## 5.3.21 Tidewater Goby (*Eucyclogobius newberryi*)

**Tidewater goby**
Photo Credit: U.S. Fish and Wildlife Service

### Status

- Federally Endangered
- State Species of Special Concern

### Ecological Requirements

- Monterey County Regions: Monterey Bay Coastline, Salinas River and Associated Corridor, Pajaro River
- RCIS Natural Communities: Saline Emergent Wetland, Estuarine (CDFW 2020)
- Found in brackish, shallow lagoons and the uppermost brackish zones of larger estuaries and river mouths (CDFW 2020, USFWS 2005a)
- Prefer sandy substrate for breeding, but can also be found on rocky, mud, and silt substrates (USFWS 2005a)
- Depend on sandbars to produce calm lagoon conditions that support summer breeding and refuge from winter conditions (USFWS 2007a)
- Full species account available: California Natural Diversity Database, RareFind 5 (CDFW 2020) and the USFWS *Recovery Plan for the Tidewater Goby (Eucyclogobius newberryi)* (USFWS 2005a)

- RCIS Conservation Target: Highest (Federally listed, few populations in the RCIS area, unique coastal estuarine habitat

### Associated Non-Focal Species

- Eelgrass (*Zostera marina, Z. pacifica*)

### Climate Change Vulnerability Assessment

Tidewater goby (TG) is sensitive to climate threats including increases in the amount of precipitation during storm event and associated flooding, as well as increased frequency and severity of drought conditions (Hutto et al. 2015; USFWS 2007b). Sea-level rise could benefit tidewater goby by increasing the amount of available shallow water pool habitat, although it may also transform pre-existing shallow water pools into deep water pools leading to a decrease in suitable habitat (Hutto et al. 2015). The impacts of sea-level rise will likely vary and depend on specific local habitat conditions (Hutto et al. 2015). Tidewater goby is sensitive to displacement from extreme storm events, which may also be beneficial or detrimental depending on local conditions, as they do not actively disperse (Hutto et al. 2015).

Multiple climate change vulnerability assessments have been conducted for tidewater goby, and results vary from "Highly Vulnerable" to "On Path to Extinction" (Moyle et al. 2012), as shown in Table 5-33., to "Moderate" (Hutto et al. 2015). Hutto et al. (2015) also conducted climate vulnerability assessments of exposure and sensitivity factors:

**Sensitivity to Climate and Climate Driven Change (Exposure)**

- Precipitation–Mid High
- pH-Low
- Sea-Level Rise–Low
- Coastal Erosion–Low

**Sensitivity of Change in Disturbance Regimes (Exposure)**

- Flooding– Mid High

**Sensitivity and Current Exposure to Non-Climate Stressors**

- Land Use Change–Moderate
- Invasive Species– Low

**Overall Vulnerability**

- Overall Vulnerability– Moderate
- Sensitivity– Moderate
- Exposure– Moderate
- Adaptive Capacity– Low

**Table 5-33. Tidewater Goby Climate Change Vulnerability Ranking**

| Present day Vulnerability | Climate Change Vulnerability | Combined Vulnerability Score |
|---|---|---|
| Approaching Extinction | Highly Vulnerable | On Path to Extinction |

Source: Moyle et al. 2012

The goals, objectives, and actions shown in Table 5-34. aim to protect, enhance, and restore present day suitable habitats for tidewater goby, as well as habitats that may become suitable in the future because of projected climate changes. Actions also address population stability, such as population monitoring, which may allow individuals to move to newly suitable habitats in the future.

A summary of natural communities where this species occurs is presented in Chapter 4. Figure 5-17 shows the range and modeled suitable habitat for the tidewater goby.

