Staff Summary for October 8-9, 2025

5. Invasive Non-Native Mussels (Including Golden, Pond, and Axe-Head Mussels) and Green Crabs (Consent)

Today's Item **Information ☐** **Action ☒**

Consider adopting proposed amendments to regulations adding invasive non-native mussels of the *Limnoperna* (including golden mussel), *Sinanodonta* (pond mussels) and *Xenostrobus* (axe-head mussels) genera, and green crab (*Carcinus maenas*), to the list of live animals restricted from importation, transportation and possession.

Summary of Previous/Future Actions

• Adopted *emergency regulation* to add golden mussel to the list of restricted animals	December 11-12, 2024
• Adopted 90-day extension of *emergency regulation* to retain golden mussel on the list of restricted animals	April 16-17, 2025
• Adopted second 90-day extension of *emergency regulation* to retain golden mussel on the list of restricted animals	June 11-12, 2025
• Notice hearing for the *regular rulemaking*	August 13-14, 2025
• **Today's adoption hearing for the *regular rulemaking***	**October 8-9, 2025**

Background

Current regulations list restricted species that are unlawful to import, transport, or possess without a permit issued by the Department. See Exhibits 3 through 8 for more information on the current proposal to add certain invertebrate genera and species to the list.

The proposed regulations expand the list of restricted species to include green crab and the genera *Limnoperna (including golden mussel)*, *Sinanodonta* and *Xenostrobus*. The amendments aim to prevent new introductions of species within the *Limnoperna*, *Sinanodonta*, and *Xenostrobus* genera into California waterways and prevent the spread of green crab, *Limnoperna,* and *Xenostrobus* to other state waterbodies. These measures are intended to protect native wildlife, agricultural interests, and public health and safety.

This rulemaking is primarily driven by the discovery of golden mussel (*L. fortunei*), an invasive freshwater bivalve, in the Port of Stockton in October 2024. Other mussel species within the genus *Limnoperna* have the potential to be inadvertently introduced to California and are highly likely to have similar negative impacts as golden mussel. Therefore, the proposed regulations add the entire genus to the restricted list as a critical preventative measure.

The other mussel species proposed to be added (*Sinanodonta* and *Xenostrobus* genera) are either known serious threats to California's ecosystems or present the potential to be inadvertently introduced to California, and are also expected to have negative impacts. Adding

the recommended genera will help prevent new introductions and translocations of species to waterbodies of the state and beyond.

The proposed regulation also includes green crab, an invasive non-native marine and estuarine species. Green crab was first detected in California in 1989 in south San Francisco Bay and has since spread and has been identified in many locations including, but not limited to, San Francisco Bay and Bay Delta, Elkhorn Slough, Bolinas Lagoon, Bodega Bay, Tomales Bay, and Humboldt Bay. (The staff summary for the August 13-14, 2025 meeting mistakenly referred to green crab having spread throughout the Sacramento-San Joaquin River Delta and intended to refer to the San Francisco Bay and Bay Delta. A corrected staff summary is provided in Exhibit 2.)

See exhibits 1, 2 and 4 for more detailed background information.

Significant Public Comments

The League to Save Lake Tahoe and Tahoe Regional Planning Agency support the proposed regulations. (Exhibit 9)

Recommendation

Commission staff: Under a motion to approve the consent calendar, approve the proposed regulatory amendments as recommended by the Department.

Department: Approve the proposed amendments to the regulations as described in the initial statement of reasons and identified in the proposed regulatory language.

Exhibits

1. Staff summary for Agenda Item 16, December 11-12, 2024 Commission meeting (*for background purposes only*)
2. Corrected staff summary for Agenda Item 12, August 13-14, 2025 Commission meeting (*for background purposes only*)
3. Department memo, received June 30, 2025
4. Initial statement of reasons, dated July 11, 2025
5. Proposed regulatory language
6. Economic and fiscal impact statement (STD 399)
7. Department email, received September 15, 2025
8. Department presentation from August 13-14 Commission meeting.
9. Letter from Julie W, Regan, Executive Director, Tahoe Regional Planning Agency, dated August 13, 2025

Motion

Moved by _____ and seconded by _____ that the Commission approves the staff recommendations for items 3 through 9 on the consent calendar.

Staff Summary for December 11-12, 2024
For Background Purposes Only

16. Golden Mussel Emergency Regulation

Today's Item **Information ☐** **Action ☒**

Discuss and consider taking emergency action to add golden mussel *(Limnoperna fortunei*) to the list of animals restricted from live importation, transportation and possession.

Summary of Previous/Future Actions

- **Today's adoption hearing** **December 11-12, 2024**

Background

On October 17, 2024, golden mussel, an invasive, freshwater bivalve native to rivers and creeks of China and Southeast Asia, was discovered in the Port of Stockton and soon after at additional sites in the Sacramento-San Joaquin Delta (Delta). The presence of the species poses a significant immediate threat to the ecological health of the Delta and all waters of the state, water conveyance systems, infrastructure, and water quality; its arrival in California is a state, national, and international concern, representing the first confirmed detection in North America. Immediate steps are necessary to stop the spread of golden mussel to prevent the translocation of this non-native, invasive species to other waterbodies in the state and beyond.

Golden mussels can tolerate a wider range of environmental conditions than the invasive quagga and zebra (dreissenid) mussels, including less calcium requirements and higher tolerances for salinity and water temperatures. Nearly all waters of California are conducive to golden mussel establishment. Without containment, golden mussels are likely to spread overland on trailered vessels and equipment to other fresh and brackish waterbodies throughout California, to other ports and inland waters of North America, and potentially abroad.

As ecosystem engineers, golden mussels can permanently change ecosystem function. Where golden mussels establish, they create large encrustations of reef-like structures in a stream or river. The increase in organic matter shifts varied microhabitats and their diversity to monocultures of species, slowly eliminating aquatic species diversity. In waterways where golden mussels are present, heavy encrustations of golden mussels block municipal and industrial water intakes, requiring ongoing removal; harm native species in the ecosystem; facilitate aquatic weed growth; and diminish water quality. Spread of golden mussels out of the Delta into fresh and brackish waters would cause infrastructure damage across the state and could threaten water delivery and electric power delivery from hydroelectric operations.

The proposed emergency regulation will add golden mussel to the list of restricted animals, which will prohibit importation, transportation, and possession of live golden mussels. Adding golden mussels to the list will reduce the potential for people to introduce and move golden mussels to other waters of the state and prevent damage to native wildlife and their habitats, protect agricultural interests of the state, and protect public health and safety.

Staff Summary for December 11-12, 2024
For Background Purposes Only

As required by Section 2118 of the California Fish and Game Code, the California Department of Food and Agriculture has been notified and concurs with the proposed action to add golden mussel to the list of restricted animals (Exhibit 7).

A notice of proposed emergency action was distributed December 4, 2024 in order to facilitate filing the rulemaking with the Office of Administrative Law as quickly as possible should the Commission adopt the regulation today. Other pertinent documents are available in exhibits 1 through 6 and Exhibit 8.

Significant Public Comments (N/A)

Recommendation

Commission staff: Find that an emergency exists, find that the project is exempt from the California Environmental Quality Act, and adopt the proposed emergency regulation adding golden mussel to the list of restricted animals as proposed in Exhibit 3 and discussed today.

Department: Adopt the regulation as proposed in Exhibit 3.

Exhibits

1. Department memo transmitting draft emergency statement, received November 26, 2024
2. Draft emergency statement and informative digest
3. Draft proposed regulatory language
4. Draft economic and fiscal impact statement (STD. 399)
5. Department news release, dated October 31, 2024
6. Department presentation
7. California Department of Food and Agriculture concurrence email, dated November 14, 2024
8. Department memo and draft notice of exemption, received November 26, 2024

Motion

Moved by _____ and seconded by _____ that the Commission finds, pursuant to Section 399 of the California Fish and Game Code, that adopting the proposed emergency regulation is necessary for the immediate conservation, preservation, and protection of birds, mammals, fish, amphibians, or reptiles, including, but not limited to, their nests or eggs and for the immediate preservation of the public peace, health and safety, or general welfare.

The Commission further determines that this project is exempt from the California Environmental Quality Act as an action necessary to protect a natural resource and the environment pursuant to the guidelines in California Code of Regulations, Title 14, sections 15307 and 15308.

The Commission further determines, pursuant to Section 11346.1 of the California Government Code, that an emergency situation exists and finds the proposed regulation is necessary to address the emergency.

Therefore, the Commission adopts the emergency regulation to amend Section 671, as discussed today.

Staff Summary for August 13-14, 2025
(*For Background Purposes Only*)
Corrected

12. Invasive Non-Native Mussels (Including Golden, Pond, Axe-Head Mussels) and Green Crab

Today's Item **Information ☐** **Action ☒**

Consider authorizing publication of notice of intent to amend regulations adding invasive non-native mussels of the *Limnoperna* (including golden mussel), *Sinanodonta* (pond mussels) and *Xenostrobus* (axe-head mussels) genera, and green crab (*Carcinus maenas*), to the list of live animals restricted from importation, transportation and possession.

Summary of Previous/Future Actions

- Adopted *emergency regulation* to add golden mussel to the list of restricted animals — December 11-12, 2024
- Adopted 90-day extension of *emergency regulation* to retain golden mussel on the list of restricted animals — April 16-17, 2025
- Adopted second 90-day extension of *emergency regulation* to retain golden mussel on the list of restricted animals — June 11-12, 2025
- **Today's notice hearing for *regular rulemaking*** — **August 13-14, 2025**
- Adoption hearing for *regular rulemaking* — October 8-9, 2025

Background

Current regulations list restricted species that are unlawful to import, transport, or possess without a permit issued by the Department.

The draft proposed regulations expand the list of restricted species to include green crab and the genera *Limnoperna (including golden mussel)*, *Sinanodonta* and *Xenostrobus*. The amendments aim to prevent new introductions of species within the *Limnoperna*, *Sinanodonta*, and *Xenostrobus* genera into California waterways and prevent the spread of green crab, *Limnoperna,* and *Xenostrobus* to other state waterbodies. These measures are intended to protect native wildlife, agricultural interests, and public health and safety.

This action is primarily driven by the discovery of golden mussel (*L. fortunei*), an invasive freshwater bivalve native to Asia. On October 17, 2024, California Department of Water Resources staff discovered golden mussels in the Port of Stockton during routine operations. Golden mussel is known to be established outside of its native range in several countries outside of the United States. Due to the significant threat it poses to the ecological health of the Sacramento-San Joaquin River Delta and other waters of the state, water conveyance systems, infrastructure, and native aquatic species diversity, in December 2024 the Commission took emergency action to added "*Limnoperna fortune* (golden mussel)" to the list of restricted species. The emergency regulations were extended in April and June 2025 and are set to expire in mid-December 2025. If ultimately approved, this regular rulemaking will add golden mussel to the list of restricted species without expiration.

Staff Summary for August 13-14, 2025
(*For Background Purposes Only*)
Corrected

Beyond the immediate threat of golden mussel, other mussel species within the genus *Limnoperna* have the potential to be inadvertently introduced to California and are highly likely to have similar negative impacts as golden mussel. Therefore, adding the entire genus to the restricted list is a critical preventative measure.

The other mussel species proposed to be added (*Sinanodonta* and *Xenostrobus* genera) are either known serious threats to California's ecosystems or present the potential to be inadvertently introduced to California, also expected to have negative impacts. Adding the recommended genera will help prevent new introductions of species to waterbodies of the state and the translocation to other waterbodies in the state and beyond.

The draft proposed regulation also includes green crab, an invasive non-native marine and estuarine species. The addition of green crab originated from a 2017 regulation change petition (Petition #2017-006), which the Commission granted in 2018 based on Department recommendation and rationale (Exhibit 2). Implementation of this petition was held until it could be bundled with other changes to the regulation section. Green crab was first detected in California in 1989 in south San Francisco Bay, and has since spread throughout the ~~Sacramento-San Joaquin River Delta~~ San Francisco Bay and Bay Delta to bays and estuaries in central and northern California. Adding green crab to the restricted species list is an important step to mitigate the risk of it expanding further, which could cause extensive damage to fisheries, aquaculture, native fisheries, and sensitive habitats.

See exhibits 1 and 4 for more detailed background information. Today the Department will present an overview of the draft proposed amendments to the restricted species list (Exhibit 7).

Significant Public Comments (N/A)

Recommendation

Commission staff: Authorize staff to publish notice of intent to amend the regulations, as recommended by the Department.

