONS FROM CRITICAL HABITAT DESIGNATION FOR THE TIDEWATER GOBY UNDER SECTION 4(A)(3) OF THE ACT

Specific area	Areas meeting the definition of critical habitat in acres (Hectares)	Areas exempted in acres (Hectares)
Shuman Canyon .....	16 (7)	16 (7)
San Antonio Creek .....	63 (25)	63 (25)
Santa Ynez River .....	638 (258)	638 (258)
Cañada Honda .....	4 (2)	4 (2)
Jalama Creek .....	6 (2)	6 (2)
San Mateo Creek .....	73 (30)	73 (30)
San Onofre .....	20 (8)	20 (8)
Las Flores/Las Pulgas Creek .....	36 (14)	36 (14)
Hidden Lagoon .....	39 (16)	39 (16)
Aliso Canyon .....	65 (26)	65 (26)
French Lagoon .....	60 (24)	60 (24)
Cocklebur Canyon .....	74 (30)	74 (30)
Santa Margarita River .....	789 (319)	789 (319)
Totals .....	1,883 (762)	1,883 (762)

Vandenberg Air Force Base

VAFB is headquarters for the 30th Space Wing, the Air Force’s Space Command unit that operates VAFB and the Western Test Range/Pacific Missile Range. VAFB operates as an aerospace center supporting west coast launch activities for the Air Force, Department of Defense, National Aeronautics and Space Administration, and commercial contractors. The three primary operational missions of VAFB are to launch, place, and track satellites in near-polar orbit; to test and evaluate the intercontinental ballistic missile systems; and to support aircraft operations in the western range. VAFB lies on the south-central California coast, approximately 275 mi (442 km) south of San Francisco, 140 mi (225 km) northwest of Los Angeles, and 55 mi (88 km) northwest of Santa Barbara. The 99,100-ac (40,104-ha) base extends along approximately 42 mi (67 km) of Santa Barbara County coast, and varies in width from 5 to 15 mi (8 to 24 km).

The VAFB INRMP was prepared to provide strategic direction to ecosystem and natural resources management on VAFB. The long-term goal of the INRMP is to integrate all management activities in a manner that sustains, promotes, and restores the health and integrity of VAFB ecosystems using an adaptive management approach. The INRMP was designed to: (1) Summarize existing management plans and natural resources literature pertaining to VAFB; (2) identify and analyze management goals in existing plans; (3) integrate the

management goals and objectives of individual plans; (4) support base compliance with applicable regulatory requirements; (5) support the integration of natural resource stewardship with the Air Force mission; and (6) provide direction for monitoring strategies.

VAFB completed an INRMP in 2011, which benefits the tidewater goby by: (1) Avoiding the tidewater goby and its habitat, whenever possible, in project planning; (2) scheduling activities that may affect tidewater goby outside of the peak breeding period (March to July); (3) coordinating with VAFB water quality staff to prevent degradation and contamination of aquatic habitats; and (4) prohibiting the introduction of nonnative fishes into streams on-base (VAFB 2011, Tab D, p. 15). Furthermore, VAFB’s environmental staff reviews projects and enforces existing regulations and orders that, through their implementation, avoid and minimize impacts to natural resources, including the tidewater goby and its habitat. In addition, VAFB’s INRMP protects aquatic habitats for the tidewater goby by excluding cattle from wetlands and riparian areas through the installation and maintenance of fencing.

Habitat features essential to the conservation of the tidewater goby exist on VAFB, and activities occurring on VAFB are currently being conducted in a manner that minimizes impacts to tidewater goby habitat. This military installation has an approved INRMP that provides a benefit to the tidewater goby, and VAFB has committed to work

closely with the Service and the CDFG to continually refine their existing INRMP as part of the Sikes Act’s INRMP review process. Based on the above considerations, and in accordance with section 4(a)(3)(B)(i) of the Act, we have determined that conservation efforts identified in the 2011 INRMP for VAFB provide a benefit to the tidewater goby and its habitat. This includes habitat located in the following areas: Shuman Canyon, San Antonio Creek, Santa Ynez River, Cañada Honda, and Jalama Creek. Therefore, lands subject to the INRMP for VAFB, which includes the lands leased from the Department of Defense by other parties, are exempt from critical habitat designation under section 4(a)(3)(B) of the Act, and we are not including approximately 727 ac (294 ha) of habitat in this critical habitat designation because of this exemption.

Marine Corps Base Camp Pendleton

MCB Camp Pendleton is the Marine Corps’ premier amphibious training installation, and its only west coast amphibious assault training center. The installation has been conducting air, sea, and ground assault training since World War II. MCB Camp Pendleton occupies over 125,000 ac (50,586 ha) of coastal southern California in the northwest corner of San Diego County. Aside from nearly 10,000 ac (4,047 ha) that are developed, most of the installation consists of undeveloped land used for training. MCB Camp Pendleton is situated between two major metropolitan areas: Los Angeles, 82 mi (132 km) to the north, and San Diego,



38 mi (61 km) to the south. Nearby communities include Oceanside to the south, Fallbrook to the east, and San Clemente to the northwest. Aside from a portion of the installation's border that is shared with the San Mateo Wilderness Area and the Fallbrook Naval Weapons Station, the surrounding land use is urban development, rural residential development, and agricultural farming and ranching. The largest single leaseholder on the installation is California State Parks, which includes a 50-year real estate lease granted on September 1, 1971, for 2,000 ac (809 ha) that encompass San Onofre State Beach.

The MCB Camp Pendleton INRMP is a planning document that guides the management and conservation of natural resources under the installation's control. The INRMP was prepared to assist installation staff and users in their efforts to conserve and rehabilitate natural resources consistent with the use of MCB Camp Pendleton to train Marines and set the agenda for managing natural resources on MCB Camp Pendleton. MCB Camp Pendleton completed its INRMP in 2001, followed by a revised and updated version in 2007 to address conservation and management recommendations within the scope of the installation's military mission, including conservation measures for tidewater goby (MCB Camp Pendleton 2007, Appendix F, Section F.22, pp. F-78-F-85). Additionally, according to the 2007 INRMP, California State Parks is required to conduct its natural resources management consistent with the philosophies and objectives of the revised 2007 INRMP (MCB Camp Pendleton 2007, Chapter 2, p. 31).

The tidewater goby receives programmatic protection from training and other installation activities within the estuarine component of its habitat, as outlined and required in both the Estuarine and Beach Ecosystem Conservation Plan and the Riparian Ecosystem Conservation Plan (MCB Camp Pendleton 2007, Appendices B and C, respectively). Management and protection measures that benefit the tidewater goby identified in Appendix B of the INRMP include, but are not limited to, the following: (1) Maintaining connectivity of beach and estuarine ecosystems with riparian and upland ecosystems; (2) promoting natural hydrological processes to maintain estuarine water quality and quantity; and (3) maximizing the probability of tidewater goby metapopulation existence within the lagoon complex (MCB Camp Pendleton 2007, Appendix B, pp. B5-B7).

Management and protection measures that benefit tidewater goby identified in Appendix C of the INRMP include, but are not limited to, the following: (1) Eliminating nonnative invasive species (such as *Arundo donax* (giant reed)) on the installation and off the installation in partnership with upstream landowners to enhance ecosystem value; (2) providing viable riparian corridors and promoting connectivity of native riparian habitats; (3) providing for unimpeded hydrologic and sedimentary floodplain dynamics to support the maintenance and enhancement of biota; (4) maintaining natural floodplain processes and extent of these areas by avoiding and minimizing further permanent loss of floodplain habitats; (5) maintaining to the maximum extent possible natural flood regimes; (6) maintaining to the extent practicable stream and river flows needed to support riparian habitat; (7) monitoring and maintaining groundwater levels and basin withdrawals to avoid loss and degradation of habitat quality; (8) restoring areas to their original condition after disturbance, such as following project construction or fire damage; and (9) promoting increased tidewater goby populations in watersheds through perpetuation of natural ecosystem processes and programmatic instruction application for avoidance and minimization of impacts (MCB Camp Pendleton 2007, Appendix C, pp. C5-C8).

Current environmental regulations and restrictions apply to all threatened and endangered species on the installation (including tidewater goby) and are provided to all users of ranges and training areas to guide activities and protect the species and its habitat. First, specific conservation measures are applied to the tidewater goby and its habitat that include: (1) Controlling nonnative animal species (such as bullfrogs) and nonnative plant species (such as *Arundo donax* and *Rorippa* spp. (watercress)); and (2) restricting military-related traffic use within riparian areas to existing roads, trails, and crossings. Second, MCB Camp Pendleton's environmental security staff review projects and enforce existing regulations and orders that, through their implementation, avoid and minimize impacts to natural resources, including the tidewater goby and its habitat. Third, MCB Camp Pendleton provides training to personnel on environmental awareness for sensitive resources on the base, including the tidewater goby and its habitat. As a result of these regulations and

restrictions, activities occurring on MCB Camp Pendleton are currently conducted in a manner that minimizes impacts to tidewater goby habitat.

MCB Camp Pendleton's INRMP also benefits tidewater goby through ongoing monitoring and research efforts. The installation conducts monitoring of tidewater goby populations at least once every 3 years, and also conducts monitoring to determine impacts of relocation of effluent infiltration ponds (MCB Camp Pendleton 2007, Appendix B, p. B8). Data are provided to all necessary personnel through MCB Camp Pendleton's GIS database on sensitive resources and in their published resource atlas. Additionally, MCB Camp Pendleton collaborated with the U.S. Geological Survey's Biological Resources Division to develop and implement a rigorous science-based monitoring protocol for tidewater goby populations throughout the installation, including monitoring water quality variables at all historically occupied sites regardless of current occupation status (Lafferty 2010, pp. 10-11).

Based on the above considerations, and in accordance with section 4(a)(3)(B)(i) of the Act, we have determined that conservation efforts identified in the 2007 INRMP for MCB Camp Pendleton provide a benefit to the tidewater goby and its habitat. This includes habitat located in the following areas: San Mateo Creek, San Onofre Creek, Las Flores/Las Pulgas Creek, Hidden Lagoon, Aliso Canyon, French Lagoon, Cocklebur Canyon, and Santa Margarita River (names of areas follow those used in the Recovery Plan (Service 2005a, pp. B21-22)). Therefore, lands subject to the INRMP for MCB Camp Pendleton, which includes the lands leased from the Department of Defense by other parties, are exempt from critical habitat designation under section 4(a)(3)(B) of the Act, and we are not including approximately 1,156 ac (468 ha) of habitat in this critical habitat designation because of this exemption.

#### Exclusions

##### *Application of Section 4(b)(2) of the Act*

Section 4(b)(2) of the Act states that the Secretary shall designate and make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he

determines, based on the best scientific data available, that the failure to designate such area as critical habitat will result in the extinction of the species. The statute on its face, as well as the legislative history, is clear that the Secretary has broad discretion regarding which factor(s) to use and how much weight to give to any factor in making that determination.

#### Exclusions Based on Economic Impacts

Under section 4(b)(2) of the Act, we consider the economic impacts of specifying any particular area as critical habitat. In order to consider economic impacts, we prepared a draft economic analysis of the proposed critical habitat designation (Industrial Economics Incorporated (IEc) 2012). The draft analysis, dated March 16, 2012, was made available for public review from July 24, 2012, through August 23, 2012 (77 FR 43222). Following the close of the comment period, a final analysis of the potential economic effects of the designation was developed taking into consideration the public comments and any new information.

The intent of the final economic analysis (FEA) is to quantify the economic impacts of all potential conservation efforts for tidewater goby; some of these costs will likely be incurred regardless of whether we designate critical habitat (baseline). The economic impact of the final critical habitat designation is analyzed by comparing scenarios both “with critical habitat” and “without critical habitat.” The “without critical habitat” scenario represents the baseline for the analysis, considering protections already in place for the species (for example, under the Federal listing and other Federal, State, and local regulations). The baseline, therefore, represents the costs incurred regardless of whether critical habitat is designated. The “with critical habitat” scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts are those not expected to occur absent the designation of critical habitat for the species. In other words, the incremental costs are those attributable solely to the designation of critical habitat above and beyond the baseline costs; these are the costs we consider in the final designation of critical habitat. The analysis looks retrospectively at baseline impacts incurred since the species was listed, and forecasts both baseline and incremental impacts likely to occur with the designation of critical habitat.

The FEA also addresses how potential economic impacts are likely to be distributed, including an assessment of any local or regional impacts of habitat conservation and the potential effects of conservation activities on government agencies, private businesses, and individuals. The FEA measures lost economic efficiency associated with residential and commercial development and public projects and activities, such as economic impacts on water management and transportation projects, Federal lands, small entities, and the energy industry. Decisionmakers can use this information to assess whether the effects of the designation might unduly burden a particular group or economic sector. Finally, the FEA looks retrospectively at costs that have been incurred since 1994 (year of the species’ listing) (59 FR 5494), and considers those costs that may occur in the 20 years following the designation of critical habitat, which was determined to be the appropriate period for analysis because limited planning information was available for most activities to forecast activity levels for projects beyond a 20-year timeframe. The FEA quantifies economic impacts of tidewater goby conservation efforts associated with the following categories of activity: (1) Water management, (2) cattle grazing, (3) transportation (roads, highways, bridges), (4) utilities (oil and gas pipelines), (5) residential, commercial, and industrial development, and (6) natural resource management.

Baseline protections for the tidewater goby address a broad range of habitat threats within a significant portion of the proposed critical habitat area. A key consideration in the incremental analysis is that, where tidewater goby critical habitat overlaps with steelhead (*Oncorhynchus mykiss*) critical habitat, steelhead conservation measures would be sufficiently protective for tidewater goby as well, and, therefore, few incremental project modification costs are anticipated in these areas. Across the designation, incremental costs primarily include costs of administrative efforts associated with new and reinitiated consultations to consider adverse modification of critical habitat for tidewater goby. In addition, only minor incremental project modification costs are forecast to result from critical habitat. This result is attributed to the following key findings: (1) Baseline protections exist for tidewater goby, (2) steelhead critical habitat overlaps with a large portion of the unoccupied units, and (3) minimal

economic activity occurs on private lands in the study area.

In total, the incremental impacts to all economic activities are estimated to be \$558,000 over the 20-year timeframe, or \$49,300 on an annualized basis (assuming a 7 percent discount rate). Approximately 98 percent of these incremental costs result from administrative costs of considering adverse modification in section 7 consultations.

Incremental conservation efforts are estimated to be \$11,500 over the 20-year timeframe or \$1,090 on an annualized basis (both assuming a 7 percent discount rate). These include the costs of adding the tidewater goby to the environmental impact reports (EIR) required for projects that are being proposed in critical habitat unit MAR–5 Bolinas Lagoon and SLO–12 Oso Flaco Lake, as well as additional surveying for tidewater goby in Oso Flaco Lake. Our economic analysis did not identify any disproportionate costs that are likely to result from the designation.

After considering the economic impacts, the Secretary is not exercising his discretion to exclude any areas from this designation of critical habitat for the tidewater goby based on economic impacts.

A copy of the FEA with supporting documents may be obtained by contacting the Ventura Fish and Wildlife Office (see **ADDRESSES**) or by downloading from the Internet at <http://www.regulations.gov>.

#### Exclusions Based on National Security Impacts

In preparing this final rule, we have exempted from the designation of critical habitat those Department of Defense lands subject to completed INRMPs determined to provide a benefit to the tidewater goby. We have also determined that the remaining lands within the designation of critical habitat for the species are not owned or managed by the Department of Defense, and, therefore, we anticipate no impact on national security. Consequently, the Secretary is not exercising his discretion to exclude any areas from this final designation based on impacts on national security.

#### Exclusions Based on Other Relevant Impacts

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts on national security. We consider a number of factors, including whether the landowners have developed any HCPs or other management plans for the area, or whether there are

conservation partnerships that would be encouraged by designation of, or exclusion from, critical habitat. In addition, we look at any tribal issues, and consider the government-to-government relationship of the United States with tribal entities. We also consider any social impacts that might occur because of the designation.

In preparing this final rule, we have determined that there are currently no HCPs or other management plans for tidewater goby, and the final designation does not include any tribal lands or trust resources. We anticipate no impact on tribal lands, partnerships, or HCPs from this critical habitat designation. Accordingly, the Secretary is not exercising his discretion to exclude any areas from this final designation based on other relevant impacts.

### Summary of Comments and Recommendations

We requested written comments from the public on the proposed revised designation of critical habitat for the tidewater goby during two comment periods. The first comment period associated with the publication of the proposed rule (76 FR 64996) opened on October 19, 2011, and closed on December 19, 2011. We also requested comments on the proposed revised critical habitat designation and associated draft economic analysis during a comment period that opened July 24, 2012, and closed on August 23, 2012 (77 FR 43222). We did not receive any requests for a public hearing. We also contacted appropriate Federal, State, and local agencies; scientific organizations; and other interested parties and invited them to comment on the proposed rule and draft economic analysis during these comment periods.

During the first comment period, we received 10 comment letters directly addressing the proposed revised critical habitat designation. During the second comment period, we received three comment letters addressing the proposed revised critical habitat designation or the draft economic analysis. All substantive information provided during comment periods has either been incorporated directly into this final determination or addressed below. Comments received were grouped into four general issues specifically relating to the proposed revised critical habitat designation for tidewater goby, and are addressed in the following summary and incorporated into the final rule as appropriate.

### Peer Review

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270), we solicited expert opinions from seven knowledgeable individuals with scientific expertise that included familiarity with the species, the geographic region in which the species occurs, and conservation biology principles associated with tidewater goby. We received responses from four of the peer reviewers.

We reviewed all comments received from the peer reviewers for substantive issues and new information regarding critical habitat for the tidewater goby. The peer reviewers generally concurred with our methods and conclusions and provided additional information, clarifications, and suggestions to improve the final critical habitat rule. Peer reviewer comments are addressed in the following summary and incorporated into the final rule as appropriate.

### Peer Reviewer Comments

(1) *Comment:* Two peer reviewers suggested that the proposed critical habitat designation contained too few areas to allow for establishment of a more continuous metapopulation dynamic in the north coast and central coast regions.

*Our Response:* We agree with the reviewers that it is important to maintain metapopulation dynamics throughout the range of the tidewater goby, including the north coast and central coast regions. Accordingly, we included connectivity in our criteria for determining critical habitat (see *Criteria Used To Identify Critical Habitat* section), and we designated those sites that are an integral part of metapopulation dynamics.

Section 3(5)(C) of the Act states that, except in particular circumstances determined by the Secretary, critical habitat shall not include the entire geographical area that can be occupied by the threatened or endangered species. It is not the intent of the Act to designate critical habitat for every population and every documented historical location of a species, nor is it the intent to designate all areas supporting metapopulations as critical habitat. We have considered all existing and potential habitat for the tidewater goby, and using the best scientific and commercial data available, we have designated all areas that meet the definition of critical habitat. However, the purpose of critical habitat designations is not to signal that habitat outside the designation is unimportant or may not contribute to recovery of the

species, and we also recognize that the designation of critical habitat may not include all of the habitat that may eventually be determined to be necessary for the recovery of the tidewater goby. Also, areas outside the final revised critical habitat designation will continue to be subject to conservation actions implemented under section 7(a)(1) of the Act, regulatory protections afforded by the section 7(a)(2) jeopardy standard, and the prohibitions of section 9 of the Act. These protections and conservation tools will continue to contribute to recovery of this species.

(2) *Comment:* One peer reviewer suggested that we give consideration in our PCE to habitats that tidewater goby must periodically traverse, but that are otherwise unoccupied, and that we expand the PCE to include population connectivity allowing for metapopulation dynamics to function.

*Our Response:* Expanding the PCE to include areas of the ocean and large bays (Humboldt Bay and San Francisco Bay) would not address the threat of fragmentation because isolation of the components of a metapopulation is the result of the loss of locations (i.e., lagoons, estuaries, saltmarshes, etc.) that support tidewater goby. When a location is lost, the distance between the components of a metapopulation may be too great to allow the species to disperse through otherwise inhospitable conditions. Furthermore, we are not aware of any threats to these stretches of coastline within the Pacific Ocean that need special management in terms of tidewater goby dispersal within and between metapopulations. Consequently, designating areas of the ocean and large bays to accommodate this dispersal would not be essential to the conservation of the species, nor would it be practical.

(3) *Comment:* Two peer reviewers recommended that we designate subunits within Humboldt Bay unit (HUM-3) in a manner similar to the approach used for the Eel River unit (HUM-4). The peer reviewers' reasoning for this approach includes: (a) Research indicates that a metapopulation dynamic may not be currently occurring within Humboldt Bay (McCraney *et al.* 2010) due to isolation by tidegates and other artificial features theoretically rendering each location occupied by tidewater gobies as a separate subpopulation. (Available evidence indicates that these subpopulations are isolated from one another and are not continuously distributed despite their relatively close proximity (McCraney *et al.* 2010).); and (b) the extent of connectivity between Humboldt Bay to

nearby areas such as the Eel River is uncertain. The reviewers noted that, because of the great distance (approximately 18.4 mi (29.6 km)) between Humboldt Bay and the Eel River, genetic exchange is unlikely to occur naturally. Therefore, the reviewers stated it is important to identify separate units in Humboldt Bay and reestablish connectivity between those locations.

*Our Response:* We respectfully disagree with the two peer reviewers. We have designated Humboldt Bay (HUM-3) as a single, large unit because of the relatively close proximity of the locations that are occupied by tidewater goby within the bay. Although as the reviewers pointed out these locations may be threatened by reduced genetic and life-history diversity, assigning subunits (or not) will not increase (or decrease) the level of protection under the Act for the tidewater goby. Rather, at this time the threats to the habitat at these locations are the same or similar and conservation of the species will be better served by including them in a single unit.

In contrast to Humboldt Bay (HUM-3), we identified Eel River unit (HUM-4) as consisting of two subunits because of the greater separation of the subunits within the Eel River unit, and because the southern Eel River subunit was only recently discovered and the metapopulation dynamic between the two subunits is unclear.