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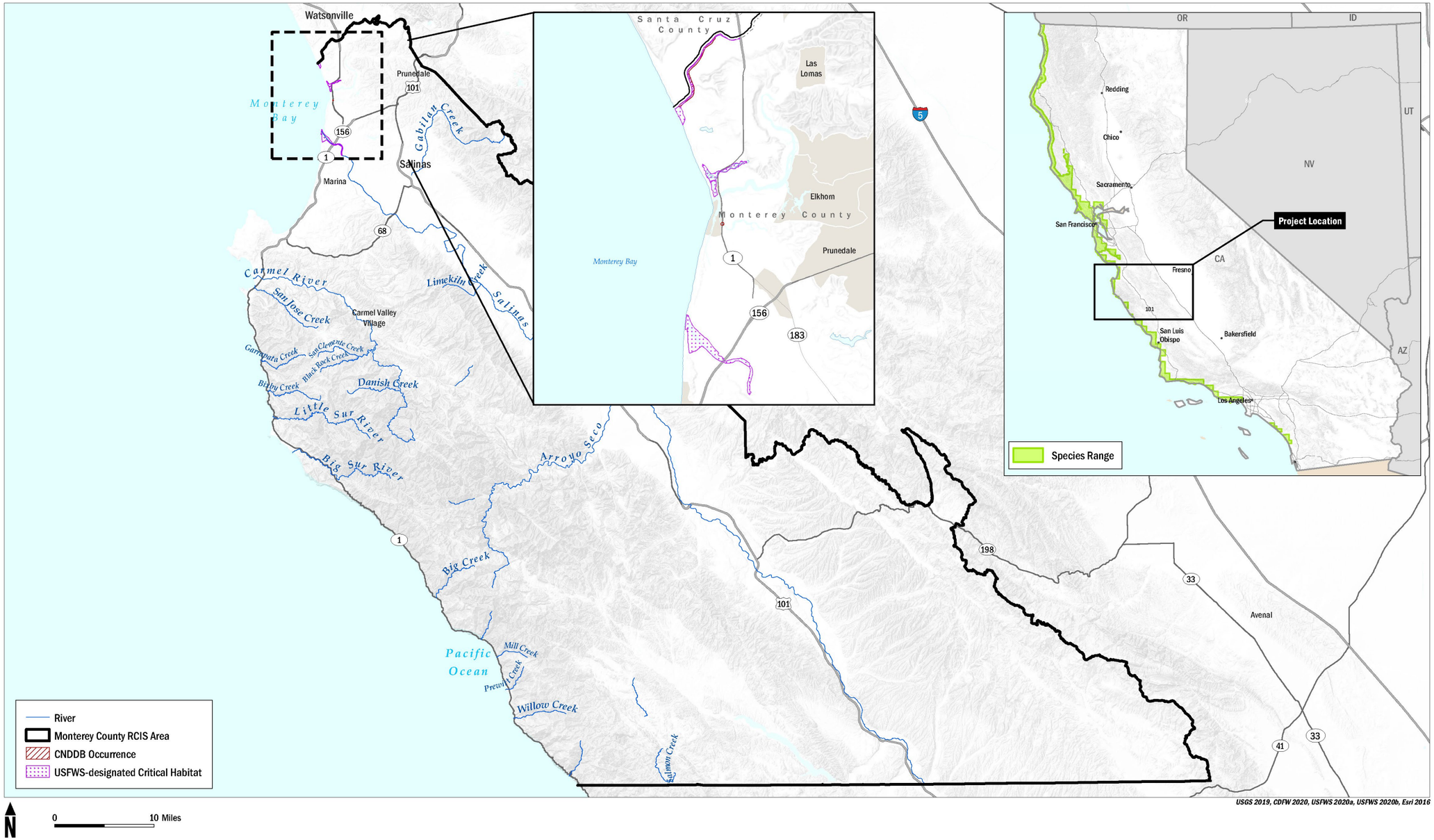


Transportation Agency for Monterey County
*Monterey County Regional Conservation Investment Strategy*

**FIGURE 5-17**
*Tidewater Goby*

**Figure 5-17. Tidewater Goby Range and Modeled Habitat**

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## Tidewater Goby Conservation Priorities, Goals, Objectives, and Actions

RC Goal 1, Water action 1.1.1, 1.1.7, 1.1.8, and Water Objectives 1.2 and 1.3 apply to tidewater goby. Table 5-34 summarizes specific goals, objectives, and actions for the species.

### Conservation Priorities

- Acquire and protect habitat in areas in the U.S. Fish and Wildlife Service -designated Greater Bay Recovery Unit: Sub-Unit GB10 (Pajaro River) and Sub-Unit GB11 (Bennett's Slough) (TG 1.1.1).
- Enhance and restore degraded estuarine habitat in the U.S. Fish and Wildlife Service -designated Recovery Sub-Units in Pajaro River and Bennett's Slough (USFWS 2005a) (TG Objective 1.2, 1.3).