Department: Authorize staff to publish notice of intent to amend regulations related to live animals restricted from importation, transportation and possession as described in exhibits 4 and 5.

Exhibits

1. Staff summary for Agenda Item 16, December 11-12, 2024 Commission meeting (*for background purposes only*)
2. Department memo regarding Petition 2017-006, received March 20, 2018 (*for background purposes only)*
3. Department memo, received June 30, 2025
4. Draft initial statement of reasons, dated July 11, 2025
5. Draft proposed regulatory language
6. Draft economic and fiscal impact statement (STD 399)
7. Department presentation

Staff Summary for August 13-14, 2025
(*For Background Purposes Only*)
Corrected

Motion

Moved by _____ and seconded by _____ that the Commission authorizes publication of a notice of its intent to amend Section 671 regarding live animals restricted from importation, transportation and possession.

State of California
Department of Fish and Wildlife

M e m o r a n d u m

Received June 30, 2025
Original signed copy on file

Date: June 20, 2025

To: Melissa Miller-Henson
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director

Subject: **Item for August 13-14, 2025, Fish and Game Commission Meeting: Submittal of Initial Statement of Reasons and Regulatory Documents for the Amendment of Section 671, Title 14, California Code of Regulations, Re: Addition of Green Crab and the Limnoperna, Sinanodonta and Xenostrobus Genera to the List of Live Animals Restricted from Importation, Transportation and Possession**

Please find attached the Initial Statement of Reasons (for a Certificate of Compliance) to amend Section 671, of Title 14, California Code of Regulations (CCR).

Current regulations in Section 671 contain the list of restricted species that are unlawful for any person to import, transport, or possess except as authorized in a permit issued by the Department. Golden mussel (*Limnoperna fortunei*) was added to the list of restricted animals in December 2024 (Office of Administrative Law File Number 2024-1213-03E).

The proposed changes will add the green crab (*Carcinus maenas*) an invasive, non-native crustacean species resulting from a 2018 Commission petition, and the *Limnoperna*, *Sinanodonta and Xenostrobus* genera which are invasive, non-native bivalve species, to the list of restricted animals consistent with California Fish and Game Code sections 2118 and 2120.

If you have any questions or need additional information, please contact Jay Rowan, Chief, Fisheries Branch at fisheries@wildlife.ca.gov. The Department point of contact for this emergency regulation is Environmental Program Manager, Martha Volkoff. She can be reached at Invasives@wildlife.ca.gov.

ec: Chad Dibble, Deputy Director
Wildlife and Fisheries Division

Jay Rowan, Branch Chief
Fisheries Branch
Wildlife and Fisheries Division

Martha Volkoff, Env. Program Manager
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Wildlife and Fisheries Division

Robert Pelzman, Assistant Chief
Law Enforcement Division

Megan Cisneros, Lieutenant
Law Enforcement Division

Kimberley Chow, Attorney
Office of General Counsel

Ona Alminas, Env. Program Manager
Regulations Unit
Wildlife and Fisheries Division

Emily McKim, Regulatory Scientist
Regulations Unit
Wildlife and Fisheries Division

David Thesell, Deputy Executive Director
Fish and Game Commission

Sherrie Fonbuena, Analyst
Fish and Game Commission

State of California
Fish and Game Commission
Initial Statement of Reasons for Regulatory Action

Amend Section 671, Title 14, California Code of Regulations
Re: Invasive Non-native Mussels (including golden, pond and axe-head mussels) and Green Crab

I. Date of Initial Statement of Reasons: July 11, 2025

II. Dates and Locations of Schedule Hearings

(a) Notice Hearing:

Date: August 13-14, 2025 Location: Sacramento, CA

(b) Discussion/ Adoption Hearing:

Date: October 8-9, 2025 Location: Sacramento, CA

III. Description of Regulatory Action

(a) Statement of Specific Purpose of Regulatory Change and Factual Basis for Determining that Regulation Change is Reasonably Necessary

Unless otherwise specified, all section references in this document are to Title 14 of the California Code of Regulations, Commission refers to the California Fish and Game Commission, and Department refers to the California Department of Fish and Wildlife.

Current regulations in Section 671 contain the list of restricted species that are unlawful for any person to import, transport, or possess except as authorized in a permit issued by the Department. Golden mussel (*Limnoperna fortunei*) was added to the list of restricted animals in via emergency action in December 2024 (Office of Administrative Law File Number 2024-1213-03E).

The proposed changes will add the green crab (*Carcinus maenas*), an invasive, non-native crustacean species, and the *Limnoperna*, *Sinanodonta and Xenostrobus* genera which are invasive, non-native bivalve species, to the list of restricted animals consistent with California Fish and Game Code sections 2118 and 2120.

Background

Green Crab (C. maenas)

The green crab (*C. maenas*), also known as the European green crab, native to the northeast Atlantic Ocean and northern Africa, is an invasive non-native species in California. Green crabs are up to 4 inches in length across the carapace and inhabit a variety of marine and estuarine habitats, with the exception of very high velocity outer coast locations. Green crab has a generalist diet that includes other crustaceans, marine worms, bivalves, and other mollusks.

Green crab first arrived in North America in the early 1800s within ship ballasts and/or attached to ship hulls, and was first detected in California in 1989 in the southern San Francisco Bay. It is suspected that the green crab arrived in seaweed-wrapped live-bait shipments. Since then, green crab has spread throughout California and has been identified in many locations including, but not limited to, San Francisco Bay and Bay Delta, Elkhorn Slough, Bolinas Lagoon, Bodega Bay, Tomales Bay, and Humboldt Bay. Green crab has a relatively long larval duration period (up to 80 days) floating in ocean currents which supports high larval dispersal that could potentially be supporting spread to other areas. Other human-mediated activities such as ballast water discharge and hull fouling may also be factors in spreading green crab.

On July 7, 2017, the Commission received a petition for regulatory change (Petition 2017-006) from Mr. Joshua Russo, President of the Watermen's Alliance, requesting that regulations be adopted to list green crab as an invasive aquatic species. The Department evaluated the petition and provided a recommendation to the Commission to grant the petition for listing due to the following reasons:

- Green crab inhabits most types of marine and estuarine habitats in northern and central California which would suggest there is potential for further population expansion.
- Green crab has caused impacts to bivalve aquaculture, native fisheries, and sensitive habitat in other established populations outside of its native range.
- There is concern that green crab can continue to expand beyond currently established populations in California and cause extensive damage to recreational and commercial fishery resources.
- Washington, Oregon, northeastern states, and Canadian Provinces on the east and west coasts have identified green crab as an aquatic invasive species through listing as a restricted species or implementing various control measures.

At its April 2018 meeting, the Commission agreed with the Department's findings and granted the petition for consideration in a future rulemaking, which would be addressed as part of a future rulemaking package to amend Section 671, allowing for regulatory efficiency by combining it with other necessary changes. Although green crab is fished commercially in its native range, a commercial fishery does not exist in California. Live green crab has been documented (once, in Long Beach) for sale in a California fish market, however this sale appears to be opportunistic and incidental to other crab fisheries. There is anecdotal evidence that some anglers may use recreationally caught green crab as bait. This practice may be occurring incidental to other target recreational fisheries for crab, where the distribution of the target species, for example Dungeness crab, overlaps with green crab. The proposed regulations would prohibit anglers from possessing live green crab. Under the proposed regulation commercial sale of domestically caught or imported live green crab would be prohibited.

Golden Mussel (genus Limnoperna)

On October 17, 2024, golden mussel, an invasive, freshwater bivalve native to rivers and creeks of China and Southeast Asia, was discovered in the Port of Stockton by California

Department of Water Resources (DWR) staff while conducting routine operations. This was the first known occurrence of this highly invasive species in North America. Shortly after, golden mussel was detected at additional sites in the Sacramento-San Joaquin Delta (Delta). The presence of the species poses a significant immediate threat to the ecological health of the Delta and all waters of the state, water conveyance systems, infrastructure, and water quality; its arrival in California is a state, national, and international concern. Without actions to prevent further spread, golden mussel is also likely to spread overland on trailered watercraft and equipment out of the Delta and to nearby and distant fresh and brackish waters, including rivers, lakes, and reservoirs within California and the rest of North America.

At its December 11, 2024 meeting, the Commission approved an emergency rulemaking to add golden mussel (*Limnoperna fortunei*) to the list of restricted animals in Section 671 (Office of Administrative Law File Number 2024-1213-03E). The existing emergency regulations will expire in December 2025 following two 90-day extensions of the emergency regulations in April 2024 (extension 1, Office of Administrative Law File Number 2025-0606-03EE) and June 2025 (extension 2). The proposed rulemaking will serve as the certificate of compliance for the addition of golden mussel to the list of restricted animals.

Golden mussel is known to be established outside of its native range in Hong Kong, Japan, and Taiwan, as well as in Brazil, Uruguay, Paraguay, and Argentina. The initial introductions to these countries and territories were likely the result of ships with biofouling on the hulls and/or through ballast water release. Impacts in these invaded regions include heavy encrustations of golden mussels forming dense reef-like structures that block municipal and industrial water supplies, agricultural irrigation, and power plant operations, necessitating ongoing biofouling removal. In most cases, the invaded range has expanded upstream from the point of introduction, and inland from ports through local, human-mediated pathways. Within the invaded range, significant impacts resulting from the dense colonization of golden mussels on hard surfaces are widely documented.

As ecosystem engineers, golden mussels can permanently change ecosystem function. As large encrustations of reef-like structures grow in a stream or river, the increase in organic matter shifts varied microhabitats and their diversity to monocultures of species, slowly eliminating aquatic species diversity (Mouthino, 2021).

Golden mussel has a similar appearance, biology, and impact as quagga and zebra (genus *Dreissena,* dreissenid) mussels. Golden mussels are small, typically under 1.5 inches in length with shell color that is light golden to darker yellowish-brown to brown color. They firmly attach to hard to semi-hard surfaces. Adult golden mussels release eggs and sperm into the water column where fertilization occurs. Fertilized eggs develop into planktonic larvae that remain suspended in the water column as they develop. Larvae are microscopic and by themselves cannot swim upstream but can be carried by flowing water and human-mediated pathways such as water within watercraft. Once a suitable substrate is found, juvenile mussels settle and attach themselves to the substrate by strong fibers called byssal threads, and develop into adults. Golden mussels can grow in dense colonies of hundreds of thousands of mussels per square meter.

Golden mussel can tolerate a wider range of environmental conditions than the invasive dreissenid mussels including less calcium, higher salinity, and warmer water temperatures. Nearly all waters of California are conducive to golden mussel establishment.

Golden mussel is likely to spread throughout the interconnected Delta, upstream into Delta tributaries, as far west as Suisun Bay, and southward via the State Water Project and Central Valley Project that draw water from the Delta. Additional discoveries of golden mussel have occurred throughout the Delta and interconnected waters, including the lower reach of the San Joaquin River (San Joaquin County), and at several points in the California Aqueduct including, from north-to-south, Bethany Reservoir (Alameda County), O'Neill Forebay (Merced County), Dos Amigos Pumping Plant (Merced County), Pleasant Valley Pumping Plant (Fresno County), Las Perillas Pumping Plant on the Coastal Branch Aqueduct (Kings County), and Check 24 (Kings County).

Without containment, golden mussel is likely to spread overland on trailered vessels and equipment to other fresh and brackish waterbodies throughout California, and to other ports and inland waters of North America, and potentially abroad.

In response to the discovery of golden mussel, the Department, in partnership with other agencies working in the Delta, began delineating the range of golden mussel in the Delta and throughout the state (Figure 1). Shortly thereafter, the Department's executive leadership convened an interagency Golden Mussel Task Force (Task Force), comprised of a steering committee with members representing the Department, DWR, State Parks-Division of Boating and Waterways, State Water Resources Control Board, California State Lands Commission, California Department of Food and Agriculture, U.S. Bureau of Reclamation, and U.S. Fish and Wildlife Service. The Task Force also formed eight task-oriented teams of staff from these same agencies, and others, to implement immediate monitoring and outreach efforts, and develop and inform the content of a response framework.

On April 16, 2025 the Task Force announced the completion of the Golden Mussel Response Framework (State of California, 2025) (Response Framework). The Response Framework provides the state and partners with a coordinated strategy for moving forward. The scope of recommendations includes containment within waters where golden mussels have been detected, prevention of introductions at uninfested waters, evaluation of existing authorities and gaps, existing funding opportunities and needs, and an approach to partner and public engagement.

