

A Survey for the Tidewater Goby (*Eucyclogobius newberryi*) in Rocky Gulch, Humboldt County, California

By

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INTRODUCTION

On May 26, 2005, a survey was conducted for the tidewater goby in Rocky Gulch, a tributary to Humboldt Bay by Mr. Ray Bosch and Mr. Greg Goldsmith from the U.S. Fish and Wildlife Service in Arcata California. The survey consisted of both seining and dip-netting in accordance with a draft protocol for the species published in the draft recovery plan for the tidewater goby, October 2004. Surveys were conducted from 0900 to 1330, during a low tide of -1.6 feet MSL at 0944. The tidal level at conclusion of the survey was estimated to be less than 3.0 feet MSL. All surveyed water bodies were above tidal influence at the time of survey. Surveys included the main channel of Rocky Gulch from a point between the recently installed tidegate and the concrete culvert under U.S. Highway 101, upstream to the middle of the area identified as the tidal transition zone, a total of approximately 500 meters linear distance. In addition, several smaller water bodies were sampled that feed directly or indirectly into Rocky Gulch throughout the brackish water portion of the stream.

Rocky Gulch has no known historic occurrences of the tidewater goby. Habitat for the species does exist, consisting of some shallow, slow moving brackish water areas with substrate composed primarily of mud with varying amounts of a sand component. The habitat includes several species of rooted and emergent vegetation, including Ruppia maritima and Carex lyngbyei, which provide cover for fish species including the tidewater goby. There are also off-channel areas of standing water pools that appear to occasionally connect to Rocky Gulch. These pools contain some habitat components, although they were of much lower habitat quality due to hydrogen sulfide presence in the substrate, and a likely poor water quality, including very low dissolved oxygen content in the water. The major limitation to habitat quality for the goby seems to be the buffering of the salinity concentration, which according to recent sampling, shows daily fluctuation in response to tidal influence from near fresh water to near sea water conditions as far upstream as the 90 degree turn in the pasture.

METHODS

Surveys were accomplished using a draft protocol for determining presence/absence for tidewater goby. This protocol has been developed with assistance from the scientific advisory team of the tidewater goby recovery plan effort. The protocol has undergone recent revisions, and there may be further refinement of this protocol as more research

and knowledge of the species is gained. The intent of the project was to document the presence/absence of suitable habitat for the tidewater goby, as defined by the available scientific literature for the species, and to conduct a presence/absence survey for tidewater goby where habitat exists. Seining was accomplished using a 3 meter by 1 meter 4.0 mm delta mesh seine. Seine hauls were approximately 20 meters in length. Dip netting was accomplished using a long-handled fine-mesh net with a 0.3 meter by 0.3 meter opening.

RESULTS

Due to the narrow width of most of Rocky Gulch, a large portion of the main channel was surveyed from below the tidegate to the upper portion of saline intrusion. The only areas not surveyed throughout this reach of stream were a few sections of shallow, running water and one deep area at the opening of the old culvert that was not suitable habitat. A total of 18 seine hauls were completed in the main channel, as well as approximately 45 minutes of dip-netting in the main channel and off-channel water bodies. In the lower section, from just upstream of the concrete culvert under U.S. Highway 101 to the new tidegate, 4 seine hauls were accomplished (Table 1). From the new tidegate, upstream to the old tidegate, 5 seine hauls were completed. From the old tidegate, upstream beyond the 90 degree bend to the upper limits of brackish water, 9 seine hauls were completed.

Fish species captured are listed in Table 1. A total of 5 fish species were captured, listed in Table 1, as well as several invertebrate species, including shrimp, amphipods, isopods, and aquatic insects. The most common species captured was threespine stickleback (*Gasterosteus aculeatus*). Total number of threespine stickleback captured was estimated at 2,229. The total for staghorn sculpin (*Leptocottus armatus*) was 11. The total number of unknown species of the genus *Cottus* was 4. In addition, one individual of the family Atherinidae was captured, as well as 3 shiner surfperch (*Cymatogaster aggregata*). The species assemblage captured is typical of those found to coexist with the tidewater goby. The survey did not result in any tidewater goby captures. The survey was completed before the typical seasonal time period specified in the draft survey protocol (July 1 through October 31), somewhat reducing the likelihood of capturing gobies that are in the early life stages, if present. Although, within the samples of threespine stickleback captured, many were very small (lengths estimated as small as 10 mm total length) individuals. Given the intensity and relatively extensive coverage of the survey, and the success at capturing small fish, it is our conclusion that tidewater gobies are unlikely to be currently inhabiting Rocky Gulch.

Table 1. Fish Species Captured by Seine Haul, Rocky Gulch.

Seine Haul #	Species captured (number of Individuals)	
<i>Section 1 – Highway 101 culvert to new tidegate</i>		
1	<i>Gasterosteus aculeatus</i> (1)	
	<i>Leptocottus armatus</i> (1)	
2	<i>Gasterosteus aculeatus</i> (64)	
	<i>Leptocottus armatus</i> (3)	

	Cymatogaster aggregate (3)	
3	Gasterosteus aculeatus (31)	
	Leptocottus armatus (4)	
4	Gasterosteus aculeatus (14)	
	Leptocottus armatus (3)	
<i>Section 2 – New tidegate to old tidegate</i>		
1	Gasterosteus aculeatus (21)	
2	Gasterosteus aculeatus (15)	
3	Gasterosteus aculeatus (3)	
4	Gasterosteus aculeatus (16)	
	Cottus sp. (1)	
5	Gasterosteus aculeatus (82)	
<i>Section 3 – Old tidegate to brackish water limits</i>		
1	Gasterosteus aculeatus (97)	
2	Gasterosteus aculeatus (unknown number)	
3	Gasterosteus aculeatus (~250)	
	Cottus sp. (1)	
	Atherinidae sp. (1)	
4	Gasterosteus aculeatus (~100)	
5	Gasterosteus aculeatus (~300)	
	Cottus sp. (2)	
6	Gasterosteus aculeatus (~200)	
7	Gasterosteus aculeatus (~350)	
8	Gasterosteus aculeatus (~250)	
9	Gasterosteus aculeatus (~250)	
<i>Section 4 – Off-channel ponds and ditches (dip-netting effort in minutes)</i>		
15	Gasterosteus aculeatus (~100)	
15	Gasterosteus aculeatus (~75)	
15	Gasterosteus aculeatus (~10)	