(4) *Comment:* Two peer reviewers suggested that we consider an additional threat to the tidewater goby and its habitat involving projects categorized as habitat restoration. The reviewers noted that it is not uncommon for proposed estuary and lagoon alterations to include "restoration" projects that are proposed to "restore connectivity" or "improve water quality." These projects sometimes involve elimination of backwaters, which may be crucial for flood refuge for the tidewater goby, because they may have poor water quality in late summer.

*Our Response:* We acknowledge that coastal lagoon restoration projects may be a threat to tidewater goby habitat. As such, we have added language in this rule to reflect this potential threat (see *Special Management Considerations or Protection* section above).

#### *Federal Agency Comments*

(5) *Comment:* The U.S. Army Corps of Engineers (ACOE) opposed designating locations as critical habitat that were unoccupied at the time of listing regardless of their historical or current occupancy (see Table 1 for a list of

locations that were unoccupied at the time of listing). The ACOE also opposed designating locations that are not currently occupied even if they were occupied at the time of listing (see Table 1), and are opposed to designating those that have never been known to be occupied (areas that meet this criteria are footnoted in Table 1). They contend that the lack of detection of tidewater gobies in an area is an indication that the habitat is not suitable for this species. For this reason, the ACOE requested the Service withdraw the proposed rule, revise it, and then recirculate the proposed rule for more comments.

*Our Response:* We respectfully disagree with the ACOE's contention that the lack of detection of tidewater gobies in an area is an indication that the habitat is not suitable for this species. The lack of detection of tidewater gobies in a particular area does not necessarily indicate that suitable habitat is not present or in some cases could not be restored. As summarized below, we used the best available scientific data to identify the specific areas that meet the definition of critical habitat, and we are appropriately designating those areas.

We developed criteria for determining the specific areas within the geographical area occupied at the time of listing that have the physical or biological features essential to the conservation of the tidewater goby. These criteria consist of the following:

(1) Areas that support source populations (populations where local reproductive success is greater than local mortality (Meffe and Carroll 1994, p. 187)). For the purposes of this designation, we identified areas supporting source populations as those that are currently occupied and have been consistently occupied for 3 or more consecutive years based on survey data and published reports. Source populations are more likely to be capable of maintaining populations over many years and are, therefore, capable of providing individuals to recruit into surrounding subpopulations.

(2) Areas that support subpopulations within each metapopulation in addition to source populations in the event that the source population is extirpated due to a natural episodic catastrophic event such as a major flood or drought.

(3) Areas that provide connectivity between metapopulations. These areas are likely to act as "stepping stones" between more isolated populations, and thereby contribute to metapopulation persistence and genetic exchange. For the purposes of this designation, we generally identified locations that

provide connectivity as those within approximately 6 mi (10 km) of another location.

After determining the specific areas within the geographical area occupied at the time of listing that have the physical or biological features essential to the conservation of the tidewater goby, we concluded that they were not adequate to ensure the conservation of the species. Therefore, we developed criteria for determining the specific areas outside the geographical area occupied by the species at the time it is listed that are essential for the conservation of the species. In some cases, these areas were known to be historically occupied but not occupied at the time of listing. Others were not occupied at the time of listing but are currently occupied, while a few areas have never been known to be occupied.

The criteria for determining the specific areas outside the geographical area occupied at the time of listing that are essential for the conservation of the tidewater goby are:

(1) Areas of aquatic habitat in coastal lagoons and estuaries with still-to-slow-moving water that allow for the conservation of viable metapopulations under varying environmental conditions, such as, for example, drought.

(2) Areas that provide connectivity between source populations or may provide connectivity in the future. These areas are likely to act as "stepping stones" between more isolated populations, and thereby contribute to metapopulation persistence and genetic exchange. For the purposes of this designation, we generally identified locations that provide connectivity as those within approximately 6 mi (10 km) of another location.

(3) Additional areas that may be more isolated but may represent unique adaptations to local features (habitat variability, hydrology, microclimate).

The areas outside the geographical area occupied at the time of listing that were selected for designation are essential for the conservation of the tidewater goby for various reasons depending on their location. Some of these areas are essential because they provide habitat for maintaining tidewater goby metapopulations where the distances between units that were occupied at the time of listing make it difficult for tidewater goby to disperse. Other areas are essential to help prevent the extirpation of a metapopulation in which only one or two occupied sites remain. As discussed in the *Metapopulation Dynamics* section, the number of subpopulations is important to the long-term stability of a

metapopulation. Furthermore, some of these areas were selected or expanded to take into account sea-level rise as projected by climate change models.

All of these areas have also been identified in the Recovery Plan as being important for the conservation of the species. As mentioned previously, the goal of the Recovery Plan is to preserve the diversity of habitats that occur within the range of the species, the metapopulation structure of the species, and genetic diversity (Service 2005a, p. 28).

(6) *Comment:* The ACOE recommended that we remove sites that are 1 ac (0.4 ha) or less from the designation because the proposed rule states that these locations tend not to be suitable for breeding. These sites include San Geronimo Creek (SLO-7), Cañada de las Agujas (SB-2), Cañada del Agua Caliente (SB-5), Arroyo Hondo (SB-7), Big Sycamore Canyon (VEN-4), and Arroyo Sequit (LA-1). The ACOE also commented that the extent of the designation on Aliso Creek (OR-1) extends beyond a barrier and the unit should be revised.

*Our Response:* While there is a general trend for sites 1 ac (0.4 ha) or less not to be suitable for breeding there are some important exceptions; for example San Geronimo Creek (SLO-7) is a source population, as evidenced by its tidewater goby population's persistence during severe drought conditions (Swift *et al.* 1991, p. 33), that is capable of maintaining its current population levels and capable of providing individuals to recruit into subpopulations found in adjacent areas despite being less than 1 ac (0.4 ha) in area. Additionally, suitable breeding habitat was not the only criteria we used in selecting units to be included in the designation. We also considered important connectivity sites that are an integral part of metapopulation dynamics. Without maintaining the connectivity between source populations, we are likely to see entire metapopulations become extirpated, which would hinder recovery. The remaining locations 1 ac (0.4 ha) or less that the commenter recommended be removed are important connectivity sites and meet the definition of critical habitat.

In regard to the potential barrier on unit OR-1 (Aliso Creek), we reviewed our information on the extent of the designation and the specific site identified as a barrier. After further review and discussion with the ACOE, the area was more appropriately characterized as a grade control structure about 2–3 ft (0.6–2 m) in height (T. Keeney, Senior Ecologist,

Corps, pers. comm. 2013). Based on the Service's evaluation of the information on the site and review of the our record for this designation, we determined the subject location corresponds to a riffle area we are already aware of on Aliso Creek. We have determined the riffle area does not present a barrier to fish passage.

(7) *Comment:* The ACOE stated that the San Luis Rey River (SAN-1) does not contain the PCE as described in the proposed rule. Specifically, this commenter claimed that PCE 1a, 1b, and 1c have not been met. The ACOE also commented that the upstream limit of the unit is not appropriate.

*Our Response:* To designate critical habitat within the geographical area occupied by the species at the time of listing, we are required to identify the physical or biological features essential to the conservation of the species. We have determined the specific areas within the geographical area occupied at the time of listing that contain the PCE essential to the conservation of the species and have included these areas in the designation. When designating critical habitat outside the geographical area occupied by a species at the time it was listed, we are required to determine that such areas are essential for the conservation of the species; the presence of one or more PCE(s) is not required by the Act to designate such areas as critical habitat. Unit SAN-1 is outside the geographical area occupied by the tidewater goby at the time of listing; thus, the presence of the PCE is not required.

Although the presence of the PCE is not required in this case, we include the San Luis Rey in the designation of critical habitat because (1) it is identified in the recovery plan as a potential site for reintroduction (see Table G-1 in the recovery plan); (2) the site was naturally recolonized in 2010 and is now considered occupied; and (3) it is essential for the conservation of the species because it serves as one of a limited number of locations that contribute toward metapopulation dynamics of the genetically unique South Coast Recovery Unit (Service 2005a, pp. 32–39).

Natural recolonization of the San Luis Rey in 2010 shows that a metapopulation dynamic is still occurring within the suite of occupied and potentially occupiable sites within the recovery plan's South Coast Recovery Unit. The natural recolonization of the San Luis Rey River by tidewater goby in 2010 further demonstrates the area is capable of supporting the species and possesses the PCE needed to support the tidewater

goby. As discussed in the *Metapopulation Dynamics* section, the number of subpopulations is important to the long-term stability of a metapopulation. As such, SAN-1 will help the species to survive and will help support the recovery of the tidewater goby population within the South Coast Recovery Unit, even potentially facilitating natural recolonization of currently unoccupied locations to the south. This unit now represents the southernmost occupied area of the species' distribution, and is important for maintaining the tidewater goby metapopulation in the region.

With regard to the delineation of the proposed critical habitat boundary, the Service reviewed information in its files used to develop the designation. Available information indicates the upstream boundary of unit SAN-1 was determined, in part, to account for expected sea-level rise. The upstream extent of the unit in the San Luis Rey River included almost all the area predicted to be inundated by the "Mean Higher High Water (MHHW) 2100" model. The MHHW 2100 model is a GIS-based model predicting the area inundated after a 1.4-meter sea-level rise—the scenario for year 2100. Given the timeframe of the model's projection, the critical habitat boundary does extend beyond what is currently estuary in order to accommodate predicted changes in estuarine and riverine habitats over time.

(8) *Comment:* Implying that the San Luis Rey River (SAN-1) should not be designated as critical habitat or should be excluded under section 4(b)(2) of the Act, the ACOE noted that the area is part of the City of Oceanside's proposed Subarea Habitat Conservation Plan/ Natural Communities Conservation Plan (HCP/NCCP) and that the area will also be managed per the ACOE-proposed Adaptive Habitat Management Plan (AHMP) for the San Luis Rey River Flood Risk Management Project.

*Our Response:* Based on our review of the best available data, the San Luis Rey River should be designated as critical habitat for the tidewater goby. Per section 3(5)(A)(ii) of the Act and its implementing regulations, designating critical habitat outside the geographical area occupied by the tidewater goby at the time of listing is based upon a determination that such areas are essential for the conservation of the species. As explained in the unit description for SAN-1, we have made that determination. However, under section 4(b)(2) of the Act, the Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits

of specifying such area as part of the critical habitat.

Collaborative processes, such as those mentioned by the commenter, can benefit listed and sensitive species, including the tidewater goby. When considering whether a current land management or conservation plan (HCPs as well as other types) provides adequate management or protection for the tidewater goby and its habitat, we consider a number of factors, including, but not limited to, the following:

(1) Whether the plan is complete and provides the same or better level of protection from adverse modification or destruction than that provided through a consultation under section 7 of the Act;

(2) Whether there is a reasonable expectation that the conservation management strategies and actions will be implemented for the foreseeable future and effective, based on past practices, written guidance, or regulations; and

(3) Whether the plan provides adaptive management and conservation strategies and measures consistent with currently accepted principles of conservation biology.

We have been working with the City of Oceanside for several years; however, the City's HCP/NCCP plan is not yet finalized. The City's plan will be an individually permitted Subarea Plan under the Multiple Habitat Conservation Program (MHCP). The MHCP Subregional Plan, finalized in 2003, is a comprehensive, multiple jurisdictional planning program in northwestern San Diego County (SANDAG 2003, entire). It serves as the "umbrella" document for individual Subarea Plans under its jurisdiction. The combination of the MHCP Subregional Plan and the City's Subarea Plan will serve as a multiple species HCP pursuant to Section 10(a)(1)(B) of the Act. The MHCP Subregional Plan does not address the tidewater goby. At the time this rule was prepared, the City of Oceanside had no plans to include the tidewater goby in its Subarea Plan, and the City has indicated it is not likely to seek coverage for the goby in the near future. Thus, at this time, we have found no basis to support exclusion of the area.

The AHMP for the San Luis Rey River Flood Risk Management Project is being developed as part of a flood control project on the lower San Luis Rey River. The ACOE consulted with us on this project to address impacts to several federally listed species; however, the tidewater goby was not one of them (Service 2005b, entire; Service 2006, entire). At the time this rule was prepared, the AHMP had not been

finalized, and the geographical scope of the AHMP, as currently planned, will be the portion of the lower San Luis Rey River that is upstream of the Interstate 5 bridge. Only 19 ac (8 ha), or 33 percent, of the area designated as critical habitat for the tidewater goby in SAN-1 is above the bridge; the remainder is downstream. More importantly, the AHMP does not address the tidewater goby.

Therefore, after considering the proposed HCP/NCCP and AHMP plans, the Secretary is not exercising his discretion under section 4(b)(2) of the Act to exclude unit SAN-1 from the final revised designation of critical habitat. We will continue to work with the City of Oceanside and the ACOE on the respective plans, including addressing the tidewater goby and unit SAN-1 should the parties deem it appropriate to do so.

#### Comments From States

Section 4(i) of the Act states, "the Secretary shall submit to the State agency a written justification for his failure to adopt regulations consistent with the agency's comments or petition." We received no comments from the State regarding the proposal to designate critical habitat for the tidewater goby.

#### Public Comments

##### Public Comments on Criteria Used To Identify Critical Habitat

(9) *Comment:* Several commenters opposed designating locations as critical habitat that were unoccupied at the time of listing (see Table 1 for a list of locations that were unoccupied at the time of listing). One commenter opposed designating locations that are not currently occupied (see Table 1), and one commenter opposed designating locations that have never been known to be occupied (see Table 1).

*Our Response:* Please refer to our response to Comment 5 above.

(10) *Comment:* One commenter opposed designating the Salinas River (MN-2) because a resource plan is under development for that area, which would provide for conservation of the species.

*Our Response:* Please refer to our response to Comment 8 above for the types of factors we consider when evaluating the conservation benefits provided by a land management or conservation plan (HCPs as well as other types).

At this time, we have not received a complete final resource management plan for the Salinas River, and the

Secretary is not exercising his discretion under section 4(b)(2) of the Act to exclude unit MN-2 from the final revised designation of critical habitat.

(11) *Comment:* One commenter opposed expanding critical habitat in Cañada de Alegria (SB-4) because the Service has concurred with a 2009 petition that downlisting the species to threatened is warranted.

*Our Response:* In our 90-day finding on a petition to downlist the tidewater goby from endangered to threatened, we determined that the petition presented substantial scientific or commercial information indicating that the petitioned action *may* be warranted and that we would conduct a review of the status of the species (76 FR 3069; January 19, 2011). This determination was based in part on our 5-year review of the species. Section 4(b)(3)(A) of the Act (16 U.S.C. 1533(b)(3)(A)) requires that we make a finding on whether a petition to list, delist, or reclassify a species presents substantial scientific or commercial information indicating that the petitioned action may be warranted. We are to base this finding on information provided in the petition, supporting information submitted with the petition, and information otherwise available in our files. Our standard for substantial scientific or commercial information within the Code of Federal Regulations (CFR) with regard to a 90-day petition finding is "that amount of information that would lead a reasonable person to believe that the measure proposed in the petition may be warranted" (50 CFR 424.14(b)). If we find that substantial scientific or commercial information meeting the above definition was presented, we are required to promptly conduct a species status review, which we subsequently summarize in our 12-month finding. However, we have not yet made a final determination as to whether or not the downlisting of the tidewater goby is warranted. More importantly, regardless of the status of threatened or endangered, we are still required under the Act to designate critical habitat.

(12) *Comment:* One commenter requested that we exclude private lands in Arroyo de la Cruz (SLO-1), Arroyo del Corral (SLO-2), Oak Knoll Creek (SLO-3), and Little Pico Creek (SLO-4) from the designations because an existing conservation easement and associated management plan includes those areas.

*Our Response:* We value our partnerships with Federal and State agencies and local jurisdictions. Collaborative processes, such as those mentioned by the commenter, can benefit listed and sensitive species,

including the tidewater goby. Please refer to our response to Comment 8 above for the types of factors we consider when evaluating the conservation benefits provided by a current land management or conservation plan (HCPs as well as other types).

As noted in the Recovery Plan and Table 2, threats that may require special management in these units include: highway construction, which may remove aquatic habitat, and grazing of aquatic and riparian habitats. These threats do not appear to be adequately addressed in the conservation easement and associated management plan. After considering the existing conservation easement and associated management plan, the Secretary is not exercising his discretion under section 4(b)(2) of the Act to exclude units SLO-1, SLO-2, SLO-3, and SLO-4 from the final revised designation of critical habitat.

(13) *Comment:* One commenter questioned why we expanded critical habitat by 1 ac (0.4 ha) in Cañada de Alegria (SB-4) and requested that we exclude this additional area from the final designation because it is protected by a preserve.

*Our Response:* We value our partnerships with Federal and State agencies and local jurisdictions. Collaborative processes, such as those mentioned by the commenter, can benefit listed and sensitive species, including the tidewater goby. Please refer to our response to Comment 8 above for the types of factors we consider when evaluating the conservation benefits provided by a current land management or conservation plan (HCPs as well as other types).

As noted in the Recovery Plan and Table 2, threats that may require special management in this additional area include: roadway maintenance that may affect aquatic habitat, upstream water diversions, alterations of water flows, groundwater overdrafting, and upstream grazing of aquatic and riparian habitats. These threats do not appear to be adequately addressed in the management of the preserve. After considering the preserve, the Secretary is not exercising his discretion under section 4(b)(2) of the Act to exclude the additional area in unit SB-4 from the final revised designation of critical habitat.

(14) *Comment:* One commenter is opposed to designating critical habitat in the Goleta Slough (SB-9) because of a belief that drainages within the slough do not have the PCE for the tidewater goby.

*Our Response:* To designate critical habitat within the geographical area occupied by the species at the time of listing, we are required to identify the physical or biological features essential to the conservation of the species. We have determined the specific areas within the geographical area occupied at the time of listing that contain the PCE essential to the conservation of the species and have included these areas in this designation. When designating critical habitat outside the geographical area occupied by a species at the time it was listed, we are required to determine that such areas are essential for the conservation of the species; the presence of one or more PCE(s) is not required by the Act to designate such areas as critical habitat. Unit SB-9 is outside the geographical area occupied by the tidewater goby at the time of listing; thus, the presence of the PCE is not required. Although the presence of the PCE is not required in this case, we do note in our discussion of SB-9 that it appears that SB-9 possesses the PCE needed to support the tidewater goby. SB-9 is essential for the conservation of the species because it provides habitat for the species, allows for connectivity between tidewater goby source populations from nearby units, supports gene flow, and provides for metapopulation dynamics within the Conception Recovery Unit. As discussed in the *Metapopulation Dynamics* section, the number of subpopulations is important to the long-term stability of a metapopulation. As such, SB-9 will help the species to survive and will help support the recovery of the tidewater goby population within the Conception Recovery Unit.

(15) *Comment:* One commenter stated that designated critical habitat should not extend beyond the lower 750 feet of Arroyo Paredon Creek (SB-12) because suitable habitat for the tidewater goby does not exist upstream of this reach and the stream gradient is too steep.

*Our Response:* In response to this comment, we reexamined the boundaries of unit SB-12. Based on information we obtained from a field investigation and recently available high-resolution LiDAR (Light Detection and Ranging) elevation data, we have identified a steep gradient that could act as a barrier to upstream dispersal and refuge for tidewater goby. Therefore, we have revised the upstream limit of the unit and removed those areas that we determined are not accessible to tidewater goby downstream of the gradient, and thus not part of the critical habitat unit. The changes resulted in a net decrease of approximately 1 ac (less than 1 ha) for the designated area in unit

SB-12 (see Summary of Changes From Previously Designated Critical Habitat and 2011 Proposed Revised Critical Habitat Designation section for more information).

#### Public Comments Regarding Legal or Policy Compliance

(16) *Comment:* One commenter stated that laws enacted since the time of listing have reduced the need for critical habitat designation. One commenter also claimed that threats to the tidewater goby have been reduced or the nature of the threat is less serious than originally believed to be the case; therefore, the need for critical habitat is reduced.

*Our Response:* Although the combined effectiveness of existing laws and regulations, including the protections afforded a listed species under the Act, have substantially reduced large-scale habitat loss and alteration, numerous small-scale projects do have an effect on tidewater goby habitat. Furthermore, while some threats to the tidewater goby have been reduced, numerous threats to the species and its habitat still exist. While some of these threats can singly have a substantial impact on individual tidewater goby localities, in most cases it is the cumulative impact that has and will continue to threaten the species. Regardless, the tidewater goby remains listed as an endangered species and therefore designation of critical habitat is required under section 4(a)(3)(A) of the Act.

(17) *Comment:* One commenter claims that provisions of the Act have been ignored by including areas of habitat that “can be occupied,” even though there is no evidence that such areas are essential for the conservation of the species. Furthermore, one commenter, citing 16 U.S.C. 1533(a)(3), disputes the legality to designate unoccupied critical habitat based on speculation that it may be needed in the future.

*Our Response:* We are required by the Act to designate areas that are essential for the conservation of the species. Conservation is defined as “the use of all methods and procedures, which are necessary to bring an endangered species or threatened species to the point at which the measures provided pursuant to this chapter are no longer necessary” (16 U.S.C. 1532(3)). Because the designation of critical habitat is thus focused on the future recovery of listed species, it is by necessity a forward-looking exercise. Therefore, we are designating critical habitat, based on the best available science, to ensure tidewater goby recovery is not precluded, even if this designation is



made in response to a future threat to the species or the need to restore habitat so that the species may be reintroduced there. The areas designated as critical habitat in this rule are essential for the conservation of the tidewater goby for various reasons depending on their location. Some of these areas are essential because they provide habitat for maintaining tidewater goby metapopulations where the distances between units that were occupied at the time of listing make it difficult for tidewater goby to disperse. Other areas are essential to help prevent the extirpation of a metapopulation in which only one or two occupied sites remain. As discussed in the *Metapopulation Dynamics* section, the number of subpopulations is important to the long-term stability of a metapopulation. In addition to serving as “stepping stones” between subpopulations, these areas have also been identified in the Recovery Plan as being important for the conservation of the species because they would serve as a buffer, decreasing the vulnerability of an entire metapopulation to natural episodic catastrophic events, maintaining its genetic diversity, and increasing its probability of persistence.