In addition, the Department announced a one-time $1 million grant funding opportunity for nonprofit organizations, public agencies, and Tribal governments that own or operate boating facilities. The intention of the grant is to support one-time start-up costs for efforts to prevent the overland spread of invasive mussels from waters where they have been detected and prevent the introduction of invasive mussels to waters of California where they have not been detected.

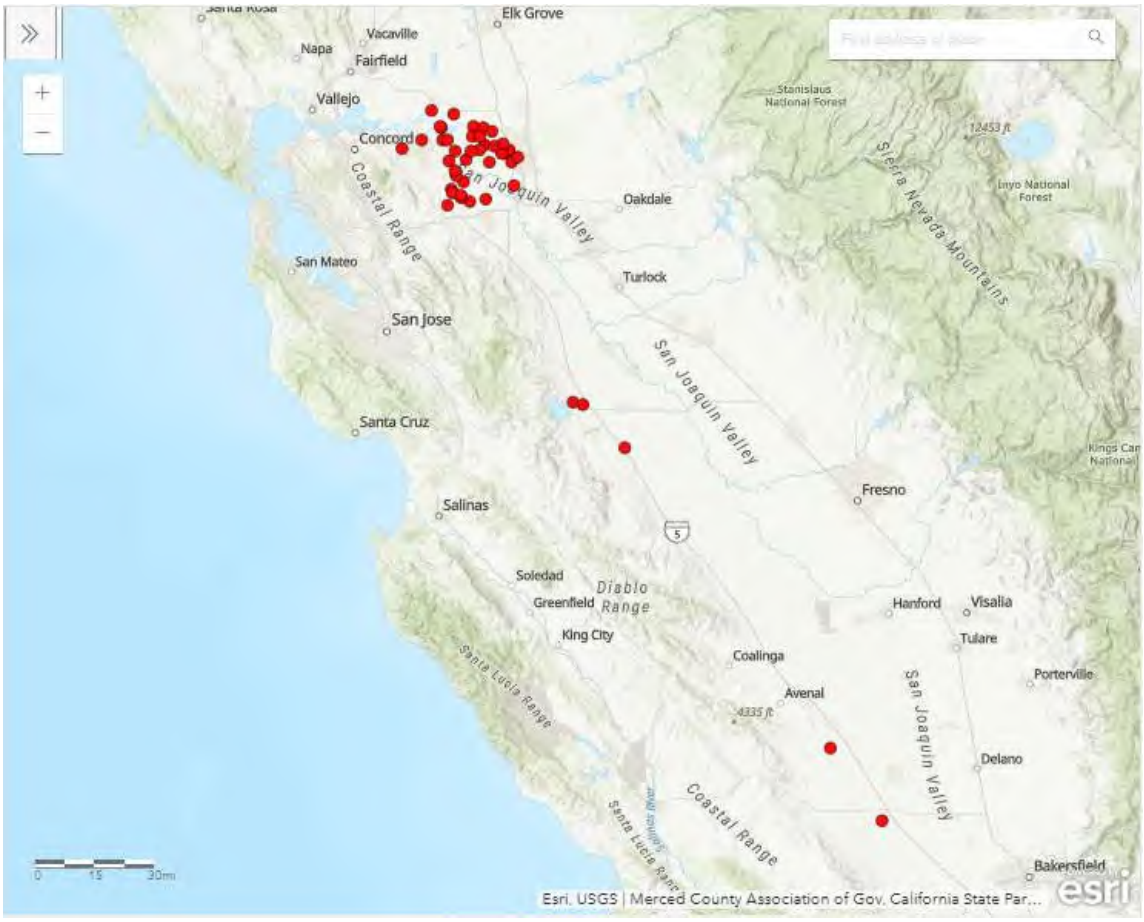
Beyond the immediate threat of golden mussel, the other five species of mussels within the genus *Limnoperna* have the potential to be inadvertently introduced to California, and are highly likely to have similar negative impacts to California as golden mussel. Other species

within the genus *Limnoperna* include *L. siamensis, L. ngocngai, L. bogani, L. sambasensis,* and *L. taprobanensis. Limnoperna* mussels are native to Asia, primarily Southeast Asia. Most *Limnoperna* species can be found in freshwater to estuarine habitats, although it is hypothesized that *L. taprobanensis* is a marine species. *Limnoperna* mussel species are small and range in color from olive-green to reddish-brown. They produce byssal threads which enable them to attach to surfaces.

Outside of golden mussel, there are few records of invasions outside of their native range by other species of *Limnoperna;* however, available literature indicates they may have similar biology and impacts as golden mussels. For example, *L. siamensis* was found to be biofouling in dams where it is native and can occur in large colonies. They can also outcompete fish by filter feeding phytoplankton and zooplankton out of the water column.

Currently there are no federal prohibitions for possessing or moving species within the genus *Limnoperna*; however, the U.S. Fish and Wildlife Service is currently proposing the addition of the genus to the list of injurious wildlife (Lacey Act; United States Code, Title 18, Section 42; Code of Federal Regulations, Title 50, Chapter 1, Subchapter B, Part 16). It is unlikely that any person is intentionally in possession of golden mussel (or other species of *Limnoperna*), as they are not known to be a species for human consumption, for aquaculture, or in the aquarium trade. In the event someone were to be in possession of golden mussel, intentionally or unintentionally, those mussels should be euthanized based on the currently effective emergency regulation. Pursuant to Section 671.1, golden mussels could be possessed under a permit issued by the Department for purposes as defined in the regulations, or through other existing Department permitting processes.

Figure 1. Golden mussel detections as of May 27, 2025 (map updated at https://wildlife.ca.gov/Conservation/Invasives/Species/Golden-Mussel#map). Red dots indicate detections.



Pond Mussels (genus Sinanodonta)

Pond mussels (*Sinanodonta*), also known as Asian pond mussels, are freshwater unionid bivalves with 26 species that are fast-growing and can reach high densities. Three species of *Sinanodonta* that have been documented to be invasive outside of their native ranges include *S. woodiana, S. lauta,* and *S. pacifica.* Species within *Sinanodonta* are difficult to morphologically identify, which has led to extensive misidentification of species. Additionally, the molecular taxonomy within the genus is still being resolved.

In 2010, *S. woodiana* was detected for the first time in the United States within aquaculture ponds in Franklin Township, New Jersey, following an eradication effort for bighead carp. Pond mussels have not been detected in California, or any other U.S. state with the exception of New Jersey. In 2019, an eradication of the pond mussel was attempted in the New Jersey ponds, and 2020 water samples collected in two of the ponds resulted in positive environmental DNA (eDNA) detections, suggesting that the mussels were not successfully eradicated. In 2021 and 2022, water samples taken downstream of the ponds at the confluence of the Raritan River and Millstone River resulted in positive eDNA detections indicating a potential population in the Raritan watershed. A subsequent eradication treatment was performed at the aquaculture ponds in 2024, and SCUBA and

snorkel surveys were conducted in the Raritan watershed. Pond mussels were not detected in these surveys.

Native to Eastern Asia including China and eastern Russia, Japan and Korea, pond mussels are known to be established outside of their native ranges and have spread rapidly to other countries including Kazakhstan, Uzbekistan, Iran, South Korea, Myanmar, Indonesia, Malaysia, Philippines, Borneo, Dominican Republic, Costa Rica, Spain, France, Italy, Germany, Austria, Slovakia, Hungary, the Czech Republic, Poland, Croatia, Serbia, Romania, Moldova, Belgium, Ukraine and Sweden.

Pond mussels reaching up to 12 inches in length have been reported. They are long lived with a life span of approximately 12 years. They can be found in lakes, oxbows, ponds, streams, canals, and rivers. They prefer benthic habitats with fine substrates such as silt, fine sand, and organic material. They are adaptable and can tolerate changing environmental conditions, and cold water temperatures, and have a high tolerance to high levels of nutrients.

Sinanodonta are dioecious, having separate male and female sexes, although a small percentage (2.3 percent) have been recorded to be both sexes and capable of self-reproduction. Characteristic of unionid mussels, the females produce free floating, microscopic, parasitic larvae called glochidia that must attach and encyst into tissue of a freshwater host fish to complete their development and life cycle. The glochidia attach to fish for about 6-14 days before detaching. Known native fish hosts of the mussel include bighead carp, black carp, common carp, grass carp, and silver carp. Of these native host species, common carp are widespread throughout California, and triploid grass carp are limited, but present in southern California. Beyond non-native carp, it is currently unknown which other native and non-native fish species in California could serve as a host for *Sinanodonta*.

Pond mussels pose a threat to California's freshwater ecosystem. They can alter water quality through their filtration, impact sediment stability and movement, and significantly affect aerobic and anaerobic metabolism and nutrient cycling.

Pond mussels also pose a threat to California's native unionid mussels and act as a reproductive competitor and ecosystem engineer. Pond mussels are known to host a range of parasites in their invasive range, potentially including pathogens that present a risk to native bivalves. For example, the presence of inflammatory capsules and infiltrates linked to bacterial infection has been observed in Italian *S. woodiana* populations.

Unlike most unionid species, the glochidia of the pond mussel are generalist and can successfully develop on fish species they would otherwise not encounter in their native range. Due to their lack of host specificity, pond mussels can outcompete native unionids and decrease the quality of hosts available for native mussel species. Once attached, the pond mussel glochidia can induce an immune response in host fish towards native unionid glochidia, decreasing the developmental success of native glochidia. Pond mussels also have a higher rate of host infection by its glochidia and higher fecundity than native unionids. In addition, the shells of the pond mussel can accumulate on the benthic floor and in the sediment, forming a shell layer which reduces the water current velocity near the

bottom, limit light access through the water column, alter benthic microhabitats, and can create physical barriers limiting movement and burrowing of native unionids.

Pond mussels pose a threat to the health of California's fish species. High densities of pond mussel (*S. woodiana*) glochidia attachments to fish are able to decrease fish body weight and alter their physiology. This could negatively affect the growth and physiology of fish stocks and natural fish communities in rivers and lakes, especially for juvenile fish that are readily parasitized by the pond mussel. Furthermore, fish that may have once been resistant to the infection of their native unionid glochidia may become vulnerable to the parasitism of the pond mussel glochidia.

Because of its parasitic glochidia life history, the most common pathway of pond mussel introduction and spread is by stocking and export of fish infested with glochidia. Migrating fish infected with glochidia can further act as a vector of spread and aid in the dispersal of the mussel. Grass carp and silver carp infested with pond mussel glochidia were likely the source of introduction into Europe in 1983. Similarly, bighead carp, grass carp and common carp found in the New Jersey aquaculture ponds were likely the introductory source of the pond mussel.

Within Asia, pond mussels can be used as a food source. They have also been considered a protein source in fish feed. In the pet trade, *S. lauta* is listed on the Aquatic Arts website as an item for sale and marketed for its ability to filter feed and clarify aquarium water.

Based on the establishment of *S. woodiana* in North America, potential vectors of introduction, and anticipated impacts to native species and the environment, prohibiting all species in the genus *Sinanodonta* is warranted. There are currently no federal laws related to *Sinanodonta*; however, the U.S. Fish and Wildlife Service is currently proposing the listing of the genus to the list of injurious wildlife (Lacey Act; United States Code, Title 18, Section 42; Code of Federal Regulations, Title 50, Chapter 1, Subchapter B, Part 16.)

Axe-Head Mussel (genus Xenostrobus)

Axe-head mussel (*Xenostrobus securis*), a small, non-native, invasive, biofouling brackish water bivalve, was discovered on December 6, 2024, just north of the Port of Long Beach and Port of Los Angeles in the lower reaches of Dominguez Channel, Los Angeles County. This detection was made by Department staff conducting early detection monitoring for invasive mussels. This is the first known occurrence of the invasive species in North America. Shortly after, axe-head mussels were detected in high densities at additional sites (Figure 2) including the lower reaches of San Gabriel River (February 21, 2025) and Los Angeles River (February 27, 2025).

Figure 2. *X. securis* sightings in Dominguez Channel (DC), Los Angeles River (LAR), and San Gabriel River (SGR) May 16, 2025. Green pushpins indicate detection.

On March 23, 2025, a watercraft traveling into California from Lake Havasu, Arizona (a lake known to be infested with quagga mussels), was quarantined at the California Border Protection Station in Vidal because adult mussels were found attached to the hull. The mussels were sent to the California Department of Food and Agriculture laboratory and genetically identified as axe-head mussel. From information provided by the watercraft owner, Department staff learned the watercraft had recently been purchased from a parking lot in Newport Dunes Marina, Newport Bay (Orange County), where it was suspected to have been moored. Notably, this is the first known occurrence of overland transport of the axe-head mussel by a trailered vessel to another waterbody and moved across state lines.

