To: Kern Delta Water District Water Users

From: Steven Teglia – General Manager

Date: January 21, 2026

Re: Update Regarding Invasive Golden Mussels in California

Golden Mussels *(Limnoperna fortunei)* are an invasive freshwater species that pose a serious risk to water conveyance systems, agricultural infrastructure, and ecosystem health.

This mussel species originated from Southeast Asia and were introduced to North America in in October of 2024 when golden mussels were discovered in the Sacramento – San Joaquin Delta. Since that time, they have spread through the State Water Project and have been discovered throughout the state. The presence of golden mussels in Kern County water conveyance facilities was confirmed towards the end of 2025.

Golden mussel detections in Kern County have so far been linked to districts with direct access to the State Water Project including the Cross Valley Canal. Please be aware that while the presence of golden mussels has been confirmed in various areas of Kern County, **District inspections have shown no evidence of the presence of golden mussels in Kern Delta Water District facilities to date.**

Golden mussels tend to attach to hard surfaces using strong byssal threads. Once established, they reproduce rapidly and can form dense colonies. Infestations can result in:

- Clogging of irrigation pipelines, pumps, and screens
- Reduced conveyance capacity and system efficiency
- Increased maintenance, operational, and repair costs
- Damage to valves, meters, and other infrastructure

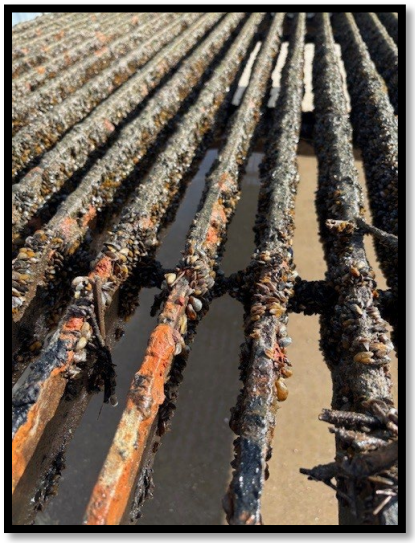
Golden mussels are a robust species that can withstand many typical types of treatment. As such, Kern Delta is continuing to monitor statewide and regional efforts to develop effective mitigation options, which are limited at present.

In the meantime, Kern Delta will continue to do everything possible to prohibit sources of water that have the potential to convey golden mussels into the District. Water users are encouraged to remain vigilant and watch for the following:

- Small, yellowish-brown mussels attached to pipes, screens, intakes, or other submerged surfaces.
- Unusual accumulation of shell material or biological growth
- Unexplained reductions in flow, pressure, or pumping efficiency

Below are several pictures depicting golden mussel colonization. If you observe any suspected golden mussels or signs of infestation, please notify Kern Delta Water District Operations at 661-834-4653 or info@kerndelta.org

Above Picture: Golden mussel colony on buoy in O'Neill Forebay



Above Picture: CVC Trash Screen

Above Picture: WRMWSD Traveling Water Screen

Attachments:

1. CDFW Invasive Species Fact Sheet – Golden Mussel

Invasive Species Fact Sheet

Golden mussel, *Limnoperna fortunei*

Golden mussels, San Joaquin County
Photo: Jeb Bjerke, CDFW

General Description

Golden mussel (*Limnoperna fortunei*) is an invasive bivalve that ranges in color from dark brown to gold. It can reach up to 1 ¾ inches long. Adult mussels form byssal threads that enable them to attach to surfaces. Adult mussels spawn multiple times each year and have the potential to produce thousands of planktonic offspring, called veligers.

Current Distribution

In October 2024, golden mussels were discovered in the Sacramento – San Joaquin Delta and O'Neill Forebay (Merced County). This discovery was the first known occurrence of golden mussel in North America. Originally from China, Thailand, Korea, Laos, Vietnam, Indonesia, and Cambodia, they have invaded waters of other countries and territories including Hong Kong, Japan, Taiwan, Argentina, Brazil, Bolivia, Paraguay, and Uruguay.

Habitat Suitability

Golden mussel can inhabit fresh and brackish-water lakes, rivers, creeks, wetlands, bays, and canals with water temperatures ranging from 41-95°F. They can establish in waters with a constant salinity of less than 3 parts per thousand (ppt) and can survive fluctuations of higher salinities. They attach to a wide variety of substrates, both man-made and natural, and at various water depths. Golden mussels are not restricted to hard surfaces and have been found colonizing soft substrates and attached to aquatic plants.