(18) *Comment:* One commenter suggested we provide site-specific explanations for why we did not propose some occupied sites and some of the potential reintroduction sites identified in the Recovery Plan.

*Our Response:* The 2005 Recovery Plan lists all areas known to be occupied or to have been historically occupied or to have the potential for being occupied if habitat is restored. However, it is not the intent of the Act to designate critical habitat for every population and every documented historical location of a species. Rather, the Act requires that we designate only specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection. In addition, the Act requires that we determine whether specific areas outside the geographical area occupied by the species at the time it is listed are essential for the conservation of the species.

In the *Criteria Used To Identify Critical Habitat* section above, we used the best scientific and commercial data available to set out the criteria for identifying the areas that meet the requirements of the Act. These criteria include: areas that support source

populations; areas that support subpopulations in addition to source populations within each metapopulation; areas that provide connectivity between metapopulations; areas of aquatic habitat in coastal lagoons and estuaries with still-to-slow-moving water that allow for the conservation of viable metapopulations under varying environmental conditions; areas that provide connectivity between source populations or may provide connectivity in the future; and additional areas that may be more isolated but may represent unique adaptations to local features. We applied these criteria to all existing and potential habitat for the tidewater goby in this designation, and have designated the areas that meet the definition of critical habitat. In some cases we included areas recommended as potential introduction and reintroduction sites that, because of their location, could provide important connectivity. In addition, occupied areas outside the final revised critical habitat designation will continue to be subject to conservation actions implemented under section 7(a)(1) of the Act, regulatory protections afforded by the section 7(a)(2) jeopardy standard, and the prohibitions of section 9 of the Act. These protections and conservation tools will continue to contribute to recovery of this species.

(19) *Comment:* One commenter suggested the final revised critical habitat designation should not interrupt ongoing management plans and projects, and should not require reinitiation of consultation for existing permits and consultations.

*Our Response:* Because the critical habitat designation only applies to actions that are authorized, funded, or carried out by a Federal agency, ongoing management plans and projects may be unaffected by the final designation. Only those plans and projects where a Federal agency has continuing discretionary authority may be affected. The regulations that implement section 7(a)(2) of the Act require reinitiation of formal consultation when certain criteria are met, including when a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16). Therefore, we cannot formulate the final rule to eliminate the requirement to reinitiate formal consultation when an ongoing project under continuing Federal discretionary authority may affect the designated critical habitat. However, if an ongoing management plan or project upon which we had previously consulted would not have an adverse

effect on the designated critical habitat, reinitiation would not be required.

#### Public Comments Regarding Threats to the Species

(20) *Comment:* One commenter disputed the listing of the tidewater goby based on a lack of scientific research on threats to tidewater goby.

*Our Response:* The final rule to list the tidewater goby was published in the **Federal Register** on February 4, 1994 (59 FR 5494). The final rule determined the tidewater goby to be an endangered species in part because of past and continuing losses of coastal and riparian habitats within the historical range of the species. Since the publication of the final listing rule, we have published a recovery plan for the species (2005), and a 5-Year Review (2007), both of which contain a threats analysis describing threats to the species and present the best available scientific information regarding the status of the species.

(21) *Comment:* One commenter opposed the expansion of critical habitat, and has a specific issue with the citation of “cattle grazing and feral pig activity that results in increased sedimentation of coastal lagoons and riparian habitats, removal of vegetative cover, increased ambient water temperatures and elimination of plunge pools and undercut banks utilized by the tidewater goby” as a threat.

*Our Response:* Threats to the tidewater goby due to poor livestock grazing practices are well-documented in the scientific literature. Adverse effects occur through watershed alteration and subsequent changes in the natural flow regime, sediment production, and stream channel morphology (Platts 1990, pp. 1–9–1–11; Belsky *et al.* 1999, pp. 1–3, 8–10; Service 2001, pp. 50–67). Livestock grazing can destabilize stream channels and disturb riparian ecosystem functions (Platts 1990, pp. 1–9–1–11; Armour *et al.* 1991, pp. 7–10; Tellman *et al.* 1997, pp. 20–21, 33, 47, 101–102; Wyman *et al.* 2006, pp. 5–7). Furthermore, improper livestock grazing can negatively affect tidewater goby through removal of riparian vegetation (Propst *et al.* 1986, p. 3; Clary and Webster 1989, p. 1; Clary and Medin 1990, p. 1; Schulz and Leininger 1990, p. 295; Fleishner 1994, pp. 631–633, 635–636), which can result in reduced bank stability and higher water temperatures (Kauffman and Krueger 1984, pp. 432–434; Platts and Nelson 1989, pp. 453, 455; Fleishner 1994, pp. 635–636; Belsky *et al.* 1999, pp. 2–5, 9–10). Livestock grazing can also cause increased sediment in the stream channel due to streambank trampling

and riparian vegetation loss (Weltz and Wood 1986, pp. 364–368; Pearce *et al.* 1998, pp. 302, 307; Belsky *et al.* 1999, p. 10). Livestock can physically alter the streambank through trampling and shearing, leading to bank erosion (Trimble and Mendel 1995, pp. 243–244; Belsky *et al.* 1999, p. 1). In combination, loss of riparian vegetation and bank erosion can alter channel morphology, including increased erosion and deposition, increased sediment loads, downcutting, and an increased width-to-depth ratio, all of which lead to a loss of tidewater goby habitat components. Lastly, livestock grazing management also continues to include construction and maintenance of open stocktanks, which are often stocked with nonnative aquatic species that are harmful to tidewater goby if they escape or are transported to waters where the tidewater goby occurs. In some cases, stocktanks are used to stock nonnative fish for sportfishing, or they may support other nonnative aquatic species such as African clawed frogs, or bullfrogs. In cases where stocktanks are in close proximity to live streams, they may occasionally be breached or flooded, resulting in nonnative fish escaping from the stocktank and entering stream habitats (Hedwall and Sponholtz 2005, pp. 1–2; Stone *et al.* 2007, p. 133).

(22) *Comment:* One commenter stated that we have neglected to take the benefits of grazing into consideration and have omitted mention of the effects of feral pigs throughout the proposed rule with the one exception of the first mention on page 64999. The commenter also states that the censure of cattle grazing and its effects on the tidewater goby discounts an entire body of scientific work, which has determined that proper monitoring and grazing of riparian zones has helped to provide habitat for the tidewater goby.

*Our Response:* We acknowledge that improved livestock grazing practices have reduced impacts to native fishes including the tidewater goby. However, although adverse effects are less than in the past, livestock grazing within watersheds where tidewater goby and its habitat are located continues to cause adverse effects, and on Federal lands, improvements occurred primarily by discontinuing grazing in riparian and stream corridors (Service 1997, pp. 121–129, 137–141; Service 2001, pp. 50–67). Furthermore, we do recognize that feral pigs are a threat in this final critical habitat rule (see “Threats” section), the final listing rule (59 FR 5494), and the Recovery Plan (Service 2005, p. 16).

(23) *Comment:* One commenter suggested that, in lieu of designating

critical habitat, we should implement existing grazing programs and Federal programs to minimize impacts to habitat.

*Our Response:* Please refer to our response to Comment 21 above. Impacts from livestock grazing on species such as the tidewater goby are decreasing due to improved management on Federal lands. However, implementation of the existing grazing programs and Federal programs only minimizes impacts to a certain extent, and livestock grazing within watersheds where tidewater goby and its habitat is located continues to cause adverse effects.

(24) *Comment:* One commenter implied that eliminating grazing activities from areas designated as critical habitat will not improve tidewater goby habitat or recover the species.

*Our Response:* Although we are not suggesting in this critical habitat designation for the tidewater goby that all livestock grazing activities be eliminated from critical habitat, studies on Federal lands found that improvements occurred primarily by discontinuing grazing in riparian and stream corridors (Service 1997, pp. 121–129, 137–141; Service 2001, pp. 50–67).

#### Public Comments Regarding Climate Change

(25) *Comment:* One commenter suggested we augment the connection we draw between the designation of unoccupied critical habitat and the threat of global warming.

*Our Response:* We agree and have added a discussion on climate change in the “Background” section accordingly.

(26) *Comment:* One commenter states there is a discrepancy in the proposed rule regarding the expansion of critical habitat in anticipation of sea-level rise. The commenter points out that we have stated in the 5-Year Review (Service 2007) that information currently available on the effects of global climate change is not sufficiently precise to determine what additional areas, if any, may be appropriate to include in the revised critical habitat designation for this species to address the effects of climate change.

*Our Response:* We have added a discussion on climate change in the “Background” section of this rule that includes information on sea level rise published subsequent to the 5-year review.

Substantial advances in our ability to predict changes that will occur as a result of climate change such as sea level rise have been made since the publication of the 5-year review in 2007. For example, between 1897 and 2006,

the observed sea level rise has been approximately 2 millimeters (0.08 in) per year, or a total of 20 cm (8 in) over that period (Heberger *et al.* 2009, p. 6). Estimates prior to the 2007 5-year review projected that sea level rise along the California coast would follow a similar rate and reach 0.2–0.6 m (0.7–2 ft) by 2100 (IPCC 2007). Observations and modeling conducted since the 2007 5-year review indicate that earlier projections were conservative and ignored some critical factors, such as melting of the Greenland and Antarctica ice sheets (Heberger *et al.* 2009, p. 6). Heberger *et al.* (2009, p. 8) have updated the sea level rise projections for California to 1.0–1.4 m (3.3–4.6 ft) by 2100, while Vermeer and Rahmstorf (2009, p. 21530) calculate the sea level rise globally at 0.57–1.9 m (2.4–6.2 ft); in both cases, recent estimates were more than twice earlier projections.

Based on the information above and in the “Background” section, sea levels have been rising and are continuing to rise. Rising sea levels will affect the tidewater goby and its habitat in several ways. Many coastal lagoons and estuaries where tidewater goby occur will be converted from brackish to primarily saltwater bodies. In addition, more severe storms that are likely to result from climate change (Cayan *et al.* 2009, p. 38), combined with the higher than normal sea levels, will breach sand bars at lagoon mouths more frequently. Therefore, it is appropriate to include the threat of global climate change as a basis for the designation of critical habitat units for the tidewater goby.

#### Comments Related to the Draft Economic Analysis

(27) *Comment:* One commenter expressed concern over the use of annualized values in the DEA. This comment suggests that the use of values annualized over a 20-year period mischaracterizes the impact of the proposed rule because all costs will be one-time costs.

*Our Response:* The DEA adopts the standard practice of reporting both present value and annualized impacts. Incremental project modification costs are assigned to the year in which they are assumed to occur. In cases where the timing of project modification costs is unknown, the DEA conservatively assumes that the costs occur in the first year of the study period. For example, the incorporation of tidewater goby into two habitat conservation plans in units MAR–5 and SLO–12 is assumed to occur immediately following the designation of critical habitat in year 2012. Species surveying in unit SLO–12 is assumed to occur every 2 years

beginning in 2012. Lacking information on when administrative impacts due to potential section 7 consultations will occur, the DEA assumes these costs are spread evenly over the 20-year analysis period.

(28) *Comment:* One commenter asserted that the DEA fails to mention compliance costs, such as the cost of fencing riparian grazing areas that may be required as a result of consultation.

*Our Response:* As described in Section 2.4.4 of the DEA, we are unlikely to request additional conservation efforts to avoid the destruction or adverse modification of critical habitat compared to efforts to avoid jeopardy of the species. As a result, project modifications such as fencing are considered baseline impacts in areas occupied by the tidewater goby. While these types of project modifications are discussed in the DEA (see Exhibit 3–1), baseline impacts are not monetized in the DEA. In areas not considered occupied by the tidewater goby, potential incremental project modifications are identified through communication with land managers and are described and monetized in the DEA. We did not identify any areas where incremental project modifications to grazing activities would be expected to occur as a result of critical habitat designation for the tidewater goby.

(29) *Comment:* One commenter expressed concern that the designation of critical habitat could result in increased State regulation. This comment suggests that the DEA should consider potential indirect impacts of additional conservation measures requested by State agencies.

*Our Response:* Chapter 2 of the DEA acknowledges the potential for several types of indirect impacts, including increased State and local regulation. There is no indication that States or local agencies will change the types of conservation efforts requested following the designation of critical habitat for the tidewater goby. In addition, we believe that the public is well aware of areas considered to be critical habitat given the lengthy history of the designation and the existence of the tidewater goby recovery plan. As a result, the DEA does not anticipate any costs associated with increased State regulation.

(30) *Comment:* One commenter noted that Del Norte County has suffered economically in recent years, in part due to cumulative effects of regulatory restrictions. This comment implies that the designation of critical habitat for the tidewater goby would have a substantial economic impact on the County.

*Our Response:* As described in Section 2.4.4 of the DEA, we are

unlikely to request additional conservation efforts to avoid the destruction or adverse modification of critical habitat compared to efforts to avoid jeopardy of the species. Because all critical habitat within Del Norte County is considered occupied by the tidewater goby, no incremental conservation measures are anticipated. The DEA does forecast administrative impacts associated with the additional consideration of adverse modification of critical habitat in three section 7 consultations within Del Norte County over a 20-year period. Appendix A of the DEA identifies Del Norte County as a small governmental jurisdiction and evaluates the likelihood that these incremental administrative impacts will substantially affect the County's economy. For this analysis, the DEA makes the conservative assumption that all three forecast consultations will occur in the same year, and concludes that impacts will not exceed one percent of annual County revenues.

#### Required Determinations

##### *Regulatory Planning and Review (Executive Orders 12866 and 13563)*

Executive Order 12866 provides that the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget will review all significant rules. The Office of Information and Regulatory Affairs has determined that this rule is not significant.

Executive Order 13563 reaffirms the principles of E.O. 12866 while calling for improvements in the nation's regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. The executive order directs agencies to consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public where these approaches are relevant, feasible, and consistent with regulatory objectives. E.O. 13563 emphasizes further that regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this rule in a manner consistent with these requirements.

##### *Regulatory Flexibility Act (5 U.S.C. 601 et seq.)*

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 et seq.), as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 (5 U.S.C. 801 et seq.), whenever an

agency must publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of an agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require Federal agencies to provide a certification statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities. In this final rule, we are certifying that the critical habitat designation for tidewater goby will not have a significant economic impact on a substantial number of small entities. The following discussion explains our rationale.

According to the Small Business Administration, small entities include small organizations, such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; as well as small businesses. Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than \$5 million in annual sales, general and heavy construction businesses with less than \$27.5 million in annual business, special trade contractors doing less than \$11.5 million in annual business, and agricultural businesses with annual sales less than \$750,000. To determine if potential economic impacts on these small entities are significant, we consider the types of activities that might trigger regulatory impacts under this rule, as well as the types of project modifications that may result. In general, the term "significant economic impact" is meant to apply to a typical small business firm's business operations.

To determine if the rule could significantly affect a substantial number of small entities, we consider the number of small entities affected within particular types of economic activities (for example, water management, transportation and utilities, livestock grazing, natural resource management). We apply the "substantial number" test individually to each industry to determine if certification is appropriate. However, the SBREFA does not

explicitly define “substantial number” or “significant economic impact.” Consequently, to assess whether a “substantial number” of small entities is affected by this designation, this analysis considers the relative number of small entities likely to be impacted in an area. In some circumstances, especially with critical habitat designations of limited extent, we may aggregate across all industries and consider whether the total number of small entities affected is substantial. In estimating the number of small entities potentially affected, we also consider whether their activities have any Federal involvement.

Designation of critical habitat only affects activities authorized, funded, or carried out by Federal agencies. Some kinds of activities are unlikely to have any Federal involvement and so will not be affected by critical habitat designation. In areas where the species is present, Federal agencies already are required to consult with us under section 7 of the Act on activities they authorize, fund, or carry out that may affect the tidewater goby. Federal agencies also must consult with us if their activities may affect critical habitat. Designation of critical habitat, therefore, could result in an additional economic impact on small entities due to the requirement to reinitiate consultation for ongoing Federal activities (see *Application of the “Adverse Modification Standard”* section).

In our final economic analysis (FEA) of the critical habitat designation, we evaluated the potential economic effects on small business entities resulting from conservation actions related to the designation of critical habitat. The analysis is based on the estimated impacts associated with the rulemaking as described in Chapters 1 through 6 and Appendix A of the analysis and evaluates the potential for economic impacts related to: (1) Water management; (2) cattle grazing; (3) transportation (roads, highways, bridges); (4) utilities (oil and gas pipelines); (5) residential, commercial, and industrial development; and (6) natural resource management.

As described in Chapters 4 and 5 of the FEA, estimated incremental impacts consist primarily of administrative costs and time delays associated with section 7 consultation. The Service and the Federal action agency are the only entities with direct compliance costs associated with this proposed critical habitat designation, although small entities may participate in section 7 consultation as an applicant. It is therefore possible that the small entities

may spend additional time considering critical habitat during section 7 consultation for the tidewater goby. The FEA indicated that the incremental impacts potentially incurred by small entities are limited to development, natural resource management, transportation, utilities, and water management activities.

Chapter 5 of the FEA discusses the potential for proposed revised critical habitat to affect development through additional costs of section 7 consultation. These costs are borne by developers and existing landowners, depending on whether developers are able to pass all or a portion of their costs back to landowners in the form of lower prices paid for undeveloped land. Of the total number of entities engaged in land subdivision and residential, commercial, industrial and institutional construction, nearly 99 percent are small entities.

Whether individual developers are affected depends on the specific characteristics of a particular land parcel as well as the availability of land within the affected region. If land is not scarce, the price of a specific parcel will likely incorporate any regulatory restrictions on that parcel. Therefore, any costs associated with conservation efforts for tidewater goby will likely be reflected in the price paid for the parcel. In this case, the costs of conservation efforts are ultimately borne by the current landowner in the form of reduced land values. Many of these landowners may be individuals or families that are not legally considered to be businesses.

If, however, land in the affected region is scarce, or the characteristics of the specific parcel are unique, the price of a parcel may not incorporate regulatory restrictions associated with that parcel. In this case, the project developer may be required to incur the additional costs associated with the section 7 consultation process. To understand the potential impacts on small entities, we conservatively assumed that all of the private owners of developable lands affected by proposed revised critical habitat designation are developers.

In Chapter 5 of the FEA, we estimated that a total of 20 formal, informal, and technical assistance consultations, plus one reinitiation, may require additional effort to consider adverse modification of revised critical habitat. Assuming that each consultation is undertaken by a separate entity, we estimate that 21 developers may be affected by the designation. For purposes of this analysis, and because nearly 99 percent of developers in the study area are

small, we assume that all 21 are small entities. These developers represent less than 0.1 percent of small developers in the study area.

Excluding costs borne by Federal agencies, costs per consultation range from \$260 for technical assistance to \$1,800 for reinitiation of a formal consultation. Because we were unable to identify the specific entities affected, the impact relative to those entities' annual revenues or profits is unknown. However, assuming the average small entity has annual revenues of approximately \$5.1 million, this maximum annualized impact of \$1,800 represents less than 0.1 percent of annual revenues.

The consultation history for natural resource management projects suggests that these projects are generally undertaken by Federal and State agencies, or County departments. The DEA estimated incremental administrative costs for section 7 consultation on natural resource management in every County except Orange County. Only one of these entities, Del Norte County, meets the threshold for small governmental jurisdiction. Del Norte County is anticipated to incur administrative costs associated with addressing adverse modification in approximately three consultations, including one reinitiation. Even if all consultations occur in the same year, total impacts to Del Norte County will be less than 1 percent of the County's annual revenue.

The consultation history for tidewater goby includes several consultations regarding utilities and oil and gas development. In Chapter 5 of the FEA, we estimate that 24 consultations involving utility activities will occur during the 20-year period. Based on the overall percentage of all small entities in the study area (56 percent), we estimated that 14 of the 24 total entities that will be affected over the 20-year period are small entities. Excluding costs to Federal agencies, the cost per entity of addressing adverse modification in section 7 consultation ranges from \$260 for technical assistance to \$880 for a formal consultation (no reinitiations are predicted for utility activities.). Because we are unable to identify the specific entities affected, the impact relative to those entities' annual revenues or profits is unknown. However, assuming the average small entity in this industry has annual revenues of approximately \$9.3 million, this maximum annualized impact of \$880 represents less than 0.01 percent of annual revenues.

Chapter 5 of the FEA also discusses the potential for water management

activities to be affected by the designation. Over the 20-year period, we estimate that 125 consultations involving water management activities, including reinitiations, will occur. Based on the overall percentage of all small entities in the study area (83 percent), we estimate that 104 of the 125 total entities that will be affected over the 20-year period are small entities. Excluding costs to Federal agencies, the cost per entity of addressing adverse modification in section 7 consultation ranges from \$260 for technical assistance to \$1,800 for reinitiation of a formal consultation. Because we are unable to identify the specific entities affected, the impact relative to those entities' annual revenues or profits is unknown. However, assuming the average small entity in this industry has annual revenues of approximately \$5.0 million, this maximum annualized impact of \$1,800 represents less than 0.1 percent of annual revenues.

The DEA also concludes that none of the government entities with which we might consult on tidewater goby for transportation or recreation meet the definitions of small as defined by the Small Business Act (SBE) (IEC 2012, p. A-6); therefore, impacts to small government entities due to transportation and recreation are not anticipated. A review of the consultation history for tidewater goby suggests that future section 7 consultations on livestock grazing (for example, ranching operations) are unlikely, and as a result are not anticipated to be affected by the critical habitat designation (IEC 2012, p. 5-13). Please refer to the DEA for a more detailed discussion of potential economic impacts.

In summary, we considered whether this designation would result in a significant economic impact on a substantial number of small entities. Based on the above reasoning and currently available information, we are certifying that the designation of critical habitat for tidewater goby will not have a significant economic impact on a substantial number of small entities, and a regulatory flexibility analysis is not required.