Axe-head mussel is one of eight extant species of the genus *Xenostrobus*. These species include *X. pulex* and *X. securis* from Australia and New Zealand, *X. inconstans* from Australia, *X. balani*, *X. mangle* and *X. sambasensis* from Southeast Asia, *X. hepatica* from Fiji, and *X. atratus* from Japan, Korea, and China. All mussels within the genus *Xenostrobus* are small (not exceeding 2 inches) and occupy estuarine or marine habitats. Axe-head mussels (*X. securis*) have been introduced and established outside of their native ranges in Japan, China, Korea, Hong Kong, Italy, France, and Spain.

The confirmed presence of axe-head mussel poses an immediate environmental and economic threat to California and other coastal states and countries because it forms dense colonies and attaches to hard and soft substrates. The axe-head mussel is an ecosystem engineer and can physically change the invaded habitat. It covers soft sediments, negatively impacts native animals living in the sediment, and acts as habitat for other fouling organisms to attach to. It alters zonation patterns within the intertidal and outcompetes native organisms. It has the potential to foul submerged structures, pipelines,

ropes, and watercraft hulls. It also has the potential to negatively impact oyster aquaculture by reducing growth and causing oyster mortality.

Axe-head mussels can reproduce when they reach lengths of under one half inch and generally within their first year. Axe-head mussel has an almost continuous breeding season where it has invaded, and a planktonic larval phase. Adults can live up to two years. Like other biofouling mussels, axe-head mussels form byssal threads that enable them to attach to various types of substrates. Axe-head mussel has a wide salinity tolerance and occurs predominantly in the upper reaches of lagoons and estuaries where salinity is generally very low; they require waters with tidal influence.

Globally axe-head mussels were likely introduced by ballast water discharge and biofouling on ships. The unintentional introduction and spread of axe-head mussel in Italy has been attributed to shellfish farming. Without containment, axe-head mussel is likely to spread via watercraft in the marine environment to other estuaries, brackish waters, and ports of California, other U.S. states and territories, and internationally, and overland on trailered vessels and equipment in North America.

Beyond the immediate threat of axe-head mussel, the other seven species of *Xenostrobus* mussels have the potential to be inadvertently introduced to California, and are likely to have similar negative impacts to California as axe-head mussel. No species of *Xenostrobus* are known to be a species for human consumption, or in aquaculture or aquarium trade. There are currently no federal laws related to *Xenostrobus* mussels.

Proposed Regulations

The proposed regulations add green crab, and the *Limnoperna*, *Sinanodonta,* and *Xenostrobus* genera to the list of live animals restricted from importation, transportation and possession:

Section 671. Importation, Transportation and Possession of Live Restricted Animals.

Amend subsection (c)(8) from Class Crustacea to Class Malacostraca.

This change is necessary to update and correct the Class for the species in this subsection. The Class Crustacea has been reclassified by The International Commission on Zoological Nomenclature to a higher level and is now a subphylum of the phylum Arthropoda. For consistency with the existing format of the list, the proposed regulations update the class name in (c)(8) to Class Malacostraca, which is the appropriate class for the restricted species designated in (c)(8)(A) and (B) and the addition of (C) described below.

Add subsection (c)(8)(C) *Carcinus maenas* (green crab) (D).

Adding green crab, which causes harm to native species and the ecosystems they depend on to survive to the list of restricted animals (as outlined in Petition #2017-006) is necessary to protect against the spread of this invasive species in California. Prohibiting importation, transportation, and possession of this species will prevent further introductions and slow the spread within and outside of California.

Amend subsection (c)(10) Class Bivalvia-Bivalves to move “All members of the genus *Dreissena* (zebra and quagga mussels) (D).” under subsection (A).

Moving this category of bivalves to a new subsection is necessary to better organize dreissenid mussels within the section. This is a non-substantive change.

Add subsection (c)(10)(B) All members of the genus *Limnoperna* (golden mussel) (D).

Adding all members of the genus *Limnoperna* (golden mussel), which can cause harm to native species and the ecosystems they depend on to survive, as well as infrastructure, to the list of restricted animals is necessary to protect against the spread of these invasive species in California. Prohibiting importation, transportation, and possession of the species will prevent further introductions and slow the spread within and outside of California.

Add subsection (c)(10)(C) All members of the genus *Sinanodonta* (pond mussel, Asian pond mussel) (D).

Adding all members of the genus *Sinanodonta* (pond mussel), which can cause harm to native species and the ecosystems they depend on to survive to the list of restricted animals is necessary to protect against the spread of these invasive species in California. Prohibiting importation, transportation, and possession of the species will prevent further introductions and slow the spread within and outside of California.

Add subsection (c)(10)(D) All members of the genus *Xenostrobus* (axe-head mussel) (D).

Adding all members of the genus *Xenostrobus* (axe-head mussel), which can cause harm to native species and the ecosystems they depend on to survive, as well as infrastructure, to the list of restricted animals is necessary to protect against the spread of these invasive species in California. Prohibiting importation, transportation, and possession of the species will prevent further introductions and slow the spread within and outside of California.

(b) Goals and Benefits of the Regulation

The California Legislature has declared that some wild animals are a threat to native wildlife or the agricultural interests of the state and that some wild animals are a threat to public health and safety. It is the Legislature’s intention that the importation, transportation and possession of wild animals be regulated to protect the native wildlife and agricultural interests of the state against damage from the existence at large of certain wild animals and to protect the health and safety in this state. The proposed regulations will help to prevent new introductions of species within the *Limnoperna*, *Sinanodonta,* and *Xenostrobus* genera to waterbodies of the state and the translocation of green crab, and extant members of the *Limnoperna* and *Xenostrobus* genera to other waterbodies in the state and beyond, thereby protecting native wildlife, the agricultural interests of the state and public health and safety.

(c) Authority and Reference Sections from Fish and Game Code for Regulation

Authority: Sections 2118 and 2120, Fish and Game Code.

Reference: Sections 1002, 2116, 2118, 2118.2, 2118.4, 2119, 2120, 2122, 2123, 2124, 2125, 2126, 2127, 2150, 2190 and 2271, Fish and Game Code.

(d) Specific Technology or Equipment Required by Regulatory Change:

None.

(e) Identification of Reports or Documents Supporting Regulation Change OR Technical, Theoretical, and/or Empirical Studies, Reports, or Documents Relied Upon

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(f) Documents Providing Background Information

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(g) Public Discussions of Proposed Regulations Prior to Notice Publication

- Fish and Game Commission Meeting, April 2018 with regards to green crab
- Fish and Game Commission Meeting, December 2024 for the original emergency for golden mussel
- Fish and Game Commission Meeting, April 2025 (for golden mussel first 90-day emergency extension)
- Fish and Game Commission Meeting, June 2025 (for golden mussel second 90-day emergency extension)

IV. Description of Reasonable Alternatives to Regulatory Action

(a) Alternatives to Regulation Change

No alternatives were identified by or brought to the attention of Commission staff that would have the same desired regulatory effect.

(b) No Change Alternative

Without the proposed changes in regulations, Green Crab, *Limnoperna genus*, *Sinanodonta genus,* and *Xenostrobus* genus would not be included on the restricted animals list and there would be no regulatory authority to help prevent the introduction and/or translocation of these non-native invasive species to waterbodies in the state and beyond. The proposed changes are sought to protect native wildlife and the agricultural interests of the state and public health and safety.

V. Mitigation Measures Required by Regulatory Action

The proposed regulatory action will have no negative impact on the environment; therefore, no mitigation measures are needed.

VI. Impact of Regulatory Action

The potential for significant statewide adverse economic impacts that might result from the proposed regulatory action has been assessed, and the following initial determinations relative to the required statutory categories have been made:

(a) Significant Statewide Adverse Economic Impact Directly Affecting Businesses, Including the Ability of California Businesses to Compete with Businesses in Other States

The proposed regulations are not expected to impact businesses, as adding a species to the list of restricted animals in Section 671 does not impose any actions that should be taken by businesses to comply, nor does it impose fees or fines upon them. Because these effects are economically neutral, it is not anticipated that any businesses will experience adverse economic impacts that would affect their ability to compete with businesses from other states as a result of these regulations.

(b) Impact on the Creation or Elimination of Jobs Within the State, the Creation of New Businesses or the Elimination of Existing Businesses, or the Expansion of Businesses in California; Benefits of the Regulation to the Health and Welfare of California Residents, Worker Safety, and the State's Environment

The proposed regulations are not expected to impact businesses, as adding a species to the list of restricted animals in Section 671 does not necessitate that any actions should be taken by businesses to comply, nor does it impose fees or fines upon them. Because these effects are economically neutral, it is not anticipated that any businesses will experience adverse economic impacts that would affect the creation or elimination of jobs within the state, create new businesses or eliminate existing businesses, affect the expansion of existing businesses, or benefit worker safety as a result of these regulations. The proposed changes are sought to protect native wildlife and the agricultural interests of the state and public health and safety.

(c) Cost Impacts on a Representative Private Person or Business

The proposed regulations are not expected to create direct cost impacts for businesses or individuals, as adding a species to the list of restricted animals in Section 671 does not necessitate that any actions should be taken by businesses or individuals to comply, nor does it impose fees or fines upon them.

(d) Costs or Savings to State Agencies or Costs/Savings in Federal Funding to the State:

Including the species and genera proposed on the list of restricted animals does not necessarily compel a requirement to act upon state agencies, but rather enables existing programs to include the species in their enforcement actions for detection and prevention. As such, the Commission does not anticipate any direct costs or savings to the Department or other state agencies as a result of this action. There may be future complementary authorities or requirements for managing the species proposed that will come from elsewhere, such as legislation, compelling costs associated with preventing the spread of these invasive species.

(e) Nondiscretionary Costs/Savings to Local Agencies: None.

(f) Programs Mandated on Local Agencies or School Districts: None.

(g) Costs Imposed on Any Local Agency or School District that is Required to be Reimbursed Under Part 7 (commencing with Section 17500) of Division 4, Government Code: None.

(h) Effect on Housing Costs: None.

VII. Economic Impact Assessment

(a) Effects of the Regulation on the Creation or Elimination of Jobs Within the State

The proposed regulations are not expected to impact the creation or elimination of jobs within the state, as adding a species to the list of restricted animals in Section 671 does not necessitate that any actions should be taken by businesses to comply, nor does it impose fees or fines upon them. Because these effects are economically neutral, it is not anticipated that any businesses will need to adjust their workforces in either a positive or negative way as a result of these regulations.

(b) Effects of the Regulation on the Creation of New Businesses or the Elimination of Existing Businesses Within the State

The proposed regulations are not expected to impact businesses, as adding a species to the list of restricted animals in Section 671 does not necessitate that any actions should be taken by businesses to comply, nor does it impose fees or fines upon them. Because these effects are economically neutral, it is not anticipated that any businesses will be created or eliminated as a result of these regulations.

(c) Effects of the Regulation on the Expansion of Businesses Currently Doing Business Within the State

The proposed regulations are not expected to impact businesses, as adding a species to the list of restricted animals in Section 671 does not necessitate that any actions should be taken by businesses to comply, nor does it impose fees or fines upon them. While businesses are required to dispose of the species if found, it is unlikely that they would face a cost burden from disposing of these species from their inventories as they are not widely carried due to a lack of commercial value. Because these effects are economically neutral, the Commission does not anticipate that any businesses will expand or fundamentally change their operations as a result of these regulations.

(d) Benefits of the Regulation to the Health and Welfare of California Residents

The Commission anticipates benefits to the health and welfare of California residents from better protection of the State’s natural resources.

The proposed regulations will help to prevent the introduction and/or translocation of members of the *Limnoperna* (golden mussel), *Sinanodonta* and *Xenostrobus* genera to other waterbodies in the state and beyond, which may help to protect water conveyance and hydroelectric power systems.

(e) Benefits of the Regulation to Worker Safety

The Commission does not anticipate impacts to worker safety.

(f) Benefits of the Regulation to the State's Environment

The California Legislature has declared that some wild animals are a threat to native wildlife or the agricultural interests of the state and that some wild animals are a threat to public health and safety. It is the Legislature's intention that the importation, transportation and possession of wild animals be regulated to protect the native wildlife and agricultural interests of the state against damage from the existence at large of certain wild animals and to protect the health and safety in this state. The proposed regulations will help to prevent the new introductions of species within the *Limnoperna*, *Sinanodonta,* and *Xenostrobus* genera to waterbodies of the state and the translocation of green crab, and members of the *Limnoperna* and *Xenostrobus* genera to other waterbodies in the state and beyond, thereby protecting native wildlife, and the agricultural interests of the state.