Pathways

Pathways are the mechanisms and processes by which invasive species are moved, intentionally or unintentionally, into a new ecosystem. Golden mussel can be carried in ballast water of ocean-going ships and released with that water. Adult golden mussel can be moved overland attached to watercraft and in-water equipment, and veligers and adults can be moved overland in water contained within watercraft and equipment.

Within interconnected waters, golden mussels can expand their range via the flow of water, and attached to, or entrapped within, watercraft and in-water structures moved within that waterway.

Impacts

Golden mussels are highly efficient filter feeders and form dense colonies. They consume large quantities of aquatic microscopic plants and animals that native species and sport fish depend on for food. Their colonization of hard surfaces impedes water flow, clogs pipes, and fouls watercraft motors, and necessitates ongoing, costly removal to maintain operational function. These costs result in economic impacts to water conveyances, energy production, recreation, agriculture, and ultimately the public.

Actions Taken if Found

If you observe golden mussel in California immediately report your sighting to the CDFW Invasive Species Program at https://arcg.is/10D4G8, or by email to Invasives@wildlife.ca.gov, or by telephone

to (866) 440-9530. Please take clear, close-up photos that include something (such as a pencil or hand) to show size.

References

Correa, N., Sardiña, P., Perepelizin, P., Boltovskoy, D. (2015). Limnoperna Fortunei Colonies: Structure, Distribution and Dynamics. In: Boltovskoy, D. (eds) Limnoperna Fortunei. Invading Nature - Springer Series in Invasion Ecology, vol 10. Springer, Cham. https://doi.org/10.1007/978-3-319-13494-9_7

Boltovskoy, D., Xu, M., Nakano, D. (2015). Impacts of Limnoperna Fortunei on Man-Made Structures and Control Strategies: General Overview. In: Boltovskoy, D. (eds) Limnoperna Fortunei. Invading Nature - Springer Series in Invasion Ecology, vol 10. Springer, Cham. https://doi.org/10.1007/978-3-319-13494-9_21

Fernandes De Oliveira, P.R.F., C.C. Rodrigues, M.I. Grano-Maldonado, and T.L. Rocha. 2023. The golden mussel *Limnoperna fortunei* (Dunker, 1857) as an emerging concern for biodiversity in the Brazilian cerrado. Folia Malacologica 31(4):211-221.

Karatayev, A., L.E. Burlakova, V.A. Karatayev, and D. Boltovskoy. 2010. *Limnoperna fortunei* versus *Dreissena polymorpha*: population densities and benthic community impacts of two invasive freshwater bivalves. Journal of Shellfish Research 29(4):975-984.

Karatayev, Alexander & Boltovskoy, Demetrio & Burlakova, Lyubov & Padilla, Dianna. (2015). Parallels and Contrasts Between Limnoperna fortunei and Species of Dreissena. 261-297. 10.1007/978-3-319-13494-9_15.

Liu, Y., He, X., Yang, Y., Bai, X., & Yuan, C. (2024). Distribution, tolerance, growth, behaviour and control methods of Limnoperna fortunei (Dunker, 1857) (Bivalvia: Mytilidae): A review. In Aquatic Conservation: Marine and Freshwater Ecosystems (Vol. 34, Issue 7). John Wiley and Sons Ltd. https://doi.org/10.1002/aqc.4217

Molina, F., S. José de Paggi, and D. Frau. 2012. Impacts of the invading golden mussel *Limnoperna fortune*i on zooplankton: a mesocosm experiment. Zoological Studies 51(6):733-744.

Morton, B. (2015). The Biology and Anatomy of Limnoperna fortunei, a Significant Freshwater Bioinvader: Blueprints for Success. In: Boltovskoy, D. (eds) Limnoperna Fortunei. Invading Nature - Springer Series in Invasion Ecology, vol 10. Springer, Cham. https://doi.org/10.1007/978-3-319-13494-9_1

Musin, G.E., F. Rojas Molina, F. Giri, and V. Williner. 2015. Structure and density population of the invasive mollusc *Limnoperna fortunei* associated with *Eichhornia crassipes* in lakes of the Middle Paraná floodplain. Journal of Limnology 74(3):537-548.

Sylvester, F., D. Cataldo and, D. Boltovskoy. 2013. Fluctuating salinity improves survival of the invasive freshwater golden mussel at high salinity: implications for the introduction of aquatic species through estuarine ports. Biological Invasions 15:1355-1366.

Xu, M., Z. Wang, C.C. Lin, B. Pan, and N. Zhao. 2013. Experimental study of invasion and biofouling of freshwater mussel *Limnoperna fortunei*. International Journal of Geosciences 4:1-7.