#### *Energy Supply, Distribution, or Use—Executive Order 13211*

Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) requires agencies to prepare Statements of Energy Effects when undertaking certain actions. OMB has provided guidance for implementing this Executive Order that outlines nine outcomes that may

constitute “a significant adverse effect” when compared to not taking the regulatory action under consideration. Chapter 5 of the economic analysis discusses the potential for critical habitat to affect utilities through the additional cost of considering adverse modification in section 7 consultation. Excluding the portion of administrative costs accruing to Federal agencies, we forecast incremental costs of less than \$9,700 over 20 years to be incurred by the energy and utility industry for section 7 consultations. In annualized terms, this represents less than \$500 annually. The additional costs are unlikely to increase the costs of energy production or distribution in the United States in excess of one percent.

The economic analysis finds that none of the nine outcomes are relevant to this analysis. Thus, based on information in the economic analysis, energy-related impacts associated with tidewater goby conservation activities within critical habitat are not expected. As such, the designation of critical habitat is not expected to significantly affect energy supplies, distribution, or use. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required.

#### *Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)*

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.), we make the following findings:

(1) This rule will not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, or tribal governments, or the private sector, and includes both “Federal intergovernmental mandates” and “Federal private sector mandates.” These terms are defined in 2 U.S.C. 658(5)–(7). “Federal intergovernmental mandate” includes a regulation that “would impose an enforceable duty upon State, local, or tribal governments” with two exceptions. It excludes “a condition of Federal assistance.” It also excludes “a duty arising from participation in a voluntary Federal program,” unless the regulation “relates to a then-existing Federal program under which \$500,000,000 or more is provided annually to State, local, and tribal governments under entitlement authority,” if the provision would “increase the stringency of conditions of assistance” or “place caps upon, or otherwise decrease, the Federal Government’s responsibility to provide funding,” and the State, local, or tribal governments “lack authority” to adjust accordingly. At the time of enactment,

these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. “Federal private sector mandate” includes a regulation that “would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program.”

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(2) We do not believe that this rule will significantly or uniquely affect small governments because it would not produce a Federal mandate of \$100 million or greater in any year; that is, it is not a “significant regulatory action” under the Unfunded Mandates Reform Act. The FEA concludes only Del Norte County meets the threshold for small governmental jurisdiction. Del Norte County is anticipated to incur administrative costs associated with addressing adverse modification in approximately three consultations, including one reinitiation. Even if all consultations occur in the same year, total impacts to Del Norte County will be less than one percent of the County’s annual revenue, which was \$65 million in 2012. Consequently, we do not believe that the critical habitat designation would significantly or uniquely affect small government entities. As such, a Small Government Agency Plan is not required.

### *Takings—Executive Order 12630*

In accordance with Executive Order 12630 (Government Actions and Interference with Constitutionally Protected Private Property Rights), we have analyzed the potential takings implications of designating critical habitat for tidewater goby in a takings implications assessment. As discussed above, the designation of critical habitat affects only Federal actions. Although private parties that receive Federal funding, assistance, or require approval or authorization from a Federal agency for an action may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. The FEA has concluded that this critical habitat designation does not affect landowner actions that do not require Federal funding or permits, nor does it preclude development of habitat conservation programs or issuance of incidental take permits to permit actions that do require Federal funding or permits to go forward. The takings implications assessment concludes that this designation of critical habitat for tidewater goby does not pose significant takings implications for lands within or affected by the designation.

### *Federalism—Executive Order 13132*

In accordance with Executive Order 13132 (Federalism), this rule does not have significant Federalism effects. A federalism impact summary statement is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of, this critical habitat designation with appropriate State resource agencies in California. We solicited but did not receive comments from the California Department of Parks and Recreation, California Department of Fish and Game, California Coastal Conservancy, and California Coastal Commission. The designation of critical habitat for the tidewater goby may impose nominal additional regulatory restrictions to those currently in place and, therefore, may have some incremental impact on State and local governments and their activities. The designation may have some benefit to these governments in that the areas that contain the physical or biological features essential to the conservation of the species are more clearly defined, and the elements of the features of the habitat necessary to the conservation of the species are specifically identified. This information

does not alter where and what federally sponsored activities may occur. However, it may assist local governments in long-range planning (rather than having them wait for case-by-case section 7 consultations to occur).

Where State and local governments require approval or authorization from a Federal agency for actions that may affect critical habitat, consultation under section 7(a)(2) would be required. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

### *Civil Justice Reform—Executive Order 12988*

In accordance with Executive Order 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule does not unduly burden the judicial system and that it meets the applicable standards set forth in sections 3(a) and 3(b)(2) of the Order. We are designating critical habitat in accordance with the provisions of the Act. To assist the public in understanding the habitat needs of the species, the rule identifies the elements of physical or biological features essential to the conservation of the species. The designated areas of critical habitat are presented on maps, and the rule provides several options for the interested public to obtain more detailed location information, if desired.

### *Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)*

This rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

### *National Environmental Policy Act (42 U.S.C. 4321 et seq.)*

It is our position that, outside the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit, we do not need to prepare environmental analyses pursuant to the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.) in connection with designating

critical habitat under the Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This position was upheld by the U.S. Court of Appeals for the Ninth Circuit (*Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)).

### *Government-to-Government Relationship With Tribes*

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with tribes in developing programs for healthy ecosystems, to acknowledge that tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to tribes. We determined that there are no tribal lands within the geographical area occupied by the tidewater goby at the time of listing that contain the features essential for conservation of the species, and no tribal lands outside the geographical area occupied by the tidewater goby at the time of listing that are essential for the conservation of the species. Therefore, we are not designating critical habitat for the tidewater goby on tribal lands.

### **References Cited**

A complete list of all references cited is available on the Internet at <http://www.regulations.gov> and upon request from the, Ventura Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

### **Author(s)**

The primary authors of this rulemaking are the staff members of the Ventura Fish and Wildlife Office.

### **List of Subjects in 50 CFR Part 17**

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

### Regulation Promulgation

■ Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

#### PART 17—[AMENDED]

■ 1. The authority citation for part 17 continues to read as follows:

**Authority:** 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245 unless otherwise noted.

■ 2. In § 17.95(e), revise the entry for “Tidewater goby (*Eucyclogobius newberryi*)”, to read as follows:

#### § 17.95 Critical habitat—fish and wildlife.

\* \* \* \* \*

(e) *Fishes.*

\* \* \* \* \*

Tidewater Goby (*Eucyclogobius newberryi*)

(1) Critical habitat units are depicted for Del Norte, Humboldt, Mendocino, Sonoma, Marin, San Mateo, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara, Ventura, Los Angeles, Orange, and San Diego Counties, California, on the maps below.

(2) Within these areas, the primary constituent element of the physical or

biological features essential to the conservation of tidewater goby consist of persistent, shallow (in the range of approximately 0.3 to 6.6 ft (0.1 to 2 m)), still-to-slow-moving lagoons, estuaries, and coastal streams with salinity up to 12 parts per thousand (ppt), which provides adequate space for normal behavior and individual and population growth that contain:

(i) Substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction;

(ii) Submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus*, *Ruppia maritima*, *Typha latifolia*, and *Scirpus* spp., that provides protection from predators and high flow events; or

(iii) Presence of a sandbar(s) across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity.

(3) Critical habitat does not include manmade structures (such as bridges, docks, aqueducts, and other paved areas) and the land on which they are located existing within the legal boundaries on March 8, 2013.

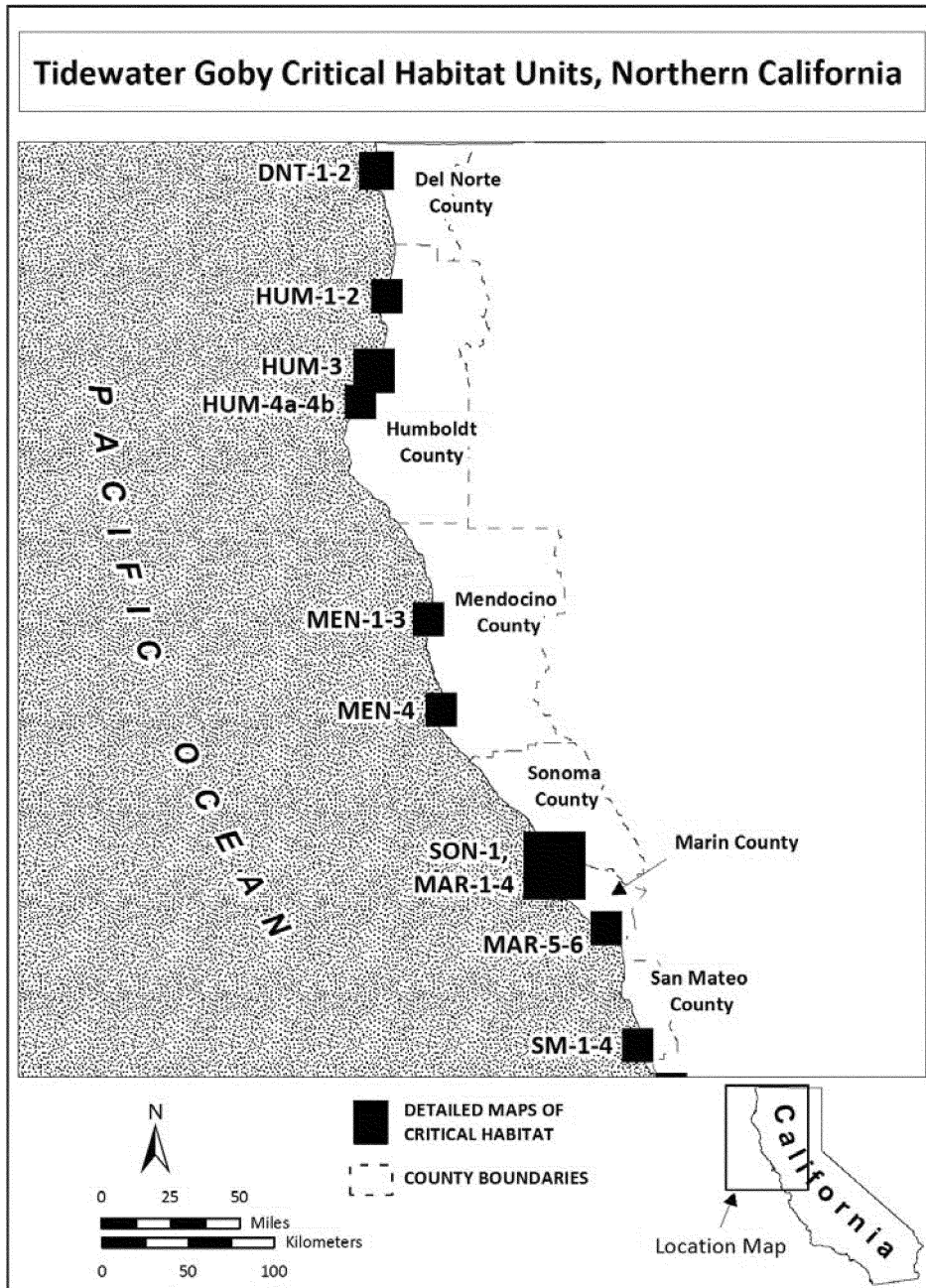
(4) *Critical habitat map units.* Data layers defining map units were created

for most units using National Wetlands Inventory (NWI) data (both published data available over the Internet and in publication provisional data). Where NWI data was lacking, unit boundaries were digitized directly on imagery from the Department of Agriculture’s National Aerial Imagery Program data (NAIP) acquired in 2005. Critical habitat units were mapped using Universal Transverse Mercator (UTM), zones 10 and 11. The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the Service’s internet site, <http://www.fws.gov/ventura/>, <http://www.regulations.gov> at Docket No. FWS–R8–ES–2011–0085, and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

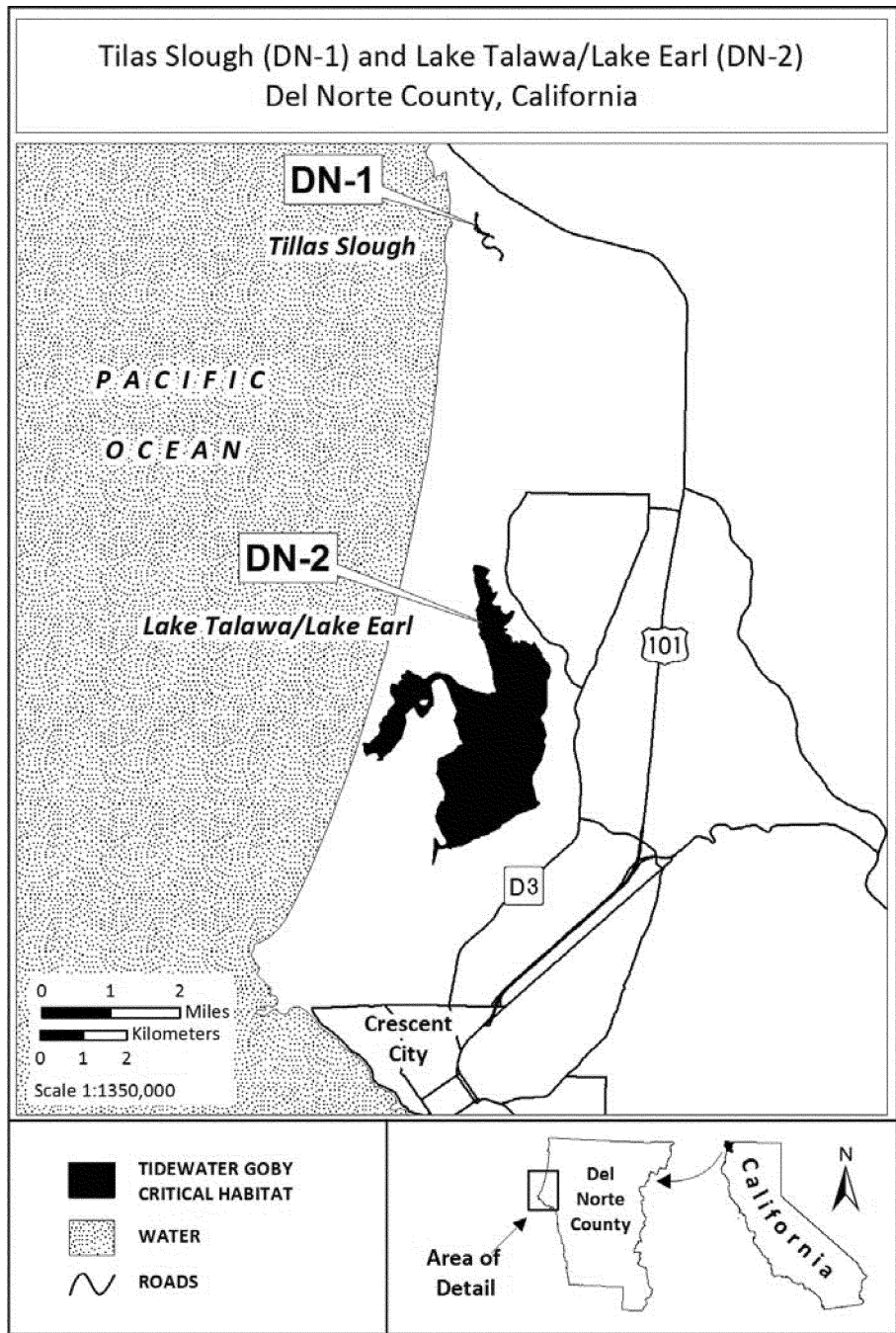
(5) Index map of critical habitat units for the tidewater goby (*Eucyclogobius newberryi*) in Northern California follows:

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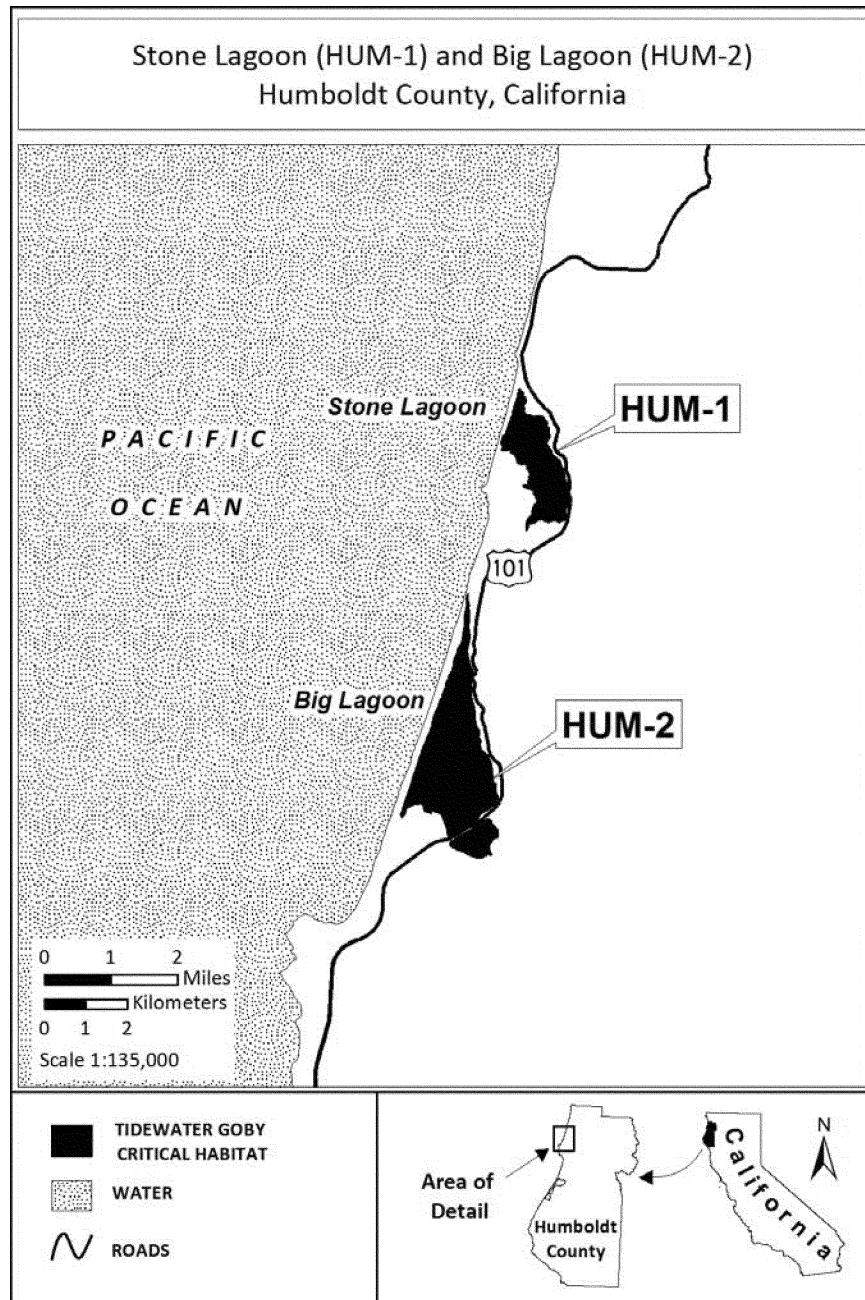
(6) Unit DN 1: Tillas Slough, Del Norte County California. Map of Units DN 1 and DN 2 follows:



(7) Unit DN 2: Lake Talawa/Lake Earl, Del Norte County, California. Map of

Unit DN 1 and DN 2 is provided at paragraph (6) of this entry.