(g) Other Benefits of the Regulation: None.

Informative Digest/Policy Statement Overview

Unless otherwise specified, all section references in this document are to Title 14 of the California Code of Regulations (CCR), Commission refers to the California Fish and Game Commission and Department refers to the California Department of Fish and Wildlife.

Current regulations in Section 671 contain the list of restricted species that are unlawful for any person to import, transport, or possess except as authorized in a permit issued by the Department. Under emergency regulatory authority, golden mussel (*Limnoperna fortunei*) was added to the list of restricted animals in December 2024 (Office of Administrative Law File Number 2024-1213-03E).

The proposed changes will add green crab (*Carcinus maenas*), an invasive, non-native crustacean species, and the *Limnoperna*, *Sinanodonta* and *Xenostrobus* genera which are invasive, non-native bivalve species, to the list of restricted animals consistent with California Fish and Game Code sections 2118 and 2120.

Background

Green Crab (C. maenas)

The green crab (*C. maenas*), also known as the European green crab, native to the northeast Atlantic Ocean and northern Africa, is an invasive non-native species in California.

Green crab was first detected in California in 1989 in the southern San Francisco Bay. It is suspected that the green crab arrived in seaweed-wrapped bait shipments from the East Coast of the U.S. Since then, green crab has been identified in many California bays and estuaries including, but not limited to, San Francisco Bay and Bay Delta, Elkhorn Slough, Bolinas Lagoon, Bodega Bay, Tomales Bay, Morro Bay and Humboldt Bay. There is concern that green crab can continue to expand beyond currently established populations in California and cause extensive damage to recreational and commercial fishery resources, aquaculture, native fisheries, and sensitive habitat.

On July 7, 2017, the Commission received a petition for regulatory change (Petition 2017-006) from Mr. Joshua Russo, President of the Watermen's Alliance, requesting that regulations be adopted to list green crab as an invasive aquatic species. The Department evaluated the petition and provided a recommendation to the Commission to grant the petition.

At its April 2018 meeting, the Commission agreed with the Department's recommendation and granted the petition for consideration in a future rulemaking.

Golden Mussel (genus Limnoperna)

On October 17, 2024, golden mussel (*L. fortunei*), an invasive, freshwater bivalve native to rivers and creeks of China and Southeast Asia, was discovered in the Port of Stockton by California Department of Water Resources (DWR) staff while conducting routine operations. This was the first known occurrence of this highly invasive species in North

America. Additional discoveries of golden mussel have occurred throughout the Delta and interconnected waters, including the lower reach of the San Joaquin River (San Joaquin County), and at several points in the California Aqueduct including, from north-to-south, Bethany Reservoir (Alameda County), O'Neill Forebay (Merced County), Dos Amigos Pumping Plant (Merced County), Pleasant Valley Pumping Plant (Fresno County), Las Perillas Pumping Plant on the Coastal Branch Aqueduct (Kings County), and Check 24 (Kings County). Without actions to prevent further spread, golden mussel is also likely to spread overland on trailered watercraft and equipment out of the Delta and to nearby and distant fresh and brackish waters, including rivers, lakes, and reservoirs within California and the rest of North America.

Golden mussel is known to be established outside of its native range in Hong Kong, Japan, Taiwan, Brazil, Uruguay, Paraguay, and Argentina. Impacts in these invaded regions include heavy encrustations of golden mussels forming dense reef-like structures that block municipal and industrial water supplies, agricultural irrigation, and power plant operations, necessitating ongoing biofouling removal. In most cases, the invaded range has expanded upstream from the point of introduction, and inland from ports through local, human-mediated pathways. Within the invaded range, significant impacts resulting from the dense colonization of golden mussels on hard surfaces are widely documented.

At its December 11, 2024 meeting, the Commission approved an emergency rulemaking to add golden mussel (*L. fortunei*) to the list of restricted animals in Section 671 (Office of Administrative Law File Number 2024-1213-03E). The proposed rulemaking will serve as the certificate of compliance for the addition of *L. fortunei* to the list of restricted animals.

Beyond the immediate threat of *L. fortunei*, the other five species within the genus *Limnoperna* mussels have the potential to be inadvertently introduced to California, and likely to have similar negative impacts to California as *L. fortunei*. Other species within the genus *Limnoperna* include *L. siamensis, L. ngocngai, L. bogani, L. sambasensis,* and *L. taprobanensis. Limnoperna* mussels are native to Asia, primarily Southeast Asia. Most *Limnoperna* species can be found in freshwater to estuarine habitats, although it is hypothesized that *L. taprobanensis* is a marine species.

Outside of *L. fortunei*, there are few records of invasions outside of their native ranges by other species of *Limnoperna;* however, available literature indicates they may have similar biology and impacts as *Limnoperna fortunei*.

Pond Mussels (genus Sinanodonta)

Pond mussels (*Sinanodonta*) (also known as Asian pond mussels) are freshwater unionid bivalves of 26 species that are fast-growing and can reach high densities. Species within *Sinanodonta* are difficult to morphologically identify, which has led to extensive misidentification of species. Additionally, the molecular taxonomy within the genus is still being resolved.

Native to Eastern Asia including China and eastern Russia, Japan and Korea, three species of *Sinanodonta* (*S. woodiana, S. lauta,* and *S. pacifica*) have been documented to be invasive outside of their native ranges and have spread rapidly to other countries including Kazakhstan, Uzbekistan, Iran, South Korea, Myanmar, Indonesia, Malaysia,

Philippines, Borneo, Dominican Republic, Costa Rica, Spain, France, Italy, Germany, Austria, Slovakia, Hungary, the Czech Republic, Poland, Croatia, Serbia, Romania, Moldova, Belgium, Ukraine and Sweden.

In 2010, *S. woodiana* was detected for the first time in the United States within aquaculture ponds in Franklin Township, New Jersey. Pond mussel has not been detected in California, or any other U.S. state with the exception of New Jersey.

Based on the establishment of *S. woodiana* in North America, potential vectors of introduction, and anticipated impacts to native species and the environment, prohibiting all species in the genus *Sinanodonta* is warranted.

Axe-Head Mussel (genus Xenostrobus)

Axe-head mussel (*Xenostrobus securis*), a small, non-native, invasive, biofouling brackish water bivalve, was discovered on December 6, 2024, just north of the Port of Long Beach and Port of Los Angeles in the lower reaches of Dominguez Channel, Los Angeles County. This detection was made by Department staff conducting early detection monitoring for invasive mussels. This is the first known occurrence of the invasive species in North America. Shortly after, axe-head mussels were detected in high densities at additional sites including the lower reaches of San Gabriel River (February 21, 2025) and Los Angeles River (February 27, 2025).

Axe-head mussel is one of eight extant species of the genus Xenostrobus. These species include *X. pulex* and *X. securis* from Australia and New Zealand, *X. inconstans* from Australia, *X. balani*, *X. mangle* and *X. sambasensis* from Southeast Asia, *X. hepatica* from Fiji, and *X. atratus* from Japan, Korea, and China. Axe-head mussel (*X. securis*) has been introduced and established outside of its native ranges in Japan, China, Korea, Hong Kong, Italy, France, and Spain.

Globally axe-head mussel was likely introduced by ballast water discharge and biofouling on ships. Without containment, axe-head mussel is likely to spread via watercraft in the marine environment to other estuaries, brackish waters, and ports of California, other U.S. states and territories, and internationally, and overland on trailered vessels and equipment in North America.

Beyond the immediate threat of axe-head mussel, the other seven species of *Xenostrobus* mussels have the potential to be inadvertently introduced to California, and are likely to have similar negative impacts to California as axe-head mussel.

Proposed Changes

The proposed regulations add green crab, and the *Limnoperna*, *Sinanodonta,* and *Xenostrobus* genera to the list of live animals restricted from importation, transportation and possession:

Section 671. Importation, Transportation and Possession of Live Restricted Animals.

Amend subsection (c)(8) from Class Crustacea to Class Malacostraca to update and correct the Class for the species in this subsection. The Class Crustacea has been

reclassified by The International Commission on Zoological Nomenclature to a higher level and is now a subphylum of the phylum Arthropoda.

Add subsection (c)(8)(C) *Carcinus maenas* (green crab) (D).

Adding green crab, which causes harm to native species and the ecosystems they depend on to survive, to the list of restricted animals is necessary to protect against the spread of this invasive species in California. Prohibiting importation, transportation, and possession of this species will prevent further introductions and slow the spread within and outside of California.

Amend subsection (c)(10) Class Bivalvia-Bivalves to move “All members of the genus *Dreissena* (zebra and quagga mussels) (D).” under subsection (A) to allow for the addition of other species under this class.

Add subsection (c)(10)(B) All members of the genus *Limnoperna* (golden mussel) (D).

Adding all members of the genus *Limnoperna* (golden mussel), which can cause harm to native species and the ecosystems they depend on to survive, as well as infrastructure, to the list of restricted animals is necessary to protect against the spread of these invasive species in California. Prohibiting importation, transportation, and possession of the species will prevent further introductions and slow the spread within and outside of California.

Add subsection (c)(10)(C) All members of the genus *Sinanodonta* (pond mussel, Asian pond mussel) (D).

Adding all members of the genus *Sinanodonta* (pond mussel), which can cause harm to native species and the ecosystems they depend on to survive, to the list of restricted animals is necessary to protect against the spread of these invasive species in California. Prohibiting importation, transportation, and possession of the species will prevent further introductions and slow the spread within and outside of California.

Add subsection (c)(10)(D) All members of the genus *Xenostrobus* (axe-head mussel) (D).

Adding all members of the genus *Xenostrobus* (axe-head mussel), which can cause harm to native species and the ecosystems they depend on to survive, as well as infrastructure, to the list of restricted animals is necessary to protect against the spread of these invasive species in California. Prohibiting importation, transportation, and possession of the species will prevent further introductions and slow the spread within and outside of California.

Benefits of the Regulation:

The California Legislature has declared that some wild animals are a threat to native wildlife or the agricultural interests of the state and that some wild animals are a threat to public health and safety. It is the Legislature’s intention that the importation, transportation and possession of wild animals be regulated to protect the native wildlife and agricultural interests of the state against damage from the existence at large of certain wild animals

and to protect the health and safety in this state. The proposed regulations will help to prevent the new introductions of species within the *Limnoperna*, *Sinanodonta,* and *Xenostrobus* genera to waterbodies of the state and the translocation of green crab, and members of the *Limnoperna* and *Xenostrobus* genera to other waterbodies in the state and beyond, thereby protecting native wildlife, the agricultural interests of the state and public health and safety.

Consistency and Compatibility with Existing Regulations

Article IV, Section 20 of the State Constitution specifies that the Legislature may delegate to Commission such powers relating to the protection and propagation of fish and game as the Legislature sees fit. The Legislature has delegated to the Commission the power to regulate the importation, transportation and possession of wild animals to protect the native wildlife, agricultural interests of the state, and the health and safety in this state (Fish and Game Code Section 2118). The Commission has reviewed its own regulations and finds that the proposed regulations are consistent with other regulations in Title 14, CCR, and therefore finds that the proposed regulations are neither inconsistent nor incompatible with existing state regulations. The Commission has searched the California Code of Regulations and finds no other state agency regulations pertaining to species on the list of restricted animals.

Proposed Regulatory Language

Section 671, Title 14 CCR, is amended to read:

§ 671. Importation, Transportation and Possession of Live Restricted Animals.

(a) It shall be unlawful to import, transport, or possess live animals restricted in subsection (c) below except under permit issued by the department. Permits may be issued by the department as specified herein and for purposes designated in Section 671.1 subject to the conditions and restrictions designated by the department. Except for mammals listed in Fish and Game Code Section 3950 or live aquatic animals requiring a permit pursuant to Fish and Game Code Section 2271, no permit is required by this section for any animal being imported, transported, or possessed pursuant to any other permit issued by the department. Cities and counties may also prohibit possession or require a permit for these and other species not requiring a state permit.

(b) The commission has determined the below listed animals are not normally domesticated in this state. Mammals listed to prevent the depletion of wild populations and to provide for animal welfare are termed “welfare animals”, and are designated by the letter “W”. Those species listed because they pose a threat to native wildlife, the agriculture interests of the state or to public health or safety are termed “detrimental animals” and are designated by the letter “D”. The department shall include the list of welfare and detrimental wild animals as part of DFG MANUAL NO. 671 (2/25/92) IMPORTATION, TRANSPORTATION AND POSSESSION OF RESTRICTED SPECIES, to be made available to all permittees and other interested individuals.

