

10 Andreas Court  
Novato, California 94945  
January 22, 2014

Timothy Dodson  
California Department of Fish and Wildlife - Region 3  
7329 Silverado Trail  
Napa, CA 94558

Dear Tim:

Subject: Comments for the State Wildlife Plan – Salt Marshes of the San Francisco Bay Area

The State Wildlife Plan for the San Francisco Bay salt marshes should consider several uncommon species of invertebrates: tiger beetles (*Cicindela* spp.), the western tanarthrus beetle (*Tanarthrus occidentalis*), and the California horn snail (*Cerithidea californica*). Except for the sandy beach tiger beetle (*Cicindela hirticollis*), these species are not listed as species of special concern or as special animals.<sup>1</sup> Nevertheless, these invertebrate species should be considered in the San Francisco Bay salt marsh portion of the State Wildlife Plan because they are indicators of important habitat of San Francisco salt marshes and they are in decline from habitat alteration or competition from non-native species.

There were once 4 species of tiger beetles in the salt marshes surrounding San Francisco Bay: the western tiger beetle (*Cicindela oregona oregona*), the sandy beach tiger beetle (*Cicindela gravida*), the senile tiger beetle (*Cicindela senilis senilis*), and the wetsalts tiger beetle (*Cicindela haemorrhagica*). According to Wesley A. Maffei<sup>2</sup> only two of these species remain within salt marshes of the San Francisco Bay, the senile tiger beetle and the wetsalts tiger beetle. The most recent surveys conducted for these beetles appeared to be in 1997. Although these surveys are quite old, habitat for these beetles appears to have declined and they are probably quite rare in the San Francisco Bay Area<sup>3</sup>.

Adult tiger beetles use open unvegetated areas such as marsh pannes and levees for hunting. Larval tiger beetles occur in vertical burrows in, often moist, unvegetated substrates. The larvae capture prey that travels close to their burrows. I am not familiar with the precise larval habitat of these species but it presumably consists of moist marsh pannes and bare moist areas above the high tide line.

The western tanarthrus beetle occurs in salt pannes and encrusted salt crystallizer ponds. They have been observed feeding on dead brine fly carcasses in these habitats. The western tanarthrus beetle is only known from 3 areas of Alameda County: the Cargill salt pans, now part of the San Francisco Bay National Wildlife Refuge, adjacent to Dumbarton Bridge, the salt pans of the Baumberg tract, City of Hayward, and from Bayfarm Island, City of Alameda. The Bayfarm Island population has been extirpated due to development.

The California horn snail (*Cerithidea californica*) was once common on the mud flats of San Francisco Bay. Since the introduction of the eastern mud snail (*Ilyanassa obsoleta*), the numbers of California horn snails have plummeted. The California horn snail is currently restricted to salt pannes and the upper portions of the mud flats where mud snails do not go.<sup>4</sup> Unfortunately, the marsh panne and upper mud flat areas are threatened with erosion as wave action erodes these areas.

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<sup>1</sup> <http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/spanimals.pdf>

<sup>2</sup> Goals Project. 2000. Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish and wildlife. Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P.R. Olofson, editor. San Francisco Bay Regional Water Quality Control Board, Oakland, Calif.

<sup>3</sup> *ibid*

<sup>4</sup> Race, M.S. 1982. Competitive displacement and predation between introduced and native mud snails. *Oecologia* 54: 337-347

Although these invertebrates are not considered California Species of Special Concern, they are an important indicator of habitat quality. Their salt panne habitat supports a specialized flora and fauna that should be considered in the California Wildlife Plan.

Please contact me at (510) 376-5702 if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Clinton Kellner". The signature is written in black ink and is positioned above the printed name.

Clinton Kellner, Ph.D.