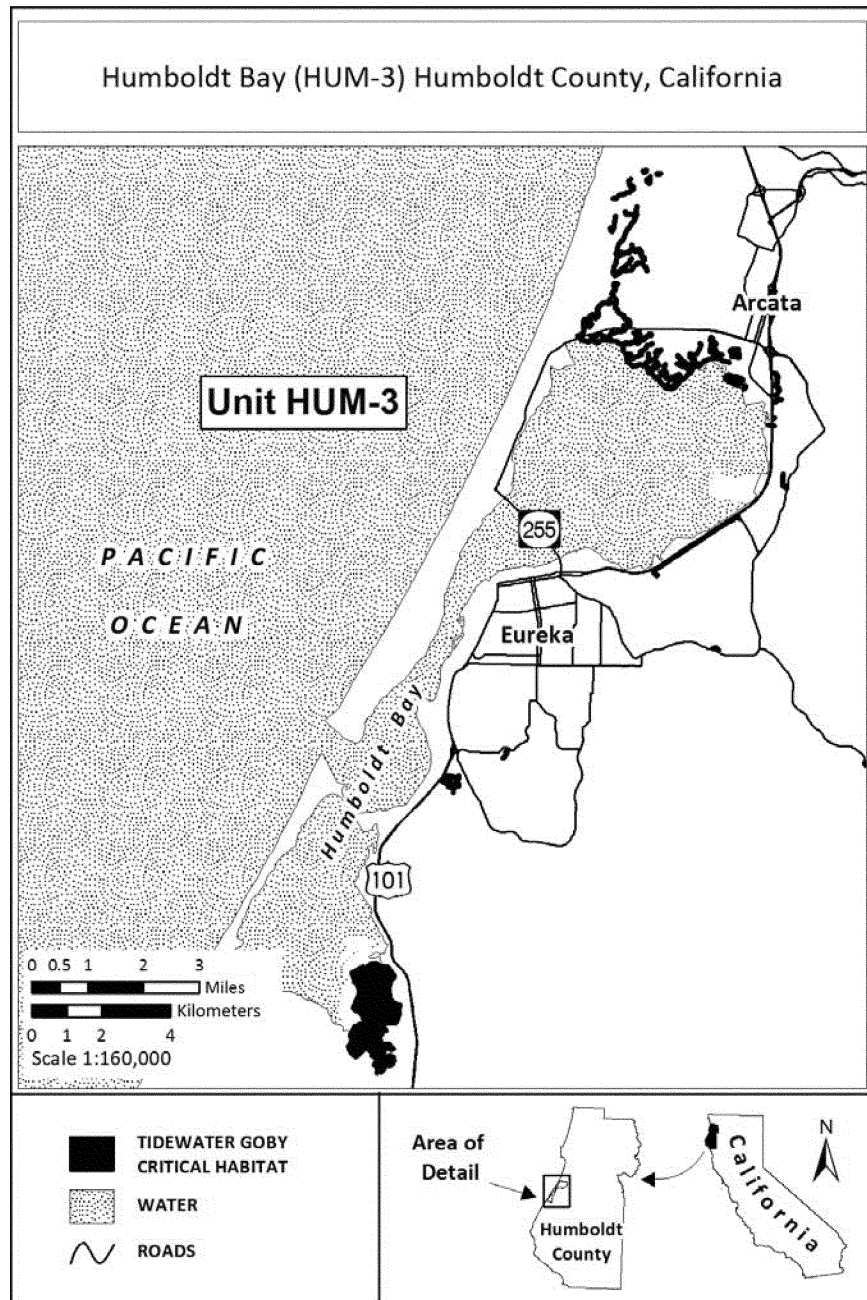
(8) Unit HUM 1: Stone Lagoon, Humboldt County California. Map of Units HUM 1 and HUM 2 follows:



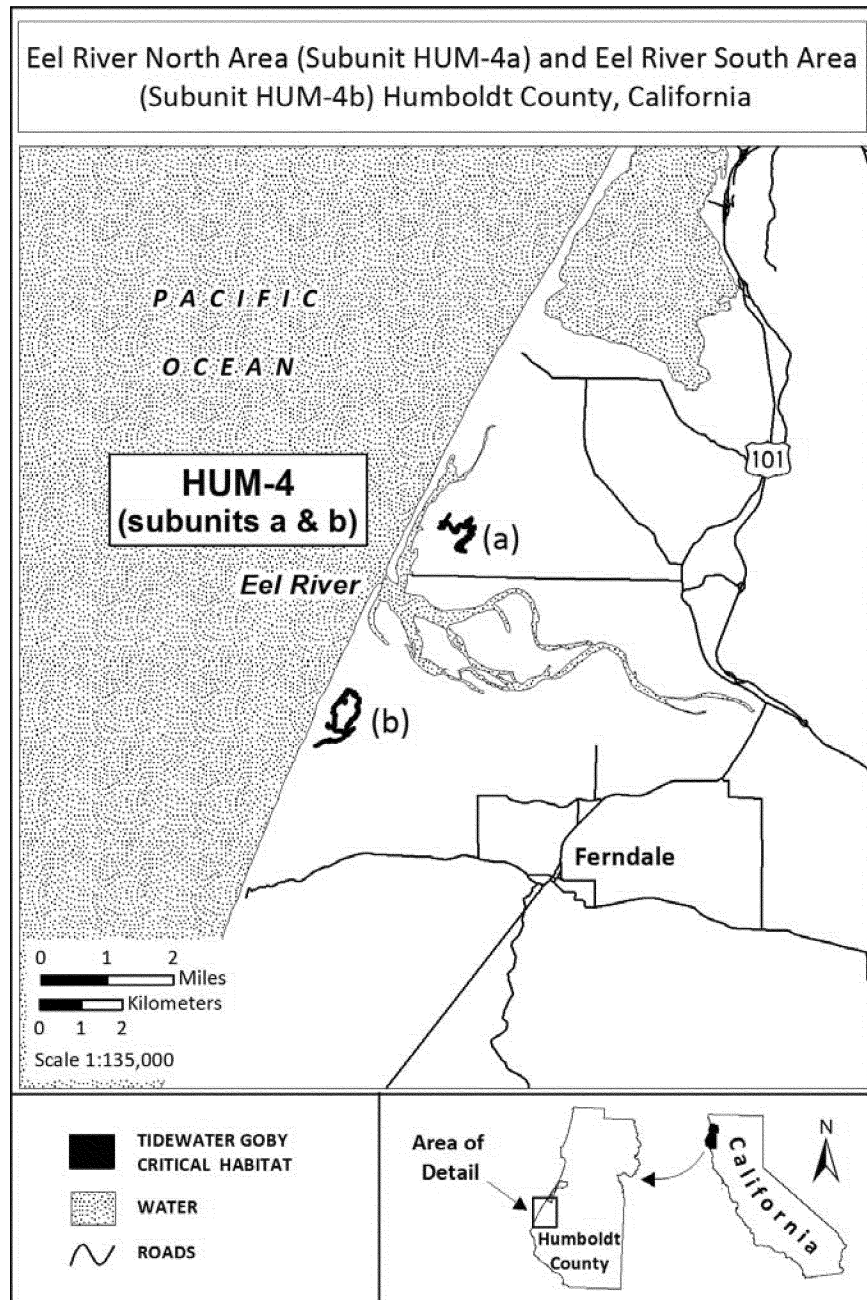
(9) Unit HUM 2: Big Lagoon, Humboldt County, California. Map of

Units HUM 1 and HUM 2 is provided at paragraph (8) of this entry.

(10) Unit HUM 3: Humboldt Bay, Humboldt County, California. Map follows:



(11) Subunit HUM 4a: Eel River North Area. Map of Subunits HUM 4a and HUM 4b follows:

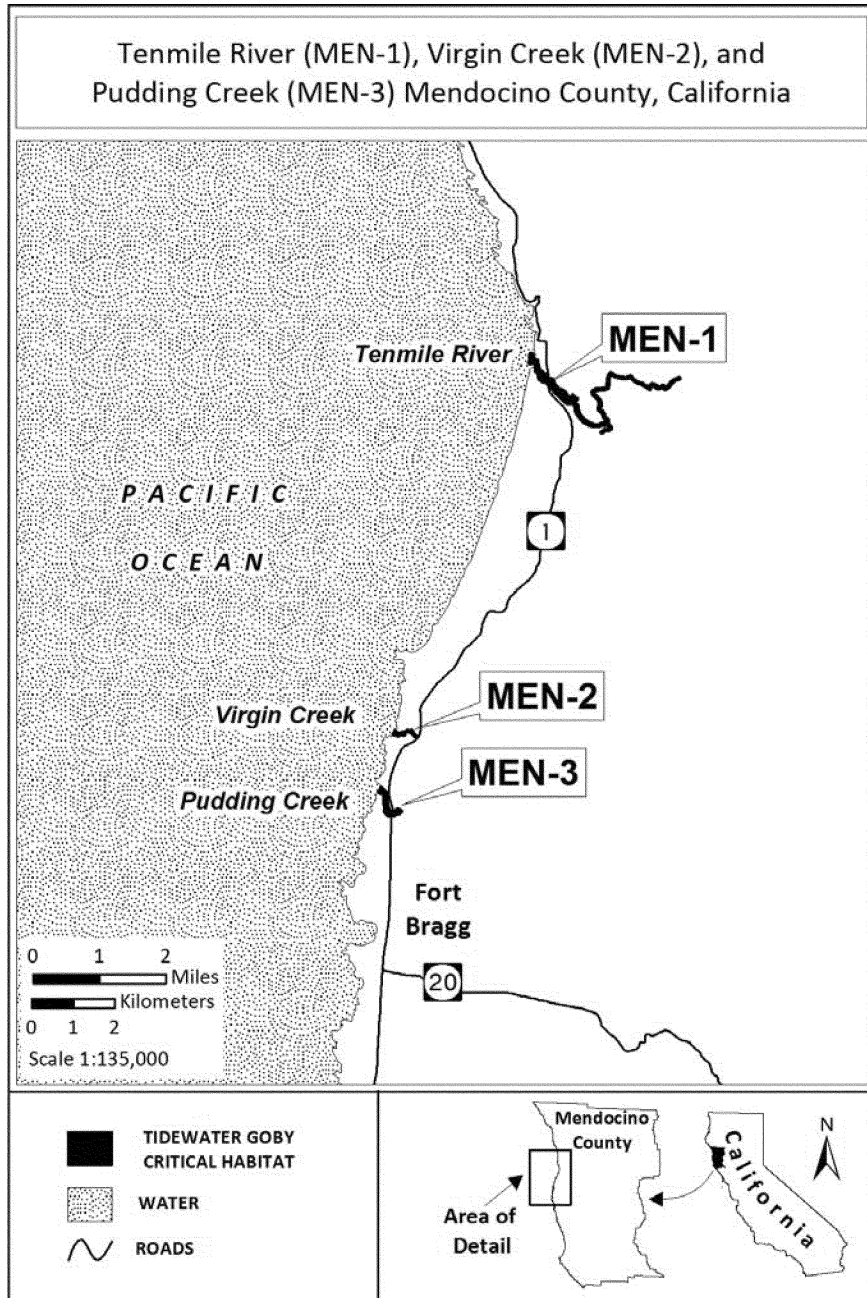


(12) Subunit HUM 4b: Eel River South Area. Map of Subunits HUM 4a and

HUM 4b is provided at paragraph (11) of this entry.

Units MEN 1, MEN 2, and MEN 3 follows:

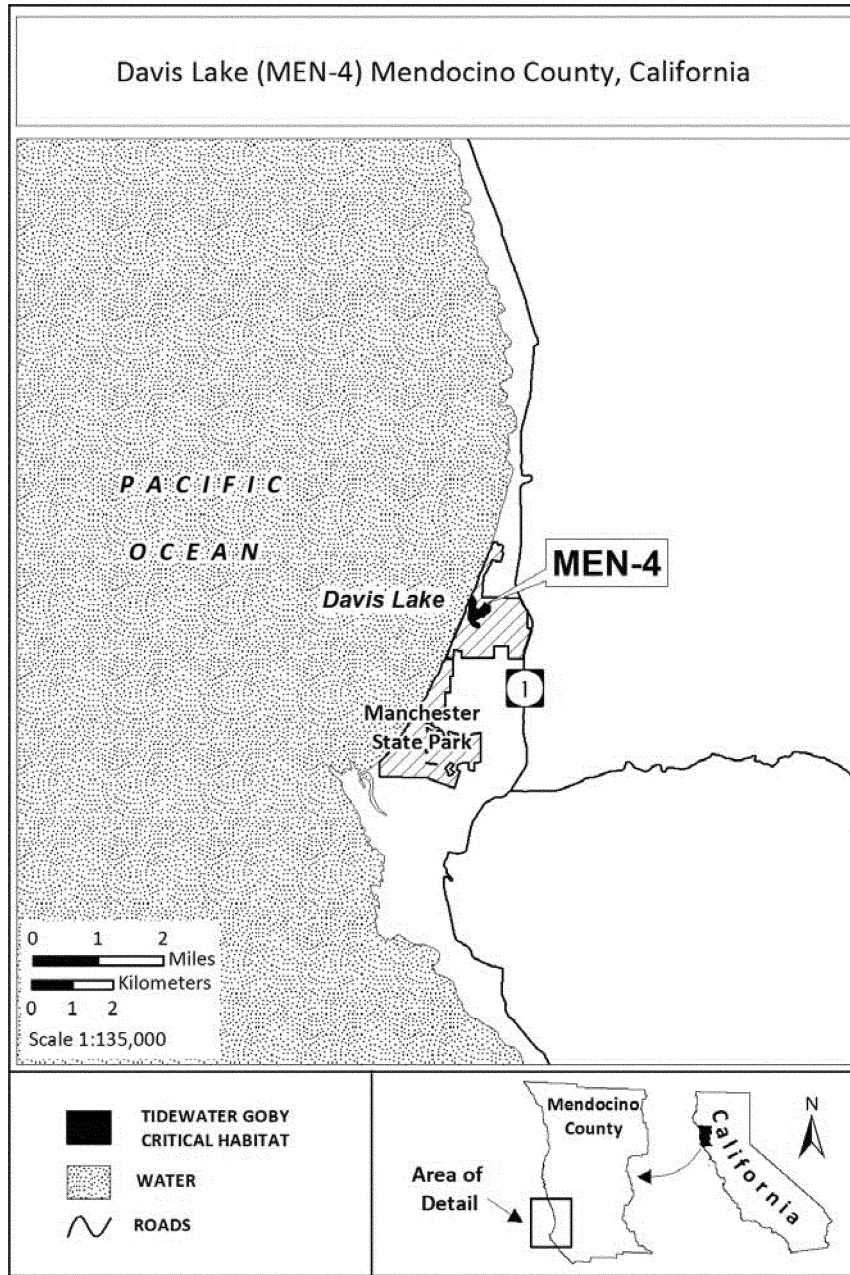
(13) Unit MEN 1: Tenmile River, Mendocino County, California. Map of



(14) Unit MEN 2: Virgin Creek, Mendocino County, California. Map of Units MEN 1, MEN 2, and MEN 3 is provided at paragraph (13) of this entry.

(15) Unit MEN 3: Pudding Creek, Mendocino County, California. Map of Units MEN 1, MEN 2, and MEN 3 is provided at paragraph (13) of this entry.

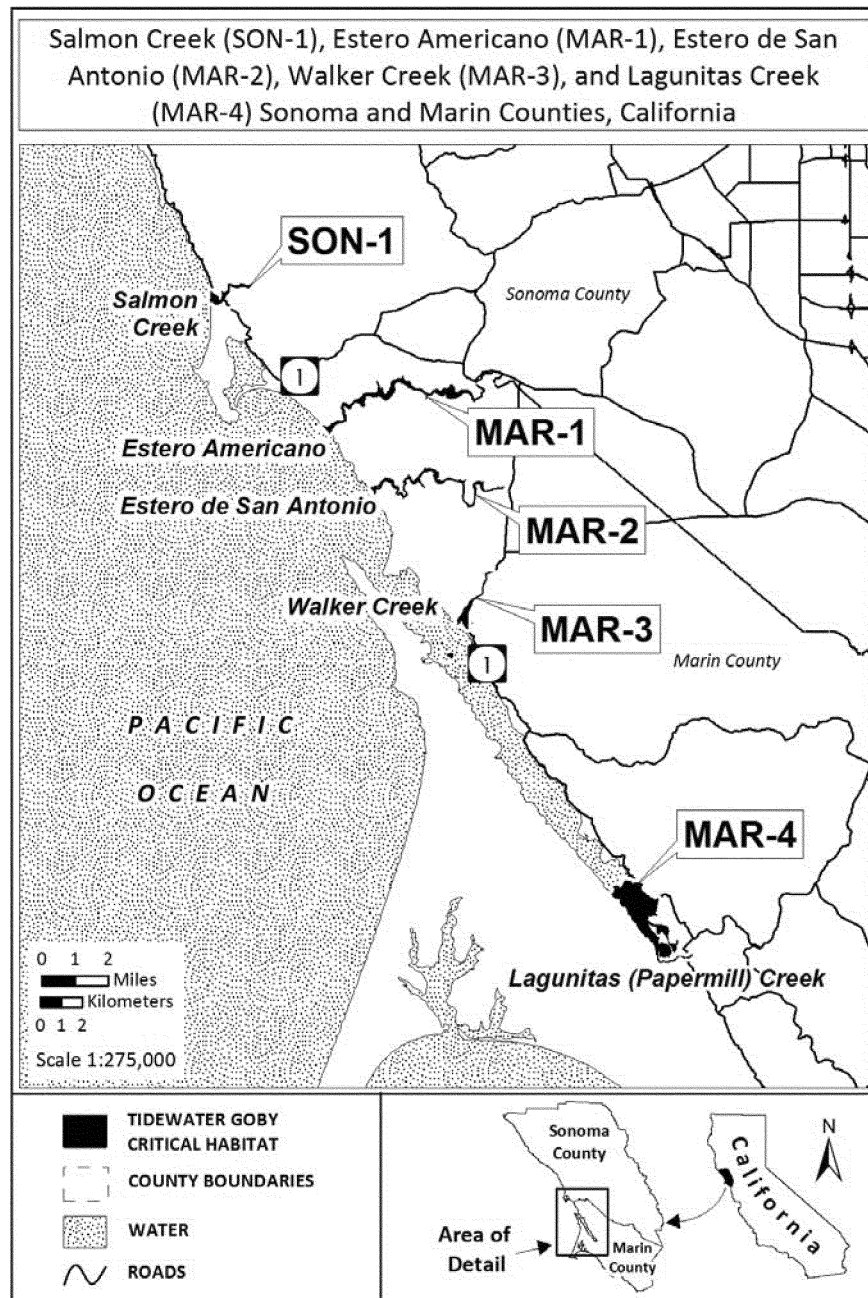
(16) Unit MEN 4: Davis Lake and Manchester Sate Park Ponds, Mendocino County, California. Map follows:



(17) Unit SON 1: Salmon Creek, Sonoma County California. Map of

Units SON 1, MAR 1, MAR 2, MAR 3, and MAR 4 follows:





(18) Unit MAR 1: Estero Americano, Marin County, California. Map of Units SON 1, MAR 1, MAR 2, MAR 3 and MAR 4 is provided at paragraph (17) of this entry.

(19) Unit MAR 2: Estero de San Antonio, Marin County, California. Map of Units SON 1, MAR 1, MAR 2, MAR

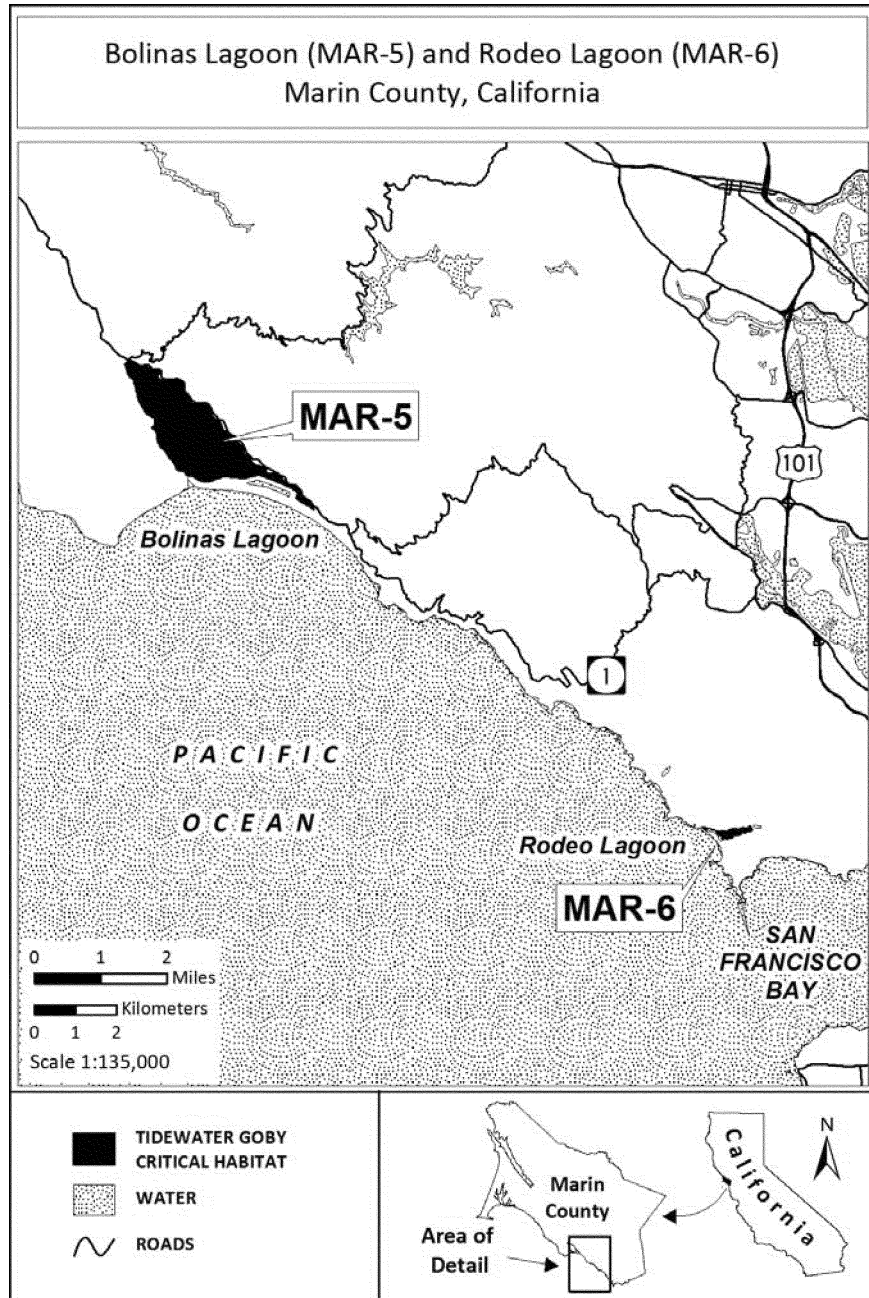
3, and MAR 4 is provided at paragraph (17) of this entry.

(20) Unit MAR 3: Walker Creek, Marin County, California. Map of Units SON 1, MAR 1, MAR 2, MAR 3, and MAR 4 is provided at paragraph (17) of this entry.

(21) Unit MAR 4: Lagunitas (Pepermill) Creek, Marin County,

California. Map of Units SON 1, MAR 1, MAR 2, MAR 3, and MAR 4 is provided at paragraph (17) of this entry.