(c) Restricted species include:

[...*No changes to subsections (c)(1) through (c)(7*)(G)1...]

(8) Class ~~Crustacea—Crustaceans~~ Malacostraca

(A) All species of Family Cambaridae—Crayfish, etc. (D), except *Procambarus clarkii* and *Orconectes virilis* not restricted.

(B) All species of genus *Eriocheir* (D).

(C) *Carcinus maenas* (green crab also known as European green crab) (D).

(9) Class Gastropoda—Slugs, Snails

(A) *Potamopyrgus antipodarum* (New Zealand mudsnail)(D).

(B) All nonnative species of slugs and land snails (D), except:

1. *Rumina decollata* (decollate snail) in the counties of San Bernardino, Riverside, Imperial, Orange, San Diego, Los Angeles, Ventura, Kern, Fresno, Madera, Tulare and Santa Barbara not restricted with the concurrence of the appropriate county agricultural commissioners.

2. *Helix aspersa (*brown garden snail) not prohibited.

(C) *Pomacea canaliculata* (Channel Apple Snail) (D).

(D) All species of genus *Haliotis* (Abalone) (D), except *Haliotis rufescens* (Red abalone*), Haliotis sorenseni* (White abalone), *Haliotis corrugata* (Pink abalone*), Haliotis fulgens* (Green abalone), *Haliotis cracherodii* (Black abalone), *Haliotis kamtschatkana* (Pinto abalone), *Haliotis walallensis* (Flat abalone) and *Haliotis assimilis* (Threaded abalone) are not restricted.

1. NOTE: Unpermitted nonnative abalone are determined to be detrimental to native populations, therefore the exemptions provided in Fish and Game Code subsection 2271(b) and subsection 236(b) of these regulations are not applicable.

(10) Class Bivalvia-Bivalves

~~All members of the genus *Dreissena* (zebra and quagga mussels) (D).~~

(A) All members of the genus *Dreissena* (zebra and quagga mussels) (D).

(B) All members of the genus *Limnoperna* (golden mussel) (D).

(C) All members of the genus *Sinanodonta* (pond mussel, also known as Asian pond mussel) (D).

(D) All members of the genus *Xenostrobus* (axe-head mussel) (D).

(11) Transgenic Aquatic Animals.

Includes freshwater and marine fishes, invertebrates, amphibians, and reptiles (D).

NOTE: Unpermitted transgenic aquatic animals are determined to be detrimental to native wildlife, therefore the exemption provided for in Fish and Game Code Section 2150(e) is not applicable.

NOTE: Authority cited: Sections 2118 and 2120, Fish and Game Code. Reference: Sections 1002, 2116, 2118, 2118.2, 2118.4, 2119, 2120, 2122, 2123, 2124, 2125, 2126, 2127, 2150, 2190 and 2271, Fish and Game Code.

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STATE OF CALIFORNIA — DEPARTMENT OF FINANCE

ECONOMIC AND FISCAL IMPACT STATEMENT (REGULATIONS AND ORDERS)

STD. 399 (Rev. 10/2019)

ECONOMIC IMPACT STATEMENT

DEPARTMENT NAME	CONTACT PERSON	EMAIL ADDRESS	TELEPHONE NUMBER
California Fish and Game Commission	Dixie Van Allen	fgc@fgc.ca.gov	916 201-6201

DESCRIPTIVE TITLE FROM NOTICE REGISTER OR FORM 400	NOTICE FILE NUMBER
Amend Sec. 671, Title 14, CCR, Re: Add Invasive Mussels and Green Crab to List of Live Restricted Animals	Z

A. ESTIMATED PRIVATE SECTOR COST IMPACTS *Include calculations and assumptions in the rulemaking record.*

1. Check the appropriate box(es) below to indicate whether this regulation:

- [X] a. Impacts business and/or employees
- [X] b. Impacts small businesses
- [ ] c. Impacts jobs or occupations
- [ ] d. Impacts California competitiveness
- [ ] e. Imposes reporting requirements
- [ ] f. Imposes prescriptive instead of performance
- [X] g. Impacts individuals
- [ ] h. None of the above (Explain below):

If any box in Items 1 a through g is checked, complete this Economic Impact Statement.
If box in Item 1.h. is checked, complete the Fiscal Impact Statement as appropriate.

2. The California Fish and Game Commission (Agency/Department) estimates that the economic impact of this regulation (which includes the fiscal impact) is:

- [X] Below $10 million
- [ ] Between $10 and $25 million
- [ ] Between $25 and $50 million
- [ ] Over $50 million *[If the economic impact is over $50 million, agencies are required to submit a Standardized Regulatory Impact Assessment as specified in Government Code Section 11346.3(c)]*

3. Enter the total number of businesses impacted: 395

Describe the types of businesses (Include nonprofits): Commercial & container ships, water operators, ports, boat launches, academia

Enter the number or percentage of total businesses impacted that are small businesses: <5%

4. Enter the number of businesses that will be created: 0 eliminated: 0

Explain: The proposed regulation adds species to the list of live restricted animals, but does not prescribe any actions.

5. Indicate the geographic extent of impacts:
- [X] Statewide
- [ ] Local or regional (List areas):

6. Enter the number of jobs created: 0 and eliminated: 0

Describe the types of jobs or occupations impacted: Sta at inspection areas for ports, waterways, boat ramps, reservoirs, etc.

Will not a ect levels of employment, only add to existing inspections and need to be familiar with species added to the list of live restricted animals.

7. Will the regulation affect the ability of California businesses to compete with other states by making it more costly to produce goods or services here? [ ] YES [X] NO

If YES, explain briefly:

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STATE OF CALIFORNIA — DEPARTMENT OF FINANCE
ECONOMIC AND FISCAL IMPACT STATEMENT
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ECONOMIC IMPACT STATEMENT (CONTINUED)

B. ESTIMATED COSTS *Include calculations and assumptions in the rulemaking record.*

1. What are the total statewide dollar costs that businesses and individuals may incur to comply with this regulation over its lifetime? $ 0

   a. Initial costs for a small business: $ 0 Annual ongoing costs: $ 0 Years: 3

   b. Initial costs for a typical business: $ 0 Annual ongoing costs: $ 0 Years: 3

   c. Initial costs for an individual: $ 0 Annual ongoing costs: $ 0 Years: 3

   d. Describe other economic costs that may occur: None, the proposed regulation only adds species to the list of live restricted animals; it does not prescribe any actions to be taken that would cause businesses or individuals to directly or indirectly incur costs.

2. If multiple industries are impacted, enter the share of total costs for each industry: All industries are impacted in that they must abide by the list of live restricted animals; however, adding species to the list without prescribing actions, as this does, will not cause them to incur costs.

3. If the regulation imposes reporting requirements, enter the annual costs a typical business may incur to comply with these requirements. *Include the dollar costs to do programming, record keeping, reporting, and other paperwork, whether or not the paperwork must be submitted.* $ 0

4. Will this regulation directly impact housing costs? ☐ YES ☒ NO

   If YES, enter the annual dollar cost per housing unit: $

   Number of units:

5. Are there comparable Federal regulations? ☐ YES ☒ NO

   Explain the need for State regulation given the existence or absence of Federal regulations: There are no federal prohibitions for possessing or moving green crab or golden, Asian freshwater, or axe-head mussels. Restricting these species is necessary to protect the state's native wildlife and ag interests.

   Enter any additional costs to businesses and/or individuals that may be due to State - Federal differences: $ 0

C. ESTIMATED BENEFITS *Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*

1. Briefly summarize the benefits of the regulation, which may include among others, the health and welfare of California residents, worker safety and the State's environment: The proposed regulations will help prevent the introduction and/or translocation of the specified invasive species to water bodies in the state and beyond, thereby protecting native wildlife, agricultural interests of the state, and public health and safety. See Addendum.

2. Are the benefits the result of: ☒ specific statutory requirements, or ☐ goals developed by the agency based on broad statutory authority?

   Explain: Fish & Game Code Sec. 2120 empowers Commission to regulate importation, transportation & possession of wildlife

3. What are the total statewide benefits from this regulation over its lifetime? $ 0

4. Briefly describe any expansion of businesses currently doing business within the State of California that would result from this regulation: The proposed regulations only add species that are not of commercial value to the list of live restricted animals, and prescribes no actions. Adding the species does not impose any costs on businesses that would cause them to expand or contract existing operations.

D. ALTERNATIVES TO THE REGULATION *Include calculations and assumptions in the rulemaking record. Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*

1. List alternatives considered and describe them below. If no alternatives were considered, explain why not: Without the proposed changes, there would be no regulatory authority to help prevent introduction/translocation of these non-native invasive species to water bodies in the state.

   No alternative was identified that would be as e ective in protecting native wildlife and the agricultural interests of the state.

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ECONOMIC IMPACT STATEMENT (CONTINUED)

2. Summarize the total statewide costs and benefits from this regulation and each alternative considered:

Regulation: Benefit: $ 0 Cost: $ 0

Alternative 1: Benefit: $ 0 Cost: $ 0

Alternative 2: Benefit: $ _____ Cost: $ _____

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives: Neither the no-change alternative nor proposed regulation require businesses or individuals to take any actions or pay any fees, nor is there a direct economic benefit from adding species to the list of live restricted animals.

4. Rulemaking law requires agencies to consider performance standards as an alternative, if a regulation mandates the use of specific technologies or equipment, or prescribes specific actions or procedures. Were performance standards considered to lower compliance costs? ☐ YES ☒ NO

Explain: Performance standards were not considered because they would not have the same e ect as adding species to the list of live restricted animals.

E. MAJOR REGULATIONS *Include calculations and assumptions in the rulemaking record.*

California Environmental Protection Agency (Cal/EPA) boards, offices and departments are required to submit the following (per Health and Safety Code section 57005). Otherwise, skip to E4.

1. Will the estimated costs of this regulation to California business enterprises **exceed $10 million**? ☐ YES ☐ NO

If YES, complete E2. and E3
If NO, skip to E4

2. Briefly describe each alternative, or combination of alternatives, for which a cost-effectiveness analysis was performed:

Alternative 1: _____

Alternative 2: _____

(Attach additional pages for other alternatives)

3. For the regulation, and each alternative just described, enter the estimated total cost and overall cost-effectiveness ratio:

Regulation: Total Cost $ _____ Cost-effectiveness ratio: $ _____

Alternative 1: Total Cost $ _____ Cost-effectiveness ratio: $ _____

Alternative 2: Total Cost $ _____ Cost-effectiveness ratio: $ _____

4. Will the regulation subject to OAL review have an estimated economic impact to business enterprises and individuals located in or doing business in California exceeding $50 million in any 12-month period between the date the major regulation is estimated to be filed with the Secretary of State through12 months after the major regulation is estimated to be fully implemented?

☐ YES ☒ NO

If YES, agencies are required to submit a Standardized Regulatory Impact Assessment (SRIA) as specified in Government Code Section 11346.3(c) and to include the SRIA in the Initial Statement of Reasons.

5. Briefly describe the following:

The increase or decrease of investment in the State: None. Adding species to the list of live restricted animals does not necessitate any actions be taken by businesses that would change their level of investment within the state.

The incentive for innovation in products, materials or processes: None. Adding species to the list of live restricted animals does not create any incentives that would increase innovation, nor does it create any impediments to innovation.

The benefits of the regulations, including, but not limited to, benefits to the health, safety, and welfare of California residents, worker safety, and the state's environment and quality of life, among any other benefits identified by the agency: The proposed changes are sought to protect native wildlife and the agricultural interests of the state from invasive, non-native species.

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STATE OF CALIFORNIA — DEPARTMENT OF FINANCE
ECONOMIC AND FISCAL IMPACT STATEMENT
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FISCAL IMPACT STATEMENT

A. FISCAL EFFECT ON LOCAL GOVERNMENT *Indicate appropriate boxes 1 through 6 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

☐ 1. Additional expenditures in the current State Fiscal Year which are reimbursable by the State. (Approximate)
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

$ _____

☐ a. Funding provided in _____

Budget Act of _____ or Chapter _____, Statutes of _____

☐ b. Funding will be requested in the Governor's Budget Act of _____

Fiscal Year: _____

☐ 2. Additional expenditures in the current State Fiscal Year which are NOT reimbursable by the State. (Approximate)
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

$ _____

Check reason(s) this regulation is not reimbursable and provide the appropriate information:

☐ a. Implements the Federal mandate contained in _____

☐ b. Implements the court mandate set forth by the _____ Court.