**Table 5-34. Tidewater Goby Goals, Objectives, and Actions**

| Goal | Objective | Threats | Co-Benefits | Action |
|---|---|---|---|---|
| TG Goal 1: Promote persistence of tidewater goby populations throughout the RCIS area through protection, restoration, and enhancement of habitat. | TG Objective 1.1: Protect known occurrences and adjacent upstream freshwater habitat and allow expansion by protecting 340 acres of suitable habitat. Measure progress toward achieving this objective by the number of acres of estuary habitat, adjacent upstream aquatic and terrestrial habitat, and | • Habitat loss, degradation, fragmentation<br>• Climate change | • Other focal/ non-focal species<br>• Biodiversity<br>Climate change resilience | TG 1.1.1: Acquire parcels with suitable estuarine and upstream aquatic and terrestrial habitat through fee title purchase or conservation easement (USFWS 2005a). Focus on areas with the U.S. Fish and Wildlife Service-designated Greater Bay Recovery Unit: Sub-Unit GB10 |

| Goal | Objective | Threats | Co-Benefits | Action |
|---|---|---|---|---|
| | associated/equivalent acres protected. | | | (Pajaro River) and Sub-Unit GB11 (Bennett's Slough). |
| TG Goal 1: | TG Objective 1.2: Enhance occupied and suitable tidewater goby habitat. Measure progress toward achieving this objective by acres of habitat and adjacent/equivalent acres enhanced and occupied by tidewater goby. | • Anthropogenic breaching of lagoons (especially in dry season) | • Other focal/ non-focal species<br>• Biodiversity | TG 1.2.1: Conduct outreach programs to educate the public about the negative impacts of anthropogenic breaching of lagoons, especially during the dry season (USFWS 2005a). |
| TG Goal 1: | TG Objective 1.2: | • Habitat loss, degradation, fragmentation | • Other focal/ non-focal species<br>• Water quality<br>• Biodiversity | TG 1.2.2: Develop an umbrella Safe Harbor Agreement or obtain financial incentives for landowners to maintain or enhance tidewater goby habitat (USFWS 2005a). |
| TG Goal 1: | TG Objective 1.2: | • Increased sedimentation (reduced water availability in lagoons, | • Other focal/ non-focal species<br>• Water quality | TG 1.2.3: Include measures to prevent increased sedimentation, channelization, and |

| Goal | Objective | Threats | Co-Benefits | Action |
|---|---|---|---|---|
| | | changes in predators, temperature changes<br>• Channelization of rivers, streams, lagoons (dredging), and wetland draining and filling<br>• Modifications to natural flow regimes (Water diversions, channelization, altered flows, groundwater overdraft)<br>• Coastal development | • Biodiversity | water diversions during coastal transportation and development projects in estuarine and upstream freshwater habitats. Design plans to minimize wetland draining and/or filling (USFWS 2005a) |
| TG Goal 1: | TG Objective 1.3: Restore degraded estuarine habitat in the RCIS area. Measure progress toward achieving this goal by acres of estuarine habitat and adjacent/equivalent acres restored and occupied by tidewater goby. | • Habitat loss, degradation, fragmentation<br>• Climate change | • Other focal/ non-focal species<br>• Water quality<br>• Biodiversity<br>• Climate change resilience | TG 1.3.1: Restore suitable estuary habitat, focusing on habitats in the U.S. Fish and Wildlife Service-designated Recovery Sub-Units (USFWS 2005a). Plant favorable vegetation upstream and around estuary and lagoon habitats. |

| Goal | Objective | Threats | Co-Benefits | Action |
|---|---|---|---|---|
| TG Goal 1: | TG Objective 1.3: | • Habitat loss, degradation, fragmentation<br>• Climate change | • Climate change resilience<br>• Biodiversity | TG 1.3.2: Survey known occupied and previously occupied localities to determine population status and collaborate to create a well-developed, long-term monitoring plan throughout the RCIS area, to help locate potential locations for restoration (USFWS 2007a). |
| TG Goal 1: | TG Objective 1.3: | • Channelization of rivers, streams, lagoons (dredging), and wetland draining and filling<br>• Habitat loss, degradation, fragmentation | • Other focal/ non-focal species<br>• Water quality<br>• Biodiversity | TG 1.3.3: Identify locations where artificial fill can be removed from estuarine habitats and restored, or where estuarine habitat can be reconnected, through replacement of culverts with bridges. |

Sources: CDFW 2015, 2020, USFWS 2005a, 2007b