(22) Unit MAR 5: Bolinas Lagoon, Marin County, California. Map of Units MAR 5 and MAR 6 follows:

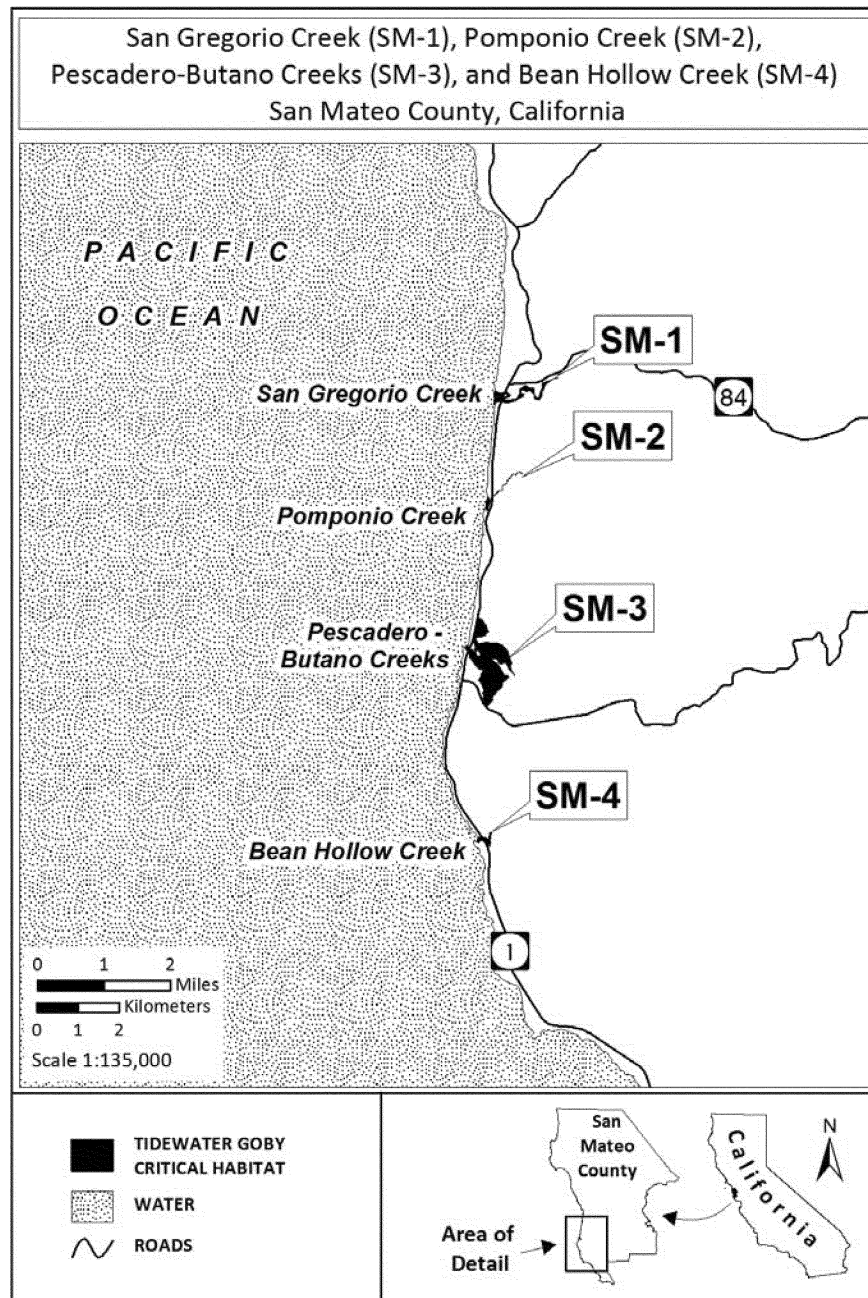


(23) Unit MAR 6: Rodeo Lagoon, Marin County, California. Map of Units

MAR 5 and MAR 6 is provided at paragraph (21) of this entry.

(24) Unit SM 1: San Gregorio Creek, San Mateo County, California. Map of

Units SM 1, SM 2, SM 3, and SM 4 follows:



(25) Unit SM 2: Pomponio Creek, San Mateo County, California. Map of Units SM 1, SM 2, SM 3, and SM 4 is provided at paragraph (24) of this entry.

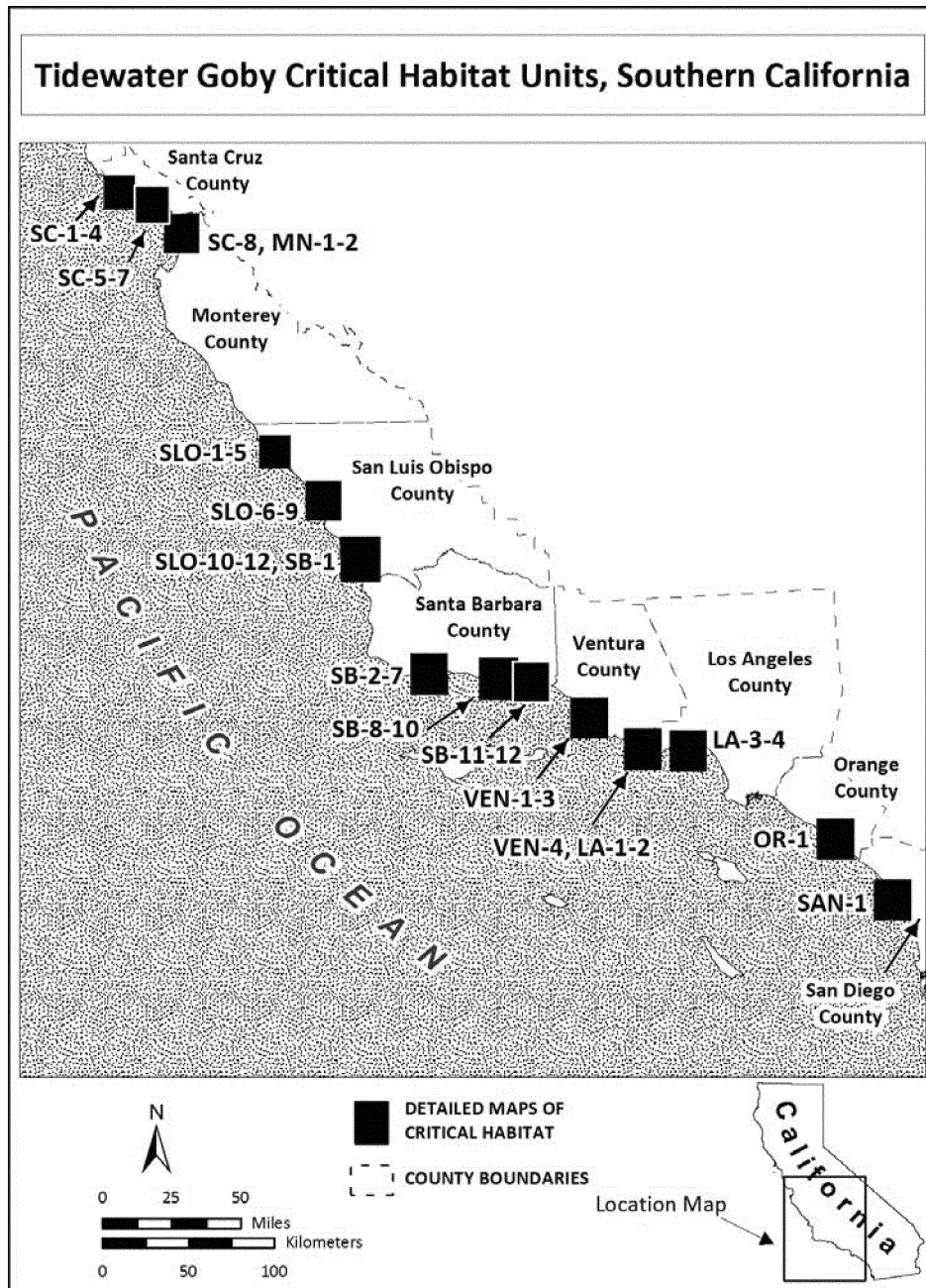
(26) Unit SM 3: Pescadero-Butano Creeks, San Mateo County, California.

Map of Units SM 1, SM 2, SM 3, and SM 4 is provided at paragraph (24) of this entry.

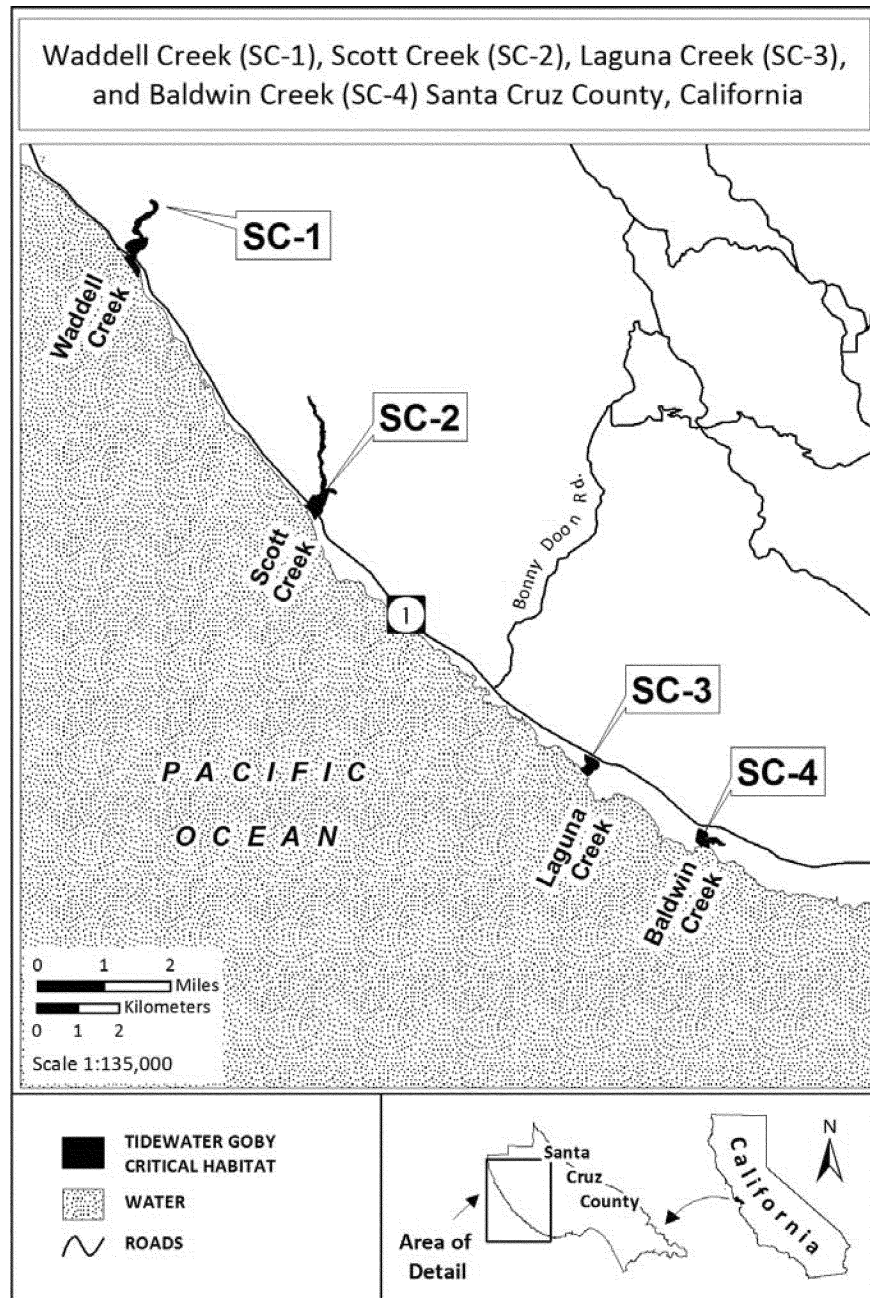
(27) Unit SM 4: Bean Hollow Creek, San Mateo County, California. Map of

Units SM 1, SM 2, SM 3, and SM 4 is provided at paragraph (24) of this entry.

(28) Index map of critical habitat units for the tidewater goby (*Eucyclogobius newberryi*) in Southern California follows:



(29) Unit SC 1: Waddell Creek, Santa Cruz County, California. Map of Unit SC 1, SC 2, SC 3, and SC 4 follows:



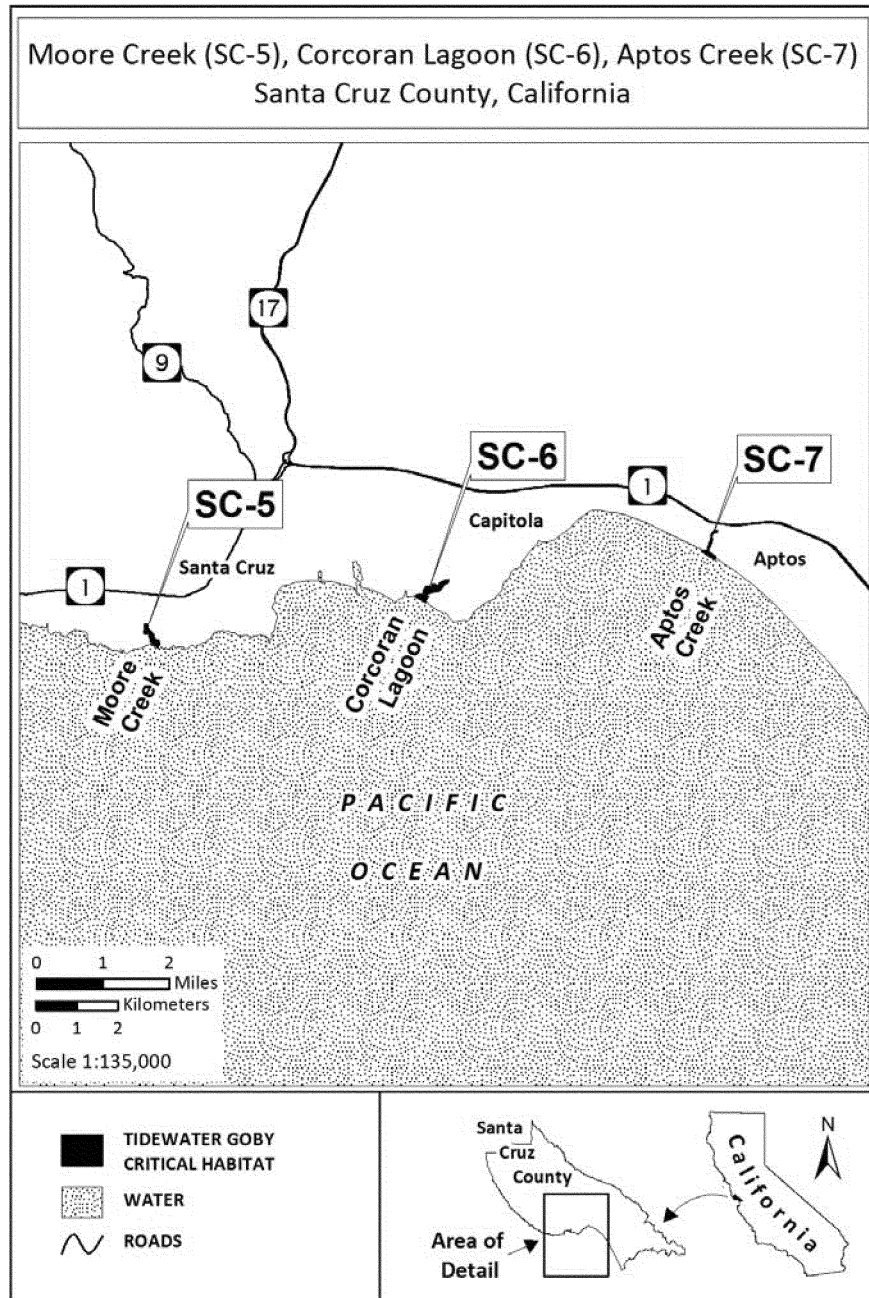
(30) Unit SC 2: Scott Creek, Santa Cruz County, California. Map of Units SC 1, SC 2, SC 3, and SC 4 is provided at paragraph (29) of this entry.

(31) Unit SC 3: Laguna Creek, Santa Cruz County, California. Map of Units

SC 1, SC 2, SC 3, and SC 4 is provided at paragraph (29) of this entry.

(32) Unit SC 4: Baldwin Creek, Santa Cruz County, California. Map of Units SC 1, SC 2, SC 3, and SC 4 is provided at paragraph (29) of this entry.

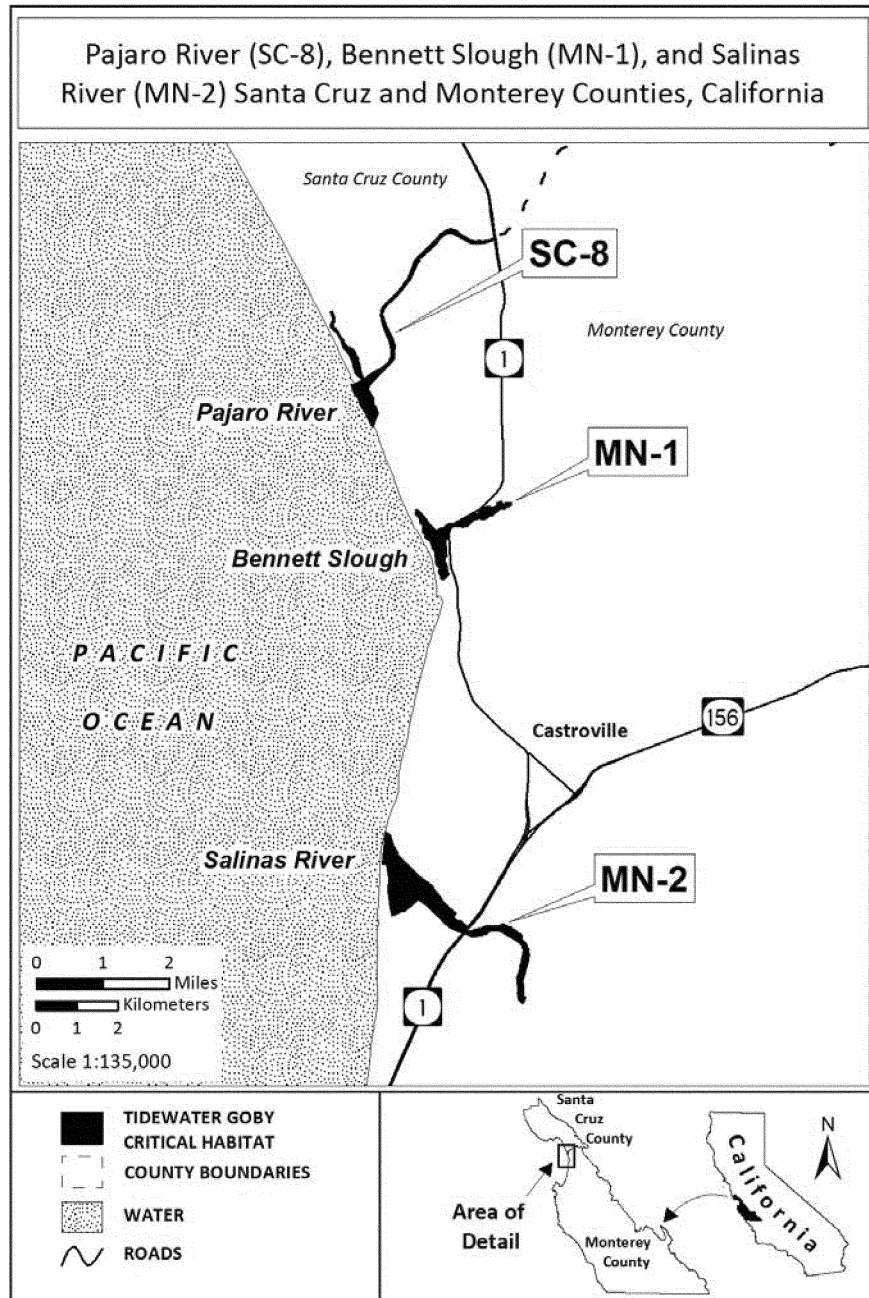
(33) Unit SC 5: Moore Creek, Santa Cruz County, California. Map of Units SC 5, SC 6, and SC 7 follows:



(34) Unit SC 6: Corcoran Lagoon, Santa Cruz County, California. Map of Units SC 5, SC 6, and SC 7 is provided at paragraph (33) of this entry.

(35) Unit SC 7: Aptos Creek, Santa Cruz County, California. Map of Units SC 5, SC 6, and SC 7 is provided at paragraph (33) of this entry.

(36) Unit SC 8: Pajaro River, Santa Cruz County, California. Map of Units SC 8, MN 1, and MN 2 follows:

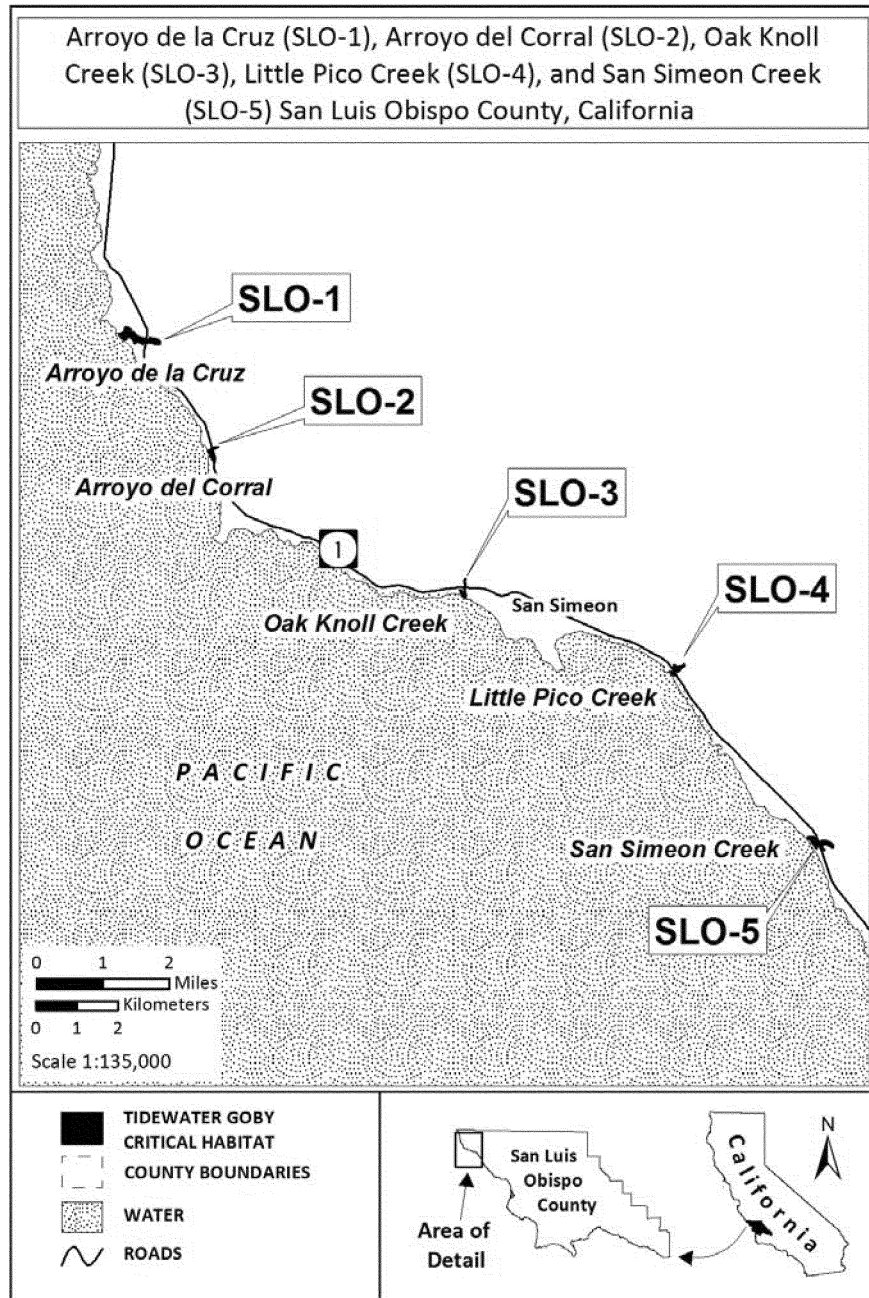


(37) Unit MN 1: Bennett Slough, Monterey County, California. Map of Units SC 8, MN 1, and MN 2 is provided at paragraph (36) of this entry.