Case of: _____ vs. _____

☐ c. Implements a mandate of the people of this State expressed in their approval of Proposition No. _____

Date of Election: _____

☐ d. Issued only in response to a specific request from affected local entity(s).

Local entity(s) affected: _____

_____

☐ e. Will be fully financed from the fees, revenue, etc. from: _____

Authorized by Section: _____ of the _____ Code;

☐ f. Provides for savings to each affected unit of local government which will, at a minimum, offset any additional costs to each;

☐ g. Creates, eliminates, or changes the penalty for a new crime or infraction contained in _____

☐ 3. Annual Savings. (approximate)

$ _____

☐ 4. No additional costs or savings. This regulation makes only technical, non-substantive or clarifying changes to current law regulations.

☒ 5. No fiscal impact exists. This regulation does not affect any local entity or program.

☐ 6. Other. Explain _____

_____

Print Form | Reset Form

Instructions and Code Citations:
SAM Section 6601-6616

STATE OF CALIFORNIA — DEPARTMENT OF FINANCE
ECONOMIC AND FISCAL IMPACT STATEMENT
(REGULATIONS AND ORDERS)
STD. 399 (Rev. 10/2019)

FISCAL IMPACT STATEMENT (CONTINUED)

B. FISCAL EFFECT ON STATE GOVERNMENT *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

☐ 1. Additional expenditures in the current State Fiscal Year. (Approximate)

$ _____

It is anticipated that State agencies will:

☐ a. Absorb these additional costs within their existing budgets and resources.

☐ b. Increase the currently authorized budget level for the _____ Fiscal Year

☐ 2. Savings in the current State Fiscal Year. (Approximate)

$ _____

☒ 3. No fiscal impact exists. This regulation does not affect any State agency or program.

☐ 4. Other. Explain _____

C. FISCAL EFFECT ON FEDERAL FUNDING OF STATE PROGRAMS *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

☐ 1. Additional expenditures in the current State Fiscal Year. (Approximate)

$ _____

☐ 2. Savings in the current State Fiscal Year. (Approximate)

$ _____

☒ 3. No fiscal impact exists. This regulation does not affect any federally funded State agency or program.

☐ 4. Other. Explain _____

FISCAL OFFICER SIGNATURE	DATE
DocuSigned by: Matthew Dyson 97936A803229469...	8/7/2025

The signature attests that the agency has completed the STD. 399 according to the instructions in SAM sections 6601-6616, and understands the impacts of the proposed rulemaking. State boards, offices, or departments not under an Agency Secretary must have the form signed by the highest ranking official in the organization.

AGENCY SECRETARY	DATE
Melissa A. Miller-Henson Bryan Cash 8/8/2025	08/05/2025

Finance approval and signature is required when SAM sections 6601-6616 require completion of Fiscal Impact Statement in the STD. 399.

DEPARTMENT OF FINANCE PROGRAM BUDGET MANAGER	DATE

STD. 399 Addendum

Amend Section 671, Title 14, California Code of Regulations, to Add Invasive Non-Native Mussels (Golden, Pond and Axe-Head) and Green Crab to the List of Live Animals Restricted from Importation, Transportation and Possession

Background

Current regulations in Section 671 contain the list of restricted species that are unlawful for any person to import, transport, or possess except as authorized in a permit issued by the Department. Under emergency regulatory authority, golden mussel (*Limnoperna fortunei*) was added to the list of restricted animals in December 2024 (Office of Administrative Law File Number 2024-1213-03E).

Consistent with California Fish and Game Code sections 2118 and 2120, the proposed amendments will use regular rulemaking authority to incorporate the previously adopted emergency provisions adding golden mussel (*Limnoperna fortunei*) to the restricted species list. The amendments will also add the following invasive, non-native species to the list of restricted animals: green crab (*Carcinus maenas*), other *Limnoperna genera*, pond mussel (*Sinanodonta);* and axe-head mussel (*Xenostrobus)* genera. This action prohibits the importation, transportation, and possession of these species, which deters people from moving them to other waters of the state and allows for enforcement if they are found in someone's possession. Including these species on the list of restricted species also gives water managers operating mussel prevention programs the grounds to refuse watercraft from launching into waterways. Additionally, it allows law enforcement personnel to detain infested vessels or equipment until such time as they no longer pose a threat.

Golden Mussel (genus *Limnoperna*)

Golden mussel (*Limnoperna fortunei*) is an invasive, freshwater bivalve native to rivers and creeks of China and Southeast Asia; it was discovered in October 2024 by California Department of Water Resources (DWR) staff while conducting routine operations in the Port of Stockton. This was the first known occurrence of this highly invasive species in North America. Additional discoveries of golden mussel have occurred throughout the Delta and interconnected waters, including the lower reach of the San Joaquin River (San Joaquin County), and at several points in the California Aqueduct between Bethany Reservoir in Alameda County and Check 24 in Kings County. Without actions to prevent further spread, golden mussel is also likely to spread overland on trailered watercraft and equipment to nearby and distant fresh and brackish waters, including rivers, lakes, and reservoirs within California and the rest of North America.

In the invaded regions, golden mussel forms heavy encrustations and dense reef-like structures that can block municipal and industrial water supplies, agricultural irrigation, and power plant operations, necessitating ongoing biofouling removal. In most cases, the invaded range has expanded upstream from the point of introduction, and inland from ports, through local, human-mediated pathways. Within the invaded range, significant impacts resulting from the dense colonization of golden mussel on hard surfaces are widely documented.

The other five species in the genus *Limnoperna* (*L. siamensis, L. ngocngai, L. bogani, L. sambasensis,* and *L. taprobanensis*) are also considered a threat as they have the potential to be introduced to California and are expected to have similar negative impacts. While there are few records of invasions outside of their native ranges in Asia, especially Southeast Asia, available literature indicates that other species of *Limnoperna* mussels may have similar biology and impacts as golden mussel.

Pond Mussels (genus *Sinanodonta*)

Pond mussels (*Sinanodonta*), also known as Asian pond mussels, are freshwater unionid bivalves native to Eastern Asia. The 26 known species are fast-growing and can reach high densities. Species within *Sinanodonta* are difficult to morphologically identify, which has led to extensive misidentification. Additionally, the molecular taxonomy within the genus is still being resolved.

Three species (*S. woodiana, S. lauta,* and *S. pacifica*) have been documented as invasive outside of their native ranges and have spread rapidly to other countries. In the United States, *S. woodiana* was first detected in aquaculture ponds in New Jersey in 2010. While pond mussel has not yet been detected in California, its potential introduction, and anticipated impacts on native species and the environment, warrant prohibiting all species in the genus *Sinanodonta*.

Axe-Head Mussel (genus *Xenostrobus*)

The axe-head mussel (*Xenostrobus securis*) is a small, non-native, invasive, brackish-water bivalve; it was discovered on December 6, 2024 outside of its native ranges, in the lower reaches of Dominguez Channel, Los Angeles County (just north of the Port of Long Beach and Port of Los Angeles). The detection was made by California Department of Fish and Wildlife staff conducting early detection monitoring for invasive mussels, and is the first known occurrence of the invasive species in North America. High densities of axe-head mussel have since been detected at additional sites, including the lower reaches of San Gabriel River (February 21, 2025) and Los Angeles River (February 27, 2025). Axe-head mussels are believed to be introduced globally by ballast water discharge and biofouling on ships.

Axe-head mussel is one of eight extant species of the genus *Xenostrobus*. The other seven species (*X. pulex* and *X. securis* from Australia and New Zealand, *X. inconstans* from Australia, *X. balani*, *X. mangle* and *X. sambasensis* from Southeast Asia, *X. hepatica* from Fiji, and *X. atratus* from Japan, Korea, and China) are also considered a potential threat and are likely to have similar negative impacts to California if introduced. Without containment, they are likely to spread via watercraft in the marine environment to other estuaries, brackish waters, and ports of California, and beyond, and overland on trailered vessels and equipment in North America, which warrants prohibiting all species of the genus *Xenostrobus*.

Green Crab (*Carcinus maenas*)

Green crab, also known as European green crab, is a small, littoral crab native to the northeast Atlantic Ocean and northern Africa. An invasive, non-native species in California, it was first detected in the southern San Francisco Bay in 1989. Suspected of arriving in seaweed-wrapped bait shipments from Maine, green crab has since spread to numerous locations in California, including the Bay-Delta (San Francisco Bay and Sacramento-San Joaquin River Delta), Elkhorn Slough, Bolinas Lagoon, Bodega Bay, Tomales Bay, and Humboldt Bay. There

is concern that green crab could continue to expand its range in California, causing extensive damage to recreational and commercial fisheries, aquaculture, and sensitive native habitats.

Economic Impact Statement

Section A. Estimated Private Sector Cost Impacts

Question 4. Number of businesses that will be created or eliminated.

The proposed regulations are not expected to impact businesses, as adding species to the list of restricted animals in Section 671 does not necessitate any actions by businesses to comply, nor does it impose fees or fines upon them. Because these effects are economically neutral, it is not anticipated that any businesses will be created or eliminated as a result of these regulations.

***Question 6. Number of jobs that will be created or eliminated*.**

The proposed regulations are not expected to impact jobs, as adding species to the list of restricted animals in Section 671 does not necessitate any actions businesses to comply, nor does it impose fees or fines upon them. Because these effects are economically neutral, it is not anticipated that any businesses will need to adjust their workforces in either a positive or negative way as a result of these regulations.

Section B. Estimated Costs

Question 1. What are the total statewide dollar costs that businesses and individuals may incur to comply with this regulation over its lifetime?

$0.

The proposed regulations are not expected to create cost impacts for businesses or individuals, as adding a species to the list of restricted animals in Section 671 does not necessitate any actions by businesses or individuals to comply, nor does it impose fees or fines upon them.

Section C. Estimated Benefits

Question 1. Briefly summarize the benefits of the regulation.

The California State Legislature declared that some wild animals are a threat to native wildlife or the agricultural interests of the state and that some wild animals are a threat to public health and safety. It is the legislature's intention that the importation, transportation and possession of wild animals be regulated to protect the native wildlife and agricultural interests of the state against damage from the existence at large of certain wild animals and to protect health and safety in this state. The proposed regulations will help to prevent the introduction and/or translocation of non-native invasive species to waterbodies in the state and beyond, thereby protecting native wildlife, the agricultural interests of the state and public health and safety.

Question 3. What are the total statewide benefits from this regulation over its lifetime?

$0

The proposed regulations are not expected to directly create economic benefits for businesses or individuals, as adding species to the list of restricted animals in Section 671 does not

necessitate any actions by businesses or individuals to comply. The benefits to the native wildlife and the agricultural interests of the state will come indirectly as waterways, boat ramp operators, port authorities, etc. react to the inclusion of these species on the list of live restricted animals, but the regulations themselves do not prescribe that these entities take any actions

Outlook

671 Restricted Species Email in Lieu of PSOR

From McKim, Emily
Date Mon 9/15/2025 3:49 PM
To Cornman, Ari; Ashcraft, Susan; Fonbuena, Sherrie; Van Allen, Dixie
Cc Volkoff, Martha; Mitchell, Karen; Alminas, Ona

Good Afternoon,
The Department of Fish and Wildlife submits this email to notify the California Fish and Game Commission that there have been no substantive comments received, amendments to the proposed regulatory text, or additional information gathered for the proposed 671 Restricted Species/Golden Mussel Certificate of Compliance rulemaking since the notice of the Initial Statement of Reason. We have received two comment letters in support for the regulation proposal. Therefore, this email is submitted in lieu of a Pre-Adoption Statement of Reasons.

Please let me know if there are any questions.

Emily McKim (she/her)
Regulatory Scientist
Regulations Unit, California Department of Fish and Wildlife
715 P Street, 17th Floor
Sacramento, CA 95814

DWR

Proposal To Add Restricted Animals

Green Crab Species *Carcinus maenas*

Mussel Genera *Limnoperna, Sinanodonta, and Xenostrobus*

PRESENTATION TO THE CALIFORNIA FISH AND GAME COMMISSION

August 13, 2025 | Thomas Jensen
California Department of Fish and Wildlife | Invasive Species Program

“Detrimental Animals”

CCR Title 14 sec. 671(b)

“Those species listed because they pose a threat to native wildlife, the agriculture interests of the state or to public health or safety are termed ‘detrimental animals’ and are designated by the letter ‘D’.”