(38) Unit MN 2: Salinas River, Monterey County, California. Map of Units SC 8, MN 1, and MN 2 is provided at paragraph (36) of this entry.

(39) Unit SLO 1: Arroyo de la Cruz, San Luis Obispo County, California. Map of Unit SLO 1, SLO 2, SLO 3, SLO 4, and SLO 5 follows:





(40) Unit SLO 2: Arroyo del Corral, San Luis Obispo County, California. Map of Units SLO 1, SLO 2, SLO 3, SLO 4 and SLO 5 is provided at paragraph (39) of this entry.

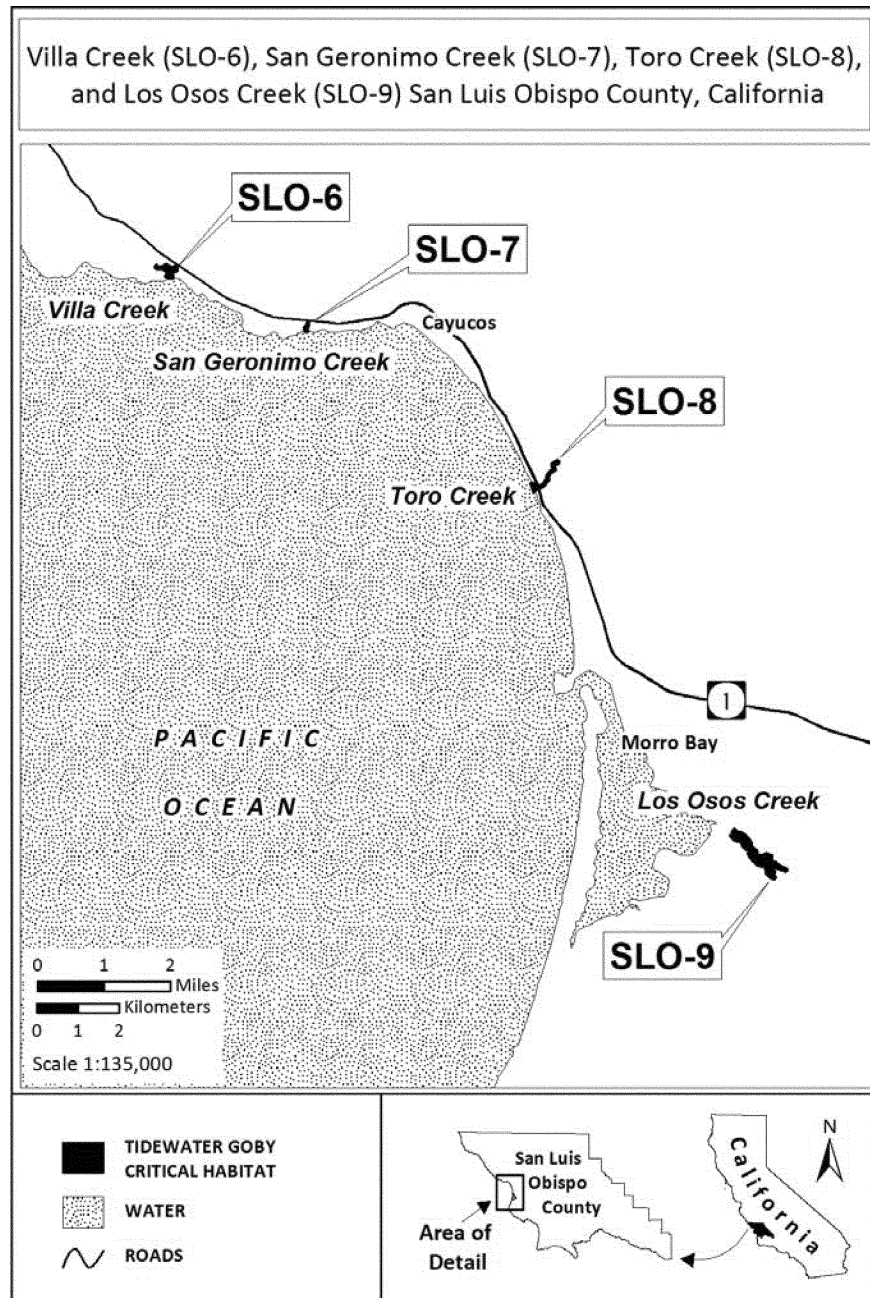
(41) Unit SLO 3: Oak Knoll Creek, San Luis Obispo County, California. Map of Units SLO 1, SLO 2, SLO 3, SLO 4 and

SLO 5 is provided at paragraph (39) of this entry.

(42) Unit SLO 4: Little Pico Creek, San Luis Obispo County, California. Map of Units SLO 1, SLO 2, SLO 3, SLO 4 and SLO 5 is provided at paragraph (39) of this entry.

(43) Unit SLO 5: San Simeon Creek, San Luis Obispo County, California. Map of Units SLO 1, SLO 2, SLO 3, SLO 4 and SLO 5 is provided at paragraph (39) of this entry.

(44) Unit SLO 6: Villa Creek, San Luis Obispo County, California. Map of Units SLO 6, SLO 7, SLO 8 and SLO 9 follows:



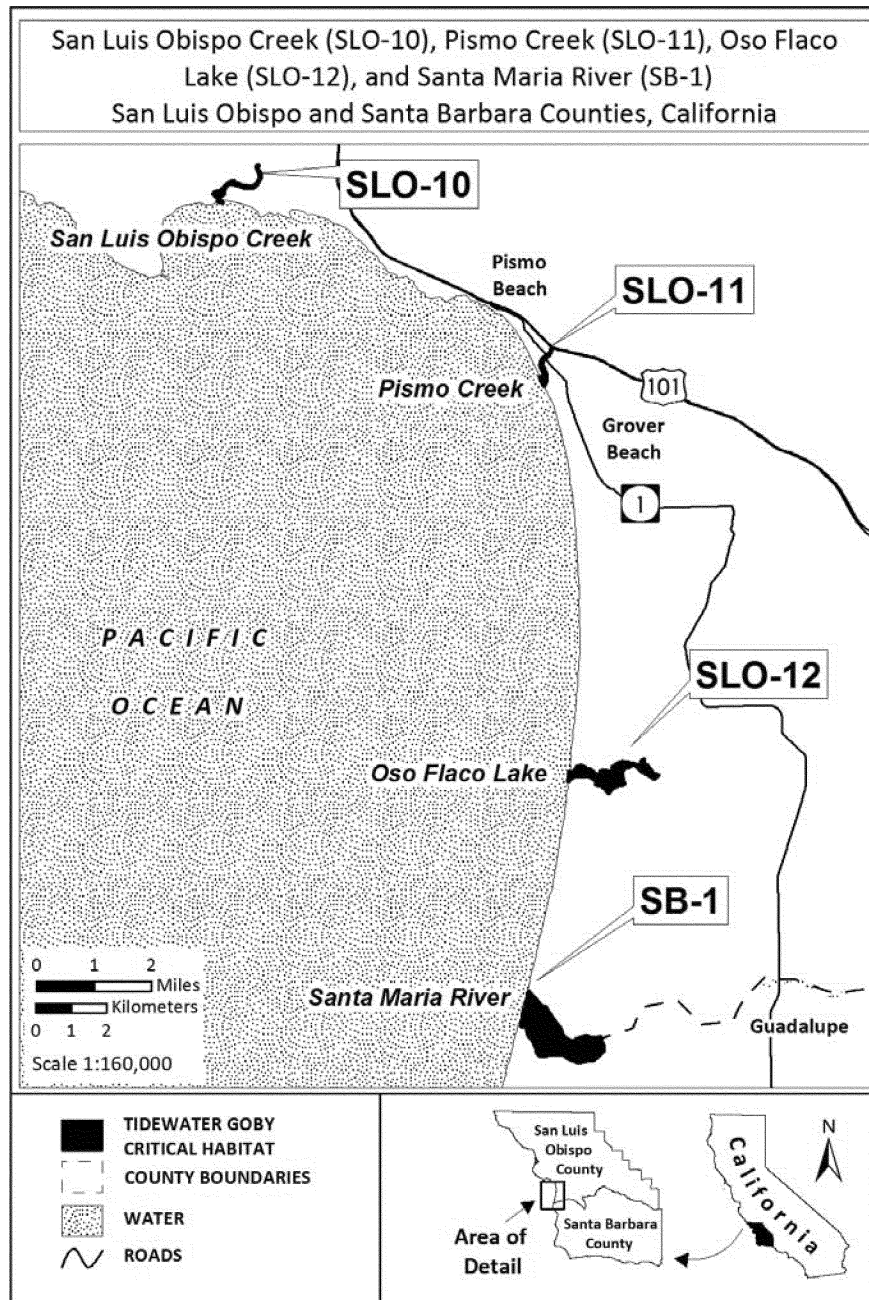
(45) Unit SLO 7: San Geronimo Creek, San Luis Obispo County, California. Map of Units SLO 6, SLO 7, SLO 8, and SLO 9 is provided at paragraph (44) of this entry.

(46) Unit SLO 8: Toro Creek, San Luis Obispo County, California. Map of Units

SLO 6, SLO 7, SLO 8, and SLO 9 is provided at paragraph (44) of this entry.

(47) Unit SLO 9: Los Osos Creek, San Luis Obispo County, California. Map of Units SLO 6, SLO 7, SLO 8, and SLO 9 is provided at paragraph (44) of this entry.

(48) Unit SLO 10: San Luis Obispo Creek, San Luis Obispo County, California. Map of Units SLO 10, SLO 11, SLO 12, and SB 1 follows:



(49) Unit SLO 11: Pismo Creek, San Luis Obispo County, California. Map of Units SLO 10, SLO 11, SLO 12, and SB 1 is provided at paragraph (48) of this entry.

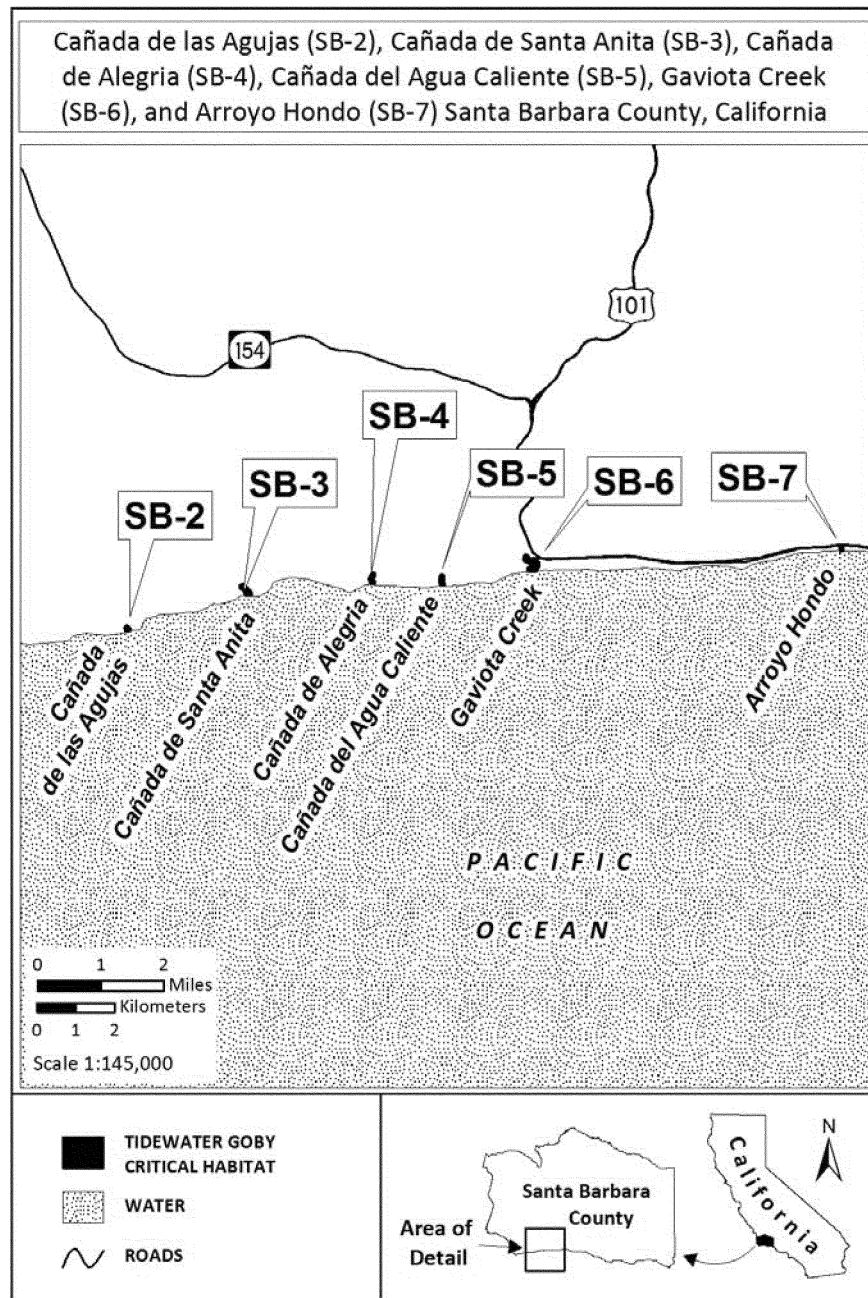
(50) Unit SLO 12: Oso Flaco Lake, San Luis Obispo County, California. Map of

Units SLO 10, SLO 11, SLO 12, and SB 1 is provided at paragraph (48) of this entry.

(51) Unit SB 1: Santa Maria River, San Luis Obispo County, California. Map of Units SLO 10, SLO 11, SLO 12, and SB

1 is provided at paragraph (48) of this entry.

(52) Unit SB 2: Cañada de las Agujas, Santa Barbara County, California. Map of Units SB 2, SB 3, SB 4, SB 5, SB 6, and SB 7 follows:



(53) Unit SB 3: Cañada de Santa Anita, Santa Barbara County, California. Map of Units SB 2, SB 3, SB 4, SB 5, SB 6, and SB 7 is provided at paragraph (52) of this entry.

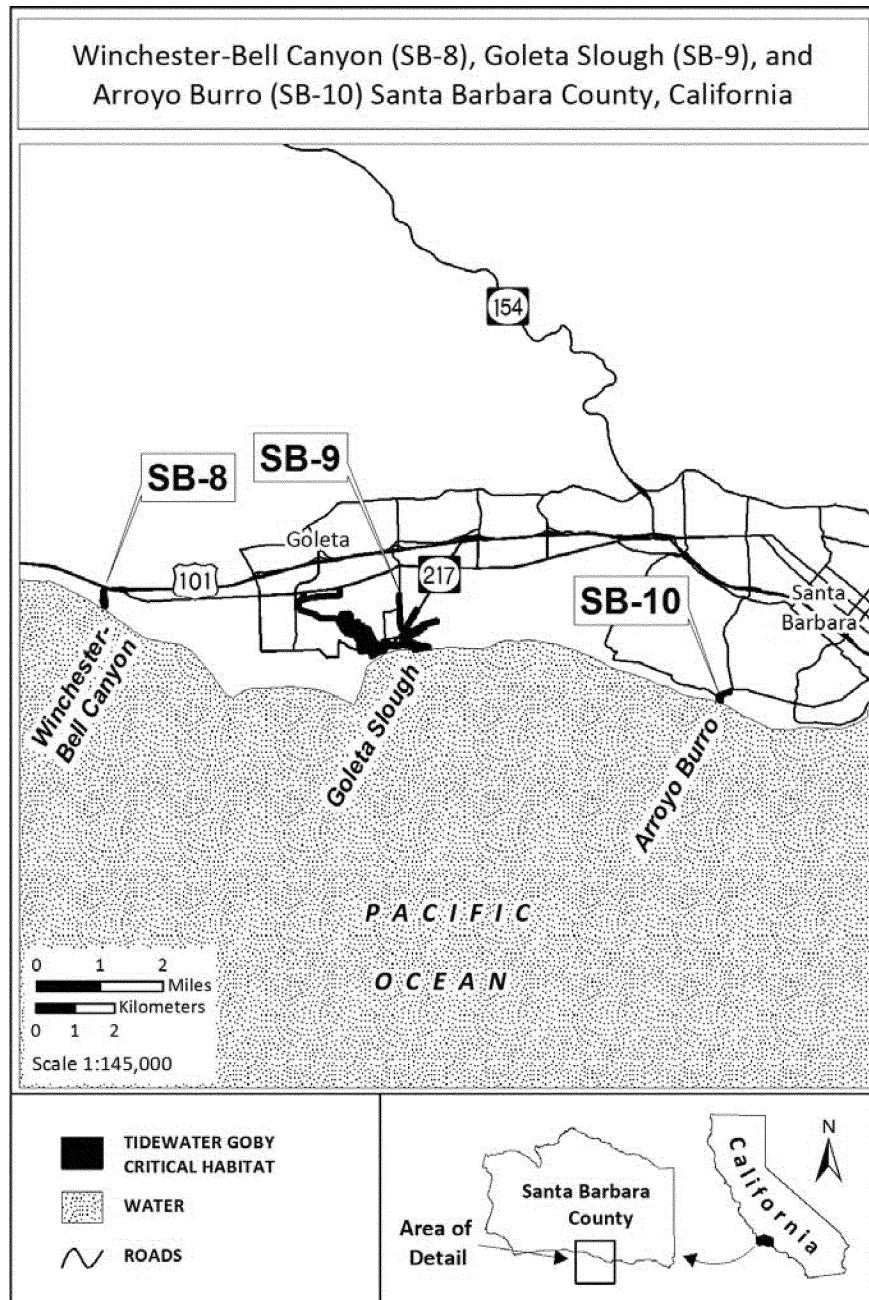
(54) Unit SB 4: Cañada de Alegria, Santa Barbara County, California. Map of Units SB 2, SB 3, SB 4, SB 5, SB 6, and SB 7 is provided at paragraph (52) of this entry.

(55) Unit SB 5: Cañada del Agua Caliente, Santa Barbara County, California. Map of Units SB 2, SB 3, SB 4, SB 5, SB 6, and SB 7 is provided at paragraph (52) of this entry.

(56) Unit SB 6: Gaviota Creek, Santa Barbara County, California. Map of Units SB 2, SB 3, SB 4, SB 5, SB 6, and SB 7 is provided at paragraph (52) of this entry.

(57) Unit SB 7: Arroyo Hondo, Santa Barbara County, California. Map of Units SB 2, SB 3, SB 4, SB 5, SB 6, and SB 7 is provided at paragraph (52) of this entry.

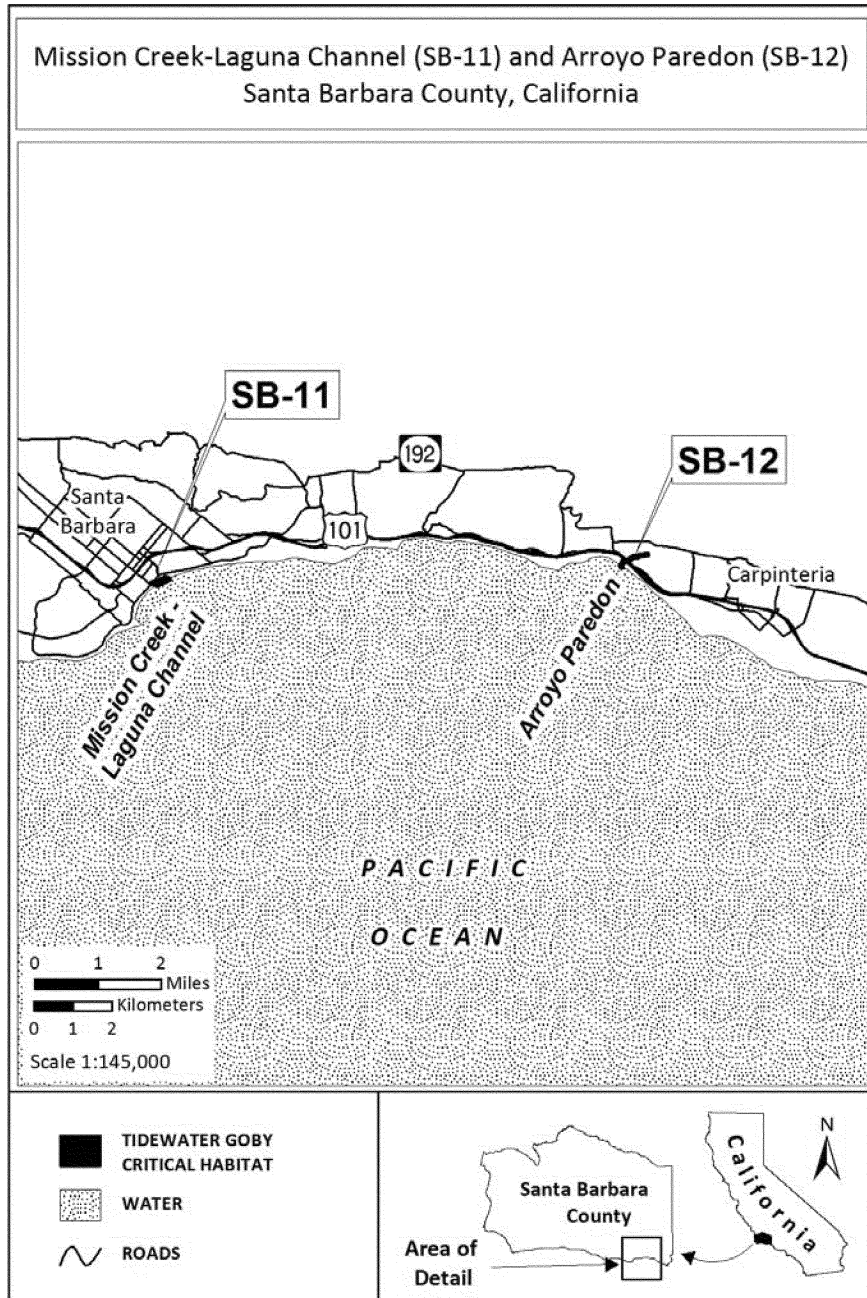
(58) Unit SB 8: Winchester-Bell Canyon, Santa Barbara County, California. Map of SB 8, SB 9, and SB 10 follows:



(59) Unit SB 9: Goleta Slough, Santa Barbara County, California. Map of Units SB 8, SB 9, and SB 10 is provided at paragraph (58) of this entry.

(60) Unit SB 10: Arroyo Burro, Santa Barbara County, California. Map of Units SB 8, SB 9, and SB 10 is provided at paragraph (58) of this entry.

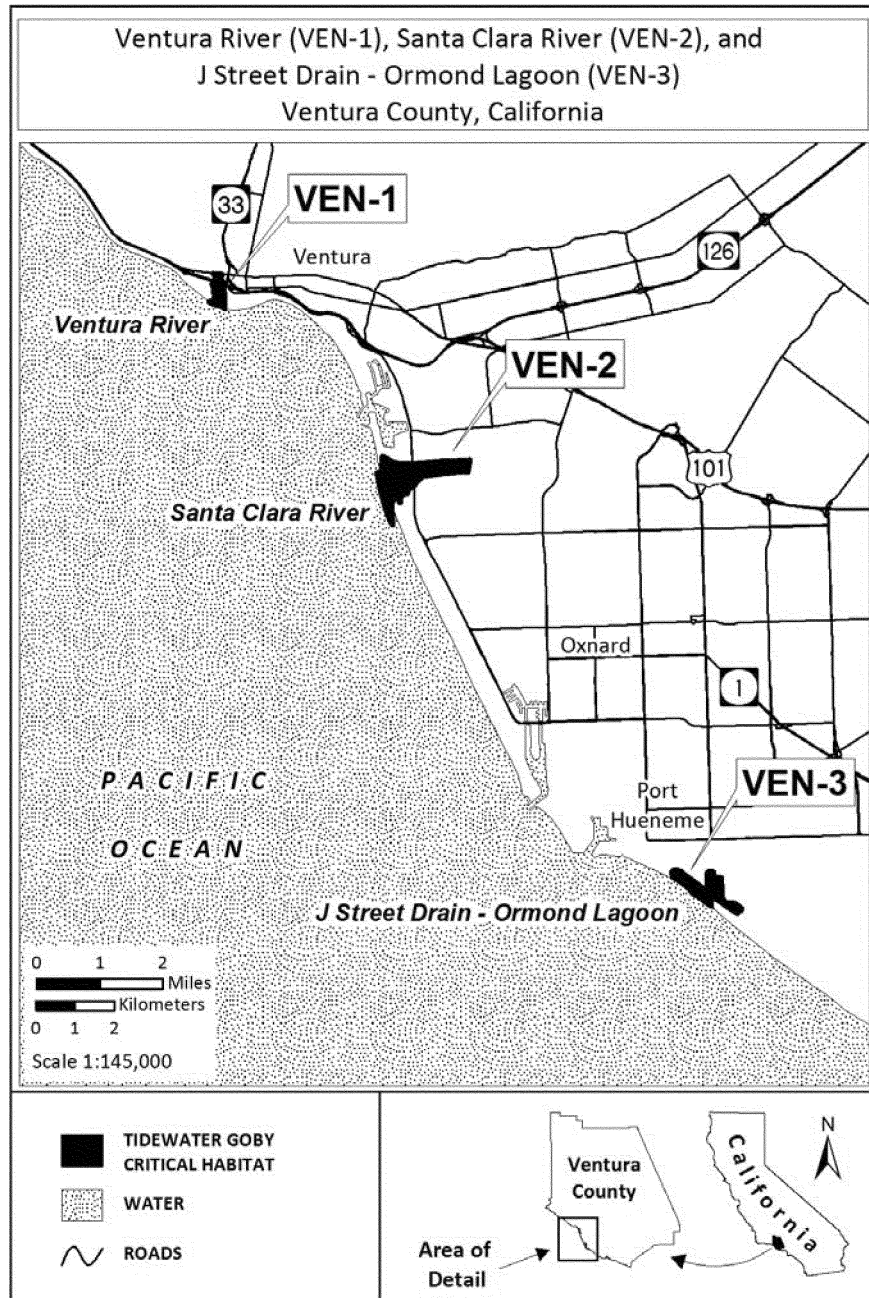
(61) Unit SB 11: Mission Creek—Laguna Channel, Santa Barbara County, California. Map of Units SB 11 and SB 12 follows:



(62) Unit SB 12: Arroyo Paredon, Santa Barbara County, California. Map

of Units SB 11 and SB 12 is provided at paragraph (61) of this entry.

(63) Unit VEN 1: Ventura River, Ventura County, California. Map of VEN 1, VEN 2, and VEN 3 follows:

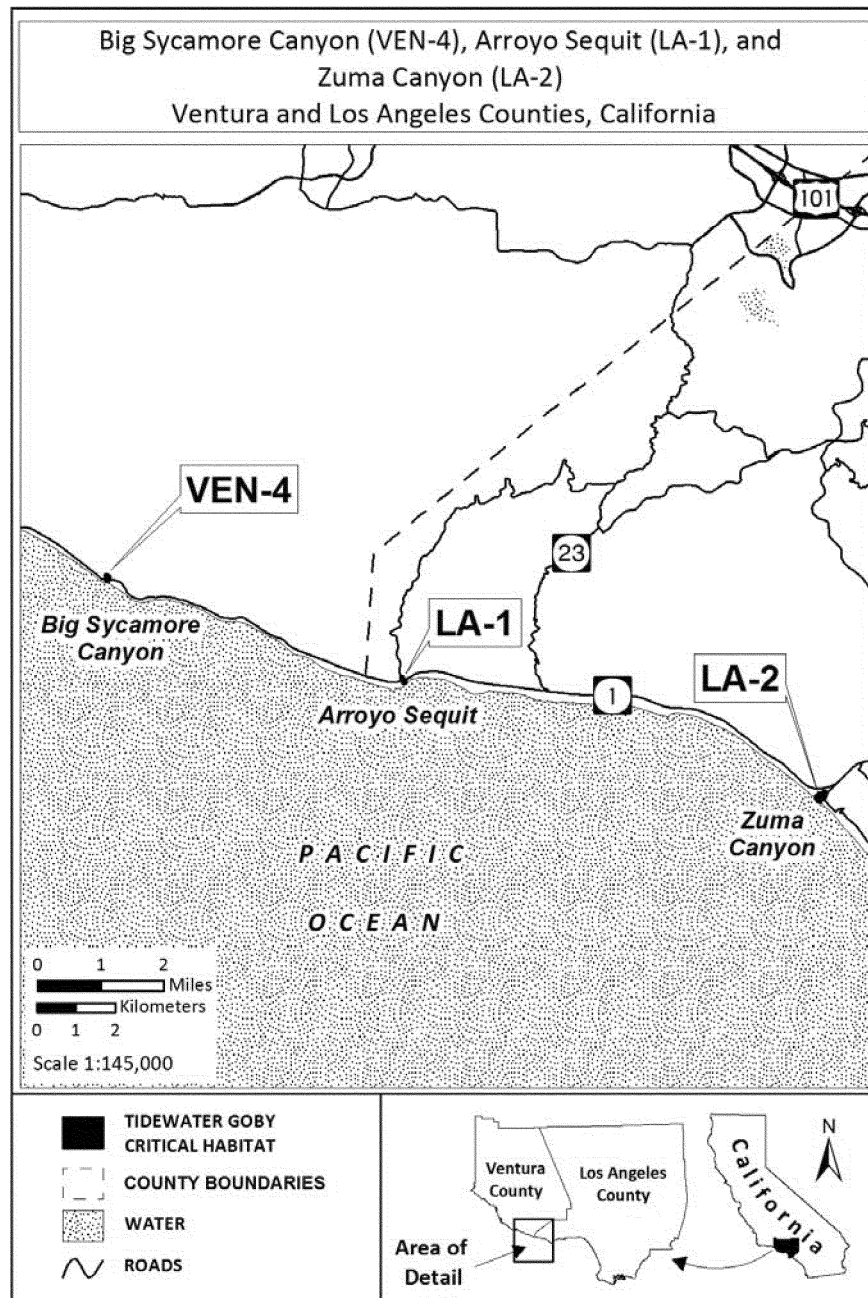


(64) Unit VEN 2: Santa Clara River, Ventura County, California. Map of Units VEN 1, VEN 2, and VEN 3 is provided at paragraph (63) of this entry.

(65) Unit VEN 3: J Street Drain—Ormond Lagoon, Ventura County, California. Map of Units VEN 1, VEN 2, and VEN 3 is provided at paragraph (63) of this entry.

(66) Unit VEN 4: Big Sycamore Canyon, Ventura County, California. Map of Units VEN 1, LA 1, and LA 2 follows:

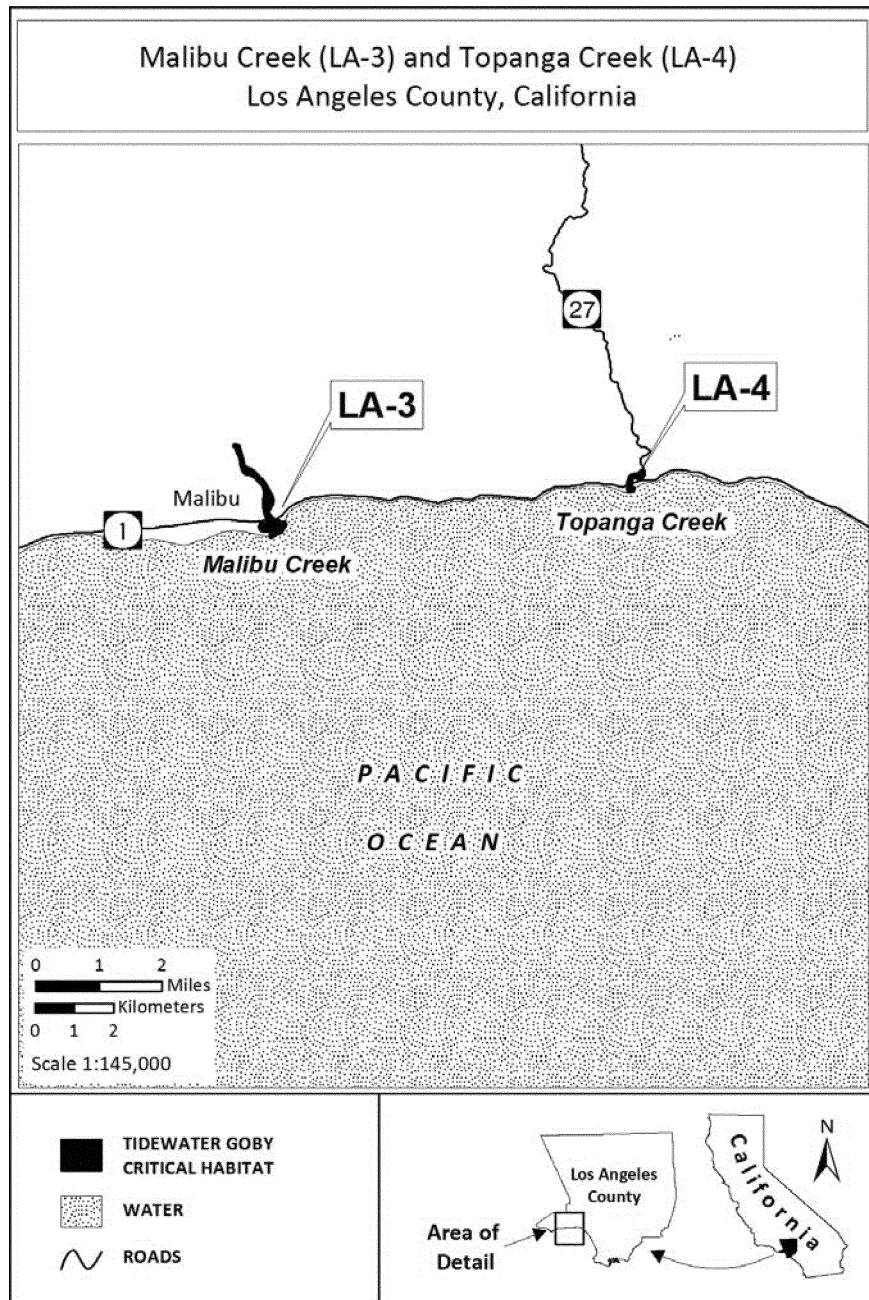




(67) Unit LA 1: Arroyo Sequit, Los Angeles County, California. Map of Units VEN 4, LA 1, and LA 2 is provided at paragraph (66) of this entry.

(68) Unit LA 2: Zuma Canyon, Los Angeles County, California. Map of Units VEN 4, LA 1, and LA 2 is provided at paragraph (66) of this entry.

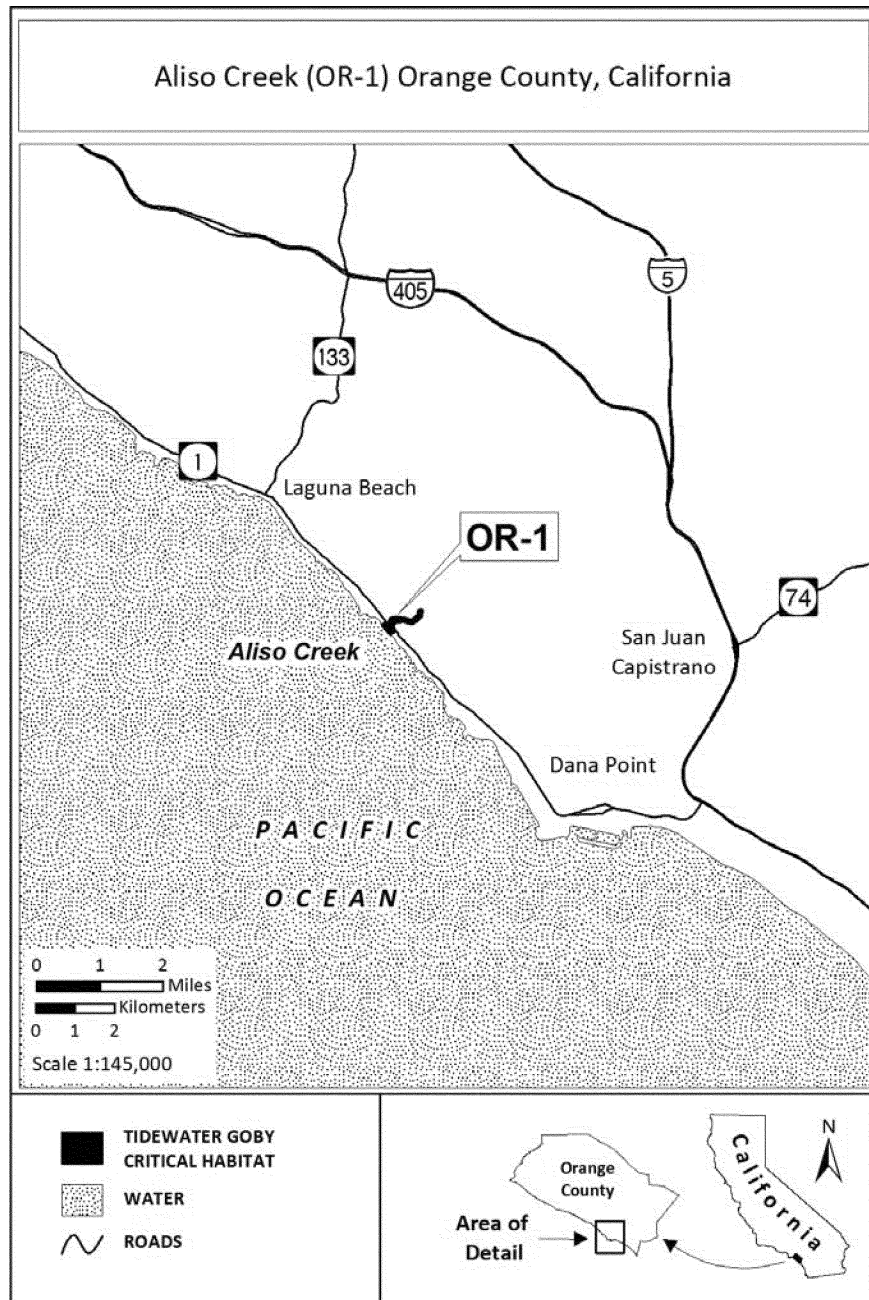
(69) Unit LA 3: Malibu Creek, Los Angeles County, California. Map of Units LA 3, and LA 4 follows:



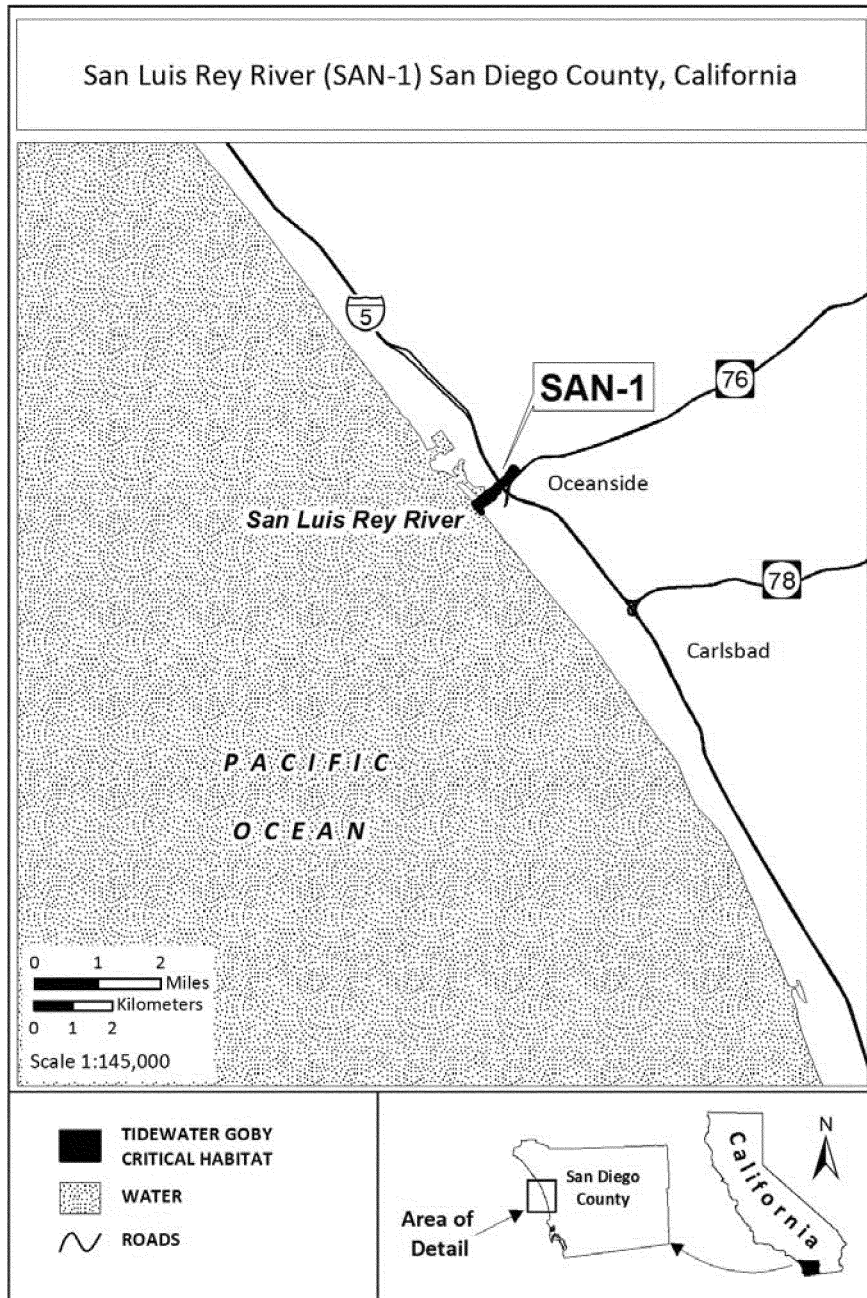
(70) Unit LA 4: Topanga Creek, Los Angeles County, California. Map of

Units LA 3, and LA 4 is provided at paragraph (69) of this entry.

(71) Unit OR 1: Aliso Creek, Orange County, California. Map of Unit OR 1 follows:



(72) Unit SAN 1: San Luis Rey River, San Diego County, California. Map of Unit SAN 1 follows:



\* \* \* \* \*

Dated: November 26, 2012.  
**Eileen Sobeck,**  
*Deputy Assistant Secretary for Fish and  
Wildlife and Parks.*  
[FR Doc. 2013-02057 Filed 2-5-13; 8:45 am]  
**BILLING CODE 4310-55-C**