“invasive species” are non-native detrimental animals

DWR

Green Crab (*Carcinus maenas*)

- Marine and estuarine crustacean
- Native to northeast Atlantic Ocean and northern Africa
- Generalist diet that includes eelgrass, crustaceans, marine worms, and mollusks
- First detected in California in 1989; since documented between Oregon border and Morro Bay

Impacts: predate on farmed bivalves, native species, and prey of native fisheries; degrade sensitive habitats

Carcinus maenas, D. Hazerli
Creative Commons Zero, Public Domain Dedication

Green Crab Regulatory History

- July 2017 – Commission received petition to list as an invasive species
- The Department evaluated the petition and concluded green crab pose a threat to native species, aquaculture, and recreational and commercial fishing
- April 2018 – Commission granted the petition for consideration for a future rulemaking

Carcinus maenas carrying eggs, Josh Boe
Creative Commons Attribution 4.0

Genus *Limnoperna*

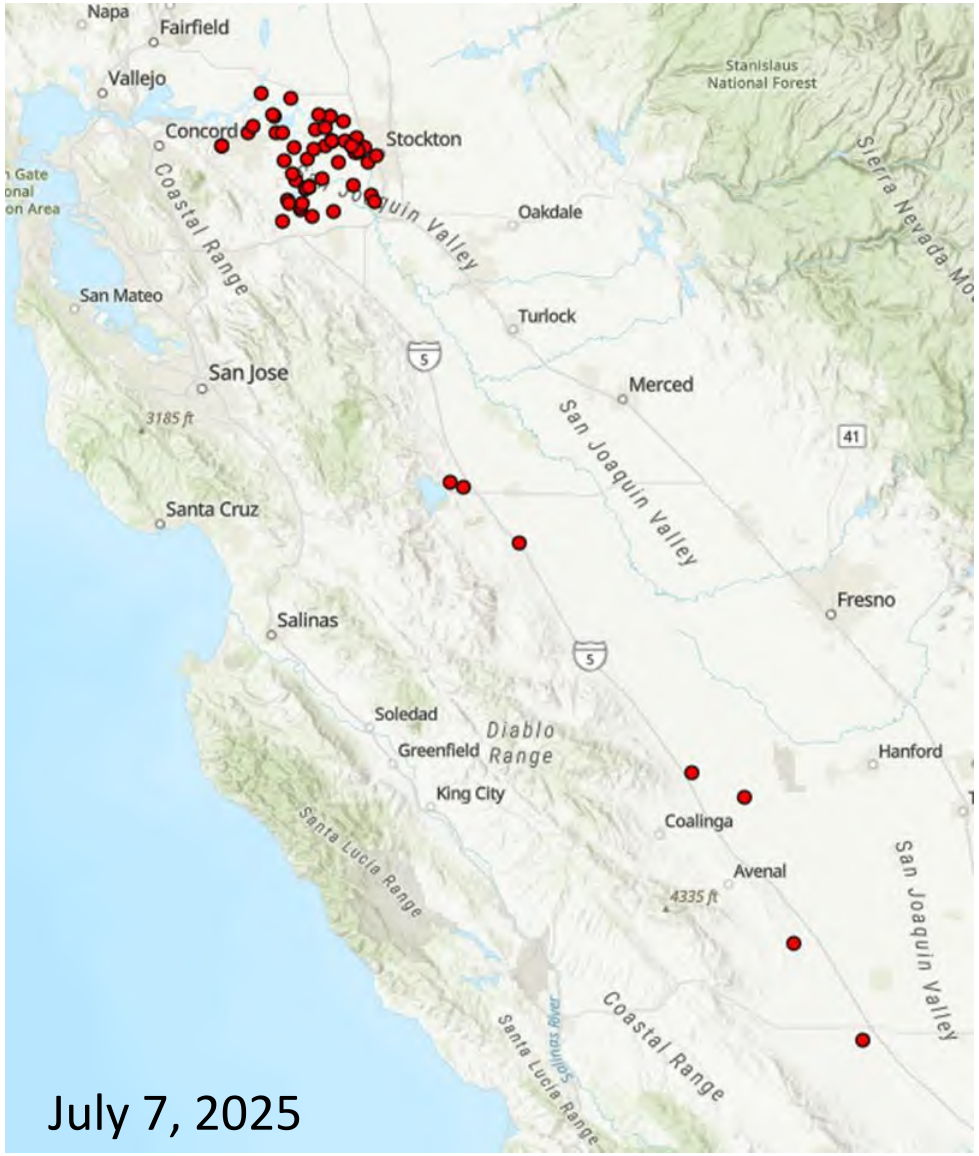
- Fresh and brackish-water bivalve
- Native to rivers and creeks of China and South-East Asia
- Six species
- Golden mussel (*L. fortunei*) detected in the Sacramento – San Joaquin Delta in October 2024
- Widespread in the Delta and spreading south via the state and federal water projects

Impacts: Mass biofouling of water conveyances and watercraft; alter food webs affecting native and game species; diminished water quality

Limnoperna fortunei, Boltovskoy,

Limnoperna fortunei Regulatory History

- December 2024 – Commission approved emergency addition to Title 14 sec. 671
- April 2025 – Commission readopted emergency listing for additional 90 days
- June 2025 – Commission readopted emergency listing for additional 90 days



Genus *Sinanodonta*

- Freshwater benthic bivalve
- Native to eastern Asia; China and eastern Russia, Japan and Korea
- 26 species
- Not known to be in California
- Detected in New Jersey in 2010

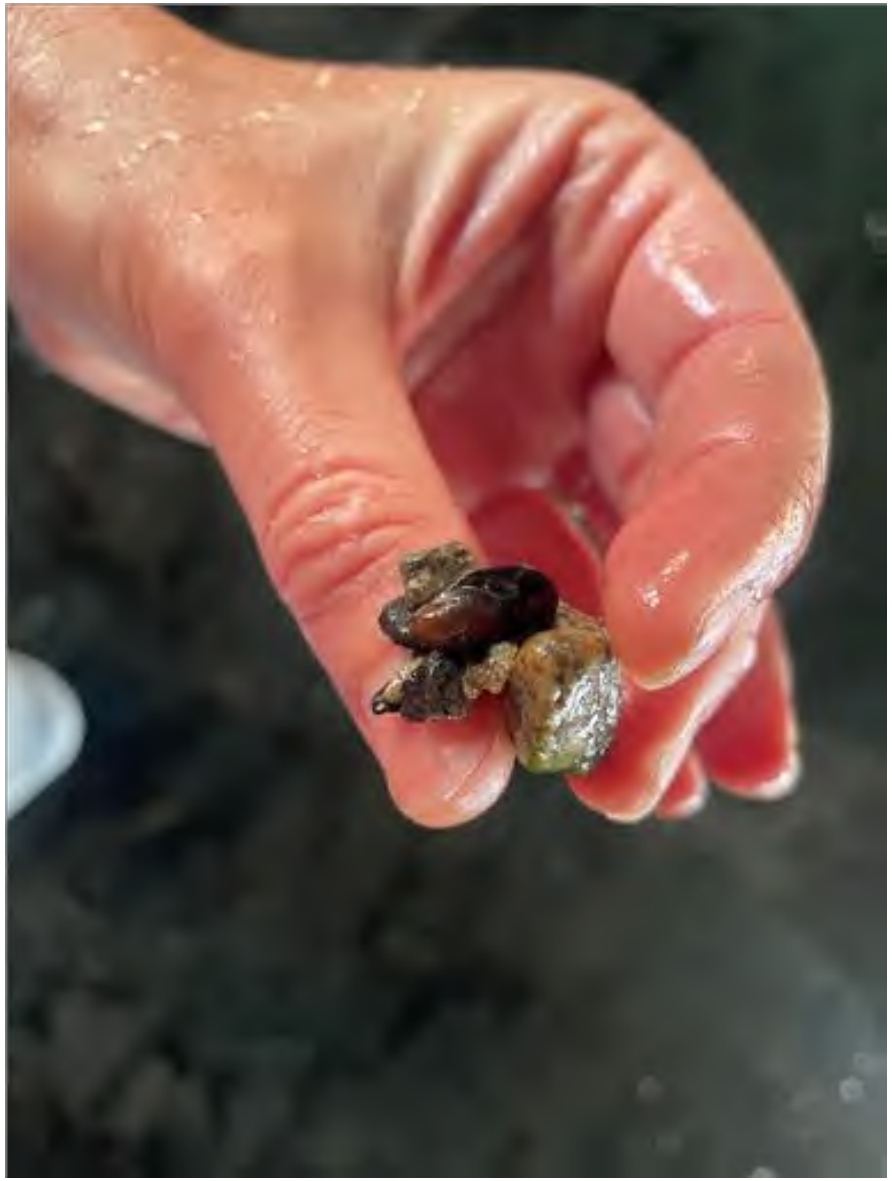
Impacts: Dense populations outcompete native unionid mussels, alter benthic habitat and nutrient cycling

Sinanodonta woodiana; Chinese pond mussel, Eastern Asiatic freshwater clam or swan-mussel, Holger Krisp,

Genus *Xenostrobus*

- Brackish-water bivalve
- Native to Australia, New Zealand, Southeast Asia, Japan, Korea, China
- Eight species
- Axe-head mussel (*X. securis*) discovered in canal north of the Port of Los Angeles December 2024 and nearby at the mouth of the San Gabriel River

Impacts: Biofoul moored watercraft, pipes and drains, and natural and constructed surfaces



CDFW

Rulemaking Timeline

- Emergency listing for golden mussel expires December 14, 2025
- August 13-14, 2025 – Commission notice hearing for (1) species and (3) genera for addition Title 14 sec. 671
- October 8-9, 2025 – Commission Adoption Hearing
- November 2025 – File Final Rulemaking with OAL with an effective date of mid-December 2025

DWR

Benefits of Rulemaking

Restricting importation, transportation and possession:

- Provides authority to act on vectors moving these species overland, enabling protection of uninfested waters
- Provides water managers legal basis for denying launch of watercraft infested with detrimental invasive species
- Prohibits intentional trade
- Listing genera is inclusive of all species that pose the the same threat

DWR

Questions | Contact

Thomas Jensen

Invasive Species Program

Fisheries Branch

invasives@wildlife.ca.gov

DWR

TAHOE REGIONAL PLANNING AGENCY

Mail
PO Box 5310
Stateline, NV 89449-5310

Location
128 Market Street
Stateline, NV 89449

Contact
Phone: 775-588-4547
Fax: 775-588-4527
www.trpa.gov

August 13, 2025

California Fish and Game Commission
P.O. Box 944209
Sacramento, CA 94244-2090

E-mailed to: fgc@fgc.ca.gov

RE: Support for Notice of Intent to Amend Section 671 — Addition of Golden Mussels to Restricted Species List

Dear President Silva and Members of the Commission,

The Tahoe Regional Planning Agency (TRPA) is in strong support of the Commission's proposed action to authorize publication of the notice of intent to amend Section 671 of Title 14, California Code of Regulations. The proposed amendment to the restricted species list — including invasive non-native mussels of the Limnoperna (golden mussels), Sinanodonta (pond mussels), and Xenostrobus (axe-head mussels) genera, along with the green crab (Carcinus maenas) — is an urgently needed step to safeguard California's waters.

TRPA's mission is to lead the cooperative effort to preserve, restore, and enhance the unique natural and human environment of the Lake Tahoe Region. Prevention and control of aquatic invasive species is a top priority of Lake Tahoe's Environmental Improvement Program, recognized nationally for its collaborative bi-state approach. Since its inception in 2008, Lake Tahoe's watercraft inspection program has prevented the introduction of devastating species like quagga and zebra mussels with the support of many partners including the California Department of Fish and Wildlife. In response to the threat from golden mussels, TRPA enhanced Lake Tahoe's prevention program to require decontamination of all visiting motorized watercraft. Amending the restricted species list will strengthen these protections while safeguarding public access and the lake's unparalleled recreation experience.

Aquatic invasive species like the golden mussel pose a persistent threat to Lake Tahoe's fragile ecosystem that could irreversibly disrupt native biodiversity, degrade Lake Tahoe's famed water clarity, and severely impact the region's $5 billion recreation and tourist-based economy. Golden mussels, recently identified for the first time in North America, are spreading rapidly and your action can help slow that spread and reduce their effects statewide. Prevention remains the only viable strategy for managing invasive mussels, as eradication is nearly impossible once populations are established.

We commend the Commission and the California Department of Fish and Wildlife for considering this important step in our collective response to emerging invasive species threats.

Sincerely,

Julie W. Regan

Julie W. Regan
Executive Director